The Competitiveness of Xinjiang Goldwind Science & Technology Co., Ltd. in the Western Wind Power Industry

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Abstract:

Xinjiang Goldwind Science & Technology Co., Ltd. is a Chinese wind turbine manufacturer and currently one of the market leaders in the global wind power industry. This thesis will investigate Goldwind's competitiveness in the Western wind power industry and will thus analyze what factors are influencing this matter. The theoretical concepts of global value chains, world systems, and state capitalism will be applied to the empirical data to answer the research question of why Goldwind is competitive in the Western wind power industry. A mixed-methods approach and a single explanatory case-study will prove the methodological foundation. The analysis revealed that Goldwind in fact is competitive due to different factors such as their geographical scope, as well as their firm-centric governance and upgrading. When continuing the analysis and thus exploring the impact of Chinese state capitalism it became clear that the Chinese state is serving in a facilitating role in Goldwind's global value chain, and that the tremendous support the Chinese state offers Chinese wind turbine manufacturers create a competitive advantage for the companies. The understanding of global value chains builds on the notion of an unequal capitalistic world system. I therefore followed the analysis with a discussion of whether China has managed to position themselves in an advantageous position within this world system due to their success in industrial upgrading, or whether it is due to their position within global value chain hierarchies as a result of Chinese state capitalism. Goldwind is competitive in the Western wind power industry, and the Chinese state capitalism is impacting this to a great extent. This paper will contribute to a significantly underdeveloped field by providing a detailed analysis of the impact of global value chain governance and upgrading, as well as the impact of Chinese state capitalism in the competitiveness of a Chinese wind turbine manufacturer.

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List of Abbreviations:

GCC: Global Commodity Chain

GVC: Global Value Chain

GWEC: Global Wind Energy Council

IMF: International Monetary Fund.

MNE: Multinational Enterprise

MSPM: Medium-speed Permanent Magnet

NPC: National People's Congress

OECD: Organization for Economic Co-operation and Development

OEM: Original Equipment Manufacturer

O&M: Operation and Maintenance

PMDD: Permanent Magnet Direct Drive

PRC: People's Republic of China

R&D: Research and Development

SOE: State-owned Enterprise

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1. Background Introduction

"*[…] it is time to think much more carefully about the centrality of politics in a GVC world, and particularly the role of states in the creation and maintenance of it.*" – this is what Mayer and Philips (2017) seek to conclude in their understanding of global value chains. Furthermore, they argue that to rightly understand global value chains, one has to pay attention to both the economic and political perspectives (Mayer and Phillips 2017, p. 135). Globalization has caused a change in the geographical scene of global production networks, which has resulted in geographical dispersed, fragmented, and specialized value chain functions and activities (Gereffi and Korzeniewicz 1994). Emerging economies, such as China and India, are increasing their shares in research and development (R&D) related activities as well as highly technologic fields, which are creating a shift in the geographical fragmentation of value adding activities (Huggins, Demirbag, and Ratcheva 2007). In the 1980's, many believed that the only way for developing countries to integrate into the global economy was to pursue the export-oriented trajectory. Now, both detractors of the neoliberal paradigm and critics of the market-radical versions agree that developing countries can increase their competitiveness in the global economy by participating in global value chains. There are two main approaches to the research of global value chains: (1) the traditional world systems approach, and (2) the chain approach covering both the frameworks of global commodity chain (GCC) and global value chain (GVC). While the traditional world systems approach holds a more holistic and macro perspective on global value chains, the chain approach tends to cover both meso perspectives, in terms of industry dynamics, and micro perspectives covering firm-centric governance and upgrading (Bair 2005). In this paper, I will utilize both approaches.

Since the implementation of the economic reforms by Chinese leader Deng Xiaoping in the late 1970's, the Chinese economy has been in a rapid development. As a result of this, the majority of global value chains have been impacted, and consequently the world economy has been impacted as well (Chow 2004). This massive growth in the Chinese economy has resulted in some structural economic shifts implemented by the Chinese government. One of these shifts is the initiative of 'Made in China 2025', which Premier Li Keqiang introduced in 2015 to develop the future of the Chinese economy. This initiative covers several core industries in the Chinese economy, such as IT, robotics, and power equipment, which all are being supported by favorable policies, financing, and subsidies, so the companies involved can become competitive in the international industries. The goal

of this initiative is to become a global manufacturing, cyber, and science and technology innovation superpower (Zenglein and Holzmann 2019). In addition to this, the goal is to push Chinese industries further up the global value chain hierarchies, and thus be less reliant on foreign research, developments, and technologies (David 2021). China, as an emerging innovation power, is investing in accessing foreign technologies through joint ventures, partnerships, collaborations and similar, which allows them to learn from foreign technological superpowers before they facilitate the developments of new processes and technologies, and thus invest in in-house research and developments (Shaowei et al. 2017). As a result of the political initiative 'Made in China 2025', Chinese companies are gradually developing into becoming lead innovative firms with support from the Chinese state.

One of the Chinese companies who are gradually developing its innovation and position within global value chains is Xinjiang Goldwind Science & Technology Co., Ltd (which will be referred to as 'Goldwind'). When the economic reforms were implemented in the late 1970's, Goldwind took the opportunity and started exploring the global wind power industry. In 1998, Goldwind first initiated research and development activities on the manufacturing of wind turbines, and since then, they have actively been pursuing expansion through technological developments, product transformation, construction of their value chain, as well as improving their cost control, and increased investments in R&D (Goldwind. About us). Today, Goldwind is ranked second out of all wind turbine manufacturers globally and is thus competing with Western companies such as Siemens Gamesa, General Electric, and Vestas Wind Systems (Finans 2022).

1.1 Problem Formulation & Objectives

This thesis sets out to explore Goldwind's global value chain in order to understand why they are competitive in the Western wind power industry. By doing so, I will divide the analysis into two parts: first the value chain approach and second the world systems approach. The objective of this two-fold analysis is firstly to analyze how firm-centric governance and upgrading can impact the competitiveness of Goldwind in the Western wind power industry, and secondly to analyze how Chinese state capitalism is influencing the competitiveness. Once this has been analyzed, I can proceed to discuss whether Goldwind is challenging the traditional power structures within global

value chains due to China's more advantageous position within the capitalistic world order as a result of successful industrial upgrading, or whether it is because of the Chinese state's influence on global value chains.

This leads to the following research question:

Why is Goldwind Competitive in the Western Wind Power Industry?

It is important to note that the objectives of this research, and the research question itself, are fluid in nature, and can thus be subject to change as I conduct this analysis.

The research question of 'why Goldwind is competitive in the Western wind power industry' is stating that Goldwind in fact is competitive. Therefore, before initiating the analysis of *why* they are competitive, I will first illustrate that they *are* competitive. First of all, whilst competitors such as Vestas Wind Systems and Siemens Gamesa entered the first quarter of 2022 with a huge deficit, Goldwind made a profit margin of 26,5 percent compared to 2021. However, one needs to consider external factors such as supply chain challenges due to the war in Ukraine, which began in February of 2022. Second of all, Goldwind's overall installed capacity in 2021 was 44,5 GW, which is a higher installed capacity than the capacity of Vestas Wind Systems, Siemens Gamesa, General Electric, and Nordex combined. In terms of price, Goldwind's wind turbines are competitive, as the average price for a newly installed megawatt was 2 million DKK in the first quarter of 2022, which is in sharp comparison to the 7.5 million DKK a Vestas wind turbine would cost in Q1 of 2022 (Finans 2022). These few factors demonstrate how Goldwind in fact is competitive in the Western wind power industry. Goldwind is listed both in Shenzhen Stock Exchange and in the Hong Kong Exchanges and has been awarded several awards since then. They have been awarded the "Most Respected Company in Asia", "Best Investor Relations Company", and been selected as the "Top 50 Most Innovative Companies in the World", "Carbon Clean 200", "Top 500 Global New Energy Companies", "New Fortune Best Listed Companies", and lastly "Fortune Top 500 Chinese Companies" (Goldwind. About Us).

1.2 Literature Review

In the following chapter, I will identify some of the main literature in the field of global value chains and political intervention and governance hereof, and thus discuss the underdevelopments and gaps of the literature within this field. I began the review of the existing literature with a search for global value chains in the database of the University Library of Aalborg University which revealed a literature review by Kano et al. (2020). Kano et al. (2020) argue that the gradual liberalization of international investments and trade, as well as the development of information technologies have altered the competition between multinational enterprises (MNE's) in the world economy. Kano et al. (2020) highlight that scholars within many different academic disciplines have contributed to the body of research on global value chains. Even though, many scholars have contributed to this field, several gaps have still been identified, such as research on global value chains impact from a macro-level (Kano, Tsang, and Yeung 2020).

The term 'commodity chains' was first introduced by Wallerstein and Hopkins (1977) who defined it as "*[…] take an ultimate consumable item and trace back the set of inputs that culminated in this item – the prior transformations, the raw materials, the transportation mechanisms, the labor input into each of the material processes, the food inputs into the labor. This linked set of processes we call a commodity chain*" (p. 104). Since then, many scholars have added to this notion. Gary Gereffi and Karina Fernandez-Stark (2019) developed a framework for analyzing global value chains and argued that there are six dimensions needing to be analyzed. From a global perspective, also called the top-down approach, one need to analyze the input-output structure, the geographical scope, and the governance structure. From a local perspective, which also is referred to as the bottom-up approach, one need to analyze the upgrading, the local institutional context, and the industry stakeholders. These dimensions allow one to understand how an industry is organized and determine what roles different actors holds in both developing and developed countries. In addition to this framework, the article also includes a critical coverage of the globalization of value chains, which have created a solid foundation for the theoretical background of this research. According to this, the framework of global value chains enables one to comprehend the structures and dynamics of global industries by analyzing the different actors involved (Fernandez-Stark and Gereffi 2019).

As I continued the search for literature on global value chains, both in the University Library and in Google Scholar, it became clear that research within the field has been conducted by scholars from many different academic fields. Scholars within Social Science, Economic Sociology, International Business, International Politics, and Economics have played a part in developing the field of global value chains, and in addition to this, interdisciplinary research has also been conducted to gain insight from different academic angles as well as to utilize different theoretical and methodological concepts (Kano, Tsang, and Yeung 2020).

After this preliminary search, I narrowed the search for more specific content on global value chains and Chinese wind turbine manufacturers. This search revealed a very underdeveloped field in the existing literature, where the latest research conducted in this specific field was developed by Rasmus Lema (2011). He analyzed the competition and cooperation between Europe and China in the wind power industry, where he covered China's transformative influence and the debate of 'Asian Drivers'. Lema's research was conducted more than a decade ago and does therefore not provide a complete coverage of the contemporary circumstances. Following the search on global value chains and Chinese wind turbine manufacturers, I began the search for political governance and political intervention in global value chains. Here, Horner and Alford (2019) produced an article in the *Handbook on Global Value Chains* called *The Roles of the State in Global Value Chains*. In this article, Horner and Alford (2019) argue that the nexus between the state and the global value chains is one of the most crucial challenges when conducting contemporary research on global value chains. They build on the notion of Horner (2017) and explore the different roles of states in global value chains in developing new industries. They distinguish between four roles. One of the roles of the state is 'facilitator', which is defined by states assisting companies in challenges related to global value chains and the world economy, such as assisting with subsidies and incentives for research and development. The second role is 'regulator', which is defined by states implementing measures that affect the GVC's, such as price control, trade policy, etc. The third role is 'producer', which is defined as state-owned enterprises. And lastly, the fourth role is 'buyer', which is defined as states buying output produced (Horner and Alford 2019).

I narrowed the search even more and began the review of the role of the Chinese state and Chinese state capitalism in terms of what influence those has on the competitiveness of Chinese wind turbine manufacturers. I delimited the search to the years of 2018-2022 to reveal the most contemporary

research. It became clear to me that research conducted within this field within the limited time period is very underdeveloped, and as a consequence, not many results directly linked to the topic appeared. In fact, when searching for "global value chains", "Chinese state capitalism", and "wind turbines" only six results appeared in Google Scholar. When removing "wind turbines" from the search field, 86 results appeared. This search clearly demonstrates the underdevelopment of this topic in current research, and this paper will thus contribute to the field.

It is not only through an academic lens that global value chains are a popular topic. A Google search on global value chains reveals different literature covering the topic. The Organization for Economic Co-operation and Development (OECD) has developed an article on global value chains about policy implications, as well as papers and policy notes (OECD. Global Value Chains (GVCs)). The same goes for the World Bank, who has developed an article about why global value chains are important for growth and how developing countries are participating in the new paradigm of global value chains (World Bank. Global Value Chains). The European Central Bank argues that "*[…] global value chains (GVCs) have emerged as paradigms of production*" (The European Central Bank, p. 4). Furthermore, they argue that global value chains allow countries to participate in areas wherein they hold their competitive advantages, which will increase the local production growth and thus increase the wages and incomes. Additionally, they emphasize that by increasing the vertical integration of global value chains, the interconnectedness between countries will grow (The European Central Bank).

The World Trade Organization has published a 'Global Value Chain Development Report 2021', which also contributes to this field by among others analyzing the recent trends in GVC's, innovation and upgrading in GVC's, and the rising risks to global value chains. They argue that access to foreign R&D through global value chains affect the productivity of a country and can boost innovation in emerging economies. Furthermore, they argue that 'moving up the ladder' of global value chain hierarchies not necessarily involves a linear process, and that firms can source technological components overseas or utilize the opportunities of international expansion to acquire strategic resources. This process allows emerging economies, and firms within, to facilitate innovation and thus climb the ladder within global value chains (The World Trade Organization).

