

# A Phronetic-Discursive Assessment of Amager Bakke Megaproject



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# Synopsis

## Title:

A Phronetic-Discursive Assessment of Amager Bakke Megaproject

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A major problem associated with the planning of megaprojects is the high level of misinformation about costs (and benefits) and the high risks such misinformation generates. And Decision makers often doubt the utility and necessity of such projects. This study seeks to investigate a controversial state-ofthe-art megaproject, Amager Bakke, which assumed to be successful by many in the beginning, but it turned upside-down. This project has had political and industrial attention at the highest levels both regionally and nationally, including ministers and industry. After the analysis two discourse coalitions were identified that display opposing storylines. By Investigating the interplay between storylines the dominant discourses were identified, power-relations become unlocked, planning styles were distinguished, tension points were revealed and the consequences of the argumentations recognized. The aim of this study was to make a contribution to megaprojects planning and decision making in the face of risk and uncertainty.

#### Preface

This report has been written in connection to the 10th semester requirements for the Master's programme Urban, Energy and Environmental Planning / Urban Planning and Management, at the school of architecture, design and planning at Aalborg University. The research and writing was conducted from 1 February until 2 June 2017. The literature references are cited according to the Harvard reference style. All translations from Danish to English have been undertaken by the author, therefore any errors and omissions are entirely my own.

I would like to extend a heart-felt thanks to my supervisor, Søren Løkke, who has unfailingly provided constructive and incisive critical feedback and suggestions without which this report would have suffered greatly. Any remaining errors or omissions are entirely my own. "It is the greatest happiness of the greatest number that is the measure of right and wrong [...] and the interest of the community is the sum of interests of the several members who compose it," Jeremy Bentham (1776 AD).

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### 1. Introduction

I see cities as complex systems in which all its components are interconnected and interrelated. One mistake can easily disturb the order of the system. Cities are like an open laboratory for planners. The world of planning is a place of "wicked problems" (Rittel & Webber, 1973). It is filled with "inherent uncertainty, complexity and inevitable normativity" (Hartmann, 2012, p. 242). The kinds of problems- societal problems- that planners deal with are "never solved" problems, and at best they are only re-solved over and over again (Rittel & Webber, 1973)

The kind of problem (phenomenon) which this project is dealing with is a complex wasteto-energy facility- Amager Bakke located in Copenhagen,Denamrk- which attempted to integrate industry, energy and urban environment. As mentioned by B&W Vøllund, "Copenhagen's state of the art plant sets new standards for environmental performance, energy production and waste treatment." "In year 2017, Copenhageners and visitors will witness a waste-to-energy plant that is not only one of the best performing European plants in terms of energy efficiency, waste treatment capacity, and environmental consideration, but also in terms of visual rendition and local acceptance" (Babcock & Wilcox Vølund, 2013). Therefore, this case embraces all three dimensions of urban, environment and energy planning. Even though the management of waste is not typically connected to design, such as architecture and landscape architecture, it certainly shapes the places we inhabit. The major focus of this project is on the planning aspect and decision making process of the case.

Over the next twenty years, an unprecedented level of investment in energy infrastructure is prognosticated. Increasing energy demand cultivates the development of energy infrastructures (power plants, electrical grid, pipelines, energy storage etc.). Part of this energy demand will be fulfilled by "small- scale projects" (e.g. gas turbine or rooftop photovoltaic plants) while some will be fulfilled by large-scale and complex "megaprojects" due to their capital nature; these include long pipelines, nuclear power plants, large wind farms etc. (Brookes & Locatelli, 2015).

Even in the so-called "de-regulated markets", decisions concerned with energy investment are generally guided by government policy rather than market signals (Hoz, et al., 2014; Locatelli, et al., 2015). Interventions related to investments in new power plants, thereupon, represent a highly significant and influential tool of any government's energy policy and, in many cases, a substantive level of public expenditure (Brookes & Locatelli, 2015, p. 57)

Amager Bakke is not just a simple piece of infrastructure, it's a megaproject. Megaprojects are complex products which are the product of complex decision-making processes in which many stakeholders play a role in developing or operating them. and Most of them are result of public investment, that form a large share of public budgets. This indicates the high political profile of megaprojects (Priemus & Van Wee, 2013). They are generally great symbols of modern engineering and for politicians an important political legacy, therefore there is a great focus on exclusiveness and uniqueness in megaproject planning (Giezen, 2012).

Megaprojects are conceived as an important part of corporate and public life, but with varying reputation. A megaproject may well be a technological success, but a financial failure, and many are, such as Sydney's Lane Cove Tunnel, the high-speed rail connections at the Stockholm and Oslo Airports, the Copenhagen Metro etc. (Flyvbjerg, 2014). Samset (2013) states that in the media unsuccessful cases get more publicity than the successful ones based on two criteria; cost overrun and delay in times.

Megaprojects have recently transformed from being a fringe spectacular activity, mainly reserved for rich, developed nations, into a global multi-trillion-dollar business with no end in sight, which affects all aspects of our lives, from our electricity bill to how we shop, what we do on the Internet to how we commute (Flyvbjerg, 2014).

Enormous investments as well as large and diverse risks and impacts of megaprojects give rise to a higher interest in the planning and management of megaprojects among researchers (Flyvbjerg, et al., 2003; Gellert & Lynch, 2003; Fainstein, 2009). Through this highly costly area of business and government it is extremely important to choose the most fitting projects and get their economic, social, and environmental impacts right (Flyvbjerg, et al., 2003).

It is a growing trend in which the wealth of whole cities and nations may be affected by a single megaproject failure (Flyvbjerg, 2014) therefore it is important to improve viability of such projects.

Decision making on megaprojects is complex, uncertainty and risks play a significant role through this complexity (Priemus, et al., 2013). Usually risks in megaprojects are quantified in risk analysis. However, the personal disposition of the assessor affects the risk assessment. Likewise, reality risks can be approached as a social construct. Different actors perceive risks differently (Solvic, 1987; Freudenburg, 1988)

Deciding whether or not build a megaproject is extremely difficult. Decision makers are caught between interests, and their evaluation is based upon disputable objectives and information that contains a high level of uncertainty (Leijten, 2013). Decision makers often doubt the utility and necessity of such projects. Formulated guidelines as well as techniques and instruments have been used in order to provide the information that is intended to rationalize decisions and make the decision making less complex and less controversial (Leijten, 2013). Despite all developments and improvements still we are witnessing megaprojects failure.

The reason why it is interesting to investigate a megaproject is that these are known for their long period of planning and decision-making, recurring controversies and a multitude of moments of stagnation and adaptations. They are, in other words, an extreme case of planning and decision-making in the face of complexity (Marrewijk, et al., 2008).

Amager Bakke is a puzzling case. On the one hand it is a great example of Integrating a complex state-of-the-art industrial technology with high green sustainability aspects into urban environment, and on the other hand it is a disappointing example of a power plant with overcapacity. This project has had political and industrial attention at the highest levels both regionally and nationally, including ministers and industry (Løkke et al., 2017). Most importantly, it is a project that, there were many contradictory discourses about whether to build it or not, and it is an artefact that considered successful by many in the beginning, but it turned upside-down.

This thesis tempts to make a contribution to the study of megaprojects' planning and decision- making in the face of complexity and uncertainty. Previous to the problem

formulation, it is important to understand the framing and the context in which the studied project is situated. Therefore, in the following part a brief literature review on megaprojects, history of Danish waste management, and Denmark's future energy supply are presented.

### 1.1. Megaprojects

#### What are Megaprojects?

Acording to Gellert and Lynch (2003, p.16) "Megaprojects can be divided analytically into four types: (i) infrastructure (e.g., ports, railroads, urban water and sewer systems); (ii) extraction (e.g. minerals, oil, and gas); (iii) production (e.g. industrial tree plantations, export processing zones, and manufacturing parks); and (iv) consumption (e.g. massive tourist installations, malls, theme parks, and real estate developments)".

There is not a single accepted definition of megaproject through literature and this phenomenon could be defined variously based upon different criteria that one might choose. For instance, from the investment perspective, megaprojects have budgets above \$1 billion with a high level of innovation and complexity (Locatelli, et al., 2014; Van Wee, 2007; Merrow, 2011; Flyvbjerg, 2004). Considering the operations phase, megaprojects are projects having long-term and far-reaching effects on their environment (Orueta & Fainstein, 2008; Ren & Weinstein, 2013; Warrack, 1993).

Warrack (1993, p.13) also introduces ten main features of megaprojects: "joint sponsors, public policy, uniqueness, indivisibility, time lags, remoteness, social environ- mental impact, market impact, risk, and financing difficulty".

Bent Flyvbjerg, the former professor in the Department of Development and Planning at Aalborg University, has provided the first detailed examination of the phenomenon of megaprojects.<sup>1</sup> He defines Megaprojects<sup>2</sup> 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. (Flyvbjerg, 2014)

<sup>&</sup>lt;sup>1</sup> Megaprojects and Risk: An Anatomy of Ambition

<sup>&</sup>lt;sup>2</sup> Scale is dependent on the context in which the specific project is being planned or built. for instance, a \$500 million project in a medium-sized town may be considered "mega," whereas this would not necessarily be the case for a similar-sized project in a major world city

In this research for defining an energy megaproject, I have adopted the definition presented by (Brookes & Locatelli, 2015, p. 58)" an energy infrastructure with a budget of at least \$1 billion with a high level of innovation and complexity with, in operation, a long-term and far reaching effects on their environment".

Over the past few decades, there has been an increasing interest in megaprojects from both policy and academic literature. Of particular concern to both had been the seemingly structural time and cost overrun associated with these projects.

Megaprojects are designed to ambitiously change the structure of society, as opposed to smaller and more conventional projects that they fit into pre-existing structures and do not attempt to modify these. Megaprojects, therefore, are not just magnified versions of smaller projects. Megaprojects are a completely different animal in terms of their level of aspiration, lead times, complexity, and stakeholder involvement. Consequently, they are also a very different type of project to manage (Flyvbjerg, 2014).

Risks are significant, Cost overruns of 50% are common, overruns of 100% not uncommon. Similarly, substantial benefit shortfalls trouble many megaprojects. Finally, regional development effects and environmental impacts often turn out very differently from what proponents promised. Cost overruns combined with benefit shortfalls spell trouble. But an interesting paradox exists for megaprojects: More and bigger megaprojects are being planned and built despite their poor performance record in terms of costs and benefits (Flyvbjerg, 2009a).

In the book "Megaprojects and risk- an anatomy of ambition" the main reason for poor performance of megaprojects is defined" inadequate deliberation about risk and lack of accountability in the project decision making process." (Flyvbjerg, et al., 2003, p. 6). One of the suggested cures to this issue is to place risk and accountability much more centrally in decision making procedures.

#### Why Megaprojects are so popular?

Popularity of megaprojects is based upon four sublimes. First, Technological sublime, i.e. the rapture engineers and technologists get from building large and innovative projects, second, Political sublime, i.e. megaprojects are politically attractive because of the rapture politicians get from building monuments, and the visibility this generates within

the public and media, third, Economic driver, i.e. large projects have always assumed to be moneymaker and given the enormous budgets for megaprojects there are ample funds to go around for all, including contractors, engineers, architects etc. ,Forth, aesthetic sublime, i.e. the pleasure designers and people who appreciate good design get from looking at gigantic, iconic and beautiful building. All four sublimes are important drivers of the scale and frequency of megaprojects. (Flyvbjerg, 2004; Flyvbjerg, 2014). When the four sublimes are at play, the following characteristics of megaprojects are typically overlooked (Flyvbjerg, 2014). See table 1.1

Inherently risky	Due to long planning horizons and complex interfaces
Weak leadership	Often led by planners and managers without deep domain experience who keep changing throughout the long project cycles
Conflict of interest	Decision-making, planning, and management are typically involving multiple stakeholders, public and private, with conflicting interests
Uniqueness bias	non-standard technology and design
Lock-in	Over commitment to a certain project concept at an early stage contribute to leaving alternatives analysis weak or absent, and leading to escalated commitment in later stage
Rent-seeking	Due to the large sums of money involved
Variable scope or ambition level of project over time	Treating projects as if they exist largely in a deterministic Newtonian world of cause, effect, and control.
High risk delivery	Managers tend to treating projects as if they exist largely in a deterministic Newtonian world of cause, effect, and control.
Disregarding complexity	Unplanned events leaving budget and time contingencies inadequate.
Misinformation about costs, schedules, benefits, and risks	The result is cost overruns, delays, and benefit short- falls that undermine project viability during project implementation and operations.

Table 1.1 A summary and overview on typically overlooked charactristics of megaproject

#### Why Megaprojects frequently ended up with problems?

Although many researchers have provided invaluable researches on megaprojects but it is still not exactly clear what are the causes of megaproject success and failures. In an interview Flyvbjerg (2004) coins the term "disaster gene" in order to answer to this question. He explains that a "disaster gene" has been built into megaprojects and therefore they usually ended up with problems. "The disaster gene is the underestimation of costs and overestimation of benefits that is often built into projects at an early stage, when projects are first proposed."(Flyvbjerg, 2004, p.54)

Why this phenomenon is happening continuously?

Because of two major reasons. First, psychological, related to over-optimism (optimism bias) which has been proven as characteristic of human decision making and second, Strategic misrepresentation, which means strategically misrepresenting projects to get started.

There are two types of information: Subjective information; which comes from sources related to a stakeholder and objective information; which comes from unrelated parties. Apparently the most reliable information for decision making is objective, even though it can be used by stakeholders in a way to serve their interests. For instance, if there are multiple objective sources of information with diverging outcomes, stakeholders may select only information that is serving their own desire. The distinction between subjective and objective information is often not so clear (Leijten, 2013, p. 62). What is presented as reality by one set of experts is often " a social construct that can be deconstructed and and reconstructed by other experts" (Flyvbjerg, et al., 2003, p. 61).

Normally the period from the proposal of the initial idea to when the project is put into operation is very long. This long time period creates a problem which is lack of accountability. It means that the costs of a possible disaster do not fall on the people who made the decision rather the costs and criticism fall on other people who administrate it. No one wants to be responsible for the created disaster and it causes a diffusion of responsibility (Flyvbjerg, 2004).

#### Why risk should be an important theme in megaproject development?

Planners and decision makers who are involved in megaprojects have a certain way of thinking, there is a general trend of deterministic thinking – i.e. a dated way of thinking which is a matter of power- rather than stochastic Thinking. And again that is because of another syndrome called EGAP: Everything Goes According to Plan. When thinking in a deterministic fashion, you end up disregarding risk which is a major problem with megaprojects (Flyvbjerg, et al., 2003; Flyvbjerg, 2004).

A cure recommended here, when undertaking a feasibility study, is to substitute what is called the "MLD-principle" for the EGAP principle. 'MLD' standing for 'Most Likely development'.

By following the MLD principle, the roles of feasibility study and appraisal are redefined form the optimistic and unrealistic everything-goes-according-to plan estimation of project viability to the realistic and experienced-based assessment of the most likely development of the projects.

Carrying out MLD appraisals, the focus is on identifying the most likely risk and the most risky parts in a given project in order to reduce these risks, and if possible, drop those parts (Flyvbjerg, et al., 2003)

Appearing such a strange phenomenon which involves highly educated range of people -i.e. engineers, economists, and planners- arises two questions in mind.

Are these people uninformed or are they acting in a calculated manner? Flyvbjerg believes that they are not uninformed since he has been also trained as a planner himself and he trains planners. So calculation remains. What are the interests behind calculation? Who is interested in ignoring risk? Ignoring risk is ignoring a part of the total cost. The consequences of ignoring risks do not become clear until it is too late, so it is possible to ignore them and still get the project built.

#### Why we should improve thinking in terms of risk?

Thinking in terms of risk means thinking in terms of alternatives, and alternatives tend to problematize deterministic thinking. It promotes critical and reflexive thinking. Term of

risk couldn't be understood without understanding probability, and probability is an empirical concept.

For instance, if you think in terms of risk, simple cost-benefit thinking with one figure for costs and one for benefits, and a single cost-benefit ratio, is immediately undermined. Anybody thinking in a risk frame of mind would not accept one figure for a project. Each figure has a certain likelihood and you have to ask what is the likelihood that it will b be an-other figure. Risk analysis is about inquiring, thinking about other possible situations (Flyvbjerg, 2004).

The aim of this chapter was to highlight a number of typical features and problems associated with megaprojects in order to become familiar with the kind of phenomenon which is aimed to be studied in this project, Amager Bakke. In this part I will bring a brief review on Danish waste management, why incineration plants emerged and how Danes dealt with the waste in the beginning, and how perception of waste transformed over the past several decades.

# 1.2. A brief history of Danish waste management, from landfilling into incinerating

Denmark has a long tradition for incinerating waste. The first plant for incineration was established in 1903. This facility was built in Frederiksberg just next to Copenhagen, in connection with a new hospital. The incineration plant was first of all a practical solution to the fact that it was becoming more and more difficult to locate suitable locations for landfilling, but it was also an, at the time, innovative way of creating steam, hot water and electricity for the new hospital.

Concurrently with lacking space for landfilling sites, other larger cities followed the example of Frederiksberg, and in the beginning of the 20th century, district heating became quite widespread. In 1973 the oil crisis gave incineration a big push forwards. Followed by this crisis, the Danish ministry for energy was established in 1976 and one of its biggest tasks was to make Denmark independent of oil. This was the same time where the infrastructure for district heating was being established in most towns in Denmark. In 1997 the ban on landfilling of all waste which is suitable for recycling or incineration was introduced and this gave the incineration sector yet another push.

Today, the Danish technology for incineration has proven to be both efficient and reliable. Current Danish waste incineration plants produce approx. 20 % of all district heating and 5 % of the electricity consumption, and the plants' total energy outcome (sale) is close to 95 %. The slag (bottom ash after waste incineration) is primarily used for road construction purposes after a curing and metal-removing stage, while the flue gas cleaning product is landfilled at controlled sites for hazardous wastes ((DAKOFA, u.d.)

Figure 1.1 illustrates the timeline of Danish waste management and its transition. In the beginning waste was primarily perceived as a health problem hence, it was deposited in landfills outside the big cities. As in1960-70s environmental concerns started growing,

waste increasingly came to be seen as an environmental problem needed to be tackled, not only because of its threat to human health, but also in order to protect the environment.



Figure 1.1 The history of Danish waste management- (Copenhagen Cleantech Cluster (CCC), 2012, p. 9)

In 1973 the increased focus on the environment led Denmark to become the first country in the world to pass an environmental protection law. From the beginning of the 1980s, when there was little room left for landfills, waste incineration and composting became the primary waste treatment solutions, diverting the waste away from landfills, while at the same time contributing to the production of heat and electricity. (Copenhagen Cleantech Cluster (CCC), 2012). In this part I briefly describe the future energy strategies of Denmark. In this way I would be able to investigate to what extent Amager Bakke as an energy supplier is fitting into Denmark's future energy strategies.

# **1.3.** A brief review on Denmark's future energy supply

Diminishing global resources, increasing global demand for energy and significant additional costs, make the Danish government to initiating a transition and look for future proof solutions in order to secure the future energy demand of its citizens (The Danish Government, 2011).

Denmark has a very ambitious plan for its future climate and energy which is aiming toward a renewable-based energy system by 2050. But this demands new technologies, architectures, markets, actors and business models to be developed (Smart Energy Networks, 2015). In other words, in order to accomplish this transition there is a need for a holistic change in the whole system.

In a report provided by Smart Networks (2015) a smart energy system is defined as follows;

"A smart energy system is a cost-effective, sustainable and secure energy system in which renewable energy production, infrastructures and consumption are integrated and coordinated through energy services, active users and enabling technologies.

such impacts follow from specific planning actions; they need to understand casual relationships between actions and impact." (Smart Energy Networks, 2015, p. 2)

The overall aim of the energy system is to provide energy services, requested by the customers, in a reliable, sustainable and cost efficient way. And this can be only achieved in a sustainable way through combinations of high energy efficiencies, integration of the various energy infrastructures (electricity, gas, heating and cooling), flexible energy consumption in buildings, industry and transport, and smart system operation (Smart Energy Networks, 2015, p. 2).

Figure 1.2 illustrates the Danish government's energy policy mile stones up to 2050.

# The government's energy policy milestones up to 2050

In order to secure 100 pct. renewable energy in 2050 the government has several energy policy milestones in the years 2020, 2030 and 2035. These milestones are each a step in the right direction, securing progress towards 2050.

2	0	2	0	

# 2030

2035

# 2050

Half of the traditional consumptions of electricity is covered by wind power

Coal is phased out from Danish power plants Oil burners phased out

The electricity and heat supply covered by renewable energy

All energy supply - elec-

tricity, heat, industry and transport - is covered by renewable energy

The initiatives up to 2020 will result in a greenhouse gas reduction by 35 pct. in relation to 1990.

Figure 1.2. Energy policy milestones (The Danish Government, 2011, p. 5)

#### Heat supply in future Energy systems

In future the heat supply from CHP plants and waste incineration plants will decrease, because due to an increased focus on recycling and resource efficiency, more combustible waste fractions are sorted out of the municipal waste for reuse or recycling. In a 100% renewable energy system, the fractions of fossil based materials like plastics will also be replaced or sorted out. The remaining waste fractions for incineration will be available in lower quantities and are expected to have a lower calorific value (Mathiesen, et al., 2015).

Thereby, other sources will have to be introduced. Renewable heat, such as heat pumps, solar thermal, and geothermal, along with a range of surplus heat supplies, such as fuel synthesis plants and biomass gasifiers, will be able to provide heat to district heating networks in the future (Mathiesen, et al., 2015).

Figure 1.3 illustrates the development of district heating systems from 1st generation to 4th generation. "The 4th Generation District Heating (4GDH) system is defined as a coherent technological and institutional concept, which by means of smart thermal grids assists the appropriate development of sustainable energy systems. 4GDH systems provide the heat supply of low-energy buildings with low grid losses in a way in which the use of low-temperature heat sources is integrated with the operation of smart energy



systems. The concept involves the development of an institutional and organisational framework to facilitate suitable cost and motivation structures." (4DH, 2015).

*Figure 1.3. Development of district heating in the past (1st and 2nd Generation), current district heating technology (3rd Generation), and the future of district heating (4th Generation) (4DH, 2015).* 

3G / 1980-2020

4G / 2020-2050

2G / 1930-1980

1G / 1880-1930

# 1.4. Amager Bakke's Birth Story and Research Question

In 2009 a proposal for constructing a new incineration plant –as a substitution of the 47year-old plant- was submitted to the municipality of Copenhagen. (Martini & sandøe, 2017). Because at one hand the old incineration plant, Amagerforbrænding, was failed to meet standards and requirements for occupational health and safety, climate and environment. And at the other hand, keeping the old plant was very costly (Scheibye, 2013).

As it has been mentioned in their application "Amagerforbrænding wishes to modernize the existing waste incineration plant by replacing the existing plant with a modern, flexible plant with high energy efficiency and high environmental profile and with futureproof processing capacity. Amagerforbrænding plans to establish two new oven lines, each with a processing capacity of 35 tons of waste per hour (560.000 ton annually)." (Rambøll, 2011)

According to ARC<sup>3</sup> "With the construction of Amager Bakke<sup>4</sup>, we are creating a multifunctional, social and cultural waste-to-energy plant with an emphasis on sustainability. The residents of the capital area will get, aside from more green energy, access to first class architecture and a new modern recreational opportunity – and Copenhagen will have a new green landmark." (ARC, 2017)

"... we build one of the world's most environmentally friendly and efficient facilities that will raise the bar both in Denmark and internationally. At the new plant, we will exploit 25% more energy from the waste. NOx emissions will be reduced significantly and there will be a reduction in CO2 emissions by more 100,000 tons." (ARC, 2017).

In 2010 Energy Agency rejected the proposal because of the assessment of Danish Environmental Protection Agency about unsure amount of future waste due to possible

<sup>&</sup>lt;sup>3</sup> Politicians in the five owner municipalities concluded an agreement, which entailed the name change from Amagerforbrænding to Amager Ressourcecenter (ARC).

<sup>&</sup>lt;sup>4</sup> The name of the new incineration plant

changes in the framework conditions (Københavns Kommune, 2011c).

In 2010 a consultant report- Ea Energianalyse- commissioned by the Copenhagen municipality questioned the durability of the prerequisites that make Amagerforbrænding's large new combustion plant a good business case. Which is primarily about uncertainties about future waste volumes, growth of heat prices in the future and the consequences of the Copenhagen municipality's plan to become CO2 neutral in 2025, which means that burning of plastic in the waste is no longer an option (Wittrup, 2012; Københavns Kommune, 2011b).

Hans Henrik Linboe, civil engineer from Ea Energianalyse argued that "According to our analyses there are all kinds of reasons to postpone the decision. There are so many uncertainties right now that "According to our analyses there are all kinds of reasons to postpone the decision. There are so many uncertainties right now that only small shifts in waste amounts or prices before the large plant stops being a good investment," (Wittrup, 2012).

And recently in a TV broadcast he explains that "A couple of years earlier we had a financial crisis and one of the immediate results of the financial crisis was that the quantities of waste were dived very quickly. And we stood two years later and could only see that the fall would continue and what was in the prognosis of Amagerforbrænding, was a continuous increase and we were struggling to match," (DR1, 2017).

In January 2011, before the municipalities had approved the economy of the project (DR1, 2017), ARC made an official press release and informed that among 36 danish and international architect firms, world-renowned Danish architectural firm- BIG-Bjarke Ingels Group- won the competition and they will build Amagerforbrænding's new waste treatment center (Amagerforbrænding, 2011).

In November 2011 in a letter from Miljøstyrelsen it was highlighted that there is a great deal of uncertainty associated with industry waste which approximately constitute 50% of the combustion waste, since as a result of EU rules it can be freely exported. It means that Danish companies can choose to export the waste to be incinerated, but the waste cannot be burned in a danish plant. Therefore there is an uncertain situation about the waste basis (Miljøstyrelsen, 2011). It has been also mentioned that there is more emphasis on prevention and increased recycling of waste and consequently reducing the amount

of combustion (Miljøstyrelsen, 2011).

In December 2011 Copenhagen municipality rejects to grant 3.9 mia.kroner loan guarantee for construction of the new incineration plant. Because they believed that the expansion of combustion will damage the climate and the environment (Andersen, 2011), the plant is too big, and there are EU requirements for National Waste Prevention Programs from December 2013, which will also reduce waste volumes (Miljøstyrelsen, 2011). Thereby, according to the EU and government plans waste should be recycled more and incinerated less in the future (Martini & Sandøe, 2017), and there will be no need for more waste incineration capacity in the next 5-8 years (Københavns Kommune, 2011a), therefore there is no need for such a huge plant. Accordingly, the Danish Environmental Protection Agency and the Danish Energy Agency have authorized Amagerforbrænding to incinerate a maximum of 440,000 tons of waste yearly (Københavns Kommune, 2011c).

Considering all these uncertainties and controversies, Copenhagen municipality asked ARC to calculate what a smaller plant would cost, but they didn't. In a TV broadcast called "Spild af dine penge" a journalist asked the former director of ARC about "Why you didn't give the same calculations on a much smaller plant than what you gave on the Amager Bakke? "The director answers that "Well, it is a big analysis work that has to be started. And with the assessments we made it didn't make sense at all to use 10 mio.kr. on analyzing what to build. We had spent 80 mio.kr on just defining the project...," (DR1, 2017).

Finally after several months of deliberation and negotiation, despite all uncertainties and critics toward the project, in September 2012 the five owner municipalities reach a consensus and the project got approval with an investment of 42,2<sup>5</sup> mio.kr. public money. The five owners gave ARC permission to build the plant with the large furnace that was destined to burn 56,000 tons of waste a year, but ARC was permitted to burn 400,000 tons of waste and also they undertake to increase recycling and separation of plastic from the

<sup>&</sup>lt;sup>5</sup> Københavns Kommune 30,8 mio. kr., Frederiksberg Kommune 5,5 mio. kr., Hvidovre Kommune 2,8 mio. kr., Tårnby Kommune 2,3 mio. kr., Dragør Kommune 0,8 mio. kr. (ARC, 2017).

waste, and they were not allowed to import waste (Bredsdorff, 2012; DR1, 2017).

While Amager Bakke was under construction there were still an ongoing discussion in media specifically among academia and experts about whether it was a reasonable decision to build the plant or not.

Brian Vad Mathiesen, energy expert form Aalborg university, who was invited to a meeting at ARC in March 2012 (Energy Supply, 2016), was one of the people who had a critical view toward the project. In September 2012 in an interview with Ingeniøren he argued that "...At a waste facility, the efficiency is low and at the same time, combustion plants are an old-fashioned technology without the flexibility that an energy system in a renewable energy system requires," (Bredsdorff & Wittrup, 2012).

He also articulated that "There are lots of other and better ways to get district heating on - such as heat pumps, geothermal, solar and heat storage. The technology that you invest in so much money today must be geared to 50 percent wind power and be able to connect quickly to wind power," (Bredsdorff & Wittrup, 2012).

In 2015, while the plant was under construction a set of updated forecasts from ARC showed that there is not enough waste in the capital to fill the new furnaces, the fact that has been mentioned many times by several experts was realized (Bredsdorff & Wittrup, 2015). And currently the five owner municipalities deliver just 350.000 tons of waste to ARC, i.e. 200.000 tons lesser than the overall capacity of the plant (Bredsdorff & Wittrup, 2015; DR1, 2017). Thereby, due to the lack of waste the plant will face shortage of 1,9 mio.kr. during its lifetime if it couldn't be able to run in full capacity. Therefore, notwithstanding the provisions of the contract, Copenhagen municipality have allowed ARC to import waste in order to rescue the economy of the plant (Wittrup, 2016; Martini & Sandøe, 2016)

Brian Vad Mathiesen mentions that "The decision to make overcapacity, beyond what was allowed for it, is a *"conscious risk"* that has been taken on behalf of the citizens," (DR1, 2017). The construction of project will be finished in spring 2017.

Considering what happened makes it extremely interesting to have a closer and deeper look into the case to see what is Amager Bakke actually? Why this happened and how could it be possible to push forward such a problematic project until its realization stage?

The overall approach for investigating this case study is Phronetic approach which is discussed in detail in chapter 2. In order to clarify values, interests, and power relations which are the principal tasks in phronetic research I need to answer four value-rational questions that this research approach embodied. And this led me to define the main research question of this research:

How have dominant discourses in the planning and decision making process of Amager Bakke, in a context with high political interest, affect the decision of constructing the plant and with what consequences?

The analysis of the main research question is guided by two sub-research questions:

(1) What metaphors, storylines and discourse coalitions emerged during the planning and decision making process of Amager Bakke?

#### (2) What does the interplay between storylines reveal?

Answering the main research question by the help of the two sub-questions enables me to elucidate elucidating where we are, where we want to go, and what is desirable according to diverse sets of values and interests and add to society's capacity for valuerational deliberation and action which is the ultimate goal of phronetic research. See the overall scheme of the research questions in figure 1.4.

#### 1) Where are we going with Amager Bakke?

- (2) Who gains and who loses, and by which mechanisms of power?
- (3) Is this development desirable?
- (4) What, if anything, should we do about it?



Figure 1.4. The overall scheme of the research questions.

<sup>&</sup>lt;sup>6</sup> The "we" referred to in questions (1) and (4) consists of those planning researchers asking the questions and those who share the concerns of the researchers, including people in the community or planning organization under study," (Flyvbjerg, 2004, p. 290)

### 2. Research design

This chapter outlines the methodological considerations as well as ontological and epistemological underpinnings of the research. And there will be a detailed explanation on Phronetic Social science and Phronetic Planning Research as the main foundation of this thesis.

#### 2.1. Methodological considerations

Planning research is political in the sense that there are multiple ways of framing and conceptualizing any piece of research. Framing is necessarily a selective process. A researcher cannot study every aspect of a problem, therefore a specific aspect has to be selected in order to focus on (Farthing, 2016).

This thesis has been conducted by inspiring from principles of a fairly new theory of social science, phronetic, introduced by Flyvbjerg (2001) combined with Hajer's (1995) discourse approach, which attempts to study a socio-political phenomenon from a discursive perspective in the frame of phronetic. Phronetic social science is ultimately about producing knowledge that can challenge power not in theory but in ways that inform real efforts to produce change" and that "improves the ability of those people to make informed decisions about critical issues confronting them," (Schram, 2012, p. 20).

Phronetic approach is based on a contemporary interpretation of the classical Greek concept phronesis, variously translated as practical judgment, practical wisdom, common sense, or prudence (Flyvbjerg, 2001; Flyvbjerg, 2004). Flyvbjeg argues that in modern society, conflict and power are phenomena constitutive of social and political inquiry, therefore he developed the classic concept of phronesis to include the issues of power. Flyvbjerg attempted to show the necessity of an in-depth understanding of context and the ability to make political judgements within these contexts (Simmons, 2012, p. 246)

Phronesis allows for a rich reflection that is much needed in complex projects and discourse analysis is an appropriate tool to explore multiple themes and analyse complex and collaborative processes which involved a variety of stakeholders with different values and worldviews.

To me what is interesting is to find the answer to the question "why did the stakeholders of Amager Bakke project acted in the way they did?" the answer is because of the way they interpreted the situation they were in, and the way they respond to that situation in what they way saw as an appropriate manner (Farthing, 2016).

The world views or the 'assumptive worlds' of policy actors, decision-makers, and planners themselves are also key to understanding the nature of policies which are developed in an area (Mills & Young, 1981). "planning teams are often not just embedded in particular policy communities, but they are also tied together both by particular traditions that provides ways of thinking about issues and priorities, and by particular practices of manipulating knowledge (Healy, 2007, pp. 242-3)

The case story itself is the result. I have incorporated discourse approach in order to not just figuring out what the world views of policy actors, decision-makers and planners are, not just describing what is in their minds, and why they therefore act in the way they do but why they think in the way they do in the first place. I need to explore the perceptions and interpretations of the people being involved in order to understand the case. As Innes (1990:32) argues "in social world we cannot know what a phenomenon is until we know what is believed to be".