In general, this literature review reveals a field that has already been explored to some extent, but also reveals some gaps in the existing literature. The Chinese wind power industry is in constant development, and therefore, the research made ten years ago might not provide a full coverage of the contemporary circumstances. This thesis will have a contemporary take on the field, and thus contribute to the gaps and underdevelopments in the existing literature. I have not delimited my search by only focusing on one academic publication or one academic database. In fact, to obtain the most scientific valid outcome of the literature review, I utilized both the databases of Aalborg University Library, Aarhus University Library, and Google Scholar. In addition to this, I have consulted different academic publications such as academic journals, academic articles, academic handbooks, research reports, and research books.

1.3 The Global Wind Power Industry

In this section, I will cover the global wind power industry, and thereby illustrate the market leaders, the emerging markets, and the role of the states as well as the role of different agreements towards climate issues. In the 20th century, the United States and Denmark were market leaders in the wind power industry, and by the early 21st century, Germany gained market shares and became the leading country in the industry. Since then, developing countries have gained increasing market shares in the industry, as they have been successful in developing their local wind power capacity. These countries, such as China and India, are now some of the main emerging markets in the global industry. The Nordic countries of Europe have been advancing their wind power technology from an early stage on, as their geographical locations result in rich wind resources, and they thus have the opportunity to develop their wind power, which also have been supported by their central governments with favorable policies (Zhang et al. 2022).

In the green energy sector, especially in the wind power industry, the role of the state is very significant, as the wind power industry is reliant on investments in green transformations. More concrete, the governments' policies create markets and can have an influence on the global value chains (Kirkegaard, Weischer, and Hanemann 2009). The Global Wind Energy Council (GWEC) is an international trade association for the wind power industry who provides research on the global wind power industry (Global Wind Energy Council. What is GWEC). The Global Wind Energy

Council (2021) is anticipating the global wind energy industry to grow an average of 4 percent each year from 2021 till 2025. These anticipations are calculated on the basis of expected new installations, inputs from regional wind associations, government targets, project information, and knowledge from experts in the wind power industry. They also highlight that the main reason for growth from 2021 till 2025 is due to government policies. 2021 was the year where new wind power installations faced a new record, and the year where countries and regions initiated their plans to meet zero CO_2 emissions in the near future (The Global Wind Energy Council 2021). Right now, the most dominant wind turbine manufacturers in the world are Vestas Wind Systems, General Electric, Goldwind, Siemens Gamesa, and Envision (Wind Energy and Electric Vehicle Magazine).

The Paris Agreement and the Kyoto Protocol have forced many states to tackle the challenges of the current climate change in the world. Agreements have followed to actively reduce the CO_2 emissions, as well as to implement and develop the utilization of renewables. Wind energy is among the preferred sources of green energy, as it has the benefits of minimal pollution and minimal disturbance, but also because the technology within this field has been explored and developed to fit the current needs and standards of clean energy (Zhang et al. 2022).

The renewable energy targets of the European Union are mainly expected to be fulfilled by the contribution of wind energy. By ultimo 2020, the total wind power capacity installations in the EU supplied 14 percent of the electricity demand equivalent to 210GW (European Commission). Offshore wind power in Europe holds a major potential for reaching the energy targets of the European Union. First of all, the public opinion of offshore wind power installations is acceptable, as they create a minimal disturbance for the citizens located nearby. Second of all, the resources are stable offshore, and will thus create a stable capacity. The European Union in general has decreased their investments in research and development, and instead started to focus on reliability and maintenance of existing turbines in order to increase the circularity of the technology (European Commission). Another aspect, the European Union is investing in, is the floating structures of wind energy systems. These investments are to increase the possibilities of deployments and make the structures suitable for multiple conditions such as deeper waters and other climate related conditions. The objectives of these investments are to strengthen the European position in the global industry, as well as to improve the circularity and performance of the existing wind turbines (European Commission).

1.4 The Chinese Wind Power Industry

In this section, I will illustrate the main characteristics of the Chinese wind power industry, and consequently touch upon Chinese installations, export numbers, and the main actors in the industry. As a result of trying to combat challenges related to air- and water pollution in China, the Chinese wind power industry has been subject to a great growth and has been in constant development in the past decade to overcome the massive energy issues in the country (Zhang et al. 2021).

As a result of the massive investments in green energy in China, the Chinese wind turbine manufacturers accounted for 50 percent of new offshore installations, and 56 percent of new onshore installations globally in 2021. Out of the total amount of global installations in 2021, Chinese wind turbine manufacturer accounted for 39 percent of onshore installations, and 28 percent of offshore installations, as illustrated in figure 1 (Global Wind Energy Council 2021).

Figure 1. New and total installed capacity both onshore and offshore in 2021 (Global Wind Energy Council 2021).

The Global Wind Energy Council expects Chinese wind power manufacturers to install between 34 percent to 53 percent of the total new installations over the years of 2020 to 2025, which consequently means that China is anticipated to be by far the biggest supplier of wind power compared to the rest of the world, as illustrated in figure 2.

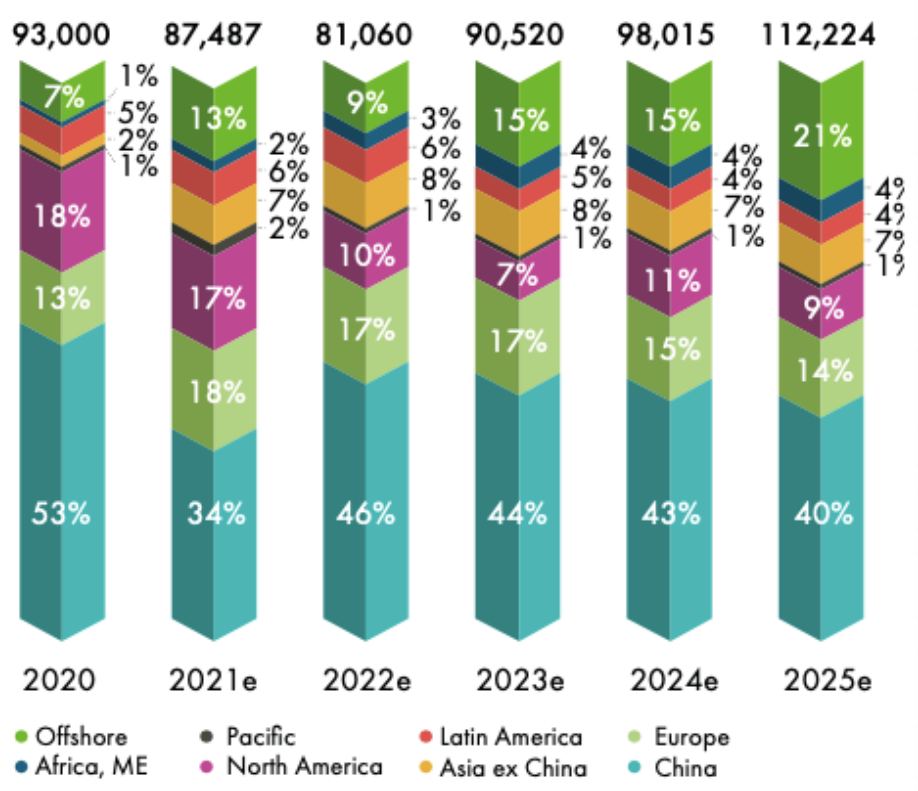

Figure 2. Outlook of new wind power installations from 2020-2025 divided by region (Global Wind Energy Council 2021).

As demonstrated in figure 2, China's new wind power installations exceeded Europe's, North America's, Latin America's, Africa's, and the rest of Asia's combined in 2020, and China thus held the greatest manufacturing and installation output globally. This massive development of Chinese wind turbine manufacturers in the recent years is partly due to the wind power policies and technical support they receive from the Chinese state, but also due to the signed agreement such as the Paris Agreement and the Kyoto Protocol. In addition to this, China's offshore wind industry is still a relatively new industry, and therefore holds a massive development and investment potential for China and overseas actors (Zhang et al. 2022).

In 2017, the export of Chinese wind turbines reached 2.9 billion USD, and over the course of four years, the export of Chinese wind turbines increased to 7.2 billion USD in 2021. This increasement demonstrates the massive potential, and competitiveness, that Chinese original equipment manufacturers (OEM's) hold in the overseas wind power industries. It is not only the export of Chinese wind turbines which has been in a massive development, wind-powered generating sets increased with 294 percent from 2017 till 2021, export of blades and hubs, and export of components to wind power generator sets were subject to an increase on respectively 150 percent and 109 percent (David 2022).

The competition in the Chinese wind power industry is increasing and different actors are competing for the market shares within China. In 2021, Goldwind installed most capacity out of all the Chinese actors in the local market and thus reached 11.4 GW. Envision, Windey, and Mingyang are following with 7.8 GW, 7.6 GW, and 7.5 GW installed capacity respectively, as illustrated in figure 3.

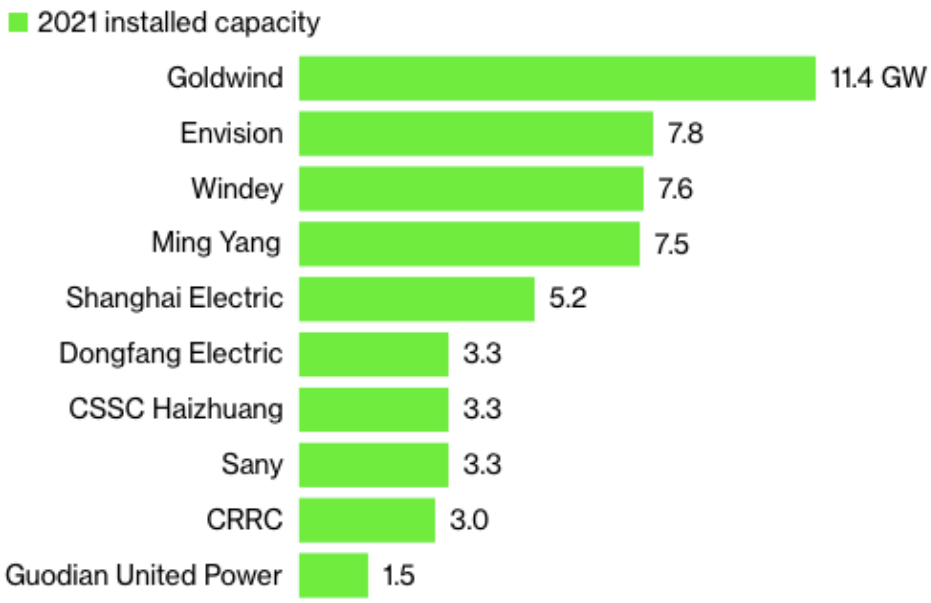

Figure 3. Installations in 2021 show rising competition in China's wind industry (Bloomberg News 2022).

2. Methodological Considerations

This chapter will outline the methodological considerations of this thesis, which will include descriptions of the choice of an appropriate research design, the choice of theoretical concepts, and the choice of empirical data and application. In addition to this, I will also touch upon the data collection and the chosen case-study of Goldwind. These considerations will assist me in answering the research question through a well-designed methodological process.

Within every research, two overall epistemological approaches can be adopted. The first one is the inductive approach, which involves "*[…] the search for pattern from observation and the development of explanations – theories – for those patterns through a series of hypotheses*" (Bernard 2013, p. 12). Here, new cases will continuously be analyzed to test the hypotheses. On the other hand, the deductive approach has its starting point in the chosen theories, and hypotheses are derived from there. This leads to observations, which will either confirm or falsify the hypotheses. Furthermore, Bernard (2013) argues that research is never completely either inductive or deductive, and elements from both approaches can be identified in every academic dissertation. In this paper, I am proceeding from the general to the particular. This means that I am utilizing deductive elements by letting the chosen theoretical concepts guide me in establishing a hypothesis of Goldwind's competitiveness in the Western wind power industry. Continuing from there, the collection and analysis of the data will prove the foundation for confirming or falsifying the hypothesis.

2.1 Research Design

This paper utilizes a single case-study research design, which functions as a qualitative research method (Flyvbjerg 1988). This research design allows me to investigate the structure of a given industry or the structure of an economy of a country or a region (Yin 2009). Yin (2009) argues that the utilization of a single case-study approach is a successful method for investigating a complex social phenomenon in an organizational setting. There are therefore several arguments for choosing this kind of research design. First and foremost, this paper operates in an organizational setting, as I investigate the competitiveness of Goldwind in the Western wind power industry, which will allow me to form a holistic understanding of real-life events. In terms of complex social phenomena, I will

investigate the globalized aspects of value chains, and thus how different forms of governance and upgrading of global value chains can influence the competitiveness of Chinese multinational enterprises. One of the advantages of utilizing a case-study is its closeness to real-life situations, and one therefore can develop a detailed and nuanced view on the reality of the case (Flyvbjerg 2006). Case-studies allow one to utilize different methods for data collection in order to gain information from multiple entities, such as either groups, organizations, or people (Benbasat, Goldstein, and Mead 1987), which I will be discussing further in chapter 2.3, where I demonstrate the choice of empirical data and approach.

I have constructed the research design from the basis of the research question. Because the research question is a *why* question, it has been recommendable to implement an explanatory research design (De Vaus 2001). In order to answer the research question, I therefore seek to develop causal explanations. Therefore, to answer why Goldwind is competitive in the Western wind power industry, I need to analyze what factors are affecting this. In this case-study, the reason for Goldwind's competitiveness is both affected by how they govern and upgrade their global value chain, as well as Chinese state capitalism. Once data has been collected to analyze the research question, I can develop causal explanations for Goldwind's competitiveness in the Western wind power industry.