To sum it up, in order to understand the case, there is a need for understanding the course of actions, and in order to understand the course of actions, there is a need for understanding individuals, and for investigating individuals I have chosen to focus on language, which is the central element of discourse and a constitutive component of the social world. What is interesting here is to unfold the tension between "what is said and what is happened."

The primary interest in discourse is in how language is used in certain contexts and what specific version of the world is being produced by describing and analysing things in a specific way in the context (Rapley, 2007). As May (2001:183) mentions "documents are now viewed as media through which social power is expressed."

In line with the phronetic approach, the theoretical perspectives in this thesis are applied ex post. The epistemological basis of the present study is social constructionist which claims that social and public phenomena are creatively, flexibly and contextually constructed by social actors in interaction (Merino & Bello, 2014, p. 3). Social constructivism has often been seen in reaction to positivism and associated with postmodernist perspectives, recognizing the socially constructed character of knowledge about reality and criticizing rational and technocratic stances drastically basing research on quantitative methods. Social constructivism relies thus primarily on qualitative and interpretative approach, recognizing the significant importance of language, meanings and experiences in framing the complex, multiple and relational facets of reality (Alvesson & Sköldberg, 2009).

For the point of view on discourses I am agree with what J.L. Austin and John Searle have argued, linguistic utterances like 'I promise' are not just words, signs or even assertions, but acts that carry a certain force and consequence (relationship between discourse, power and practice)(2012, 172). Innes (1990) emphasizes the need to understand or make sense of social life and she argues that research does not give us direct access to social reality but only to interpretations of reality which reflect the concepts and frames of reference which we employ.

According to Laclau et al. (1985) and Howarth et al. (2000), from the discourse analysis perspective, reality cannot be directly presented, rather it is made through discourse which constructs a 'representation' of reality. Language then has the capacity to 'make' politics, 'create' signs and symbols that shift power balances, 'render' events harmless or, on the contrary, 'create' political conflicts.

The case study builds on document analysis of background reports, political documents, press releases, newspaper articles available from 2009-2017. Much qualitative research treats language as a mechanism for understanding the social world. Therefore, documents are analysed for the version of the world which is produced in a specific context (Farthing, 2016).

## 2.2. The Ontological & epistemological underpinnings

"Knowledge, and the ways of discovering it, is not static, but forever changing." (Grix, 2002, p. 177). There exists multiple views of the world and different ways of gathering knowledge (Grix, 2002). In social research and urban planning, the growing importance of philosophical concerns and arguments has contributed to a diversity of views amongst researchers about certain fundamental assumptions underpinning research (Farthing, 2016).

"Claims and assumptions that are made about the nature of social reality, claims about what exists, what it looks like, what units make it up and how these units interact with each other." (ontology); and "claims about how what is assumed to exist can be known." (epistemology) (Blaikie, 2000, p. 8), underlying this thesis will be accounted for together with a short overview of the main trends in theory use within planning schools.

Today there is disillusion about the role of research in supporting policy development amongst many planning academics. The hoped-for certainty of knowledge that underpinned the rational model of planning has been displaced by significant uncertainty about the values of research findings. "one response has been to turn away from expert research and to encourage dialogue amongst groups with different perspectives on policy (the communicative theory of planning) to create a shared social construction of the world. Another response has been to argue that since we have no way of independently assessing what the nature of reality is , all we can do is little more than provide our own descriptions and accounts without any claims about the relationships of these two reality, "(Farthing, 2016, p. 32).

Flyvbjerg (2001) argues that most schools of planning thought (including the communicative paradigm) that influence the nature of planning research should be refused (Farthing, 2016, p. 186). "the taken-for-granted 'truths 'about the rational and progressive promise of planning should be replaced by an analysis of these truths and of planning in term of power," (Flyvbjerg, 2004: 284). He encourages planning researchers to engage with values, to question value rationality, in other words, to conduct phronetic research.

In this project, the over-all research approach has not been guided by any specific theory. Instead, this thesis is based on the phronetic approach to social sciences which is explained in more details in part 2.4.

Phronetic social science has its own ontological and epistemological commitments that are based on an understanding of the distinctive nature of the subject matter of the social sciences. Phronesis is based on praxis-oriented epistemology, theory of science and methodology which makes it particularly effective in dealing with issues of power in collaborative work (Flyvbjerg et al., 2012, p.6). Flyvbjerg's separation of episteme from phronesis elucidates the ideal role of social science as aiding in deliberation about values and goals rather than achieving universal prediction, it is less useful to try to separate epistemology from practical reasoning (p.239)

It is important to acknowledge that phronetic social science doesn't adhere to specific methods of data collection and it is open to relying on a diversity of data collection methods which could promote change in regards with the studied issues. In this regard, phronetic social science provides an opportunity to move beyond the debates between positivists and interpretivists about how to organize social science in terms of method (Schram, 2012, p.20).

In this project, I have chosen to work with qualitative data analysis, and I have employed discourse analysis. Discourse analysis is the study of language in use (Wetherell, et al., 2001), and it could be placed in the interpretative or social constructionist tradition in social sciences (Guba & S. Lincoln, 1989). "This tradition has anti-essentialist ontology; it assumes the existence of multiple, socially constructed realities instead of a single reality, governed by immutable natural laws," (Hajer et al., 2005, p.176).

This approach takes a critical stance towards 'truth' and highlights the communications through which knowledge is exchanged. Since the reality is seen as socially constructed, the analysis of meaning becomes central. Taking into consideration the reality as a socially constructed phenomenon give prominence to specific situational logic (Hajer et al., 2005).

## 2.3. Phronetic Social Science

The origins, development and principles of phronetic research and what this has meant for the analysis of social practices is described in the following part. Social practices as the object of study provides a promising path for future studies in order to find effective policy solutions.

#### Origins and the development of phronetic social science

Social scientific research approaches can be divided broadly into three main types (1) problem driven, (2) theory driven, and (3) data driven (Landman, et al., 2016a). Problem driven research pinpoints a set of questions based on a perceived paradox or puzzle that emerges from an initial set of observations made about the social world. it is largely inductive and can involve a variety of different quantitative and qualitative methods.

Theory-driven research starts with a number of assumptions about human behaviour, beliefs, or preferences. This approach is deductive and moves from assumptions about how the world works to a set of testable propositions that are either confirmed or rejected through empirical analysis. Methods for data collection and analysis within this approach are typically quantitative.

Data driven research is based on the collection (original or existing sources) of data from which patterns, problems and puzzles emerge that are then used to develop a research programme. it is inductive, but its premise is the large-scale collection and accumulation of data, which then serve as the basis for a wide range of tests and the emergence of 'event regularities' that are in need of explanation (Landman, et al., 2016a).

"Alongside the development of these three approaches and somewhat tangential to the many methods wars that have flared up between practitioners of each, the idea of a 'phonetic social science' has emerged and is now gaining ground" (Landman, et al., 2016a, p. 2). Flyvbjerg presents a way for social sciences to let go of the idea of imitating methodologies of the natural science and instead embracing the fact that social phenomena are fundamentally different.

"Articulated initially by Bent Flyvbjerg (2001) in Making Social Science Matter the phronetic approach recaptures the Aristotelian notion of phronesis, or 'practical wisdom' and advocates for a social science whose reflexive analysis of values and power in the social world gives new meaning to the impact of research on policy and practice, " (Landman, et al., 2016a, pp. 2-3). "Phronesis begins with turning away from ideas and theory, and depending instead on the observation of practice that can be trusted," (Frank, 2012, p. 49).

As against theory-driven, data driven and some problem-driven research in the social sciences, phronetic social science offers a fundamental challenge to the desire and attempt within the social sciences to mimic the natural sciences.

Considering the inherit nature of human activity and knowledge as contextual, it is impossible to reach the ideal of complete and predictive theory that is the requirement in the classical definition of ideal science (Flyvbjerg 2001, pp. 38- 49). Only through recognising and embracing the contextual nature of the social science and relinquishing predictive theory building as its main purpose, social science can become relevant again and contribute to better practices in the social and political spheres (Flyvbjerg 2001, pp. 166-168).

Social and political sciences should solve problems experienced in practice and provide society with concrete empirical analyses and ethical guidance, increasing its capacity for "value- rational deliberation and action" (Flyvbjerg 2001, p. 167).

As Schram (2012, p.20) mentioned; "phronetic social science is ultimately about producing knowledge that can challenge power not in theory but in ways that inform real efforts to produce change" and that "improves the ability of those people to make informed decisions about critical issues confronting them."

Within political sciences other scholars have also shared the ideas of pluralism and reformation of social sciences, but what sets Flyvbjerg and the phronetic approach apart is the "solid intellectual justification" of the effort and the thorough review of social science research already applying these ideas (Schram, 2006, p. 27).

#### 2.4. Phronetic planning research

Phronetic planning research is an approach to the study of planning based on a contemporary interpretation of the classical Greek concept phronesis (Flyvbjerg, 2004). Phronesis goes beyond analytical, scientific knowledge (episteme) and technical knowledge or know how (techne), it concerns values, what Vickers (1995) calls "the art of judgement". In other words decisions made in the manner of a virtuoso social actor.

Aristotle saw phronesis as the most important of the intellectual virtues, because it is that activity by which instrumental rationality (means-rationality )is balanced by value rationality(substantive rationality), and because such balance is vital to the sustained happiness of the citizens in a society (Flyvbjerg, 2001, p.4; Flyvbjerg, 2004, p.285).

In Aristotle's words phronesis is an intellectual virtue that is "reasoned, and capable of action with regard to things that are good or bad for man" (Flyvbjerg, 2004, p. 284). Indeed, other planning reseach has focused on practical judgement and to some extent contain elements of phronesis in this sense (Forester, 1993, pp. xi, 32;1999; Throgmorton, 1996), but the major difference between such reseacrh and phronetic approach lies in the concept of power (Flyvbjerg, 2004).

Previous research with a focus on practical judgement has been steeped in the communicative, Habermasian tradition, but this tradition is not the most effective for thinking about power in planning (Flyvbjerg, 1998). The point of departure in phronetic planning research is on the work of scholars whom concern power (Machiavelli, Nietzsche, and Foucault), not thinkers who focus on communicative rationality.

Whereas episteme and techne have modern connotations('epistemology' and 'epistemic'; 'technology' and 'technical') and are prominent in contemporary society; phronesis, which Aristotle and other founders of the Western tradition saw as a necessary condition of successful social organization, and as its most important prerequisite, has no modern synonymous. This indicates the degree to which scientific and instrumental rationality dominate modern thinking and language (Flyvbjerg, 2004).

Episteme is equivalent to the naturalist perception of science as generalizable and context-independent knowledge. Planning research practiced as episteme contains strong elements of positivism and rationalism, which aims for universality and searching

for generic truths or laws about planning. Nowadys, this type of research is considered as a long-dead phenomenon of the 1960s and 1970s by many planning researches.

The objective of techne is application of technical knowledge and skills based upon a pragmatic instrumental rationality, what Foucault calls "a practical rationality governed by a conscious goal" (Foucault, 1984b, p. 255) Planning research practiced as techne would be a type of consulting aspire to arrive to better planning by means of instrumental rationality, where 'better' is defined with regard to the values and goals of those who employ the consultants, sometimes in negotiation with the latter.

"Phronesis is a sense or a tacit skill for doing the ethically practical rather than a kind of science." (Flyvbjerg, 2004, p. 287) The person who possess practical wisdom (phronimos) has knowledge of how to manage in each particular circumstance that can never be equated with or reduced to knowledge of general truths about managing. Planning research practiced as phronesis would be concerned with deliberation about (including questioning of) values and interests in planning (Flyvbjerg, 2004). To sum it up, the three intellectual virtues of Aristotle can be categorized as follows;

Aristotle's intellectual virtues	Characteristics	Basis	Contemporary equivalence	Planning research focus
Epistme	Scientific knowledge; Universal, invariable, context-independent.	Based on general analytical rationality	Epistemology Epistemic	Uncovering universal truths and laws about planning
Techne	Craft/Art; Pragmatic, variable, context-dependent. Oriented toward pro- duction	Based on practical instrumental rationality governed by a conscious goal	Technique technical technology	Better planning by means of instrumental rationality, where 'better' is defined in terms of the values and goals of those who employ the consultants
Phronesis	Ethics; Deliberation about values with reference to praxis. Pragmatic, variable, context-dependent. Oriented toward action.	Based on practical value-rationality.	No analogous contemporary term	Deliberation about (including questioning of) values and interests in planning

Figure 2.1 Intellectual virtues of Aristotle

#### Four Phronetic Questions and power at the core of analysis

The primary task of the researcher who conducts phronetic research is to answer the following value-rational questions and "use their studies not merely as a mirror for planning to reflect on its values, but also as the nose, eyes, and ears of planning, in order to sense where things may be going next and what, if anything, to do about it (Flyvbjerg, 2004, p. 290). Question (2), the power question, is what differentiate, specifically, contemporary from classical phronesis, and phronetic planning research from other types of such research.

## Key Questions of Phronetic Planning Research

- (1) Where are we going with planning?
- (2) Who gains and who loses, and by which mechanisms of power?
- (3) Is this development desirable?
- (4) What, if anything, should we do about it?

Figure 2.2 Phronetic Questions

As mentioned by Flyvbejerg (1998b) in order to provide an adequate understanding of planning, analysis of planning should be placed within the context of power. Rationality without power is meaningless. With four questions of phronetic planning research and with the focus on value-rationality, phronetic planning researchers relate explicitly to a primary context of values and power.

Combining the best of a Nietzschean/Foucauldian interpretation of power with the best of a Weberian/ Dahlian one, the analysis of power is guided by a conception of power that can be characterized by six features; See table 2.1 (Flyvbjerg, 2004, p. 293). This format of power serves as a possible and productive point of departure for dealing with questions of power in doing phronesis.
**Power** is viewed **as productive and positive**, and not only as restrictive and negative.

**Power** is viewed **as a dense net of omnipresent relations**, and not only as being localized in 'centers,' organizations, and institutions or as an entity one can 'possess.'

**Power** is viewed **as ultra-dynamic**; power is not merely something one appropriates, it is also something one re-appropriates and exercises in a constant back-and-forth movement within the relationships of strength, tactics, and strategies inside of which one exists.

Knowledge and power, truth and power, rationality and power are analytically

inseparable from each other; power produces knowledge and knowledge producespower.

The central question is how power is exercised, and not merely who has power and why they have it; the focus is on process in addition to structure.

Power is studied with a point of departure in small questions, 'flat and empirical', not only, nor even primarily, with a point of departure in 'big questions' (Foucault, 1982, p. 217). Careful analysis of the power dynamics of specific practices is a core concern.

### Table 2.1 Conception of power in Phronetic Research

Several scholars have noted that the development of social research is inhibited by the fact that researchers tend to work with problems in which the answer to the question: 'If you are wrong about this, who will notice?' is all too often: 'Nobody'. (Flyvbjerg,2004). Baily (1992, p. 50) calls the outcome of such research "so what' results'. Phronetic planning researchers become part of the context they studied by getting close to the community, organization or phenomenon that they study during the phases of data

analysis, feedback, and publication of results. Combined with focus on relations of values and power, this strategy typically creates interest in the research by parties outside the research community who will test and evaluate the research in various ways. In this way they go beyond the limits of social research which is labeled as "so what' results'.

#### Un-packing the four phronetic questions

Phronetic planning researchers are highly aware of the importance of perspective, and see no neutral ground, no 'view from nowhere', for their work. The phronetic questions can be answered in different ways for a given area of interest, depending on perspective. And since there is always an urban politics in a democracy, the praxis that works in one situation does not necessarily work in another (Flyvbjerg, 2002).

First of all, I want to study Amager Bakke deep to see what all these dualities mean. I am curious to see what is this project actually? By focusing deep on little things and trying to zoom in and getting closer to the case as much as possible I would be able to unfold the case. Based on these findings I would be able to answer the first phronetic question, "Where are we going with Amagar bakke?"

In order to answer the second question, I will investigate the interplay between rationality and power in defining winners and losers to see based on which analytical rationalities different views of reality is being constructed. In other words, based on a single case how many interpretations of reality exist. The interpretation, which has the stronger power base, becomes Amager Bakke's truth, understood as the actually realized physical, economic, ecological, and social reality. In this manner power defines a reality, which based upon that I would be able to define winners and loosers. As mentioned by Flyvbjerg (2002) while power produces rationality and rationality produces power, their relationship is asymmetrical. Power has a clear tendency to dominate rationality in the dynamic and overlapping relationship between the two.

The third value-rational question is whether the situation depicted the first two questions is desirable. So, based upon the results of the two first phronetic questions, I will be able to provide an answer to the third question, whether Amager Bakke, is desirable or not?