2.2 Choice of Theoretical Concepts

I have chosen to utilize three different theoretical concepts: the theory of global value chains, theory of state capitalism, and world systems theory. The purpose of choosing these theories is to create the most scientific valid foundation for answering the research question of:

Why is Goldwind Competitive in the Western Wind Power Industry?

I will now outline the main arguments for choosing the theoretical concepts, beginning with the theory of global value chains.

I chose to utilize the theory of global value chains, as it allows me to investigate what influence different factors, such as governance and upgrading, has on the competitiveness of Goldwind in the

Western wind power industry. Within the theoretical framework of global value chains, I can dig deeper into how the activities within Goldwind's global value chain are being governed and controlled both from a firm-centric perspective and from a country-level perspective. The firm-centric and country-level governance of global value chains will assist me in answering the research question, as by analyzing how value-adding activities are being controlled, I can analyze how this is influencing the competitiveness of a company.

When analyzing Goldwind's global value chain, I will utilize the framework of Gereffi and Fernandez-Stark (2019). As I explained in the literature review, this framework has six dimensions: three in the top-down approach, also referred to as the global approach, and three dimensions in the bottom-up approach, which is also referred to as the local approach. I will have a careful focus on the governance and upgrading of Goldwind's global value chain activities, as I want to uncover both the impact of the firm-centric governance and upgrading of the value chain activities, but also the impact of public governance and political intervention. In order to analyze the governance part of the value chain from both a micro- and a macro perspective, I will also include the concepts of state capitalism and world systems theory into the analysis. The world systems theory and state capitalism allow me to take a macro perspective on the value chain, whereas the theory of global value chains will give me a micro perspective.

I chose to utilize the theory of state capitalism, as this theory will prove the foundation for analyzing the impact of political intervention as well as public governance of Goldwind's global value chain. Through this, I can analyze the role of the Chinese state, and thereby analyze how this role contributes to the competitiveness of Goldwind. The theory of world systems assists me in concluding whether Goldwind's competitiveness in the Western wind power industry is due to how they manage firm-centric upgrading and governance, or whether it is due to how Chinese state capitalism is influencing the activities of the value chain. Therefore, these theoretical concepts are creating a solid foundation for investigating the value chain from both a micro- and macro perspective.

2.3 Choice of Empirical Data & Approach

In this paper, I have chosen to utilize both quantitative and qualitative data in order to answer the research question. The following chapter will outline the considerations I made in terms of collecting the empirical data, as well as what contributions they offer the thesis.

I have mainly collected secondary data, which allows me to consult research made by other academics on this matter. The secondary data consists of academic articles, books, and journals. In addition to this, I have collected my data through different organizational entities. First and foremost, I have utilized the information available at Goldwind's webpage, as well as the webpages of Goldwind's subsidiaries. In addition to this, I have consulted different medias such as Forbes, Energywatch and Windpower Monthly who dedicates themselves to critical journalism and analyses regarding the wind power industries. To uncover official regulations, policies, and data, I have consulted different governmental institutions, such as the webpage of the European Commission, the webpage of the National People's Congress of the People's Republic of China, the State Council of the People's Republic of China, and the United Nations.

As I illustrated in the literature review, this specific field is relatively underdeveloped, and it has therefore been very recommendable to consolidate these sources, as the industry is in constant development, thus the data available is changing continuously.

As illustrated, the secondary data consists both of qualitative and quantitative data, hence I have been implementing a mixed-method approach for my analysis. The implementation of this approach has been very advantageous in terms of forming an understanding of the industry based on quantitative data, such as statistics of the global market shares in the wind power industry, as well as statistics on China's rapid development in the global industry. The qualitative data has assisted me in analyzing activities within Goldwind's global value chain, as well as analyzing the different governmental policies and regulations influencing the industry and the actors involved.

2.4 Preliminary Investigation

The process of this thesis was initiated by a preliminary discussion with a department in Vestas Wind Systems, whose purpose is to analyze different strategies of competitive actors in the global wind power industry. This department expressed interest in the Chinese competitors, as they have witnessed the massive investments and the rapid development of the Chinese wind power industry. This discussion led to further considerations about the competitiveness of Chinese wind power manufacturers in the Western industry, and how political intervention and public as well as firm-centric governance of global value chains can strengthen one's competitiveness in a given industry. After this discussion, I conducted systematic literature reviews in regard to this topic, and thus decided to contribute to the field of global value chains in the global wind power industry. This not only allows me to study the Chinese wind power manufacturers, but also allows me to contribute to the department in Vestas, as they have yet to analyze the corporate strategies of their Chinese competitors. Because Chinese wind turbine manufacturers up until recently have implemented most of their installations within China (Finans 2022), Vestas has not been analyzing their strategies. However, as Chinese wind turbine manufacturers now have an international reach, and are heavily investing in overseas projects, Vestas has expressed interest in an analysis of the Chinese competitors, hence this thesis will contribute to that. These discussions initiated this thesis and combined with further research; I established the research questions.

2.5 Case-study: Xinjiang Goldwind Science & Technology Co., Ltd.

Xinjiang Goldwind Science & Technology Co., Ltd., also known as Goldwind, is one of the market leaders in the global wind power industry and has been operating and exploring the industry, mainly the Chinese wind power industry, since 1985. Since then, Goldwind has been investing heavily in research and development on foreign technology within the manufacturing of wind turbines and have thus been successful in transforming their industrial chain, as well as to internationalize their value chain activities into the overseas wind power industries. They are now operating under the strategy of targeting overseas industries and their overall objective is expansion in the international market (Goldwind. About us). As per ultimo 2021, Goldwind employed 10.781 worldwide, whereas 3239 of these were employed within the research and development departments. The rest of the personnel

was spread across different functions such as production, sales, finance, administration, service, and operation and maintenance (O&M) (Goldwind. Annual Report 2021).

Goldwind has benefitted from the prosperous development of the Chinese renewable energy sector, which also have established them in a favorable position in the global wind power industry. The international reach of Goldwind includes six continents and 32 countries, and they have installed 43.000 wind turbines globally (Goldwind. About us). Goldwind's annual report of 2021 revealed a net profit of RMB 3,456.96 million, which is a year-on-year growth of 16.65 percent. Most of Goldwind's revenue stems from the manufacturing and sales of wind turbine generators and components, wind power services, which refer to wind farm construction and finance services etc., and wind farm developments (Goldwind. Annual Report 2021).

For 11 consecutive years, Goldwind has been ranked as the largest wind power manufacturer in China, and in 2021, Goldwind was ranked second of all wind turbine manufacturers globally, only surpassed by Vestas Wind Systems (Finans 2022). This illustrates the company's position within the global industry, and thus proves Goldwind as an industry-leading provider of wind power solutions. Goldwind's product portfolio represents promising technological advancements covering 1.5MW, 2S-platform, 3S/4S-platform, 6S/8S-platform, and medium-speed permanent magnet' (MSPM) turbines with independent intellectual property rights (Goldwind. Annual Report 2021).

20.12 percent of Goldwind's total shares is owned by China Three Gorges Corporation, which a Chinese state-owned enterprise. 90 percent of China Three Gorges Corporation is directly owned by the central State-Owned Asset Supervision and Administration Commission, whereas the last 10 percent is owned by the Social Security Fond (FitchRatings 2020). In addition to this, Forbes (2015) highlights that the Chinese state owns under 50 percent of the shares of Goldwind. So, even though Goldwind can't be classified as a state-owned enterprise, the Chinese state owns directly and indirectly many shares of Goldwind.

2.6 Limitations & Specifications

Throughout this paper, when mentioning a 'world economy', I will be referring to Wallerstein's (2008) definition. He characterizes a world economy as "*[…] a large geographic zone within which there is a division of labor and hence significant internal exchange of basic or essential goods as well as flows of capital and labor*" (p. 56). Additionally, he emphasizes that a world economy is not limited to one unitary political structure and that there is no political or cultural homogeneity (Wallerstein 2008). Furthermore, when mentioning 'capitalism' and a 'capitalistic system' I am again referring to Wallerstein's (2008) definition. He argues that a capitalistic system is a system giving priority to eternal accumulation of capital. This means, that firms are accumulating capital with the purpose of accumulating more capital (Wallerstein 2008). Furthermore, throughout this paper I will also be referring to China as an 'emerging economy', which is based on the foundation of the International Monetary Fund (IMF). Factors such as high per capita income, exports numbers, and incorporation into the global financial system determine how a country can be defined. With these factors in mind, the IMF classified China as an emerging economy, and I will thus do the same (International Monetary Fund).

I have limited the thesis to only investigate Goldwind's competitiveness in the Western wind power industry. Therefore, when referring to the Western wind power industry, I am referring to mainly the wind power industries of Europe, Australia and the United States. Furthermore, when referring to Western competitors, I am referring to some of the global market leaders, such as Vestas Wind Systems, Siemens Gamesa, and General Electric. I am aware of how other industries also can be classified as belonging to the Western industry, but by limiting the thesis to these specific industries, I can make the thesis narrower and more focused.

During the 1980s and the 1990s, there was a shift in the terminology regarding global commodity chains, and researchers argued that a shared terminology in regard to value chain analysis was useful for encouraging a research community within international production networks in the world economy. Therefore, 'global value chain' became the shared terminology for research on international production networks, global production networks, global production systems, and global commodity chains (Bair 2005).

I have limited the analysis to fit within a specific time frame, as this will provide me with the most scientific valid outcome. Therefore, the analysis will only cover Goldwind' competitiveness from 2018 until the first quarter of 2022, as the industry and the Chinese wind turbine manufacturers are in constant development, and I thus saw the need to delimit the paper to this specific time frame.

Even though the name 'Made in China 2025' is no longer being used in official documents of the Chinese government, the initiative is still active (Wei 2019). And throughout this paper, I will be referring to the initiative as 'Made in China 2025'.

3. Theoretical Background & Application

In this chapter, I will provide a thorough description of the theoretical background of this research, where I will be focusing on the theoretical concepts of global value chains, state capitalism, and world systems. In the end of this chapter, I will briefly discuss the applicable and nonapplicable aspects of the chosen theoretical concepts.

3.1 The Theory of Global Value Chains

Gereffi and Fernandez-Stark (2019) distinguish between two main approaches to the analysis of global value chains. The first approach covers the top-down perspective, and the second approach covers the bottom-up perspective. They argue that when focusing on the value-adding activities within global value chains, one can form a holistic view of global industries. The top-down approach includes analyses of a company's input-output structure, geographical scope, and governance, whereas the bottom-up approach covers areas of upgrading, local institutional context, and industry stakeholders. The bottom-up approach explains how countries participate in global value chains (Fernandez-Stark and Gereffi 2019). Gereffi et al. (2005) developed a theory on value chain governance and illustrated five types of governance structures which connect lead firms and suppliers in network relationships in global industries. They argue that relationships structures between lead firms and suppliers may change depending on which industry they are situated in. This is due to the different characteristics of different industries, such as production processes and availability of

technology. The theoretical framework developed by Gereffi et al. (2005) on the governance of global value chains explains how inter-firm relationships are developed by looking at the industry structure and the characteristics of production-processes from a micro perspective. In producer-driven chains, such as value chains of wind turbine manufacturers, it is firms who control the main products and process technologies who decide the key parameters. In addition to this, external actors can also decide the main parameters, such as international organizations and government agencies. Parameters set by external actors can be in relation to specifications about design and manufacturing with a specific focus on consumer safety and establishment of transparent markets (Humphrey and Schmitz 2001).

Whereas Gereffi et al. (2005) distinguish between five types of governance: market, modular, relational, captive, and hierarchical governance, Humphrey and Schmitz (2000) distinguish between three types of governance: network, quasi-hierarchy, and hierarchy. Humphrey and Schmitz (2000) argue that 'governance' refers to both "*[…] any mode of co-ordination of inter-dependent activities, including 'anarchy of exchange, organizational hierarchy, and heterarchy*" (p. 4), but also co-ordination through networks and organization through non-market relationships. I will determine how Goldwind's governance can be classified based on these frameworks and thus analyze how their form of governance impacts the competitiveness of the company.

A more recent approach to value chain analyses investigates how firm-centric industrial upgrading can be identified to analyze how firms, especially within a peripheral region, can advance their position within global value chain hierarchies and thus gain more power in the power relationships within global value chains (Bair 2005). Firms within developing countries can experience competitive pressure to improve their performances within global value chains. One way such firms can increase their participation and performance within value chains is to upgrade on different activities. For example by making processes more efficient, produce more sophisticated products, and adopt more functions within a chain (Humphrey and Schmitz 2000). Bair (2005) argues that this firm-centric approach to upgrading within a global value chain fronts a dilemma, as how can one translate the firm-centric upgrade into a country-level upgrade? Scholars, such as Gereffi (1994), have argued that countries are dependent on how local firms are participating in global value chains, as this determines a country's development prospect in the global world economy. When building on this notion, how does one translate the firm-centric upgrading into a country-level upgrading?

Frederick W. Mayer and Nicola Philips (2017) have published an article in *New Political Economy*, where they have developed a framework for understanding the role of political intervention and states in constructing and maintaining a global value chain. Much of the literature on global value chain governance is related to firm-centric governance and has its main focus on how lead firms govern suppliers and other actors within the value chain. In this literature, the main focus is on concrete practices of governance, power dynamics between buyer and supplier, and the characteristics of the organizational forms in the structure of global value chains. Mayer and Philips' (2017) interest are in the hybrid forms of public and private governance and how these interacts. When analyzing public governance, it is worthy to adopt a three-fold typology of governance: (1) facilitative, (2) regulatory, and (3) distributive. The role of the state in the facilitative typology is important in terms of emergence and spread of value chains globally. The state has the power to facilitate value chains through different structures and modes of governance. Even though some argue that the role of the state is very limited in private governance, the regulatory typology of governance predicts otherwise. States can purposely outsource regulatory governance to private actors by dynamically encouraging private regulatory regimes. In terms of outsourcing distributive governance, states have been criticized for not distributing wealth fairly, as a result of global value chains, however, Mayer and Philips (2017) argue that states have purposely not been engaging in the distributive form of governance, as it could affect the competitiveness of the firms (Mayer and Phillips 2017).