The answer to the last question is to deliberately and actively feed the results of research

back into the political, administrative, and social processes that has been studied, which Flyvbjerg (2002,16) has called "research on the body."

So, to sum it up the overall aim of this analysis (research), is to unlock the hidden power relations, which are largely constructed through language. I am particularly interested to see (if)certain world views have been marginalized by power interplays and with what consequences?

It should be acknowledged that no one has enough wisdom and experience to give complete answers to the four questions. Phronetic researchers attempt to develop their partial answers to the questions. These answers would be input to the ongoing dialogue about the problems, possibilities, and risks that planning face and how things may be done differently.

#### Conducting Phronetic Research

As I mentioned before Phronetic approach is an approach which is open to every quantitative or qualitative methods that can best answer the four aforementioned valuerational questions (Flyvbjerg, 2004). I have chosen to focus on discourse approach which in my point of view in Amager Bakke case make it possible to answer those questions and analyse the case.

The research presented in this thesis applied a case study methodology which is a prime investigative method of phronetic research; phronesis being concerned with the particular and context (Flyvbjerg, 2001).

The use of case studies has often been criticized by traditional researchers who systematically undermine the credibility and use of the method. Flyvbjerg(2006) has addressed this critique, which he attributes to misunderstandings of the nature of case studies and the aim of social science and inquiry in general (Flyvbjerg, 2006)

Case studies are usually seen as less valuable because of; (i) generalizable, theoretical (context-independent) knowledge is seen as more valuable, (ii) individual cases cannot be generalised, (iii) case studies are mainly useful to generate hypotheses for later testing in larger samples, (iv) case studies contain bias towards verification, and (v) it is difficult to summarize and generalise findings from individual case studies.

Generalisations and predictive theory cannot capture the understanding of social acting and practices and thus cannot be the sole task of social science. In the study of human affairs it is important to provide concrete and context-dependent knowledge as it better represents the detailed reality of the human experience. Bias towards verification is present in all research methods and case studies nonetheless, but in-depth analysis has the capacity for falsification and discovery of "black swans". The five misunderstandings and Flyvbjerg's arguments is summarized in the following table. See table 2.2.

Misunderstandings	Flyvbjerg's arguments
General, theoretical knowledge is more valuable than concrete, practical knowledge	Predictive theories and universals cannot be formed in the study of human affairs. Context dependent knowledge is more variable in these fields
One cannot generalize on the basis of an individual case	Generalization is possible in lots of cases. Formal generalization is overrated, "force of example" in undervalued.
Case studies are useful in generating hypotheses, not as much in hypothesis testing and theory building	Case studies are useful for both generating and testing hypotheses, and can go beyond these two goals
Case studies contain biases towards verification	Other methods of inquiry also have similar biases, case studies might actually have a bias towards falsification
Often difficult to summarize case studies and develop propositions and theories from them	Summarizing is difficult exactly because of the properties of the reality studied. Case studies should be left as narratives and should not be summarized

#### Table 2.2 Five misunderstandings about case studies and Flyvbjer's arguments

Considering this project's exploratory and transformative goals, a phronetic approach is a proper choice for two reasons. First, it provided a framework that particularly emphasizes real world concerns and Second, a phronetic approach emphasizes the importance of grounding an understanding of social phenomena in social and historical context.

There are different ways of seeing and interpreting a given phenomenon. The researcher doing qualitative methods is interested in the subjective meaning of a phenomenon. Accordingly, I want to discover different world views and interpretations around the case study- Amager Bakke- to figure out which interpretation is more dominant, or in other words constitutes the reality. In order to do this, considering the nature of the phenomena, I have chosen to incorporate discourse analysis which in my point of view is the best way to dig through the case (or answer the questions). The aim of this analysis is not only to identify discourses but also to assess their influence, in other words discursive approach used to understand different arguments and phronetic to evaluate them.

#### Validity

Validity, for the phronetic researcher, is defined in the conventional manner as wellgrounded evidence and arguments, and the procedures for ensuring validity are no different in phronetic planning research than in other parts of the social sciences (Flyvbjerg, 2004, p. 292). Phronetic planning researchers do not claim final, indisputable objectivity for their validity claims, however, nor do they believe other social scientists can make such claims. They also do not claim their analyses to be outside power, because no analysis is (Flyvbjerg, 2004)

Phronetic planning researchers withstand the view that any one among a number of interpretations lacks value because it is 'merely' an interpretation. As stressed by Nehamas (1985, p. 63), the focal point is the establishment of a better option, where 'better' is defined in the customary manner as based on better sets of validity claims, accepted or rejected by the community of scholars. If a new interpretation appears to better explain a given phenomenon, that new interpretation will replace former, until it, too, is replaced by a new and yet better interpretation. This is typically a continuing process, not one that terminates with 'the right answer' (Flyvbjerg 2001, pp. 130-131; Flyvbjerg, 2004, p.292).

### 3. Methods

### 3.1. Case study

The problems in cities are problems of organized complexity, and there are no general theories or procedures that can be used reliably to solve this kind of problems (Weaver, 1948). Thus, the study of individual cases becomes a necessary and sufficient instrument for the study of social problems (Flyvbjerg, 2006), since no accurate predictions can be done about human behaviour and traditional science is not able to understand the consequences of changes in urban environment. Moreover, a greater number of deeply analysed good cases could contribute to make research about social sciences -and in this case about urban planning - a more effective discipline (Flyvbjerg, 2006).

This research will be primarily based on a single explorative case study. This project aims for investigating the decision making process of a controversial megaproject – Amager Bakke- in order to gain an insight on how 'risk' as a critical factor in megaprojects development, has been handled. I am particularly interested to see how diverse competing world views can co-exist side by side in particular socio-political contexts, and with what consequences, and how the unsettled nature of the context effects the process. In this way, the phenomenon being studied becomes intertwined with the research context. It is argued that the case study is a particularly useful research approach in cases where the boundaries between the phenomenon and research context are not clearly evident, as it investigates a contemporary phenomenon within its real-life context (Yin, 2003). This makes the case study a specifically relevant research approach not only to this master thesis, but to research within the field of planning more generally, as planning practices always should be understood within the particular context in which they are embedded.

There are varied understandings of the term case study both in the planning literature, and more generally in social sciences (Farthing, 2016). The literature on case study research generally differentiates between two ways of designing case studies, which characterize two extreme end points for case study design. At one end, the case study intended to test clearly formulated hypotheses, typically developed from a literature review. Yin (2003) emphasizes the importance of a well-structured case study design in

which propositions and units of analysis are laid out before empirical evidence is 'gathered'. The other end holds a grounded theory approach to case studies. In this case, the aim is to construct theory from empirical research, rather than theory testing. While the theory testing approach highlights how formulation of hypotheses are needed to structure the case study, the grounded theory approach emphasizes that a strong focus on theory in an early stage through the research process might restrict the research and prevent new perspectives from emerging (Glaser & Strauss, 1967). The other important distinction is that the grounded theory approach understands empirical evidence as socially constructed by the researcher, rather than being 'gathered' in some kind of objective manner as the theory testing approach tends to assume. This draw attention to the role of the researcher in case study research which I will elaborate it in the following part.

This research is neither about hypothesis testing nor generating truth claims, rather critically exploring the case in order to bring an input for further discussions and improvements. Likewise, the following quote reflects, the case study engages in forming and improving a pool of knowledge which might be fallible or replaced by other knowledge claims. "The value of the case study will depend on the validity claims that researchers can place on their study and the status the claims obtain in dialogue with other validity claims in the discourse to which the study is a contribution" (Flvvbjerg, 2006: 233).

Researchers adhering to the ideas of Phronetic Social Research, and in the case studies, in their field of study, attempt to

- 1. Actively identify dubious practices within policy and social action,
- 2. Undermine these practices through problematisation; and
- 3. Constructively help to develop new and better practices (Flyvbjerg et al., 2012, p. 290);

#### The role of researcher and research ethics

I inevitably will play an important role through the research process. Flyvbjerg (2006) argues that the researcher's own learning process plays an important part of the case study. Through the case study, the researcher acquires context dependent knowledge, which is important for developing research skills at the highest level (Flyvbjerg, 1991). The most advanced form of understanding of the situation or phenomenon of investigation takes place through placing the researcher in the center of the object of study (Flyvbjerg, 1991). Just through placing ourselves (as researchers) in the centre of our research, we can understand our own biases, and only when we understand ourselves, we can begin to understand and make sense of others' lives and actions (Maaløe, 2002).

# 3.2. The successive principle

Despite the fact that Project Management (PM) and Cost Engineering(CE) have made tremendous advances in recent decades, budget overrun and severe delays of schedules are still two well-known characteristics of major projects in conventional practices (Lichtenberg, 2016) which also have been discussed in chapter 1.

Political or strategic reasons<sup>7</sup>, inadequate cost estimation and risk assessments<sup>8</sup>, and human judgment <sup>9</sup>have been identified as project failure reasons through several studies (Klakegg & Lichtenberg, 2015). See the humoristic version of the story



Figure 3.1 "The figures I have given are wrong. That is because I don't have the right figures"

(Klakegg & Lichtenberg, 2015)

<sup>&</sup>lt;sup>7</sup> Bent Flybjerg

<sup>&</sup>lt;sup>8</sup> Edward W. Merrow

<sup>&</sup>lt;sup>9</sup> Daniel Kahneman and Amos Tversky, Nils Lange

Traditional tools and techniques for project planning and management were based on deterministic logic, albeit leading scholars early realized this was not sufficient. It was very complicated to deal with uncertainty in these traditional methods. Uncertainty was considered as almost impossible to address, while using the classical statistical theories towards planning and estimating the fuzzy future. The existing procedures were either too primitive or too difficult to operate (Klakegg & Lichtenberg, 2015).

This realization sparked a research effort led by Steen Lichtenberg, in 1970, aiming more realistic project estimates at the Technical University of Denmark, DTU (Klakegg & Lichtenberg, 2015). "It focused on two features: (1) using the group synergy between knowledge, intelligence and intuition or common sense better, and (2) working top down, systematically focusing only on the few most important matters during successive steps of improvement," (Lichtenberg, 2005b).

In 1990 the research effort resulted in a procedure called 'successive principle', which proved most successful (Klakegg, 1993; Lichtenberg, 2000). "Its immediate primary applications were as a quality tool towards budget and schedules of larger projects. Besides being able to forecast surprisingly accurate future final results, it identified and ranked the major optimization options. It has been used to augment the productivity considerably." (Klakegg & Lichtenberg, 2015, p. 178).

## A glance through its history

The principle was originally a tool for fast, early cost estimating and scheduling in the construction industry and was soon known by users as intelligent cost estimating. Thereafter, it developed into a multi- purpose management instrument. From the 1980s onwards it has functioned as a Risk Management and General Management tool in most public and private business areas (Lichtenberg, 2005b; Lichtenberg, 2005a)

### Successive principle from a closer view

Uncertainty exists in every endeavor of any size that could be quantified and reduced to manageable levels of risk (Archibald, 2016). "Instead of considering uncertainty as a necessary evil, it should be considered as an extremely important, inspiring and useful

factor given its inherent opportunities for making improvements and taking measures against risk." (Lichtenberg, 2000, p. 21). Present trends (i.e. environmental protection, energy concerns, growing internationalization etc.) in complex projects mandate a focused approach for dealing with uncertainty. New complex financing structures as well as related national or regional requirements also add to the impact and importance of uncertainty in projects. "correspondingly, the concept of man as a "little machine", who simply receives orders and then executes them exactly as planned is even less appropriate." (Lichtenberg, 2000, pp. 27-28)

Successive principle is a multi-purpose management tool which integrates different scientific areas in order to provide the management user a sharper and more realistic long-distance view of the future except, obviously, in the case of major catastrophes (Lichtenberg, 2005a; Lichtenberg, 2005b). It is "a proven process to reduce uncertainty, minimize risk, capitilise on opportunities and assure project success." (Archibald, 2016, p. 2). Utilizing successive principle allow professionals to calculate the projected total actual cost or duration of new projects or ventures in a more realistic and controlled manner – based on holistic, broad coverage of all factors influencing or involved with the project, including subjective factors, hidden assumptions, and especially areas of uncertainty or potential change. (Lichtenberg, 2005a; Lichtenberg, 2005a; Lichtenberg, 2005b; Archibald & Lichtenberg, 1992).

The basic requirements of the principle are as follows;

- "Focus on the future and its uncertainty
- Inclusion of all internal and external matters that might affect the total result including fuzzy ones.
- Non-biased subjective evaluation of their impact on the result made by a relevant group.
- Scrupulously following the natural laws of uncertainty during the calculation of the result." (Lichtenberg, 2005a, p. 3).

## The underlying philosophy and logic

The basic philosophy is that realism in forecasts and efficiency requires:

(I) The joint effort of a balanced and competent analysis group with diverse expertise which deals with the complexity and fuzziness of the actual issues, (II)and can openly

identify all elements of possible importance (not only physical and formal items but also fuzzy and sensitive matters). (III) All relevant figures, both subjective and objective, are evaluated in a neutral and correct manner. (IV) Treatment of uncertainty adhere closely to the natural laws of uncertainty in accordance with latest scientific knowledge. (V)Following a top-down procedure in order to proceed systematically and fast with the very few essentials and to avoid spending time on less important matters (Lichtenberg, 2000, p. 34)

The logical outcome of this philosophy, is the "Successive Principle".

The practical procedure follows the main phases illustrated in figure 3.2. It embraces distinct Qualitative, Quantitative and Action-Planning stages (Lichtenberg, 2016; Lichtenberg, 2000). See table 3.1.

The Method involves an Analysis Group in a creative, multidisciplinary process in which qualitative and quantitative data- "soft" factors as well as 'hard' technical ones- about the future are captured and modelled. "The overall idea is to promote a dynamic and stimulating process, which concentrates thinking on the uncertainties (unknowns and "unknown unknowns") rather than the certainties (knowns)." The process is guided by an experienced facilitator (Lichtenberg, 2016, p. 7).



Figure 3.2 An illustration of the general procedure

The fundamental basis is to let a balanced group of key persons perform a few analysis sessions together, during which they identify and then organise all possible sources of uncertainty. After that they operate top-down, systematically detailing and evaluating the most significant issues in successive steps. This provide an opportunity to have an overview, to focus on the really important aspects and to avoid wasting resources on the many issues of little or no importance. The other important aspect is the arranging of all uncertainties into discrete statistically independent elements and then working with the conditional uncertainty of each of the elements. This enables simple yet sufficiently accurate statistical calculations (Lichtenberg, 2005a).

# Qualitative Phase

**Establishing a properly balanced analysis group** for an in-depth discussion of the actual programme or project, its objectives, characteristics, scope et.

Identifying all **general** sources of uncertainty, organizing them in groups and defining them according to sub-routines

# **Quantitative Phase**

**Establishing and evaluating the basic structure**. Choosing a set of main items or activities and evaluating their numerical values using the so-called "group triple estimating` (minimum, likely, maximum)

**The first result.** Performing numerical calculations of the total result by using statistical rules. Result in a mean value and its related variability in a 'priority figure' for every discrete element

The systematic, successive detailing process continues until the analysis group has approached the un-avoidable minimum level of uncertainty.

Finally **establishing an action plan** which is likely to optimize the venture.

Table 3.1 Main phases of the practical procedure

In order to obtain benefits of successive principle managers, project sponsors, and decision makers need a realistic, unbiased overview of the situation, of the consequences of plans, including specifically the scope for improvement, and of the risks; and that they are willing to allow the necessary open two-way communication among their key actors (Lichtenberg, 2000).

## New logic of project management Vs old logic

Many artificial boundaries including political, technological, functional, economic, bureaucratic, cultural and mental exist between projects and their environment.

Moreover, there are more important boundaries between the subsystems that are involved in any given project. "The new logic focuses first on managing within these more natural systems boundaries, and then, when necessary, across the systems boundaries when projects involve multiple systems. This requires the ability to recognize and define the systems and subsystems to be managed." (Archibald & Lichtenberg, 1992, pp. 2-3).

In the successive principle "Holistic systems thinking" which is a corner stone of the new logic is combined with team planning.

Systems thinking is a discipline for seeing wholes. Application of systems thinking to projects contribute to learning to see the project as a whole process creating its specified products or results, and the natural subordinate elements as whole subsystems.

Holistic thinking seeing systems as wholes and uses the whole brain, both logic and intuition. Senge says: "Eventually, reintegrating reason and intuition may prove to be one of the primary contributions of systems thinking. "In order to deal with uncertainty and change, , intuition has proven to be a powerful source of help, especially when a team's collective intuition can be tapped (Archibald & Lichtenberg, 1992, p. 3). See table 3.2.