3.2 World Systems Theory

In 1977, Immanuel Wallerstein and Terrence Hopkins published an article in *Review*, which is a journal issued by the State University of New York Binghamton's Fernand Braudel Center covering the studies of economics, civilizations, and historical systems. Wallerstein and Hopkins (1977) argue that within the structures of the capitalist world economy, two sets of relationships contradict each other. The first relationship is the core-peripheral relationships among economic regions. The second relationship is the dominant states versus the dominated states. Within the world system, division of labor is being stratified into different geographical locations where advantages can be obtained. Even though, the specific task being stratified to a geographical location can change over time, the economic reward will never be the same as for other tasks. The core regions have always been

stratified tasks related to high-wage, high-profit, high-technological developments, whereas the peripheral regions will be assigned comparative opposite tasks. In between this, the semi-periphery will be a mixture of both core related activities and peripheral related activities (Hopkins and Wallerstein 1977). The semi-periphery includes different countries with different economic backgrounds and political strengths, such as China among others (Wallerstein 1976). Wallerstein and Hopkins (1977) argue that commodity chains have existed since the beginning of the history of the capitalist world economy. In 1986, Wallerstein and Hopkins published another article in *Review*, where they offered a conceptualized definition of commodity chains as "*[…] a network of labor and production processes whose end result is a finished commodity*" (Hopkins and Wallerstein 1986 p. 159).

One of the differences between the world systems approach and the chain approach to global commodity chains is that the researchers within the school of world systems have had a main focus on this historical reconstruction of industries since the sixteenth century and argue that global commodity chains have been a central element of the capitalist world economy since the sixteenth century (Wallerstein 2000). On the contrary, researchers identifying with the school of global commodity chains and global value chains investigate how goods are being produced in the contemporary world economy (Bair 2005). Researchers of the contemporary chain approach argue that geographically dispersed production is integrating into a globalized system of coordination, where one can distinguish between buyer-driven commodity chains and producer-driven commodity chains (Gereffi 1996).

From the perspective of the chain approach, the objective of studying a value chain is to create an understanding of how industries within the world economy are organized and controlled (Appelbaum and Gereffi 1994). One of the steps in doing this is to map every involved actor in the chain and thereby identify the relationships among the actors. This is done by having a specific focus on the lead firms in the industry, as they have the advantageous role in the power relationships among other actors, as well as the ability to serve as agents in developing and upgrading. By having a specific focus on the power relationships and power dynamics within a chain one can create an understanding of the development opportunities for a country within an international production network (Gereffi 2001).

3.3 State Capitalism

In this chapter, I will introduce the theoretical concept of state capitalism, where I will have a specific focus on the state capitalism being exerted in China, as this has relevance when analyzing the different forms of governance of Goldwind's global value chain, as well as when analyzing the upgrading of different processes and activities within the value chain.

Aldo Musacchio, who is a Professor of Business and Director of Master of Business Administration at Brandeis International Business School, attaches his main focus to research within the field of state capitalism and how governments support firms to become more competitive in the local and international industries (Brandeis Faculty Guide). Musacchio et al. (2015) distinguish between two types of state capitalism: (1) the traditional model, where states own and control state-owned enterprises, and (2) the new form of state capitalism, which is defined as "*[…] the widespread influence of the government in the economy, either by owning majority or minority equity positions in companies or by providing subsidized credit and/or other privileges to private companies*" (Aldo and Sergio 2014, p. 2). Within the new form of state capitalism, Musacchio et al. (2015) have highlighted three varieties of state capitalism: (1) state as majority investor, (2) state as minority investor, and (3) states with strategic involvements.

In the new form of state capitalism, states and foreign private investors jointly work together to develop strategic measures and other value-adding activities. Here, states often either own minority or majority equity positions in the given company, or they support private companies with the development of strategies or support them with credit, economic protections, or subsidies. Research has showed that many of the companies following this new form of state capitalism are actually positioning themselves really well on the international market, and they can often compete on the same level as their competitors in private firms (Musacchio, Lazzarini, and Aguilera 2015).

Musacchio et al. (2015) have identified four theoretical perspectives on state capitalism: (1) Managerial Agency, (2) Social View, (3) Political View, and (4) Institution-Based View:

(1) The perspective on managerial agency predicts that increasing state control will often cause poor results in firms. The argument is that when delegating decisions to agents one will often

receive a negative result, as the agents and principals do not have the same objectives. The agent being delegated to make decisions is often a member of the ruling political coalition, and thus the agent might not have the same agenda as the principal.

(2) The perspective on the social view argues that states will make target of state-owned enterprises' (SOE) social objectives, which often do not go hand in hand with the profitability of the given company. This could for example be social objectives in terms of lowering the prices or making investments in remote geographical locations.

(3) The perspective on the political view also predicts a negative outcome, as political agents often will pursue objectives benefitting their political gain and not benefitting the company. It is not uncommon in China, that political allies or politicians linked to the Communist Party of China will be appointed to become managers or directors of a SOE. In general, the political view on state capitalism is often connected with negative results of SOE's, because the SOE's pursue political objectives instead of objectives with positive private or social value.

(4) The perspective on the institution-based view argues that country-specific features have an influence on the effectiveness of SOE's. Because countries have different kinds of institutional development, the result of SOE's will follow accordingly. Voids in product markets or voids in underdeveloped financial markets can be filled in by state capital, for example by financial supporting activities related hereof.

These four perspectives all have different contributions to the traditional form of state capitalism as well as on the three kinds of new state capitalism: see figure 4. It is important to note that when analyzing state capitalism using this framework, some countries might use a combination of the varieties of state capitalism (Musacchio, Lazzarini, and Aguilera 2015).

Theoretical Perspectives and Their Contribution to Understanding the Varieties of State Capitalism

	Wholly owned state-owned enterprises (SOEs)	State as majority investor	State as a minority investor	State strategic involvement
Managerial agency	Managerial agency is likely an important cause of poor performance, given the absence of external, for-profit investors and the lack of improved governance practices in wholly owned SOEs (e.g., boards and executive teams are packed with members of the government).	Managerial agency problems will be moderate if SOEs have improved governance practices (e.g., boards with independent external members), pay-for-performance executive salaries, and enhanced accounting standards.	Managerial agency problems will be moderate to low, as SOEs with minority state capital are not directly controlled or run by the government.	Managerial agency problems will be low, as the government may support private firms run by professional managers.
Social view	Managers will likely face a "double bottom line" (e.g., social objectives such as low customer prices or higher employment beyond profitability). Mixed, complex objectives will likely undermine the quest for efficiency and profitability.	"Double bottom line" still present, but with an enhanced emphasis on profitability depending on the presence of external, for-profit investors and the existence of improved governance practices that insulate the SOE from excessive governmental influence.	There is likely an emphasis on profitability, except in cases where the state has a residual ability to intervene (e.g., there is collusion between state-related minority shareholders).	There is likely an emphasis on profitability, subject to policy goals (e.g., state capital supports riskier projects with high social externalities).
Political view	Use of SOEs for political gain undermines profitability (e.g., SOEs will be run by politically appointed managers and benefit politically connected capitalists). Soft budget constraints are present (governments will likely bail out poorly performing projects).	Soft budget constraints are still present (SOEs with majority state control will hardly go bankrupt). However, improved governance practices may make it more difficult the use of SOEs to support political allies.	There are moderate budget constraints, given that there is still minority state capital. Constraints will be softened, however, if the firm is singled out as a national champion and has extensive political connections.	There are moderate to hard budget constraints, depending on the extent to which industrial policies have clear performance metrics and "sunset" clauses.
Institution-based view	The institutional environment will act as a contingency-based factor that will affect performance of each model (see Table 3).			

Figure 4. Theoretical perspectives and their contribution to understanding the variety of state capitalism (Musacchio, Lazzarini, and Aguilera 2015).

3.4 Applicable & Non-applicable Aspects of the Theoretical Concepts

For this analysis, I will be taking both macro- and micro perspectives on Goldwind's global value chain. I will do this by utilizing aspects of all three theoretical concepts, as mentioned above. The first part of the analysis will focus on the specific activities within Goldwind's global value chain, as well as how these are governed from a firm-centric perspective. From a micro perspective, I will utilize the framework of Gereffi, Humphrey, and Sturgeon's (2005), the framework of Gereffi and Fernandez-Stark, and the framework of Humphrey and Schmitz's (2000) to analyze Goldwind's activities with their global value chain as well as how they govern their value chain activities. Humphrey and Schmitz (2000) distinguish between three types of governance: network, quasi-hierarchy, and hierarchy, whereas Gereffi et al. (2005) distinguish between five types of governance, which connect lead firms and suppliers in network relationships. Gereffi et al. (2005) also highlight that depending on industry structures, the governance of one's value chain might chance over time (Gereffi, Humphrey, and Sturgeon 2005). Following is a description of the five types of governance:

(1) Market governance has fairly simple transactions. The suppliers can easily produce goods with a limited amount of input from the buyers. In this kind of governance, the price is the main mechanism.
(2) Modular governance is characterized by suppliers producing goods to the customers specifications. This kind of information exchange about producing goods minimalizes the coordination costs.
(3) Relational governance is a reality when the buyers and the suppliers are relying on non-easily transmitted information. When coordinating relational chains, the actors need to ensure trust, communication, and knowledge sharing.
(4) Captive governance is when several small-sized suppliers are reliant on a small number of buyers in order to secure their market access and resources. The small-size suppliers often work under pre-set conditions formed by the particular buyer.
(5) Hierarchical governance is characterized by vertical integration and managerial control within the main companies of whom develop and manufacture the products.

Once I have analyzed the value chain from a micro perspective, I will continue and analyze the value chain from a macro perspective. In doing this, I will utilize the theoretical concepts of world systems and state capitalism to analyze what influence the Chinese state has on the governance and upgrading of the value chain. Using the world systems theory, I will analyze Goldwind's position within the capitalist world order and thereby analyze how this can be impacting Goldwind's competitiveness. Hopkins and Wallerstein (1977) argue that by analyzing a global value chain construct, one can get analytical insights into the complex determinations of a world economy. By doing this, I can reveal the international division of labor which is incorporated into the core, semi-peripheral, and peripheral societies in the capitalistic world system (Bair and Werner 2011). From this notion, the understanding of global value chains is based on an unequal capitalistic world order, where peripheral societies are handling activities related to manufacturing, and core societies are handling activities related to research, development, and design etc. (Humphrey and Schmitz 2000). Continuing from this argument, I will continue the analysis with a discussion of whether China has positioned themselves more advantageous within the capitalistic world system due to successful industrial upgrading, or whether it is because of the influence of Chinese state capitalism on global value chains.

I will proceed with a discussion of whether China's position with the capitalistic world system is due to a successful industrial upgrading within global value chains, or whether it is because of how the Chinese state capitalism influence Chinese global value chains.

4. Empirical Analysis

In this chapter, I will analyze Goldwind's global value chain both from utilizing the chain approach and the world systems approach.

4.1 The Chain Approach

4.1.1 Input-Output Structure

The input-output structure, as a part of the top-down approach of the framework of Gereffi and Fernandez-Stark (2019), identifies the process of converting raw materials into a final product. In this chapter, I will analyze Goldwind's inputs in terms component supply, in-house manufacturing, as well as what services they provide. I will also analyze what impact the input-output structure has on the competitiveness of Goldwind.

Goldwind provides different services and wind farm solutions to their customers' projects. This includes technical expertise as well as customer support. In addition to this, they also provide components for manufacturing of wind turbines, the construction of turbines, commissioning, and operation and maintaining of projects (Goldwind, Services). Goldwind has the capacity to fully develop all their turbines and main components in-house, however, some of the components are being outsourced to different third-party manufacturers. All of Goldwind's blades for example are designed in-house but have been outsourced to third-party manufacturers (Wind Power Monthly 2020).

Even though Goldwind manufacture most of their wind turbine components in-house, they have chosen to purchase some of their components from Western suppliers. These suppliers are also supplying component to some of Goldwind's competitors in the Western wind power industry, such as Siemens Gamesa and Vestas Wind Systems. Because Vestas and Siemens have chosen to purchase some of their components from third-party suppliers, they are now faced with the consequence of using the same components as their competitors from Goldwind (Energy Watch 2021a). LM Wind

Power is a Danish manufacturer of blades for wind turbines (LM Wind Power. Our Roots). They signed an agreement with Goldwind entering a three-year collaboration of supplying wind turbine blades for Goldwind's onshore 3-4MW platform. By entering this collaboration, LM Wind Power will supply three different kinds of blades, which will be targeting both the Chinese market and the overseas markets (Globe Newswire). Today, 1/5 of the turbines worldwide have LM wind power blades (LM Wind Power). Especially in terms of components to offshore wind turbines, many Danish suppliers are collaborating with Chinese wind turbine manufacturers, as besides the fact that Chinese manufacturers have yet to develop a top-quality offshore wind turbine, the market in China provides huge potential for overseas suppliers. According to Goldwind's Sustainability Report of 2021, they had 355 major suppliers in 2021. 295 of these suppliers were located within China, 6 of the suppliers were from other Asian countries, 44 from Europe, and 10 from Northern America. Goldwind has introduced an 'advanced quality management tools', which purpose is to improve the quality and liability of the components purchased from suppliers. In doing this, they run on-site tests, conduct inspections of the quality, process checks among other initiatives (Goldwind. Sustainability Report 2021).