	Conventional Logic	New Logic
Area Uncertainty	Should be avoided, or hidden, treated as a necessary evil, and put aside as a separate specialty, like "Risk Management."	Is openly acknowledged as part of the real world. Considered as a most exciting and important part of managing and planning. Dealt with seriously, according to recognized natural laws, and integrated into the planning process.
Quantification	All figures, which can be quantified and calculated are calculated in detail, while "non-measurable" figures are eliminated using relevant preconditions.	Figures are in general evaluated in stochastic terms. All factors of importance are included, whether "calculable" or not. On the other hand, non-significant figures are not specified before they are necessary.
External and internal assumptions	Assumptions are generally transformed into firm preconditions (to allow a normal calculable figure). No firm requirement to the realism of these preconditions.	Assumptions are dealt with in great detail. Their most likely affect and the uncertainty attached are seriously evaluated.
Evaluation	Hunch evaluation is used when absolutely necessary. No formal requirements to the quality of these evaluations.	Evaluations, including hunch evaluations are performed, while using evaluation techniques to ensure against biases.

Table 3.1 Conventional logic Vs New Logic (Archibald & Lichtenberg, 1992, p. 3)

# 4. Theories

# 4.1. Discourse as a theory and method

## What is discourse?

Discourse theory is inescapable as an element of both critical analysis and reflexive practice in planning. It helps practitioners to understand how power works in planning, and it helps them to operate reflexively in in complex, highly politicized environments (Richardson, 2002).

Discourse theory is a form of Social constructivism, that is, how we understand the world is more important than how the world is actually. Planning could be seen" as an arena of constant struggle over meanings and values in society, played out in the day-to-day micro-level practices." "Discourse is a powerful tool for understanding what goes on in planning (Richardson, 2002, pp. 353-354).

Discourses are understood as' shared ways of apprehending the world'. They are stories, built from specific kinds of structural elements. Embedded in language, it enables those who subscribe to it to interpret bits of information and put them together into coherent stories or accounts. Discourse construct meanings and relationships, helping define common sense and legitimate knowledge. Each discourse rests on assumptions, judgements, and contentions that provide the basic terms for analysis, debate, agreements, and disagreements. (Dryzek, 2013)

Discourses coordinate the actions of large numbers of people and organizations who do not otherwise need to interact. Different sides seems to interpret the issues at hand in (very) different ways power structures (Ricahrdson, 2002). In all conflicts, the different sides interpret the issues at hand in very different ways. The way the issue is dealt with depends largely (though not completely) on the balance of competing discourses. Discourses can themselves embody power in the way they condition the perceptions and values of those subject to them, such that some interests are advanced, others suppressed, some people made more compliant and governable (Foucault, 1980)

To sum it up, discourse theory is not here to tell us what should we do, rather it will make routine things suddenly seem much more complex. It forces us to think out of the box and challenge the status quo and investigate why we do what we do?

#### Why Discourse?

"The study of discourse also allows one to see how a diversity of actors actively try to influence the definition of the problem." (Hajer & Versteeg, 2005, p. 177)

As the quote by Hajer indicates, discourse not only refers to language but also practices. "Language does not simply 'float' in society, but should be related to the particular practices in which it is employed" (Hajer & Versteeg, 2005, p. 177)

"Defining discourse as a particular linguistic regularity that can be found in conversations distinguishes it from 'deliberation' and 'discussion'." (Hajer & Versteeg, 2005, p. 1)The term deliberation refers to the quality with which a discussion may be conducted, and through discourse analysis it is possible to unfold the power-relations underlying a debate and asses to what extent it is deliberative, i.e. inclusive, open, accountable and reciprocal (Hajer & Versteeg, 2005). This may not be the case, as discourse may be used for exclusion through truth-claims. For instance, through the use of analytical tools such as cost-benefit analyses, a site-specific discourse of engineering can construct truth and render public inquiries opposing a planning decision irrational or irrelevant. Since humans do not sense things directly, a selection process takes place through the application of models producing representations. Consequently, often, there is no given solution and a negotiation and power-struggle over what is being sensed takes place. The ability of an individual or a discourse coalition to mobilize discourses effectively therefore holds significant power (Hajer & Versteeg, 2005).

### Why language matters?

Language, and how it is reproduced in different places, is of critical importance in shaping events in the world, and certain languages can reinforce power structures (Ricahrdson, 2002). Language has the capacity to make politics, to create sign and symbols that can shift power-balances and impact on institutions and policy-making. It can render events harmless, but it can also create political conflicts (Hajer, 2006, p. 67; Hajer & Versteeg, 2005, p.179).

### What is Discourse Analysis?

Overtime diverse traditions of discourse analysis have been emerged which are derived from differing interpretations of the meaning of discourse (Mills, 1997; Torfing, 2005)

It should be clarified that what is understood by discourse in this project is discourse in Foucauldian sense, which interprets discourses as multiple and competing sets of ideas and concepts which are produced, reproduced and transformed in everyday practices, and through which the material and social world is given meaning (Hajer, 1995)

"This approach to discourse works on the boundaries between freedom and control. It encourages researchers to probe at the ways discourses frame the possibilities of thought, communication and action for practitioners, for participants and nonparticipants in planning and for theorists." (Richardson, 2002, p. 354)

Foucauldian discourse analysis therefore focuses on power relationships in society expressed through language and practice. This approach shares similarities with critical theory (Fischler, 2000) A Foucauldian definition of discourse is descriptive/analytical and not normative. (Hajer & Versteeg, 2005)And has served a point of departure for Hajer who has operationalized the work of Foucault into a methodology for discourse analysis.

Hajer formulates discourse analysis as "the examination of argumentative structure in documents or other written and spoken statements as well as the practices through which these utterances are made" (Hajer, 2006, p. 66). Discourse analysis rests on the assumption that language is not a neutral medium but instead shapes how reality is viewed (Hajer, 2006).

Discourse analysis provides a means to study how such a process takes place: "The study of discourse also allows one to see how a diversity of actors actively try to influence the definition of the problem." (Hajer & Versteeg, 2005, p. 177).

#### Discursive concepts

Hajer makes use of five discursive constructions in his approach; (1) discourse, (2) metaphors, (3) story lines and narratives, (4) discourse coalitions and (5) practices. The meanings of these concepts and their relations to one another are described in the following part.

(1) Discourse: Metaphors, story lines and narratives are the three concepts that highlight the features of discourses. Discourse refers to a set of concepts that structures the contributions of participants to a discussion (Hajer, 2006).(2) Metaphor: A metaphor is a constructed term that stands instead of something else. Metaphors are utilized to create an understanding and experience of a particular thing or event in terms of the

characteristics of another. (3) Storyline: Hajer refers to a story line a "condensed sort of narrative that connects different discourses" (Hajer & Versteeg, 2005, p. 70). In other words, story line is a statement which summarizes complex narratives. A story has a beginning, middle and end. While a story can be too complex to understand, a story line provides an effective way for conveying a message. Different understandings of a story exist and Hajer states that "mutual understanding is false" (Hajer & Versteeg, 2005, p. 69) Therefore, a story line can provide a sense of agreement and is functional in creating a political coalition even though it conceals discursive complexity. Generally, there are a few story lines that fulfill a particularly strong role and provide the basis of 'discourse coalitions'. (4) Discourse coalition: Hajer delineates a discourse coalition as "the ensemble of particular story lines, the actors that employ them and the practices through which the discourses involved exert their power (Hajer & Versteeg, 2005, p. 70). A discourse coalition is formed when a group of actors share the same set of practices (routines, rules and norms that give coherence to social life) and also use the same or similar narrative lines to reproduce and transform specific discourses. (5) Practice: Hajer formulates a practice as the "operational routines and mutually accepted rules and norms that give coherence to social life" (ibid.: 70). A brief and simplified overview of Hajer's discourse concepts/discursive constructions. See table 4.1.

Discourse	Structures in a discussion
Metaphor	A constructed term that assigns meaning; understanding and experiencing one kind of thing in terms of another
Story-line	A condensed form of narrative in which metaphors are used;
Discourse coalition	Group(s) of actors using the same storyline over a period of time
Practice	The operationalization of discourse

#### Table 4.1 Hajer's discursive constructions

Hajer (2006) indicates that in analyzing political discourse, attention must be paid to power relations, institutions and domination. This introduces the concept of discursive institutionalization which arises when a particular discourse is solidified into specific institutional plans, regulations or laws. The study of discourse unveils how various actors actively engage in defining a public phenomenon and develop a deep understanding of what a problem is about. This is why discourse analysis plays a prominent role in the study of environmental politics and policy making because understanding how a problem is conceptualized by particular discourses may provide the solution for such problems. Hence, illuminating discourses provides an opportunity for a better understanding of controversies, not in terms of rational argumentation, but in terms of the argumentative rationality that people bring to a discourse (Hajer, 2005).

# 4.2. Linking Flyvbjerg and Hajer

In combination, parts of the works of Flyvbjerg and Hajer form the theoretical framework of this research project. Hajer's approach to discourse analysis, is used as the main analytical tool to answer phronetic questions.

Flyvbjerg does not propose a fixed methodology for the analysis of power in planning rather he offers a set of questions in his phronetic planning approach- See chapter 2, Phronetic planning research (Schmidt-Thome & Mäntysalo, 2014).

However, the works of Flyvbjerg and Hajer have been undertaken separately, it in many ways supports and complements each other. Both Hajer and Flyvbjerg draw on the work of Foucault and both take a point of departure in a Foucauldian approach to discourse, as opposed to a Habermasian approach, thereby studying discursive systems rather than utterances and focusing on "what actually is being done" rather than "what should be done" (Flyvbjerg & Richardson, 2002, p. 1). The strong connection between discourse approach and phronetic approach is that, the two approaches investigate the construction of reality through "power". Power defines what gets to count as knowledge. It shows, furthermore, how power defines not only a certain conception of reality. It is not just the social construction of rationality, which is at issue here, it is also the fact that power defines physical, economic, social, and environmental reality itself (Flyvbjerg, 2002, p.15).

Flyvbjerg emphasises the importance of a focus on power in planning which, he argues, is part of the dark side planning. In Flyvbjerg's works there is an assumption that

manipulative, coercive power is 'given' from the structure of society which influences planning practice. He criticizes communicative planning theorists such as John Forrester, Patsy Healy, Charles Hoch and Judith Innes for failing to balance structure and agency and focus on idealized consensus building with- out constraints (Fischler, 2000).

Foucault uses a genealogical approach and argues that a given system of thought uncovered in its essential structures by archaeology, is the result of contingent turns of history, not the outcome of rationally inevitable trend (Stanford Encyclopedia of Philosophy, 2013). Hajer likewise highlights the importance of balancing structure and agency and engages critically with Gidden's concept of the duality of structure, i.e. that neither agency nor structure can be analyzed separately but rather must be seen in the light of the other. Thus, society (and power-relations) are continually being reproduced in this "process of interaction between agents and structures" (Hajer, 1995, p. 58). Hajer argues that this process can be unfolded through discourse analysis, since Hajer sees discourse as a medium between structure and agency.

Also, both Flyvbjerg and Hajer emphasize the "primacy of context"; "Judgment, which is central to phronesis and praxis, is always context dependent. (Flyvbjerg, 2004, p. 19). Likewise Hajer accentuates the context of practices; As he mentions "Key in an argumentative discourse analysis (ADA) is the examination of what is being said to whom, and in what context" (Hajer, 2006, p. 72)

Flyvbjerg argues that it is necessary to look at planning practice before discourse: "What people actually do in planning is seen as more fundamental than either discourse, text, or theory—what people say" (Flyvbjerg, 2004, p. 16). This is in line with Hajer's approach to discourse analysis as Hajer defines discourse as including practice; "Practices are the essential discursive cement that creates communicative networks among actors with different or at best overlapping perceptions and understandings. They are, therefore, also the prime vehicles of change." (Hajer, 1995, p. 63)

Practices that can be' trusted ' have been emphasized both by Flevbjerg and Hajer as the two following quotes indicate.

"The argumentative approach conceives of politics as a struggle for discursive hegemony in which actors try to secure support for their definition of reality. The dynamics of this argumentative game is determined by three factors: credibility, acceptability, and trust." "trust\_refers to the fact that doubt might be suppressed and inherent uncertainties might be taken for granted if actors manage to secure confidence either in the author." (Hajer, 1995, p. 59)

"Phronesis begins with turning away from ideas and theory, and depending instead on the observation of practice that can be trusted," (Frank, 2012, p. 49).

Hajer's approach to argumentative discourse analysis, including the investigation of discursive concepts (i.e. story lines, narratives and metaphors) is useful in uncovering how certain powerful actors in coalitions mobilize discourses through practices that legitimize or rationalize their agendas. There are sone similarities between Flyvbjerg's concept of a process of rationalization steered by power and Hajer's concept of discourse structuration and institutionalization.

Flyvbjerg explains the process of rationalization as the way in which power is deployed in defining reality. Hajer's concept of discourse structuration and institutionalization is useful in order to investigate such a process of rationalization and the power-relations giving it direction both in relation to a structural context and the agency of powerful actors that are able to mobilize discourse effectively within this structural context.

## 4.3. Materiality of discourse

Inspired by Foucault, a central building stone is to bring out the institutional dimension of discourse, considering where things are said, how specific ways of seeing can be structured or embedded in society at the same time as they structure society (Hajer, 1995, p. 263). Institutions and individuals can hence reproduce, maintain and 'carry' discourses, illuminating that discourses are not text and speech 'floating around', but have a material and institutional anchoring (Neumann, 2001, p. 92).

Discourse analysis is not to be counteracted with institutional analysis, but is rather a different way of looking at institutions that is meant to shed new light on the functioning of those institutions, how power is structured in institutional arrangements, and how political change in such arrangements comes about (Hajer 1995:264).

A discourse maintains a degree of regularity in social relations, it produces preconditions for action (Neumann, 2008). Discourse analysis makes the social world more transparent by demonstrating how its element interact. It also attempts to capture the inevitable cultural changes in representations of reality (Neumann, 2008).

Discourse analysis should be conducted in an overall perspective, that is, discourse should be understood as both linguistic and material phenomenon. Although, the difference between the language and the material does not disappear for that reason. (Neumann, 2001). There is a material side, and there is an ideational side, and one just have to choose how to mix them, but cannot look only at one side (Neumann, 2001).

Analysis of discourse based on a Foucauldian perspective, cannot remain simply within the text, but needs to move (Hook, 2001). As mentioned by Neumann (2001; 2008) meaning and materiality must be studied together. Because without reference to materiality discourse analysis remains largely condemned to 'the markings of a textuality', a play of semantics, a decontextualized set of hermeneutic interpretations that can all too easily be dismissed (Hook, 2001, p. 38).

Studying materiality and discourse together enables me to grasp what has been excluded. There is also a physical materiality which is not deniable. In this way I would be able to identify tension points, that is, find the difference between what has been said and what has been happened.

# 5. Analysis

Before I start with the result of the analysis I will briefly describe the analytical steps I carried on during the analysis.

# 5.1. Analytical steps carried out in this project

As I have mentioned previously, I have applied Hajer's approach (1995) which studies the nature of problems of modern societies (e.g. urban planning, environmental and energy policies, etc.) from a discursive perspective.

I approach my study by analysing discourse samples from relevant social and political leaders involved in the Amager Bakke decision making process available from 2009-2017. I have focused on Hajer's analytical constructions; metaphors, storylines and discourse coalitions.

In this part I will briefly describe phases of my analysis which I moved back and forth between them during the whole process.

**Desk research;( a general survey of documents and positions).** In this stage I did and initial review of newspaper articles, websites and videos related to Amager Bakke. Through this phase I identified the key stakeholders and I got a general idea of what has been happened during the Amager Bakkes's development process. I also created a sequence of decisions and events (timeline) of the process. At this stage I also conducted a literature review on Megaprojects, in order to gain an overview about this phenomenon as well as identifying general symptomatic characteristics, causes and effects of these artefacts.

Analysis for positioning the effects; at this point based on the results of the collection of data from document analysis, I started to identify discourse coalitions and corresponding story lines as well as metaphors being interacted between stakeholders.

Identifying key incidents; during this phase I mapped out the key incidents that were emerged during the planning process of the case.

Analysis of practices in particular cases of argumentation; I tried to analyse and investigate to what extent a coherent relation between utterances and practices is existing. This provides an insight to the way in which actors build argumentation on a site-specific discourse which they normally are in conflict with.

**Interpretation**; Through this stage I prepared an analysis of the discourses structuring the story lines of coalitions and the practices supporting them in order to identify dominant discourse coalitions.

Meanwhile I was looking through documents and literatures I had the four phronetic questions in the back of my mind, so it affected the way I was looking at the case. It made my mind to look toward some certain directions and finally enabled me to provide a phronetic assessment (value-judgement) of the case study.

## 5.2. My perspective and perception

Diagram 5.1. illustrates the way I saw and perceived the case. I attempted to have a holistic view on the case, therefore I tried to see and analyse the case from several different perspectives. I saw Amager Bakke as accumulation of different storylines, from its initial stage until it become materialized. By looking deeper through the case it became visible to me that Amager Bakke is surrounded by several central and peripheral storylines. Central storylines are those dominant storylines which attempted to shape the reality of the case and peripheral storylines are those ones which are not that much controversial and strong. And again by going much deeper and zooming in and analysing the interplay between storylines some certain things become unfolded to me. It became possible to see what has been said and what has been happened, what has been excluded, what kind of power game were at play etc.





# 5.3. Findings

In the case of Amager Bakke, several central and peripheral storylines, and two discourse coalitions (proponents and opponents) have been identified. It is worth mentioning that during the decision making process some stakeholders turned from being opponent into proponent. In these two groups there are some certain types of storylines which have been produced and reproduced by stakeholders during the process. The opponents group build their discourses around certain metaphors; Showing and Selling Danish Technologies to the world (Amager Bakke as an inspiration), Energy efficient – clean air plant, Amager Bakke as a Landmark, Internship and job and opponents group weren't as much united as the proponent were, but they share similar worries about the amount of the waste and the size of the plant. Investigating the interplay between storylines enabled me to identify the dominant discourses, un-lock the power relations, distinguish planning styles, reveal the tension points i.e. the contradiction between what has been said and what has been happened, and the consequences of the argumentations, because words are not just simply words rather they have some consequences.

### Showing and Selling Danish Technologies to the world (Amager Bakke as an inspiration)

Chairman of the board (ARC), Mogens Lønborg says to Licitationen;

"[...] hopefully this decision is also a starting point for exporting Danish technology and knowhow and thus fulfilling the ambitions of green growth," (Sigh, 2012)

He also says to Amager Bladet;

"...It is amazing that Amager Bakke receives so much attention, because it gives us a reason to tell the whole world that it can pay off - both economically and environmentally - to produce electricity and heat from the waste that cannot be recycled," (Schneider, 2011).

In these storylines the chairman of ARC is emphasizing that by establishment of Amager Bakke they will be able to kill two birds with one stone, both showing and selling Danish technology and fulfilling the ambitions of green growth. Green Energy's chairman Jørgen Mads Clausen from Danfoss, he is supporting what Chairman is saying

"...We in Denmark are the international leader in district heating because we have the tradition of using the resources best Possible. It provides a huge potential for growth and job creation, " (Mortensen, 2012).

Phrases *"international leader"* and *"using the resources best possible"* are like a documentation which claims that they know what they are doing and to some extent it resembles confidence and certainty to taking the right decision. More over this decision boost growth and job creation.

Likewise the former director of ARC, Ulla Röttger, support the statements of the ARC's chairman "... *We recently had foreign guests who wanted us to build a plant*..." (Vestergård, 2014).

This argument is showing that even before the plant become completed there are some countries who are interested to bring the Danish technologies to their countries. This argument is substantiating the fact that the export of Danish technologies as one of the aims of the project, is already on the way.

John Veje Olesen CEO of Babcock & Wilcox Vølund says to Berlingske Business that;

"...Scandinavia is already a model in environmental technology. Now we have the opportunity to show a building in the middle of where people live, and just opposite the Queen's castle, where we use waste for energy," (Jasper & Sand, 2013).

He is also supporting the idea that Danes are pioneer in environmental technology and now it's the time to tell this to whole world.

He also says to Amager Bladet that;

"[...] with the establishment of Amager Bakke, we will create the largest and most significant showcase for Danish knowledge and environmentally friendly technology for the production of energy based on waste incineration. It can in itself have invaluable importance for the Capital Region and for Denmark as it promotes green knowledge, technology and energy, " (Schneider, 2012).

Using strong metaphors like "largest", "most significant showcase for Danish knowledge" and "environmentally friendly technology" which promotes "knowledge", "technology" and

*"energy"* deviate the attention from thinking of other aspects and it resembles the best case that would be ever possible which is measured on every single aspect.

The director and chairman of ARC, CEO of Babcock & Wilcox Vølund, and Green Energy's chairman, are all supporting the idea that it is important to show the Danish technology to the whole world. It is showing that how being a *"show case"* and representation of the latest Danish technology played an important role in development of Amager Bakke.

Likewise, Inger Anette Søndergaard, head of waste-to-energy department at Rambøll, also supports the idea that Amager Bakke would be served as a symbol and example for other countries;

"There are many countries looking at the Amager Bakke project due to the size of the plant and its high environmental and energy profile. In addition, it is a project that has attracted much attention around the world because of the ski slope" (Jasper & Sand, 2013)

*"Size", "High environmental and energy profile"* and *"ski slope"* are the features which distinguishes Amager Bakke and attract a lot of attention.

Managing Director of Wonderful Copenhagen is backing up the necessity of bringing such unique and distinguishing projects;

"...In a city like Copenhagen, with ambitions of being an international city, you must always have exciting new stories that can prove that we are creative and skilled." (K. Hansen & S. Hanssen, 2012).

He is arguing that in order to be able to realize the fact of being an international city it is important to always come up with some new stories. It is quite obvious that the ambition of being unique and globally branded as the first country who brings a multipurpose industrial infrastructure plays a quite strong role in Amager Bakke's story. By seeing Copenhagen as a city with *"ambitions of being an international city"* and the necessity of bringing *"new stories that can prove that Danses[we] are creative and skilled"*, It is a "must" and prerequisite for Copenhagen to bring projects like Amager Bakke.

ARC writes in its official web-site that;

"With the establishment of Amager Bakke, Copenhagen will have the world's most modern and environmentally-friendly waste-based energy plants. At the same time, the groundbreaking, multifunctional industrial architecture becomes an ambitious bid for how a green energy plant can be combined with recreational areas that promote adventure, play and movement," (ARC, 2017).

ARC's narrative in this excerpt highlights that the main focus is on bringing a lot of benefits to Copenhagen. Using metaphors such as "world's most modern and environmentally-friendly", "groundbreaking multifunctional industrial architecture" is showing that the infrastructure is measured on multiple aspects and is quite well investigated to bring something beneficial to the city. These metaphors are very strong and diverting the attention from other aspects, for instance the size of the plant, and more important the need for the plant. The storyline conveys the meaning that there is a need for an incineration plant and ARC has attempted to bring one of the bests to the Copenhagen.

#### Energy efficient – clean air plant

In the environmental assessment of the case it has been much focused on the emissions and they showed that emissions are very low due to the highest and newest technology that have been applied in the plant. But discussions about do we need to burn the waste are not taking part.

ARC writes in its official web-site that;

"With the establishment of Amager Bakke, we build one of the world's most environmentally friendly and efficient facilities that will raise the bar both in Denmark and internationally. At the new plant, we will exploit 25% more energy from the waste. NOx emissions will be reduced significantly and there will be a reduction in CO2 emissions by more 100,000 tons," (ARC, 2017).



Reducing emissions by 85–99.9%

Figure 5.1 . NOx emissions reduction mg/m3 (Babcock & Wilcox Vølund, 2013)

The above mentioned storyline is strongly focusing on the emissions and by bringing a disgram which illustrates that by developing Amager Bakke "*NOx emissions*" will be reduced up to 6 times, they are trying to convince the audience that it is the best case that could be ever possible. This diagram has been utilized as a rhetoric device to persuade the actors, and provoke their enthusiasm in order to support the project.

Likewise the project manager, Lars Juel Rasmussen, supports the clean and emission free plant and feel proud to build the plant, Babcock & Wilcox Vølund writes that;

"Lars Juel Rasmussen is proud to build a plant that utilises more than 100% of the fuel's energy content, has a 28% electrical efficiency rate, reduces sulphur emissions by 99.5%, and minimizes NOx emissions to a tenth, compared to the former plant. "(Babcock & Wilcox Vølund, 2013)

#### He also adds that;

"The plant stands out in terms of environmental considerations, energy production, and its working environment. It is also located near the airport and just five kilometers from Copenhagen's Town Hall Square, so we're not just talking about an industrial installation, but a landmark of the Danish capital, as well,"

### Amager Bakke as a Landmark

Chairman of the board (ARC), Mogens Lønborg talks about the novelty of the Copenhagen's landmark;

"... The landmarks of other countries are typically churches or cultural monuments. But there is some evidence that the idea of Amager Bakke - a combustion plant - can become a world-renowned landmark for Copenhagen," (Schneider, 2011).

Similar views have been put forwarded by Bjarke Ingels, the founder and architecture in BIG;

"I like the idea that after 2017 we might get a world champion in alpine skiing. But also that Copenhagen's landmark is not necessarily an opera, but a power plant that makes energy out of waste where people ski on top and that makes smoke rings," (Jasper & Sand, 2013). In the two above mentioned storylines by comparing Copenhagen's landmark with other countries' landmark and bringing the argument that Copenhagen's landmark is something different compare to landmarks of other countries, is explicitly referring to the storyline Copenhagen *"with ambitions of being an international city"* which put forward by Green Energy's chairman Jørgen Mads Clausen from Danfoss, in the first part. So, more over the benefits that mentioned in the previous part, Amager Bakke will also become a distinctive landmark for Copenhagen.

ARC writes in its official web-site that ;

"Amager Bakke is designed as a hill where the roof is available to the public. With its 85m height, Amager Bakke will become Copenhagen's largest "mountain" and represent a distinctive landmark for the city. On the roof, citizens and visitors can enjoy mountain and sport activities such as alpine skiing (year round), climbing, running and hiking," (ARC, 2017).

By using the phrases "the roof is available to the public", "citizens and visitors can enjoy mountain", it has been attempted to convey the message that they have also considered people to get benefit from the plant for recreational purposes. Which is also adding a bonus to the people who bring the Amager Bakke, because more over considerations about the energy efficiency, highest technology, uniqueness etc. they also considered citizens and visitors.

All the arguments that actors bring in this part as well as the previous parts lead to the following formula;

Development of Amagr Bakke = Bringing all sorts of good things to Copenhagen

#### Internship and job

In this part I want to show that how internship and job opportunity has gotten an extra attention form the proponents' group. There have been shaped some certain storylines around the job creation and internship that comes with development of Amager Bakke, while job creation is a fact that comes with almost every construction project. But in Amager Bakke's case it has played a stronger role than what is usually perceived. Job creation as an actual fact gain a stronger identity in Amager Bakke's story and was to some extent perceived as an extra advantage. For instance, Councilor Margit Ørsted, board member of ARC, see this fact as *"is an amazing story"* which wasn't considered effectively.

"...Behind the ski slope there is an amazing story. A story that unfortunately does not come out to the same extent; It is the internship and apprenticeships that we have managed to adapt to the construction," (Ørsted, 2014).

The fact of job creation and internship was also supported by other actors;

The former director of ARC, Ulla Röttger says to MetroXpress that

"The construction of Amager Bakke would otherwise give the municipality 1,000 new jobs and a few hundred apprenticeships next four and a half years," (K. Hansen & S. Hanssen, 2012).

Also Babcock & Wilcox Vølund writes in its official web-site that;

"The Amager Bakke project will provide work equivalent to 4,600 man-years, of which 2,000 man-years will be in the form of existing and new jobs at Babcock & Wilcox Vølund, jobs for project engineers and architects and jobs at the many sub-contractors involved in the project as providers of products and services," (Babcock & Wilcox Vølund, 2013).

And also it is a story that has been supported by the Lord Mayor of Copenhagen as well;

"[...] It will contribute to exports and green growth [...] the new incineration plant will create 4,600 new jobs." (Bredsdorff, 2012).

During the initial stages when the Copenhagen municipality rejected the ARC's application, the chairman of the ARC, Mogens Lønborg, said to Licitationen that;

"[...] The government has made green growth for its key issue. Copenhagen Municipality as well. At the same time, you have in Copenhagen municipality and now also at national level introduced so-called social clauses that ensure that apprentices and trainees are used for construction and construction work. With its no to Amager Bakke, the municipality of Copenhagen spans its own goal of getting more apprentices and interns at work. In 2010, the municipality of Copenhagen decided that there should be ten percent apprentices / trainees at all construction and construction centers, and behind the proposal were the same parties - The Red–Green Alliance, the Social Democrats, SF and the Radical - which now removes the opportunity to estimate 100 internships for apprentices in the capital, " (Bjerring, 2012).

It could be concluded that job and internship get extra attention and value from the proponents. That's a good point that a project creates a lot of job opportunities, but it doesn't mean that it is a fact or kind of criterion that based upon that could be said that this project should get construction permission and the other one shouldn't because it creates less job opportunities. Of course job opportunity is an important factor as well but not as much as the waste volume and the size of the plant are!!!

### Profit and image of stakeholders

Amager Bakke not only brings all sorts of benefits into Copenhagen but also it becomes an important stepping stone for the technology providers of these types of plants because it is a "show case" for them that makes them the next deliverer of these types of plants in countries where they need incineration.

#### Bjarke Ingels mentions that;

"Investments in power plants, for example, are insane, so there is an extreme awareness of risk. It has traditionally made it difficult to get exciting architectural projects led through. Nobody wants to do anything before it's been tried before. I therefore think that Amager Bakke can be a door opener, and not just for us, but also for other architects who can point towards Copenhagen, " (Jasper & Sand, 2013).

The meaning underlying this storyline reveals that Copenhagen is taking the risk of doing something that "*Nobody wants to do [...] before it's been tried before*" and Amager Bakke is playing the role of a hero to become a "*door opener*" for other architects. When it is a risky case, it means that you are exposing the city (citizens) to danger, but to what extent it has been assessed that this is a positive risk? (See what happened afterwards in conclusion part).

The following statements expressed by John Veje Olesen CEO of Babcock & Wilcox Vølund and Erik Hemmingsen, the director of NCC, imply that this hero not only will become a *"door opener"* for architects but also a *"lighthouse"* for industry and construction. In this way the suppliers guarantee their chances for new contracts with other countries (See what happened afterwards in conclusion part).

"Although we export 80 percent of our production, Amager Bakke means very much for us. We are in great need of such lighthouses, and such a unique project will mean that the focus is very much on us and on what Our industry can," (Knudsen, 2012).
"...It's a really exciting project that we are happy to be a part of. This involves complicated concrete and construction work, as NCC specializes in, and I am sure Amager Bakke will be a new landmark for Copenhagen," (NCC, 2013).

#### Opponents

The storylines produced and reproduced by the opponent group are not as much united as the proponents' group is. And as mentioned in the beginning of the analysis part, some of the opponents change their position and join to the proponents group during the process. And all the discussions in the opponent group was around the amount of waste and huge combustion capacity which leads to an uncertain economy for the plant.

Ayfer Baykal, the former technical and environmental mayor of Copenhagen,

"I do not want to approve a large new combustion plant with clear overcapacity. Instead, we must try to promote new technologies and consider waste as a resource, "(K. Hansen & S. Hanssen, 2012).

She also says to Amager Bladet;

"My concern is that Amagerforbrænding will expand capacity at a time when the EU and the government say we need to burn less waste. This will mean that we have to import waste from Poland, for example, to fill the plant. We are not going to have a situation of how big ships begin to be built in the harbor of Copenhagen with Polish waste that has to be driven through the city in large trucks. It goes against what both the municipality of Copenhagen and the government want in the environment and climate area," (Schneider, 2012b).

In a note entitled "Advantages and disadvantages of high combustion capacity" from Copenhagen's municipality they have named cons and pros with large combustion and they concluded that;

"... The expansion will lead to overcapacity of 160,000 tones (almost 40%) [...] As the amount of waste in Amagerforbrænding surrounding area in the next decades will not rise to this level, the administration estimates that the plans will inevitably result in adverse environmental impact due to an insufficient use of biomass and / or waste imports (which may be expected to contain plastic) and hence increased transportation. Management acknowledges that economies of scale

provide financial incentives for greater capacity, but consider the disadvantages to exceed the benefits," (Københavns Kommune, 2011d).

Brian Vad Mathiesen, once was invited to ARC during the decision making process, he says to JyllandsPosten that ;

"...I presented arguments that the economy in such a plant would not be particularly robust. At that time, it was clear that it is a very uncertain future that you enter into, when you base economy on the price of burning waste in a renewable energy system." (Martini & Sandøe, 2016a)

It is extremely interesting that such a problematic plant, with quite clear arguemntations in relation to its capacity and its uncertain future could easily be approved by Copenhagen municipality. That's related to the power game, which I will talk about in the conclusion part.

#### Amager Bakke is the best solution from all aspects

In this part I want to show how all the critics were always rejected by ARC and they (mostly the director) consistently insist that Amager is the best case ever possible with a sound economy.

The former director of ARC, Ulla Röttger says to Licitationen that ;

"...We have always meant that Amager Bakke is a very good project, measured on all relevant parameters. With a sound economy, a high environmental profile and a focus on security of supply for the citizens," (Solberg, 2012, p. 3).

#### She also mentions;

"...After numerous analyses and expert assessments, the conclusion is that the model with the two oven lines, each of which can burn 35 tons per hour, is the optimal and future-proof model. And in that solution there is also a lot of focus on recycling, alternative forms of energy and possible future waste technology. So the solution decided by the board is the optimum set in both a technical and environmental perspective, " (Solberg, 2011). In the following storyline the director of the ARC mentions "*we have ensured* [...] *we can deliver energy at very competitive prices*,", it is not obvious that how it has been ensured that the heat will be available at competitive prices while opponents are uncertain about the future of the plant

"... With the new plant on Amager Bakke, we put additional trump on that part of The waste that goes into combustion [...] we have ensured that during the same period we have both managed and able to exploit the growing amounts of waste in the Capital Region and that we can deliver energy at very competitive prices," (Schneider, 2012a).