Besides the partnership with LM Wind Power, Goldwind also partnered with a Danish sub-supplier, who is supplying components for wind turbines. This partnership resulted in Goldwind not only gained components for their wind turbines, but also established a collaboration with a small Danish company called Hydratech, which developed an operating system for Goldwind (Energy Watch 2018). By this, Goldwind has secured component supply from an advanced Danish company using high-end technology, and also secured a partnership with a supplier in the Danish wind power industry.

CEO of Wind Denmark, Jan Hylleberg, states that partnerships between Danish suppliers and Chinese manufacturers are growing, and an increasing number of Danish suppliers are now delivering components to offshore wind turbines in China, as the offshore market in China is still relatively new and has a big potential for the Danish suppliers. In addition, the green transition in China is set to happen in a fast pace, due to the enlarged focus the Chinese state has on the green transition in China, which consequently creates opportunities for Western manufacturers and suppliers at the Chinese market unlike at any other markets (Energy Watch 2021a).

Feng Zhao, Head of Strategy and Market Intelligence at the Global Wind Energy Council, states that Chinese manufacturers have secured a positive level of quality in their products, and that they have obtained a very solid value chain where they partner with mature international suppliers, whom also are located in China, hence the infrastructure can be handled easily (Energy Watch 2021a). Goldwind has 11 industrial facilities where they manufacturer most of their turbines (Goldwind America 2018). These facilities are all located in China, which consequently means that they can enjoy the competitive advantage of low labor costs in China (International Labor Organization).

What is clear from the input-output structure of Goldwind's global value chain is that they have secured themselves a wide range of different suppliers, both from within China, but also from the rest of the world, where the majority of their overseas suppliers are based in Europe. They have initiated strategic partnerships with two different Danish suppliers, which is a great advantage for Goldwind. Besides partnering with Danish suppliers, which can contribute with high-quality components, they are also purchasing components from suppliers delivering to Western competitors, which means the level of quality in Goldwind's components will be the same as of those from their Western competitors.

In addition to this, Goldwind's Chief Engineer, Endi Zhai, states that Goldwind has gained substantial knowledge from the partnerships and collaborations they form with external institutions and suppliers, and that since 2006, where their in-house technology development began, they have experienced a rapid growth in developing next-level technologies, which consequently allows them to provide advanced products on the market (Wind Power Monthly 2020).

4.1.2 Geographical Scope

The geographical scope is also a part of the top-down approach, and thus has its focus on the global elements of a value chain. As illustrated in the input-output structure of Goldwind's global value chain, Goldwind has partnered with different component suppliers in Europe, which allows the company to utilize the same components as those of which Vestas Wind Systems and Siemens Gamesa utilize. Besides this, the collaboration Goldwind has formed with the small Danish start-up enables Goldwind to acquire an operating system technology developed by a Danish company (Energy Watch 2018).

Goldwind International, which is a fully-owned subsidiary of Xinjiang Goldwind Science & Technology Co., Ltd., includes eight overseas regional centers (Goldwind). These subsidiaries provide comprehensive wind power solutions to encounter the challenges and requests from the international industry (Goldwind Australia). The principal subsidiaries of Goldwind cover R&D, manufacturing of components for wind turbine generators, wind farm developments, and wind power services (Goldwind Sustainability Report 2021).

One of Goldwind's subsidiaries is located in Australia, and they offer several different activities within the value chain, but mainly investments, construction, and operation and maintenance services (Goldwind Australia). Goldwind Australia has also established a R&D institution, which has formed a collaborative partnership with the University of New South Wales in Sydney, where Goldwind has invested 1.4 million USD in funding to support the research activities as well as to support the exchange of knowledge and knowhow. The objective of this partnership is to strengthen the research of finding solutions to the challenges of Goldwind's digital grid future (Goldwind Australia 2019).

Another one of Goldwind's subsidiaries is located in Denmark. Goldwind's subsidiary in Denmark is solely a R&D focused subsidiary, who's objective is to support the R&D department in Beijing (Goldwind Denmark). Goldwind Denmark invested in a collaborative partnership with a small Danish start-up, which has developed an operating system technology for Goldwind's wind turbines (Energy Watch 2018). This collaboration, as well as the collaboration with the University of New South Wales, illustrate Goldwind's geographical disparity as well as their initiatives to obtain international technology and development opportunities. These international activities allow them to create a competitive global value chain. Due to the fast development track Chinese wind power manufacturers have experienced in the past ten years, Feng Zhao, Head of Strategy and Market Intelligence at the Global Wind Energy Council, states that the Chinese wind turbine manufacturers, such as Goldwind, now can compete with Western manufacturers in terms of technological development (Energy Watch 2021a).

Besides the already mentioned subsidiaries in Australia and Denmark, Goldwind has several other subsidiaries in Germany and the United States, which are focusing on R&D activities, as well as project development, manufacturing, and the after-sales services (Goldwind America).

The eight overseas subsidiaries also clearly illustrate how many of Goldwind's activities are carried out in different parts of the world. This is often an advantage for companies involved in the world

economy, as they can exploit the different competitive advantages of the countries involved (Fernandez-Stark and Gereffi 2019). In addition to the competitive advantages of the given countries the subsidiaries are located in, the geographical scope that the subsidiaries hold allows Goldwind to be located near some of the main markets in the industry, such as the United States and Northern Europe (Global Wind Energy Council 2021). The location of the subsidiaries also creates a competitive advantage for Goldwind, as they thereby can obtain knowledge and knowhow from some of the core societies within the industry.

This is also why the geographical scope of Goldwind's research and development institutions is a great advantage for the company, as they can obtain and develop new technologies and top-quality products and research from different universities and suppliers all over the world. These activities can be very value-adding for a company, as global disparity and internationalization can create competitive advantages and benefits for a company (Fernandez-Stark and Gereffi 2019).

Goldwind has chosen to keep all their industrial facilities in China, which is due to the advantages they can receive from the low labor costs of China (International Labor Organization). In addition to this, because most of Goldwind's global market shares up until recently have been merely due to their capacity installations in the Chinese industry (Finans 2022), the industrial facilities are therefore strategic located within China to ease the infrastructure and logistics related to a wind project. However, because Goldwind has a greater focus on international wind farm projects, the location of all their industrial facilities can possibly create a challenge for them in the future, as it will automatically make the logistics harder and increase the costs of transport for a project in Europe.

Overall, Goldwind's geographical reach within their supply chain is globally dispersed, which consequently mean that Goldwind has spread their value-adding activities in their global value chain to cover most regions of the world. The geographical reach covers both dispersed subsidiaries, international suppliers, and international strategic partnerships.

4.1.3 Governance

The top-down approach of global value chains also includes governance, and how lead firms govern and control their global-scale affiliate. The understanding of governance in global value chains is crucial to identify the company's development opportunities within international industries

(Fernandez-Stark and Gereffi 2019). In this section, I will analyze the power structures within the global value chain, and thus analyze what form of governance Goldwind is using according to the frameworks of Gereffi et al. (2005) and Humphrey and Schmitz (2000). In chapter 4.2, I will analyze how the Chinese state is governing global value chains within the Chinese wind power industry, and thus how this can create a competitive advantage or disadvantage for Goldwind.

As illustrated in chapter 1.4, Chinese wind turbine installations accounted for 39 percent and 28 percent of the total amount of installations globally in 2021 onshore and offshore, and of the newly established installations globally in 2021, Chinese manufacturers accounted for more than 50 percent both onshore and offshore (Global Wind Energy Council 2021). Goldwind, being one of the global leaders in green energy (Goldwind), is therefore also characterized as a lead firm in the industry. Lead firms in an industry can influence the value-adding activities in a global value chain, as they can place new demands or implement product differentiations, which will automatically increase the complexity in the network structure between the suppliers and manufacturing companies (Gereffi, Humphrey, and Sturgeon 2005).

Goldwind's source of influence over suppliers in their global value chain, and thereby also in the industry, mainly stems from their tremendous development in the Chinese industry as well as their market shares in the global industry. These circumstances make them very attractive to possible partnerships and collaborations from international suppliers and other relevant institutions, as they have many development opportunities in the Chinese industry. As already mentioned, Goldwind's geographical scope is globally dispersed, and they have established subsidiaries in most regions of the world, allowing them to be geographical close located to some of the main markets in the industry, such as the United States and Europe (Goldwind. Annual Report 2021).

Goldwind is also heavily investing in research and development activities, and with more than eight R&D institutions worldwide, as well as 3239 R&D employees (Goldwind. Annual Report 2021), Goldwind has established a thorough foundation for developing new technologies, which also is an advantage in the power relationships between Goldwind and other actors in the industry.

As global value chains of wind turbine manufacturers are characterized as producer-driven chains, their value chains are typically more vertical integrated, hence they utilize the technological

advantage of their suppliers. The governance of Goldwind's global value chain can be characterized as 'relational governance'. I have identified Goldwind's governance as relational governance, because both the supplier and the buyer of the final-products rely on very complex information. To codify, transmit, and learn this complex information, it is a requirement to engage in regular interactions with the buyer, and the knowledge sharing between buyer and supplier needs to be of high priority. These networks and relationships need to be prioritized and maintained, hence the lead firm has to allocate time and resources into the building of these relationships (Gereffi, Humphrey, and Sturgeon 2005). Even though, the suppliers in relational governance are very capable and competent, and even though there need to be mutual dependence between the suppliers and the buyers, the lead firm still holds the power in terms of identifying the needed specifications for the products, and they therefore have most of the control of the value chain.

As I briefly explained, Goldwind established a partnership with Hydratech, who developed an operating system for Goldwind's offshore wind turbines. This partnership lasted for a year and involved 12 face-to-face meetings between the supplier and the buyer, hence Goldwind spend a great amount of resources to build a relationship with the Danish supplier (Finans 2018). This partnership illustrates the relational governance of Goldwind's global value chain, as both Goldwind and Hydratech have relied on complex information to develop the operating system, and thus to transmit and codify this information, they made sure to prioritize, build, and maintain the partnership.

Geographical contexts, institutions, globalization are conditions which all can influence an industry, and industries will evolve and mature, hence the structures and patterns of governance in global value chains can change. Additional, it has been demonstrated in different academic papers that global value chains can be characterized by using different forms of governance, and the structures of governance can also change and be characterized from other sources of governance (Gereffi, Lee, and Christian 2009).

I will therefore argue that Goldwind's global value chain governance also can be characterized by 'modular governance', as I have identified structures from this form of governance matching with Goldwind. First of all, Goldwind provides their customers with customized energy solutions in order to comply with the characteristics and requirements of their needs. The characteristics and requirements of Goldwind's customers can vary, hence Goldwind's product portfolio includes wind

power solutions which are adapted to meet specific and diverse operating conditions. This could for example be low or high temperature conditions, or low wind or high altitude conditions (Goldwind, Utility Scale).

Modular governance of global value chains is also described as suppliers providing turn-key services (Gereffi, Humphrey, and Sturgeon 2005), which is a service Goldwind is committed to by offering turn-key services including research and development activities, the development of projects, manufacturing, management and supervision, and after-sales services (Goldwind America). The modular form of governance in global value chains creates substantial partnerships and inter-firm relationships due to the large volume of information spreading across firms, hence Goldwind can take advantage of the knowhow and information they get from their suppliers and partners (Fernandez-Stark and Gereffi 2019). These structures have characteristics related to modular governance of global value chains, hence I argue that Goldwind's governance of their global value chain can be identified by relying on structures and patterns from two different forms of governance.

Humphrey and Schmitz (2000) argue that governance structures between developed and developing countries often are linked through the 'quasi-hierarchy' governance, which is defined as developing countries are producing and developed countries are retailing. In this type of governance, high competence of suppliers can't be generalized, and buyers often have a high degree of control over suppliers. Additionally, it is the buyer who defines the product. This form of governance does not completely reflect the governance structures within Goldwind's global value chain, as Goldwind attaches great effort into establishing partnerships and collaboration with suppliers, and they are therefore not only purchasing supplies from them. Furthermore, Humphrey and Schmitz (2000) also highlight the 'network' governance form, where buyer and suppliers are more equals, and they jointly collaborate in defining specifications of products. This form of governance often occurs when both parties are highly investing in innovation. When arguing why Goldwind's governance also can be characterized as 'network', I will emphasize how both Goldwind, and their suppliers, are prioritizing innovation. As I illustrated in the first parts of this analysis, Goldwind is heavily invested in facilitating research and developments, and they have established R&D subsidiaries in many parts of the world. One of Goldwind's suppliers, LM Wind Power, is constantly developing new technologies, and their main focus is on "*[…] making wind compelling, competitive and cost-effective*" (LM Wind Power. Technology Centers).

I how now analyzed how Goldwind's form of governance can be characterized as relational and modular according to Gereffi et al. (2005), as well as network, and to some degree quasi-hierarchy according to Humphrey and Schmitz (2000). It is notable from this analysis, that Goldwind attaches great importance into developing partnerships with high-quality suppliers. Both Hydratech and LM Wind Power are top-quality suppliers from Denmark, which is advantageous for Goldwind as Denmark is one of the leading markets in the wind power industry (Global Wind Energy Council 2021), and through these strategic collaborations, Goldwind can learn from their suppliers. What is problematic when analyzing Goldwind's type of governance is that Goldwind is not fitting within the box of the traditional power structures of global value chains. This will be discussed further in chapter 4.2.1.

4.1.4 Bottom-up Approach

As a part of the bottom-up approach, 'upgrading' focuses on how decisions affect economic upgrading or downgrading. Companies, countries, and regions can all hold influence on the economic upgrading of global value chains by attaching more resources to activities of higher value within global value chains. The economic upgrading of global value chains can be set by different corporate strategies, government policies, and technologies (Fernandez-Stark and Gereffi 2019). In this section, I will analyze the corporate strategies of Goldwind's upgrading. Whereas, in the next chapter, I will analyze the role of the state in upgrading value chains, and also how firm-centric upgrading can be translated into country-level upgrading.

From a firm-centric perspective, Goldwind is upgrading their global value chain with new product lines, where they upgrade their current product portfolio with innovative solutions to create products of higher value. Goldwind has for example presented two new models of onshore turbines, which hold some of the industry's largest rotors. These models are targeting the international industry in terms of a GW165-3.6/4.0MW turbine developed for low and medium wind conditions, as well as a GW165-5.XMW developed for operating medium and high wind conditions (Wind Power Monthly 2020).

Besides the launch of the two new onshore models, Goldwind is also developing a new product portfolio, which is based on 'medium-speed permanent magnet' technology holding seven new turbine models. Due to the rising prices for minerals, which were used in permanent magnets from which the technology of 'permanent magnet direct drive' (PMDD) stems from, Goldwind has launched a new product portfolio using new technologies. PMDD has previously been the main foundation for all OEM's wind turbines, but because of the increasing mineral prices, this technology is now being reconsidered. The new product portfolio is upgrading on size and scale, and the new models hold rotor diameters up to 242 meters (Energy Watch 2021b).

Besides the specific product upgrading within Goldwind's portfolio, Goldwind is, as illustrated, also upgrading in terms of research and developments. In accordance with Fernandez-Stark and Gereffi's (2019) framework, Goldwind is supplementing their 'product upgrading' by implementing 'functional upgrading', meaning they acquire new functions to increase the value-adding activities within their value chain. Facilitating and investing in R&D related activities illustrate how Goldwind is functional upgrading their in-house activities, which leads Goldwind to 'end-market upgrading', as their product portfolio is advancing which results in advancing their opportunities in overseas markets (Fernandez-Stark and Gereffi 2019).

From the traditional value chain perspective, local producers can obtain great knowledge from their buyers in terms of how to optimize productions processes and ensure high quality. Furthermore, from the traditional perspective, developing countries can increase their developments of their economy by integrating into global value chains, and thus upgrade their activities within global value chain (Humphrey and Schmitz 2000). However, I will argue that this perspective is problematic in this case-study, as Goldwind, as a part of the semi-peripheral region of China, is not upgrading to climb the ladder of global value chains, as they already are situated in an advantageous position in the global value chain hierarchy. Instead, Goldwind is upgrading to increase their competitiveness against their competitors.

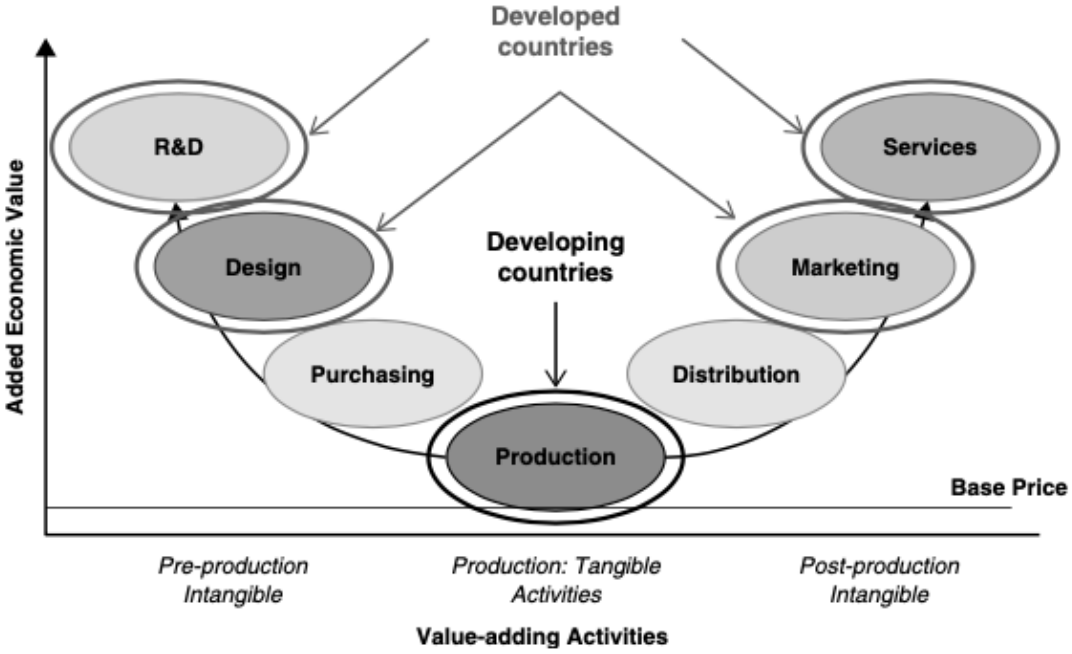

Figure 5. Value-adding activities. (Fernandez-Stark and Gereffi 2019).

Figure 5 illustrates how developing countries often only handle activities related to productions in global value chains, and that developed countries handle all other activities, such as R&D, design, purchasing, distribution, marketing, and services (Fernandez-Stark and Gereffi 2019). Even though this figure does not include all activities related to value chains of wind turbine manufacturers, it still demonstrates how developing countries only handle production and thus only can climb the ladder by upgrading. Goldwind is an example of a company within a developing country who handle basically all activities related to their input-output structure themselves, and thus their upgrading does not necessarily mean to climb the ladder of global value chains, but merely focuses on improving their competitive advantages.

The local institutional context of China allows Goldwind to upgrade and increase their competitiveness. The economic context within China ensures low labor costs (International Labor Organization), ensures infrastructure, and other relevant factors for a company's development opportunities. Besides this, the local institutional context also proves a foundation for Goldwind's intangible activities, such as funding and support to R&D related facilities (The State Council of the People's Republic of China 2014). Goldwind's firm-centric upgrading has its biggest attention focused on product upgrading, functional upgrading, and lastly end-market upgrading. The objective

for Goldwind is not to upgrade to climb the ladder of global value chain hierarchies, but mainly to upgrade to increase its competitiveness. As Goldwind can't be classified into the traditional structures of this theory of global value chains, I can't argue that Goldwind, as a part of a developing country, is upgrading to gain more power within global value chains. Goldwind has proven to be situated very favorable in global value chains and is thus upgrading to keep its position and compete with other OEM's. I have in this section only analyzed the upgrading from a firm-perspective, I will analyze the country-level upgrading in chapter 4.2.1.

4.1.5 Sub-conclusion on the Global Value Chain Perspective

An analysis of global value chains allows one to understand the structures and dynamics of international industries. Global value chains do also allow developing economies to participate in the world economy, which is an important element in the development of an emerging economy. To continue the terminology by Wallerstein and Hopkins (1977), it has historical been the core societies who have been the drivers of global value chains. However, recent literature demonstrates that emerging economies, such as China, India, and Brazil have gained bigger roles in driving global value chains (Fernandez-Stark and Gereffi 2019).

Goldwind's input-output structure, geographical scope, governance, and upgrading of its global value chain demonstrate how they challenge the traditional power relationships and governance structures in global value chains. With R&D institutions in many Western countries, Goldwind's global value chain is challenging the traditional elements in the theory and thus proving that a Chinese company, as a part of the emerging economy of China, is serving as a core state in regard to research and developments in the global wind power industry. Traditionally, the ownership of high technological developments and research related activities will be controlled and facilitated by a core society. However, Goldwind, as a part of a semi-peripheral society, is proving otherwise, and thus taking ownership over facilitating development of new highly technologically innovative solutions.

It is clear from Goldwind's developments within 'upgrading' that they explore many different opportunities to advance their position within the industry and thus create a competitive advantage for themselves. By implementing different firm-centric opportunities for upgrading, and by having an enlarged focus on facilitating and developing research and development related activities within

their value chain, Goldwind is challenging the traditional power structures of global value chains and thus proving that a company within a semi-peripheral region can have a bigger role within global value chains. The question is whether Goldwind is challenging the traditional power structures within global value chains is due to China's more advantageous position within the capitalistic world order due to successful industrial upgrading, or whether it is due to the Chinese state's influence on global value chains. This will be analyzed in the next chapter.

4.2 The World Systems Approach

Where researchers identifying with the chain approach explore how goods are being produced in the contemporary world economy and argue that value chains are being integrated into a globalized system of coordination. Researchers within the school of world systems argue that global value chains have been a part of the capitalist world economy since the sixteenth century. After having analyzed Goldwind's global value chain from a micro perspective, I will now proceed and analyze the value chain from a macro perspective, where I will include the world systems theory and the theory of state capitalism. As Mayer and Phillips (2017) argue "*[…] it is time to think much more carefully about the centrality of politics in a GVC world, and particularly the role of states in the creation and maintenance of it*" (p. 135). In addition to this, they argue that economic and political power are inevitable linked together, and it is therefore necessary to examine global value chains both from a political and economic perspective. Most literature on the governance of global value chains are concerned with firm-centric governance and the power relationships between buyer and supplier. It is therefore important to analyze the role of the state and public governance of Goldwind's global value chain, as I thereby can analyze whether Goldwind's position in global value chain hierarchies is due to China's more advantageous position within the capitalistic world order due to successful industrial upgrading, or whether it is due to the Chinese state's influence on global value chains. This will be analyzed in the next chapter.

As analyzed in the first part of the analysis, Goldwind has been heavily investing in research and development facilities as well as internationalization developments, which mean they are challenging the traditional power structures of global value chains. Goldwind, being a part of China's position in the semi-peripheral region, has proved that it is not only the core states who can dominate industries and facilitate high-technology developments and innovative solutions. Because the Chinese state is

heavily involved in supporting and facilitating some of Goldwind's activities within their value chain, I will argue that the Chinese state is serving as a 'facilitating' form of governance, according to Mayer and Philips' (2017) framework. I argue this because the state is facilitating both emergence and spread of the global value chain, and the state is to great extent involved in architecting the activities.

A concrete example of how the Chinese state is facilitating and coordinating activities within Goldwind's global value chain is among other seen in the policies regarding carbon neutrality, where the Chinese state is strategically implementing measures to improve the renewable energy capacity. For example, at the United Nation's General Assembly, where the Chinese President Xi Jinping declared that China is targeting carbon neutrality by 2060, have resulted in favorable initiatives towards the green energy sector (Global Wind Energy Council 2021).

Chinese wind power manufacturers have the advantage of receiving great support from the Chinese state in terms of investments, funding, and development opportunities. In 2020, the Chinese state spent 563.310 million USD in research and development, which is in sharp contrast to Germany and Denmark who spent 125.132 million USD and 8939 million USD respectively (OECD). Therefore, the Chinese state has a significant role in the economic upgrading of global value chains. Government policies have been implemented to support the Chinese wind turbine manufacturers, for example the Renewable Energy Law of the People's Republic of China (PRC), which was amended the 26th of December 2009 to the decision of the 12th meeting of the Standing Committee of the 11th National People's Congress of the People's Republic of China (The State Council of the People's Republic of China 2014). This law delivers legal basis to six aspects of the formulation and implementation of wind power policies. Development planning, administration, and market transactions are the three main aspects of the wind power policies, and they serve the objective of progressing the development of Chinese wind power. This top-level plan for the wind power policies assists in coordinating a sustainable development of Chinese wind power, as well as to improve the structure, and to insert a green and low-carbon energy system. The State Council of the People's Republic of China implemented the Renewable Energy Law for the purpose of "*[...] promoting the development and utilization of renewable energy, increasing the supply of energy, improving the structure of energy, safeguarding the safety of energy, protecting environment, and realizing a sustainable economic and social development*." (The State Council of the People's Republic of China 2014, para 1).

Article 12, within the Renewable Energy Law, highlights that the state shall prioritize research related to science and technology, and thus integrate this research in the development plan. Moreover, the state shall arrange for funds to assist the research of science and technology, decrease the production costs of renewable energy products, as well as support the improvement of the quality of the products (The State Council of the People's Republic of China 2014). One of the advantages of China's wind power is the enormous amount of support the Chinese state provides the wind turbine manufacturers. As illustrated in Article 12 of the Renewable Energy Law, the Chinese state assists in funding not only the production costs of the turbines, but also the research & development initiatives of the companies. The Chinese state capitalism is forming an advantage for Goldwind in this case, as they support the industry, and thereby the company, which will assist them in becoming more competitive in the Western industry. It is not only the central government of China who invests in wind energy, the regional governments of China are also increasing their investments. BlueWeave Consulting and Research (2022) conducted an analysis revealing that one of the reasons for China's rapid growth in the local wind power market is because of the regional governments' increasing investments in wind power. The regional governments have developed different development plans for generating the majority of their energy through wind power. I have been limited in collecting further data in regard to the impact of the regional government of Xinjiang, which I will touch upon in chapter 5.1.