All the storylines are showing that there is not any interest from the ARC to talk about the amount of the waste and size of the plant, and the only thing they are interested in is to stay loyal to Amager Bakke.

#### Opponents who become visible when Amager Bakke materialised

In this part there are some storylines related to the opponents who appear when Amager Bakke comes into being and people start seeing its reality. All the facts that were rejected by ARC and proponent became materialized.

Lars Berg (LA) from Frederiksberg municipality says that;

"...Ski slope on top of a waste hill, it's a beautiful building, but I do not think it's a municipal task to build a ski slope so we cannot support the project," (Engelund, 2014)

Similarly, Thyge Enevoldsen ( $\emptyset$ ), criticizes the project and at the same time make fun of it;

"...It's no secret that we are against the project being made. It's too big and unnecessary. We support the project, even if it is a loan we certainly cannot get back. There is a CO2 saving in the project, if people went to Amager Bakke and not Isaberg," (Engelund, 2014)

Peter Thiele, SF's member of the Technology and Environment Committee in Copenhagen Municipality;

"...I think it was wrong to spend 4 mia.kr. for the plant, I can conclude that it is almost built, and that cannot be changed. So I think that, as a responsible politician, you must find a solution that damage the climate and the environment less," (Martini & Sandøe, 2016)

what can be concluded is that all start seeing that the plant has overcapacity and economic unsustainable, but what could be done about it? Peter Thiele mentions that *as a responsible politician, you must find a solution that damage the climate and the environment less*", the plant is there, and what we could do about it? Just one choice is possible, run it!

#### Decision making process and planning styles

After analysis it became evident that there are remarkable differences in the planning approach regarding the substance (core) of the plant and the roof-top (surface) of the plant. During the decision making of the roof-top, ARC involved more than 50 people in a two-days workshop to work together and come up with some ideas about what kind of activities is interesting to



Figure 5.2 Illustration: Jacob Christensen

be brought on to the surface of the plant (Spangsbo, 2013).

As they have written in their official website;

"There were a lot of ideas on the table when around 50 enthusiasts from local sports clubs, officials from the municipality, architects and town planners and various creative heads gathered together for two days to find out what should take place at the top of Amager Bakke," (ARC, 2017b)

Patrik Gustavsson, project manager of recreational area of Amager Bakke in 2770 Tårnby mentions that;

"It is crucial for us to create something long-term for the recreation area. Therefore, we invited a lot of different and dedicated people with their professional skills at the camp, to ensure that the area is also relevant in 15-20 years," (Bjørton, 2013).

These arguments display that ARC in order to ensure that the plant is relevant in the next 15-20 years involved a lot of people but why they didn't do the same thing about the core of the plant to make sure if it is a relevant technology and a long-term investment?

During the decision making of the core of the plant they were quite closed and not that much interested to hear any voice from outside. As mentioned by Brian Vad Mathiesen , energy expert from Aalborg University ;

"It has subsequently become apparent that people were not interested in the facts. People were almost fact-resistant. Particularly on pointers on waste volumes and the role of waste incineration into the future of the future, " (Martini & Sandøe, 2016a)

The outcome of this analysis resembles planning styles defined by Innes and Booher (2003), what they call "Alternative models of planning and policy making." Innes and Booher based on two criteria, i.e. diversity and interdependence of interests, define four planning styles. Each planning style is useful under different conditions of diversity and interdependence among interests. See a brief review on planning styles.

	LOW	DIVERSITY	HIGH
LOW	Technical Bureaucratic This model is about convincin policy makers through analysis what is the right course of actio	<b>9</b> This model is at the players so the common course	<b>luence</b> bout <b>co-opting</b> hey will buy into a e of action.
INTERDEPENDENCE OF INTERESTS			
	Social Movement	Collaborati	ve
HIGH	This model is about <b>converting</b> players to a vision and course o action.	f This model is all of <b>coevolving</b> to standing, direct heuristics.	oout stakeholders a common under- ion, and set of

Table 5.1 Four styles of planning (Inneth & Booher, 2003, p. 52).

The planning approach that has been utilized during the decision making process of the surface (roof-top) resembles what Innes and Booher (2003) call "collaborative planning". The collaborative model is about stakeholders coevolving to a common understanding, direction and set of heuristics. It is a model which deals both with diversity and interdependence since it needs to be inclusive and to explore interdependence in the search for solutions. It does not ignore or override interests, but seeks solutions that satisfy multiple interests (Inneth & Booher, 2003).

Considering what happened during the decision making process of the core it becomes visible that in this phase of planning "Technical Bureaucratic" style is present since there is neither diversity nor interdependence among interests. This is a model where there is only one interest in effect and where there is agreement about the objectives and a single decision making entity.

"Technical Bureaucratic" planning style specifically in relation to megaprojects which contain a great deal of complexity and uncertainty is not a desirable approach to adapt. The education that planners and policy analysts in this tradition get typically ignores diverse goals and starts instead with a question about which is the best way to meet one predetermined goal (Inneth & Booher, 2003). Maybe this planning style would work in other contexts and in other planning arenas but in the case of megaprojects it's not an appropriate choice, rather megaprojects need and open and collaborative planning style.

When I looked further through the documents I figured out that in 2010 at a very early stage, when the project was in its initial planning phase in a brochure called "A' med Affald" prepared and published in 2010 by Amagerforbrænding, the following vision was defined by the former director and chairman of the board

Ulla Rötteger, the former director of ARC states that;

"The waste center will be one of the country's largest environmental projects and make a significant difference to what we can achieve with the current plant,". (Amagerforbrænding, 2010, p. 2).

The chairman of the board, Mogens Lønborg explicates ;

"...We want to build a plant with the cleanest modern technology. At the same time, we would like to show that waste treatment does not need to take place in

An ugly concrete block - we want to build a nice plant that becomes a distinctive figure in harmony with the cityscape, " (Amagerforbrænding, 2010, p. 9).

It was mentioned in the brochure that

"...the center will contain two furnaces for 35 tons of waste per hour." (Amagerforbrænding, 2010, p. 9).

The meaning underlying these storylines are showing that how a certain vision was defined by the board of the ARC and followed almost without any adaptation and adjustment until it realized. These storylines are supporting the idea that these stage of planning was quite one sided and interest-oriented, and interdependency of interest and diversity is present at the minimum level.

When you look at the project from outside it seems that the planning process has been quite collaborative and open-minded, but when you come closer to the case and investigate it much deeper it becomes visible that it hasn't been that much open and collaborative as it seems. It can be concluded that it was a quite selective process, that is, you decide when to be open-minded and when to be closed-minded. Thought provoking strategy!

As mentioned by Inneth and Booher (2003, p.40) in a policy dialogue, stakeholders must be diverse in order to get the most benefits from the creativity that can come from trying to find actions that can respond to a wide set of competing interests. They must also be interdependent in order to attain the kinds of results that will allow them collectively to create an adaptive learning system that can be robust and effective. The stakeholders must be conscious that they cannot meet their interests working alone and that they share with others a common problem so they will continue to work together in response to change. I am not sure if Amager Bakke get the benefits from collaborative work equally through all its development stages.

## 6. Conclusion

Long years must pass before the truths we have made for ourselves become our very flesh.

Paul Valéry

In order to sum up the findings from the analysis, I decided to divide the plant into two parts; Core which is the plant itself and surface which is the roof-top or generally the surface of the plant (the recreational area comprise the ski slope, café, picnic area and climbing wall).





Figure 6.1 illustrates the interrelation between surface and core in Amager Bakke's story. It shows how the core of the plant which is the problematic part was hidden inside the surface, which is not necessarily reflecting what is the core's reality. I would say the beast took refuge under the shadow of the beauty. What I mean is that sometimes you are able to hide some realities (facts) under the surface of something else, so on the surface everything might seem quite reasonable and desirable, and that's what has been happened in the Amager Bakke's case. In other words, you need to tear the surface to be able to see the core's reality. In one sentence "the surface of the plant was utilised as a rhetorical strategy."

After analysis it became clear to me that, each group has its own interpretation and therefore they cannot understand each other.

In other words, the proponent's view of reality is not structured by the same analytical rationality as that of the opponents group, therefore they do not draw the same conclusions about the waste amount, the size of the plant and importantly the need for the plant. But one question that is interesting to ask here is that is it a situation where people are placed in different rationalities and therefore they have difficulties in understanding each other or is it a situation where people speak a different rationality? That is, the rationality that they are speaking is reflecting not only the rationality but also some specific interests. In other words, the focus on the surface is strategic point and it is not something that is embedded in the structure of language.

It can be concluded that decisions informed by the proponents group were embedded in a filtered basis in order to keep out some certain key aspects (all the facts about the core), and they managed to set a certain agenda through discourse.

To sum it up in a few points;

- In the proponents group there is a strong focus on the shell and in the opponents group there is a strong focus on the core.
- The focus of the proponents group is on something that could be seen and its tangible.
- The focus of the opponent group is on something which is not visible (but is become visible at a certain point, when the plant faces a budget deficit).
- Proponent group outpace the opponent group since what are they talking about is visible and tangible by other actors, therefore they become able to persuade others and involve them and make their group bigger and stronger (but this involvement was a quite selective process, they were aware to involve whom).

What is interesting here is to highlight the relation between discourse and power. Mouffe (2000) emphasises that communication cannot occur without power, since power relationships are part of the human condition and persuasion is always present in argumentation. Hence, there is always politics embedded in discourse, and this implies that discourse is vulnerable to the influence of power. Gunder and Hillier (2009) argue that the terminology used in planning is full of 'empty signifiers', e.g. sustainability, growth, globalization, which are used by power to construct the strategies, the micro and macro relations, knowledge, institutions, etc., resulting on a frame of the reality, of what is possible, and of what is desirable.

Power is always present in the different levels of the planning-process, adopts multiple shapes, and consists of constantly changing force-relations among actors. Actors use both the power to block and the power to push. Applying this statement to the planning process, actors can use power to block, for instance, by hiding knowledge or misinforming (Forester, 1982), filtering rumors, or evading action dragging out the process, undermining the image and the legitimacy of the project.

It's interesting to hear ARC's arguments for the economic problem of the plant

"ARC maintains that the cause of the company's difficult situation is due to unexpected changes in the framework conditions, particularly falling electricity prices (down 35% from 2012 to 2015) and the decline in waste volumes from the 2012 forecasts," (ARCs Ejerkommuner, 2017)

After analysis, it was uncovered that there were some discussions that weren't allowed to become part of public discussion. For instance, discussions about the size of the plant and the need for the plant. And also it didn't become clear that how finally such a problematic and sceptical project got the construction permission and how the Environmental and Technical Mayor changed her mind and moved away from opponent group into proponent group. And also it is not clear that why finally Finance minister, Environment Minister and Lord mayor of Copenhagen support the project.

I think it was a very strategic decision when ARC involved the Lord Mayor of Copnehagen , Frank Jensen, in the decision making process of the roof-top (surface) (ARC, 2017) - the fancy and eye-catching part- most likely in order to bring a strong actor into their group to support the project. The way ARC make use of powerful politicians was a calculated action. ARC was quite aware where to be liberal and involve whom and where to be conservative and ignore whom. Frank Jensen, lord mayor of Copenhagen;

"The plant will be one of the world's most environmentally friendly combustion plants and create a world-class showcase for Danish environmental technology. It will contribute to exports and green growth [...] the new incineration plant will create 4,600 new jobs." (Bredsdorff, 2012).

The above mentioned quote is showing that the Lord Mayor is just using the same words and the same way which ARC members used to describe the Amager Bakke. ARC could easily change the mindset of the Lord Mayor and make indirect use of his political power.

To sum it up, as mentioned by Flyvbjerg (2001) Knowledge could be easily marginalized by power, and power producing the knowledge that served its purpose best. ARC had more power in this game in the sense that they could finally convince the Lord Mayor, Technical and Environmental Mayor, Environmental Minister in order to pursue their goal, that is, building the state-of-the-art incineration plant with a huge overcapacity. Ideals seem to block the view to reality (Flyvbjerg, 2001).

#### Answer to the phronetic questions

#### (1) Where are we going with Amager Bakke?

It's obvious. With Amager Bakke the city and its citizens are being posed in a risky situation. Now there is a plant with overcapacity, the only thing we could do is to feed the plant. Basing the economy of an infrastructure on diminishing resources of other countries means uncertain future. As mentioned by Hans Henrik Linboe

"[...] So I would say that it is very uncertain whether there is waste for Danish plants at a price we know today,"

*"When more facilities are being built all over the Europe, there will be struggle for the waste. It means that the fee will fall,"* (DR1, 2017).

It means that there will be a situation that Tax-payers should pay for an infrastructure which there were no need for it. Bringing the show case ended up in a costly price for Copenhageners, maybe it was better for Danes to hide their technology for themselves and stay humble.

#### (2) Who gains and who loses, by which mechanisms of power?

In answering the second question what is interesting to me is the interplay between rationality and power in defining winners and losers. No doubt, that suppliers and stakeholders were the main winners. In the beginning the people who bring the project were winners in the sense that it is a unique project that catching the eyes of the world but gradually when it became proved that the plant has over capacity and deficit, everything turned upside-down. And hopefully now there is no way for ARC to hide the reality, the plant has been materialized and it is standing there (as mentioned by one of the actors ) right in front of the Queen's slot.

Amager Bakke internationally could still be a winner since it is a door opener for suppliers to be engaged in more international projects. So the main winners after Amager Bakke become constructed are Suppliers, as mentioned in "Spild af dine penge" programme;

"Vølund has sold five new combustion plants in England, Among other reasons because of the good advertising presented by Amager Bakke," (DR1, 2017).

And as Dansk Affaldsforening wrote in their official web page;

"[...] ARC highlights that Babcock & Wilcox Vølund have just won two major tasks in Scotland, where Amager Bakke has been used as a reference case," (Toftegaard, 2015)

And as mentioned in the first question in near future, tax-payers need to pay for the unnecessary infrastructure since there is a strong likelihood of a huge increase in heat price. It could be concluded that the main losers are citizens.

Brian Vad Mathiesen, Energy Expert from Aalborg University, express that;

"If you build a larger capacity than the citizens need, you do not fulfill your task. It's a waste of citizens' money when they build oversized plants, " (Martini & Sandøe, 2016c)

So it could be concluded that Amager Bakke succeeded to pursue the aim of becoming a *"show case"* and *"inspiration"* or other countries, but it didn't succeed to fulfil its central goal which was running the plant efficiently therefore, the construction of Amager Bakke, in a national perspective, was just waste of citizen's money.

#### (3) Is this development desirable?

This question asks whether the situation depicted in answering the first two questions is desirable. My answer to this question is NO for some reasons.

First of all, it is not a kind of investment which fits properly into Denamrk's future energy system as I described in part 1.3 due to Denmark's vision of implementing a smart energy system through the whole country, the need for old fashioned facilities like incineration plant will be reduced and some other new technologies will be introduced. Therefore, from this perspective constructing an incineration plant with extremely huge capacity is neither desirable nor efficient.

Second, in order to run the plant optimally there is a need to import waste from other countries to fill the plant. As Associate professor Søren Løkke, from the Department of Development and Planning at Aalborg University, acknowledges waste is a diminishing product, both in Denmark and around Europe. *"In other words, we are basing the economic sustainability of our plant on the obsolete waste management policies of other countries,"* (Finsen, 2017). Therefore, basing economy of such a huge plant on a quite uncertain basis is neither intelligent nor desirable.

Søren Løkke also mentions that importing waste is reasonable just from a short term environmental and financial perspective, thereby it is only a temporary solution. He also says to MURMUR *that "…The waste market is volatile and fragile. With a forthcoming EU liberalisation of the waste market – combined with fierce competition from incineration plants in Sweden, the Netherlands and Germany – even the current back-up plan to sustain Amager Bakke with imported waste, might not be enough to save the plan from a massive deficit in the short term," (Finsen, 2017).* 

Third, importing waste from other countries to fill the plant will disturb the aim of "Copenhagen's to be carbon-neutral by 2025".

Jens Peter Mortensen, an environmental expert at The Danish Society for Nature Conservation says to ingeniøren that;

"Imported trash typically consist of paper, cardboard and plastic – typically between 15 to 40 percent plastic. In comparison, Danish waste contains an average of only 11 percent plastic," (Wittrup, 2016).

He believes that import of waste will hurt the environment and increase Copenhagen's carbon footprint and thereby, endanger Copenhagen's ambitious climate plans.