4.2.1 The Impact of Chinese State Capitalism

China's economic system can be characterized as 'state-capitalism', which consequently means that the state has a central role in regard to facilitating markets and firms. In more concrete terms, this means that the Chinese state has a clear influence on the economic development in terms of ownership stakes, as well as different financial and institutional involvements in the industries. The state can influence different industries by for example giving access to credit and subsidies, but also by implementing different policies and regulations targeting the industries (Pearson, Rithmire, and Tsai 2021). As illustrated, the Chinese state has been targeting the wind power industry with policies favoring the industry, and thus granting funds to the companies involved, as well as state support for investing in research and development related activities to make the firms even more competitive. In 2018, the National People's Congress (NPC) of the People's Republic of China allocated 255.5 billion CNY from the central budget to combat the critical challenges against pollution. Compared to the year before, this allocation had an increase on 13.9 percent, and is the biggest allocation made by the

NPC towards combating the pollution in the country (The National People's Congress of the People's Republic of China).

The dynamics of the Chinese state capitalism has inevitable an influence on the Chinese companies' competitiveness in the Western industry, which among others is reflected in the energy-targeted policies they implement. One of the reasons why the Chinese state attaches attention to the green energy industry is because the industry creates millions of jobs worldwide. An analysis conducted by the Global Wind Energy Council (2019) illustrates that the wind power industry alone over the next five years can create 3.3 million of jobs globally. This analysis included both onshore and offshore wind, as well as all the activities in a value chain, including manufacturing, R&D, O&M, and commissioning. In 2020 alone, approximately 550.000 of Chinese people were employed in the wind energy industry (Global Wind Energy Council 2019).

In addition to this, GWEC's market intelligence expects an extra 470GW wind capacity to be installed globally from 2021 till 2025, hence they expect that this additional capacity will create approximately 3.3 million of extra jobs globally. These extra jobs will mainly be created in the emerging economies of which the wind power industry is in rapid development, which among others include China. It is therefore very rational that the Chinese state attaches its attention to this industry, as there are prospects for millions of new jobs to be created. The installation of wind power farms is a long process, both because of the construction elements, but also due to the operation and maintenance related to these projects. Therefore, the jobs created within this industry can be expected to be sustainable and long-term (Global Wind Energy Council 2019).

This industry is not only important for the Chinese state in terms of job creations, but also in terms of technological advancements, as well as competitive advantages in the international wind power industry. Because of the major potential the wind power industry has on the Chinese economy, as well as the world economy, the Chinese state has maintained a certain level of involvement in the industry to ensure a certain level of competitiveness (Christensen and Hansen 2015).

As the Chinese state only owns less than half of the shares of Goldwind, Goldwind cannot be classified as a state-owned enterprise. However, as I already illustrated, Goldwind is enjoying the support of the central government of China, as well as support of the regional government of Xinjiang

(Forbes 2015). Due to the Chinese state only owning less than half of the shares of Goldwind, and due to the tremendous amount of support the company enjoys from the state in terms of favorable policies, the Renewable Energy Law, and the increasing investments made in R&D related activities in the wind sector, I will argue that the Chinese state is a minority investor, who is serving in a facilitating role contributing with strategic involvement to the company, based on the framework of Musacchio et al. (2015).

With the framework of Musacchio et al. (2015) in reference, I will argue that challenges related to the managerial agency in Goldwind is relatively low, as the Chinese state is not directly controlling Goldwind, and the agency-principal structure therefore should not be causing any conflicts, as the objectives of the agent and principal will be the same. In terms of the social view, the state capital supports the wind power industry, as the industry has positive effects on the social capital e.g., by contributing to more job creations, assisting in becoming an innovation superpower, as well as by producing products assisting with the green transition. The state is supporting this industry, and thereby also Goldwind, as the industry assists in reaching the goal of carbon neutrality by 2060 declared by Chinese President Xi Jinping. The political perspective on state capitalism is similar to the managerial agency perspective, and the challenges are therefore also low in this perspective and not effecting Goldwind in a negative way. Because it is not a politician running the company, there is no direct political agenda behind the decisions made by Chairman and CEO Wu Gang. This also means that the agent and the principal have the same objectives. In SOE's in China, managers and directors often have close links with the Chinese Communist Party, which tends to create some challenges between the agent and the principal, because they do not have the same agendas and objectives (Musacchio, Lazzarini, and Aguilera 2015).

As I illustrated in chapter 3.2, global value chains can be traced back to the theory of world systems. The world system theory describes global value chains as "*[…] a useful construct for thinking about the international division of labor characteristic of capitalist production […]*" (Bair 2005, p. 155). Scholars of world systems argue that global value chains are not a recent phenomenon, as it can be traced back to the existence of the capitalist world economy in the sixteenth century (Wallerstein 2000).

The Chinese state is actively controlling some parts of the global value chains of Chinese wind power manufacturers, as they, by implementing favorable policies, can increase the in-house value-adding

activities of the companies and thereby force the companies to advance their technologies and improve their designs by arranging funds for research and development (The State Council of the People's Republic of China 2014). This also mean that the Chinese state have an influence on the governance of Goldwind's global value chain. Gereffi (1994) defines governance of global value chains as "*[…] authority and power relationships that determine how financial, material, and human resources are allocated, and flow within a chain*" (p. 97). Because the Chinese state provide support in terms of funding and subsidies, Goldwind has the favorable position in the power relationships between them and other actors involved, as they can determine how to allocate, control, and coordinate the flow of financial, material, and human resources. Traditionally, it is the core societies who control and govern global value chains and consequently the peripheral and semi-peripheral societies who hold less power in the power relationships. Goldwind, being a part of the emerging economy of China, and thus categorizes in a semi-peripheral society, is challenging the traditional theory of global value chains, and thus proving emerging economies in semi-peripheral societies can control and coordinate the governance structures and power relationships of global value chains.

As seen in figure 6, Frederick (2019) developed an industry-neutral model of a global value chain, which serves as a visual template for mapping some of the main areas of a global value chain. Chinese manufacturers have for a long period of time been keeping most of the supply chain stages in-house, as they have enjoyed the low labor-costs of China. In 2019, the gross monthly minimum wage in China was 217 USD, whereas, in comparison to Australia, the gross monthly minimum wage was 2232 USD (International Labor Organization). In addition to this, most of installations implemented by Chinese wind power manufacturers have been within China (Finans 2022). In terms of R&D related activities, the emergence of Chinese wind power has for a long time been dependent on outsourcing research and development to other markets with more expertise and technological advancements in this field. This is also the case of Goldwind, as they have been relying on technological collaborations with institutions and companies in Europe and Australia.

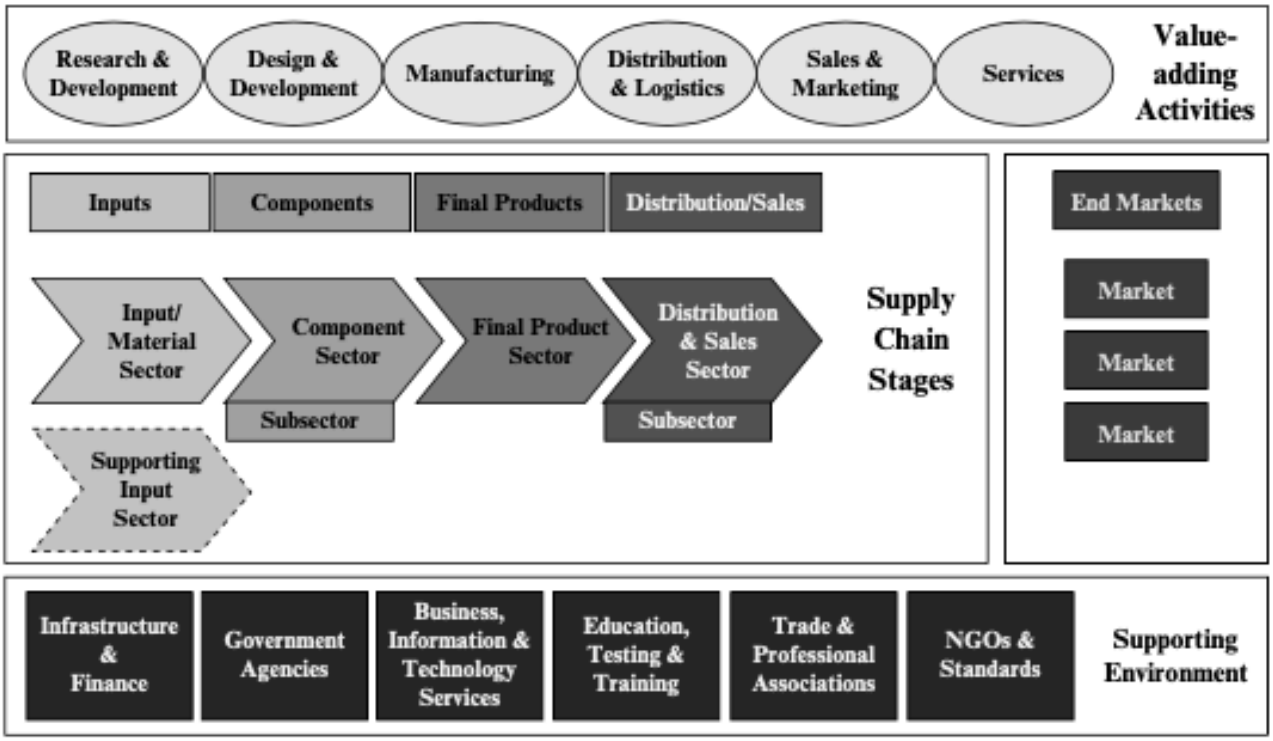

Figure 6. Parts of global value chains. (Frederick 2019)

This is where Chinese state capitalism has a clear impact on global value chains of Chinese wind turbine manufacturers. Because China has been lacking technical knowledge and knowhow in this industry, the companies have been forced to seek international collaborations to keep up with the technological advancements made in the more mature markets. The Chinese state has since the amendment of the Renewable Energy Law in 2009 actively been pushing for an increase in research and development within China by arranging funds for research and development related activities, as well as providing support for the improvement of products of higher quality and upgrading (The State Council of the People's Republic of China 2014).

The Paris Agreement is an international treaty, which is legally binding the involved nations to act on climate change. The objective of this agreement is for nations to implement ambitious policies and efforts to combat climate change (United Nations Climate Change). With this agreement, nations have to form long-term strategies in order to reach the overall objective. The Paris Agreement has a positive effect on the wind power industry, as governments are dependent on green energy to reach the overall objectives of the agreement. Therefore, it is not only in China that the state is favoring the

wind power industry, however, the difference is that other states are supporting the industries as a strategic measure to battle climate change, whereas the Chinese state actively influences some parts of the value chains of the companies involved. The question is if the form of state capitalism executed in China is having an influence on Goldwind in the Western wind power industry. Even though the Chinese state is very supporting of the wind turbine manufacturers in China, they will inevitably encounter challenges when entering the Western wind power industry. With different economic systems, political systems, and even cultural differences, challenges will occur.

4.2.1.1 An Example of Strategic Involvement

In March 2022, the Chinese state-owned enterprise, State Grid Corporation of China, signed an agreement with Energinet from Denmark in order to strengthen the collaboration between Denmark and China in terms of green energy. Energinet is a public enterprise owned by the Danish Ministry of Climate, Energy, and Utilities, and the purpose of Energinet is to structure and build energy-infrastructures, and thus maintain the development of climate neutral energy supply (Energinet). The agreement made with State Grid Corporation of China is a three year agreement, which objective is to support the Chinese government's target of installing +1000 GW by 2030. In more general terms, this agreement will have a specific focus on development and knowledge sharing, in terms of the experience Denmark has from the green transition (Energinet 2022). Energinet was founded in 2005 (Energinet 2010), and they have therefore many years of experience with increasing the renewable energies in Denmark. These experiences will assist China in transferring into green energy, and thus reach their target of being climate neutral by 2060, as agreed in the Paris-agreement (Energinet 2022). It is interesting to discuss why Energinet agreed to a collaboration with this state-owned enterprise of China, as besides supporting the Chinese state with the green transition, the agreement will also give access to the Chinese energy market. As I have illustrated in this paper, the Chinese wind power industry is in a rapid development and therefore holds many opportunities for overseas actors and parties, hence it could be anticipated that Energinet expects to gain access to the prosperous Chinese energy market.

Peter Markussen, Senior Director of International Relations at Energinet, explained to me how the background for initiating a collaboration with State Grid Corporation of China is to exchange knowledge on development and operation of energy systems with increasing share of renewables. He

emphasized how China is responsible for approximately 25 percent of the global CO_2 emission and that Denmark and Energinet want to decrease the Chinese emissions, and thus make an impact globally. Even though, Energinet assists and shares their experiences in green transitioning, they are still aware of the benefits they can gain from the collaboration. Peter Markussen further states that the knowledge exchange hopefully will support the Danish green transition by gaining new inspiration and insights into both the Danish solutions and the Chinese solutions. He states that "*[...] they are for example quite advanced in their technological level for transmission grid development*", which is knowledge Denmark wants to obtain and learn from. Markussen also highlights that Energinet is aware of the differences between China and Denmark in terms of values and public governance, and that Energinet is actively pursuing an open collaboration with democratic values. This is an example of how Chinese state capitalism can succeed in terms of influencing global value chains. They manage to establish beneficial partnerships and collaborations all over the world with states and companies with completely different economic and political systems, and thus create advantages for themselves in becoming an innovation superpower and increasing their capabilities in R&D related initiatives.

Even though, the overall objective of this collaboration is to support the Chinese government in reducing their CO_2 emission and reaching the target of installing +1000 GW by 2030, Energinet is still hoping to gain insight into the technological advancements of China. This illustrates the power the Chinese state holds in terms of research and developments initiatives. The Chinese wind power industry contains a lot of opportunities for overseas actors, and they can therefore collaborate with many different actors in the global industry and thereby gain different knowledge and knowhow. The Chinese state can gain many opportunities when targeting at becoming an innovation superpower, which also will increase their in-house capabilities and automatically make Chinese companies more competitive in the overseas industries.