Ingeniøren asks Jens Peter Mortensen what they as an environmental organization will suggest to politicians? He points out two things:

First ; "They could stop or downsize Hofors's new flip-flops Bio4 Amagerværket, which is planned to supply all of Copenhagen with heat. This will avoid obvious heat supply overcapacity and a new economic scandal,"

The above mentioned quote shows that there is no guarantee for "not" taking other risky decisions by decision makers and politicians which supports what Brian Vad Mathiesen says. He points out that there is a lack of national coordination

"...There is a wakeup call that in so many situations, overcapacity has been built. Local authorities need to be a little more critical of the advice they receive, "

second; "And you could build a biogas plant in Copenhagen that could supply ARC with biogas instead of driving food waste from Copenhagen to biogas plants in Funen and Jutland. Then the goal of recycling could be achieved, at the same time the investment of 4 mia. Will not be completely wasted," (Wittrup, 2016).

To sum it up, building Amager Bakke was problematic from several aspects. First of all, it is not fitting into future energy strategies, second the plant is oversized regarding the existing amount of waste, third it is an old-fashioned way for treating waste, and there are more green and sustainable solutions rather than waste incineration for example heat pumps, geothermal, solar and heat storage. Considering all these facts and shortcomings Amager Bakke could not be seen as a desirable development at least for its own citizens. And the other important thing is that even though generally incineration plant is a much better technology in compare to for example landfilling but regarding the context it is not an intelligent solution for Denmark. Maybe it would work for other countries who are just at the beginning of the way which Denmark has passed for several decades ago.

#### (4) What, if anything, should we do about it?

"If you start with certainty you'll finish with doubt but if you start with uncertainty you will finish with certainty" Sir Francis Bacon, philosopher (1561-1562)

Considering what happened in Amager Bakke project, there is quite obvious that one of the main problematic issues with this project was marginalizing risk assessment, or it could be said, basing assessments on a wrong basis which led the project to face economic issues and become a defeated and to some extent failed project.

What we should do about it (Amager Bakke) is to learn from it in order to help change things for better. In order to improve the situation in future similar cases there is a need for Robust Decision Making (RDM) approaches or Decision Making Under Uncertainty (DMUU) approaches in order to support decision-making and policy analysis under conditions of deep uncertainty. The other useful tool that I would like to suggest is the "successive principle", as I have described it in detail in chapter 3.

"The basic philosophy behind the Successive Principle is (1) to make more efficient use of human common sense, creativity, intelligence and group synergy in order to identify all relevant factors; (2) to provide an unbiased evaluation of their impact; and finally (3) to handle the many subjective uncertainties in a scientifically correct manner," (Lichtenberg, 2003, p. 14). This principle is linked to a management style which focuses on cooperation and encompass a degree of openness which allows the participants to speak out about all sorts of relevant uncertainties.

If we just go back to what I talked about in the conclusion part, the core and the shell, it becomes clear that, the core, which is the major part of the plant wasn't assessed thoroughly and all the focus was pointed towards the surface. But if successive principle was applied the stakeholders had to go into the core and discuss that carefully, because that is the area in which all the major areas of uncertainty is accumulated

If we just take the calculations which ARC had prepared itself (440.000t, 500.000t, 560.000t), see appendix, and according to real amount of waste make a triple estimation (360.000t, 400.000t, 440.000t), it becomes clear that even if we take the best case scenario of the real estimation, and calculate it, the plant will face a huge amount of cost overrun.

What has been calculated by ARC shows that they have assumed that the most likely amount of the waste will be 500.000t waste, therefore they calculated the economy of the plant based upon that amount of waste, while currently the five owner municipalities deliver just 350.000 tons of waste to ARC and according to Ea-Energianalyse calculations the amount of waste will grow slightly in the future (Ea Energianalyse, 2010, p. 54).

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Affaldsmængde til forbrænding (PJ)	37,9	38,4	39,1	40,0	40,0	40,0	40,0	40,5	41,0	41,6	42,1	42,7	43,2	43,8	44,4	44,9
Årlig vækst i affald (%)		1,3%	1,8%	2,3%	0,0%	0,0%	0,0%	1,3%	1,3%	1,3%	1,3%	1,3%	1,3%	1,3%	1,3%	1,3%

*"Unchanged waste volumes 2008-2011 due to the economic crisis, Then 1.3% annual increase."* (Ea Energianalyse, 2010, p. 53)

In successive principle the detailing process of the areas of uncertainty continues until no further reduction of the uncertainty is possible, therefore If they applied successive principle during the risk assessment of Amager Bakke, they would have never been able to base the economy of the plant on such an uncertain basis. See a simplified version of the two scenarios.



What should be happened...

### 7. Discussion

The phronetic approach to social sciences was the foundation of this master thesis. The phronetic approach has inspired the questions asked, use of methods and application of theoretical perspectives. The aim of the phronetic approach has had a strong influence on the direction of this project; to do social science that matters, and as mentioned by Flyvbjerg (2004) focusing on practices that problematize taken-for-granted 'truths' about the progressive and rational promise of planning, and re-evaluate these contestable truths in the context of power in order to understand who gains and who loses by the telling of such truths, and how things can be done differently. And furthermore this study would become part of the power relations had been uncovered.

In this project it has been attempted to uncover the tension points, that is to investigate what is said and what is happened, and trying to reveal the importance of social practices.

The aim of this research was not to come up with final solution for action rather this research is an open-ended process which could be put forward for further research and discussion, as the ultimate goal of the phronetic research is. As mentioned by Flyvbjerg (2014), "With a better understanding of causes a better grasp of cures can be followed."

This project also is a contribution to discursive understanding of Amager Bakke megaproject. From the discourse analysis perspective the analysis illustrates how metaphors are used as a rhetoric tool in the construction of persuasive arguments to build the plant.

Any decision that are being made for the society has a specific outcome, it might be desirable or not, depending on how deep decision makers investigate and consider different aspects of their action. Decisions are not just social constructions and accumulation of words, they become materialized and they contribute to certain outcome with definite consequences. And in this case we are witnessing what has been said is far from what happened.

In the Amager Bakke case, what has been materialized can lead us to see what has been excluded, the results unveil many things. It also enables us to see what kind of institution is behind the project, since institutions are important players of the game. The aim of this research was not to figure out what is the truth or what is not, rather the aim of this research was to figure out the tension points and investigate what has been happened and finally, in order to make a value-judgment of the case. This research enables me to see how discourses are playing an important role on interpreting different realities which are not necessarily right and how dominant discourses could easily deviate the attention and distance you from other important aspects of the project. How language in some specific cases like this case can convince you to take wrong decisions in spite of existence of credible facts and documents.

The outcome of this research enables me to see how visual sense, which is defined by some philosophers like Aristotle, Plato and Galileo, as being dominant sense in human being can deceive you and make you believe that you are taking the right decision, because everything looks pleased. It shows that how visual sense as a sense that enables you to see can easily make you blind and leads you to easily step in a wrong direction. How our visual sense is interested in seeing and believing beauties which are not necessarily as beautiful as they might seem!!! Like the story of surface and core that I described.

This research illustrated that how world views of a specific group of people can easily affect the worldview of others and become dominant and gain more power. In other words, how certain way of thinking and seeing can be easily (deliberately or not) injected to other actors and bring costly consequences to the society.

The other important learning from the research is that, it is very important that all stakeholders have a clear idea of what is risk management and risk analysis and how it is important to communicate that it is much wider than what is normally appreciated. It is not only enough to identify risk and uncertainty areas, rather it is more important to choose the right and qualified persons for those assessments. As mentioned by Flyvbjerg et al. (2003) risks cannot be eliminated form major projects, but they can be acknowledged and their impacts reduced through careful identification and by allocation of risks to those best suited to manage them.

It is important not to exclude a lot of worldviews in a planning process. In order to reduce complexity in decision making processes it is necessary to exclude some extra world views but if you do it too blindly and too powerful you might be in danger of cutting out very relevant perspectives. There are also some other aspects about the project which are not necessarily related to the need for plant or not. For instance, the decisions to integrate an industrial infrastructure with architecture, adding recreational area and make it people-friendly are not necessarily undesirable things. But depending on how you make use of them it will change. In other words, you can give a specific identity to all those add-ons and make use of them as a tool for rationalizing your own personal interests. In this way they become as political and persuasive tools.

As I described in the conclusion part, I divided the plant into two parts; core which is the plant itself and surface which is the roof-top. Core and surface could be evaluated separately. Imagine that having the core is necessary and by adding an extra thing (surface) you make it better, but when there is no need for the core and you add the surface and say hey look, there is a need for something like this, it's eye-catching and unique, we should have something like this, in this way you make use of the surface as a persuasive and political tool. Actually what kind of role the surface has been played in this game? Maybe if the roof-top wasn't there the plant wouldn't be able to get the construction permission that easy or at least faced more confrontations and probably some adjustments were established or maybe they gave birth to another artefact? Who knows!!!!

One point that could be mentioned here is that it was a good idea if during the decision making process there were discussions about whether to build the expensive plant or not independently of the discussions about the surface, because surface distort the discussion and it wouldn't allow for a balanced and unbiased discussion about the main issues, that is, the need for plant, and the need for the heat from the plant.

Moreover, during the analysis it was revealed that the opponent group gain momentum and started to be heard when the plant comes into being. And the real criticises started to rise when the plant with deficit and overcapacity was standing in Copenhagen and the problematic artefact couldn't hide itself under the shadow of the surface anymore. See a schematic diagram of coalitions' dynamic development through the process.



Distribution of opponents and proponents beto Amager Bakke materialised

Distribution of opponents and proponents after Amager Bakke materialised

What that could have been useful was to bring balance between the discussions about the surface and the core and minimizing the risk of exaggerated focus on some certain aspects of the project. Otherwise, when you follow just one side of the arguments there is only one choice, to build the plant, but when you follow the other side of the arguments, it is not smart to build the plant.

In the TV programme when the journalist asked the former director of the ARC that why you disregard the experts' warnings? She answered that *"we didn't ignore, we just calculated differently,"* (DR1, 2017).

The meaning underlying the argumentation brought by the Former director is showing that she even didn't question that why they calculated differently? Or if she did, she just didn't consider it seriously. This is a questionable situation, how it could be possible that one group come up with calculations that is showing the waste amount is continuously growing and the other group come up with some argumentations that the amount of future waste is quite uncertain? How could it be possible that the two results differ in an extreme degree?

And also she said to Jyllands-posten that;

"It is still crucial that Amager Bakke has a 30-40 years lifespan, so the answer to the question of whether the plant is too big can really be seen first in the future,"

So according to arguments of the former director of ARC we need to wait until next 30-40 yeas to see "whether the plant is too big," (Martini & Sandøe, 2016b).

So, maybe we need to wait until next 30-40 years to see what happens!!! Maybe a miracle?

In order to improve the situation for future cases there is a need for having Critical Risk Assessment. The problem in this project was that those actors who were protecting to build the plant have been manipulating the reality, or maybe they were unpurposed blind. And that should not be allowed with public money. Public money could be invested in better ways.

As mentioned before risks associated with major projects are substantial and institutional reform as a prerequisite for diminishing risk could play an important role. The new institutional forms require the acceptance of change and evolution as normal. It also requires giving up on the idea that anyone knows the answers. It demands public understanding that the goal of governance in complex, controversial and uncertain situations has to be to create a shared intelligence that allows all the players acting autonomously with shared heuristics to make the complex system into an intelligent, adaptive one (Inneth & Booher, 2003, pp. 58-59).

Furthermore, there is a need for more transparency, that is, all documents and other information prepared by the government and its agencies must be accessible to public. Since major infrastructure projects are among the most costly ventures in society and often citizens as taxpayers are the ultimate guarantor for such projects, therefore they should be well informed and have a say on the project (Flyvbjerg, et al., 2003). Documents should be subject to independent and public peer review on major issues. Active participation by stakeholder groups and the general public in environmental impact assessment, monitoring and auditing, must be allowed. And there should be more expert involvement during the decision making process.

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I/S Amagerforbrændi Model for beregning af se konsekvenser ved beslutr	ng Iskat ning (	os- og samf om valgt an	undsøkon Iægstekn	omiske ik m.v.		Retur til ba	asis-ark														Version:	KII 18. i 8_Projektforsi	1B/RAMBØLL 'ebruar 2010 'agsscenarier
SELSKABSØKONOMI Scenario 2x35			2015	2016	2017	2018	2010	2020	2021	2022	2022	2024	2025	2026	2027	2028	2020	2020	2021	2022	2022	2024	2025
			2015	2010	2017	2018	2019	2020	2021	2022	2023	2024	2025	2020	2027	2028	2029	2030	2031	2032	2035	2034	2035
Total affaldsmængde	Po	t/år	######	500.000	500.000	500.000	500.000	500.000	500.000	500.000	500.000	500.000	500.000	500.000	500.000	500.000	500.000	500.000	500.000	500.000	500.000	500.000	500.000
Indtægter	Re	acty maengue		1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000
El-indtægter		mio. kr/år		160,3	160,3	160,3	160,3	160,3	160,3	160,3	160,3	160,3	160,3	160,3	160,3	160,3	160,3	160,3	160,3	160,3	160,3	160,3	160,3
Varmeindtægter		mio. kr/år		192,2	192,2	192,2	192,2	192,2	192,2	192,2	192,2	192,2	192,2	192,2	192,2	192,2	192,2	192,2	192,2	192,2	192,2	192,2	192,2
Øvrige indtægter		mio. kr/år		0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Indtægter i alt		mio. kr/är	4.824	352,5	352,5	352,5	352,5	352,5	352,5	352,5	352,5	352,5	352,5	352,5	352,5	352,5	352,5	352,5	352,5	352,5	352,5	352,5	352,5
Omkostninger																							
Driftsomkostninger		mio. kr/år	1.824	124,5	125,4	126,3	127,3	128,3	129,3	130,3	131,4	132,5	133,6	134,8	136,0	137,3	138,6	139,9	141,2	142,6	144,1	145,6	147,1
Finansiering, Annuitet	Α	mio. kr/år	2.875	245,7	240,9	236,2	231,5	227,0	222,5	218,2	213,9	209,7	205,6	201,6	197,6	193,7	189,9	186,2	182,6	179,0	175,5	172,0	168,7
Scrapværdi, Annuitet	Α	mio. kr/år																					0,0
Affaldsafgifter		mio. kr/år	1.580	115,4	115,4	115,4	115,4	115,4	115,4	115,4	115,4	115,4	115,4	115,4	115,4	115,4	115,4	115,4	115,4	115,4	115,4	115,4	115,4
Omkostninger ekskl scrap. i alt		mio. kr/år	6.279	485,6	481,7	477,9	474,3	470,7	467,3	463,9	460,7	457,7	454,7	451,8	449,1	446,4	443,9	441,5	439,2	437,1	435,0	433,0	431,2
Ekstern behandlingsomkost	tning	er																					
Medtages (1/0)		0																					
Inkl. afgifter		mio. kr/år	0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Ekskl. afgifter		mio. kr/år	0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Resultat inkl. affaldsafgifte	r og (	omkostninge	r til ekster	n behand	lling																		
Resultat		mio. kr/år		-133,2	-129,2	-125,5	-121,8	-118,2	-114,8	-111,5	-108,3	-105,2	-102,2	-99,3	-96,6	-94,0	-91,5	-89,1	-86,8	-84,6	-82,5	-80,6	-78,7
NPV af resultat		mio. kr.	-1.455																				
Affaldsbehandlingspris, år for å	ir	kr./ton		266,3	258,5	250,9	243,6	236,4	229,6	222,9	216,5	210,3	204,4	198,7	193,2	187,9	182,9	178,1	173,5	169,2	165,0	161,1	157,5
Affaldsbehandlingspris, ger	nnem	snikr./ton	212,7																				
Resultat ekskl affaldsafgifte	er me	en inkl. omko	stninger t	il ekstern	<u>behan</u> dli	ng																	
Resultat		mio. kr/år		-17,7	-13,8	-10,0	-6,3	-2,8	0,7	4,0	7,2	10,3	13,2	16,1	18,8	21,5	24,0	26,4	28,7	30,9	32,9	34,9	36,7
NPV af resultat		mio. kr.	125																				
Affaldsbehandlingspris, år for å	ir	kr./ton		35,4	27,6	20,0	12,7	5,6	-1,3	-8,0	-14,4	-20,5	-26,5	-32,2	-37,7	-42,9	-48,0	-52,8	-57,4	-61,7	-65,8	-69,7	-73,4
Affaldsbehandlingspris, ger	nnem	snikr./ton	-18,2																				
Beregning af projektværdi																							
Affaldsbehandlingspris, inkl. af	gift	kr./ton	270,0																				
Resultat inkl. affaldsbetaling		mio. kr/år		1,8	5,8	9,5	13,2	16,8	20,2	23,5	26,7	29,8	32,8	35,7	38,4	41,0	43,5	45,9	48,2	50,4	52,5	54,4	56,3
Projektværdi		mio. kr.	392,4																				

#### SELSKABSØKONOMI

Uden omkostninger til bortskaffelse af kondensat Selskabsøkonomi; Affald: 500 tt/år Uden biomasse Med biomasse

Data til komprimeringskurve

Affald	440.000 t/ 500.000 t/ 560.000 t/år								
Uden bio	6,9	10,0	13,1						
Med bio	12,2	12,6	13,1						



(Rambøll, 2011)