While Denmark and China have completely different economic and political systems, they still manage to establish collaborations with respectively Danish and Chinese state owned enterprises, where both enterprises can obtain a beneficial outcome. This collaboration, along with the collaboration between Goldwind and Hydratech and LM Wind Power, as well as Goldwind's subsidiary in Denmark clearly demonstrate how Chinese state capitalism is influencing Goldwind in the Western wind power industry. The form of state capitalism being executed in China is completely

different from the economic systems in the Western wind power industry, but because of the prosperous wind power industry in China, and because of the massive development opportunities, the Chinese state is still influencing the Western wind industry and the global value chains hereof.

4.2.2 Why is Goldwind competitive

So, taking all these factors into considerations, why is Goldwind competitive in the Western wind power industry? First of all, Goldwind is actively upgrading many activities within their value chain. The decisions made in terms of product upgrading, functional upgrading, and end-market upgrading increase Goldwind's competitiveness in the Western wind power industry, as they increase their research and development related activities as well as improving their product portfolio. This automatically make them competitive in the industry, as they partner and collaborate with many Western suppliers and institutions from which they can obtain knowledge and knowhow about the latest research and technology in the industry. Because of the firm-centric upgrading, Goldwind can, as stated by Feng Zhao, Head of Strategy and Market Intelligence at the Global Wind Energy Council, compete with Western wind power manufacturers in terms of technological development (Energy Watch 2021a). In addition to this, Goldwind's geographically dispersed value chain activities mean they can leverage the competitive advantages of the different countries they are located in. With reference to Fernandez-Stark and Gereffi (2019) as well as the theory of world systems, core societies are typically dominating in terms of product development and research and development, which is something Goldwind is leveraging by implementing subsidiaries as well as establishing partnerships with institutions within the core regions. At the same time, Goldwind is taking advantage of the low labor costs in China (International Labor Organization) and has thereby implemented all their industrial facilities within China and can thus enjoy the competitive advantage hereof.

Besides the firm-centric upgrading, and how this creates a competitive advantage for Goldwind, they are also experiencing the effects of the Chinese state's attention towards the wind power industry. Funding, subsidies, and the facilitation of R&D assist Goldwind in being competitive in the Western industry, as the Chinese state is contributing with many favorable initiatives to increase the company's competitiveness. Because Goldwind is a Chinese company, they are automatically situated in a semi-peripheral region and would traditionally not be a central part of the top of the global value chain hierarchies. This means that traditionally, Goldwind would not have much power

within the power relationships of global value chain, but as illustrated throughout this paper, Goldwind is in fact challenging these power relationships and hierarchies within global value chains. Even though, Goldwind is situated within the semi-peripheral society of China, they have still managed to climb the ladder of global value chains and is now located as a part of the top in global value chain hierarchies.

Now, has Goldwind managed to position themselves in an advantageous position within global value chain hierarchies because of China's more advantageous position within the capitalistic world order due to successful industrial upgrading, or because of the Chinese state's influence on global value chains. This will be analyzed in the next chapter.

To answer this question, I will continue the notion of Bair (2005) and thus discuss how firm-centric upgrading can be translated into its implications for larger units. I will argue that a country's incorporation into the world economy is reliant on firms' involvements within global value chains. Semi-peripheral and peripheral societies will often have the least power within the power relationships of global value chain hierarchies in the capitalistic world system. I will argue that this notion is problematic, especially in the global wind power industry, as most states are involved in this industry to some extent. Goldwind, and the emerging economy of China, are examples of how semi-peripheral societies can be a part of the top of global value chain hierarchies, and how they can challenge the traditional power relationships within global value chains. This is also the reason why I argue that Goldwind is competitive in the Western wind power industry. From the political perspective, Goldwind's global value chain is being governed and coordinated on a macro-level, and it is therefore not only the micro-level that Goldwind can create a competitive position for themselves. The Chinese state is actively assisting Goldwind and other Chinese MNE's in becoming more competitive. This is done through the commitments to the Paris Agreement, the Kyoto Protocol, as well as the 'Made in China 2025' initiative. Besides combatting energy issues within China, the Chinese wind power industry also serve as a platform to increase China's in-house innovation capabilities and thus assisting in the Chinese state's commitment to becoming an innovation superpower. Through this, Goldwind can increase their competitiveness due to the massive support they directly and indirectly receive from the Chinese state.

4.3 The Challenges for Goldwind

I have now analyzed why Goldwind is competitive in the Western wind power industry, and how geographical disparity, firm-centric upgrading, public governance, and Chinese state capitalism are all contributing to this matter from both a global value chain perspective and from a political perspective. However, even though Goldwind has managed to position themselves in an advantageous situation within global value chain hierarchies, they still face some challenges. First of all, the quality of Chinese wind turbines has been questioned in the Western wind power industry. Jens Rasmussen, CEO of Eurowind Energy, which is one of the leading developers of wind farm project in Denmark and abroad (Eurowind Energy. Om os), stated that there have yet to be installed Chinese wind turbines in Denmark, as the Chinese wind turbines do not reach the same quality level as what Western competitors can offer. Furthermore, he states that even though the Chinese wind turbines are not as attractive as those of Western competitors, does not mean that this can't change in the future. Johannes von Dechend, Head of Sourcing and Procurement of Eurowind Energy, argues that before initiating a collaboration with a Chinese wind turbine manufacturer, Eurowind Energy needs to get clarifications about different factors such as the technological aspect of the wind turbines, working conditions for the employees, and the service level among others (Finans. 2022).

As I illustrated in chapter 1.1, Goldwind offers a very lucrative price for a newly installed megawatt, however, even though this might be a great competitive advantage, there are still some challenges related to this. For example, when Chinese wind turbine manufacturers deliver wind turbines to their local market, the costs of logistic will automatically be lower. Additionally, there is lack of transparency in terms of service and support, which also affects the price. And lastly, when installing new wind parks, especially offshore wind parks, there is often a demand of a local production, which consequently will increase the costs of logistic on Chinese wind turbines (Finans 2022).

5. Limitations, Contributions, and Future Research

This chapter will evaluate on the thesis, and thus touch upon the limitations of the thesis and unforeseen challenges. Furthermore, I will highlight the contributions of this paper and discuss directions for future research.

5.1 Limitations

The theoretical perspectives of this thesis have had a noteworthy emphasis on the papers developed by Gereffi and Fernandez-Stark (2019) and Gereffi et al. (2015). These theoretical frameworks have framed most of the first part of the analysis covering the value chain approach. The frameworks developed by Mayer and Philipps (2017), Musacchio et al. (2015), and Hopkins and Wallerstein (1977) proved the foundation for the analysis covering the world systems approach. I am aware of how this might present a narrow and limited view of the global value chain theory in general, but these frameworks proved most relevant for this paper, due to their emphasis on both firm-centric and public governance, upgrading, as well as the role of the state in increasing global value chain activities.

Flyvbjerg (2006) argues that "*One can often generalize on the basis of a single case, and the case study may be central to scientific development via generalization as supplement or alternative to other methods. But formal generalization is overvalued as a source of scientific development, whereas 'the force of example' is underestimated.*" (p. 12). Therefore, the case-study of Goldwind can serve as a central element in the generalization of the circumstances in China and thus create an example of why a Chinese wind turbine manufacturer is competitive in the Western wind power industry. However, formal generalization can't be conclusive, and therefore, the sources of Goldwind's competitiveness might not be central in similar cases.

I have faced challenges in collecting data from Chinese sources, which consequently have limited me in generating a full coverage of the case. Governmental publications from the Chinese central government have provided a wholesome picture of its involvement in Chinese global value chains. On the contrary I have been very limited in collecting data from the regional government of Xinjiang Uyghur Autonomous Region, and I have therefore not been successful in analyzing how the regional government is impacting the global value chain of Goldwind.

5.2 Contributions

To assess the theoretical contributions of this paper, I will utilize the assessment tool developed by David A. Whetten (1989). To be classified as a theoretical contribution for publishing, a paper should follow some main criteria (Whetten 1989). The first criteria concerns whether a paper make a value-adding contribution. He argues that a paper not necessarily needs to include completely new theories, but modifications of established theories should challenge current thinking. In this paper, I challenge the current thinking of global value chain theories, and thus proves, through the case-study, that semi-peripheral societies can position themselves in an advantageous position within global value chain hierarchies. I illustrate the importance of analyzing political intervention in global value chains, and consequently discuss whether China's position within the capitalist world system is due to their success in industrial upgrading, or whether it is how they are situated within global value chains as a result of Chinese state capitalism. The second criteria concerns whether the evidence is compelling. As I argued in chapter 5.1, case-studies can't formally generalize on a specific circumstance, which limit the conclusion. However, the case-study builds on a basis of convincing arguments, and the supporting evidence of why Goldwind is competitive in the Western wind power industry thus adds to the notion of why this paper can be classified as a theoretical contribution. Lastly, the third argument covers the contemporary interest to scholars within this field. As I highlighted in the literature review, the field of global value chains, political intervention, and wind turbine manufacturers is very underdeveloped. The understanding of the competitiveness of Goldwind is relevant both from a micro- and a macro perspective, as the Chinese state's involvement in the GVC consequently strengthens Goldwind's upgrading, but also the country-level upgrading, and thus enhance the initiative of becoming an innovation superpower.

5.3 Future Research

To further develop this area, it would be recommendable to analyze whether this case of Goldwind is a general or specific case. This could be done by analyzing other Chinese wind turbine manufacturers and their competitiveness in the Western wind power industry. Furthermore, to create a full coverage of the competitiveness of Goldwind, one could analyze the global value chain of one of Goldwind's competitors, such as Vestas Wind Systems or General Electric. To further explore whether Goldwind's competitiveness is due to China's success in industrial upgrading, or whether it

is due to China's position within global value chain hierarchies, one could analyze a similar case of another emerging economy. An analysis of a wind turbine manufacturer from India or Brazil and the involvement of their central governments would be recommendable when generalizing on the case of an emerging country. Through this, the impact of Chinese state capitalism would also be easier to conclude.

6. Conclusion

This case-study of Goldwind sets out to explore the competitiveness of Chinese wind turbine manufacturers in the Western wind power industry. By doing this, this paper analyzed Goldwind's global value chain both from a value chain perspective and from a political perspective. This micro- and macro perspective on the value chain allowed me to analyze what factors are relevant for Goldwind's competitiveness. I decided to utilize a mixed-method approach, as this allowed me to consult both quantitative and qualitative data, which was very advantageous when creating an understanding of the competitive factors within the industry as well as Goldwind's position within global value chain hierarchies. I consolidated a variety of secondary sources which proved the foundation for the analysis and thus assisted in answering the research question. I chose to utilize three different theoretical concepts, as these served as valuable frameworks for analyzing Goldwind's competitiveness. The theory of global value chains, the theory of state capitalism, and the world systems theory proved helpful to answer the research question of *Why Goldwind is Competitive in the Western Wind Power industry.* When initiating this research process, it became clear to me that two overall factors were important for Goldwind's competitiveness. First of all, Goldwind's global value chain, as well as how the activities within the value chain are governed and controlled, are important factors for determining the company's competitiveness. Second of all, the political intervention in the company's activities, as well as in the local industry, proved to have a significant influence on the competitiveness of Goldwind. As I had determined and analyzed these perspectives, I could initiate the answering of why Goldwind is competitive. Is it because of China's more advantageous position within the capitalistic world system due to successful industrial upgrading, or is it because of the Chinese state's influence on global value chains?

This paper illustrated how the traditional global value chain theory concerning an uneven world system and how peripheral societies are situated low within global value chain hierarchies is not necessarily the case in all industries. Wallerstein (1976) argues that China is situated in a semi-peripheral region, which consequently mean that China should traditionally not have much power in the power relationships in global value chain hierarchies. However, the case-study of Goldwind proved otherwise, and thus illustrated how a semi-peripheral country can be situated in the top of global value chain hierarchies. Whether this is due to China's more advantageous position within the capitalistic world order as a result of successful industrial upgrading, or a result of the Chinese state's involvement in the global value chain is hard to conclude. I will argue that both factors have a huge say in this matter. Goldwind has invested heavily in research and development related activities, which among other is illustrated in their more than 3000 employees working in R&D departments. Besides this, Goldwind has been successful in developing their global value chain and thereby obtain the competitive advantages of each country their subsidiaries are situated in. Besides these factors, Chinese state capitalism has inevitably an influence on Chinese MNE's, as they serve in a facilitating role as well as contribute with strategic involvements in the company's activities. Furthermore, the World Trade Organization argues, that firms can source technological components overseas and thereby utilize overseas opportunities. Through this process, emerging countries can facilitate innovation. Goldwind's overseas R&D departments as well as the strategic partnerships they form with research institutions contributes with the facilitation of innovation and can thus emerge the 'Made in China 2025' initiative.

So, to answer the research question of why Goldwind is competitive in the Western wind power industry, I will argue that both factors of the continuous firm-centric upgrading and governance and Chinese state capitalism are influencing this. However, in reference to the traditional global value chain theory, it is problematic to conclude, especially within the global wind power industry, as most states to some degrees are involved in their local wind power capacities. Therefore, within this industry, I will argue that one can't place global value chains within certain structures of the world systems, as this industry has proved to be a special case. China, and Goldwind, hold a great amount of power within the global value chains hierarchies, and their upgrading and governance of the value chain is a central element in Goldwind's competitiveness in the Western wind power industry.

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