



UNIVERSITY OF AMSTERDAM

China's Energy Security of Supply and National Oil Companies

A Study of Sino-Brazilian Energy Relations



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Abstract

This thesis examines the energy relationship between China and Brazil and the activity of China National Petroleum Corporation in the Brazilian energy sector from 2013-2018. To this end the theory of Geopolitical Economy is employed to analyse the foreign activities of China's National Oil Companies. The thesis concludes that the CNPC's activities in contribute marginally to China's energy supply security by securing equity oil. Furthermore, these activities have the potential to further energy cooperation between China and Brazil. The geopolitical economic conditions in Latin America render infrastructure the focal point of Chinese engagement on the continent and contribute positively to Sino-Brazilian energy relationship by presenting opportunities for cooperation in energy infrastructure.

Keywords: China, Brazil, China National Petroleum Corporation, energy security, oil supply

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Maps

Map 1 – Political Map of the People's Republic of China



Source: www.geology.com¹

¹ Retrieved from: <https://geology.com/world/china-satellite-image.shtml>

Map 2 – Political Map of the Federative Republic of Brazil



Source: www.geology.com²

² Retrieved from: <https://geology.com/world/brazil-satellite-image.shtml>

Map 3 – Political Map of South America



Source: www.geology.com³

³ Retrieved from: <https://geology.com/world/south-america-satellite-image.shtml>

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List of Abbreviations

ADB	Asia Development Bank
AIIB	Asia Infrastructure Investment Bank
ANEEL	National Electric Energy Agency
ANP	National Agency of Petroleum, Natural Gas and Biofuels
BP	British Petroleum
BRI	Belt and Road Initiative
BRICS	Brazil Russia India China and South Africa
CCP	Chinese Communist Party
CDB	China Development Bank
CEBC	Brazil-China Business Council
CELAC	Community of Latin American and Caribbean States
CNOOC	China National Offshore Oil Corporation
CNPC	China National Petroleum Corporation
CNPE	National Council for Energy Policy
COD	Central Organisation Department
COSBAN	Coordination and Cooperation Committee
CTG	State Grid and China Three Gorges
E&P	Exploration and Production
EPE	Energy Research Office
ESMC	Electric Sector Monitoring Committee
Eximbank	Export Import Bank of China
FADC	Framework Agreement on Defence Cooperation
FDI	Foreign Direct Investment
FIESP	Federation of Industries of the State of São Paulo
FTA	Free Trade Agreement
FTAA	Free Trade Area of the Americas
FYP	Five-Year Plan
GDP	Gross Domestic Product
GSD	Global Strategic Dialogue
IMF	International Monetary Fund
IOC	International Oil Company

IPE	International Political Economy
IR	International Relations
JCEC	Joint Commission for Exchange and Cooperation
LAC	Latin America and the Caribbean
Mb/d	Million Barrels per Day
MERCOSUR	Common Market of the South
MME	Ministry of Mines and Energy
MOFA	Ministry of Foreign Affairs (China)
MOST	Ministry of Science and Technology
MOU	Memorandum of Understanding
MWR	Ministry of Water Resources
NAFTA	North American Free Trade Agreement of United States, Canada and Mexico
NEA	National Energy Administration
NEC	National Energy Commission
NDRC	National Development and Reform Commission
NOC	National Oil Companies
Petrobras	Petróleo Brasileiro S.A.
PPSA	Pre-Sal Petróleo S.A.
PRC	People's Republic of China
SASAC	State Asset Supervision and Administration Commission
SEPA	State Environment Protection Administration
Sinopec	China Petroleum and Chemical Corporation
SOE	State Owned Enterprise
TPP	Trans Pacific Partnership
TTIP	Trans Atlantic Trade and Investment Partnership
US	United States
USIDFC	US International Development Finance Corporation
USD	United States Dollar

Chapter 1 Introduction

1.1 Introduction

China's swift economic growth and industrialisation have placed enormous pressure on the country's energy resources, and particularly on its limited oil resources. In the 1990s, these conditions drove Beijing to start seeking access to foreign energy resources by intensifying its engagement with energy rich countries and devising foreign policies that facilitate the achievement of this objective. Considering the finite nature of fossil fuels and its status as the 'lifeblood' of the global economic system, China's increasing demand of these resources and the subsequent cooperation and competition for them has strategic implications to major energy consumers, and to the global balance of power.

The remainder of this chapter addresses the objectives, research question and the delineation of the study. An examination of the relevant body of literature will be presented in section 1.2. Thereafter, section 1.3 will address the theoretical framework of this study by discussing the theoretical concepts of Geopolitical Economy and their applicability to studies of China's energy security of supply. Section 1.4 outlines the hypotheses of the study, followed by a discussion of the method and data in section 1.5. Finally, section 1.6 will conclude the chapter with a brief discussion on the organisation of the research.

1.1.1 Objectives

The main objective of the thesis is to explore the activities of China National Petroleum Corporation (CNPC) in Brazil's energy sector. Hence, the Sino-Brazilian energy relationship will be the focal point of the study, along with CNPC's operations in the Libra and Peroba oil fields. China's 'going out' strategy stems from an unfavourable energy situation, and the transnationalization of its National Oil Companies (NOCs) is key to its energy security of supply. Therefore the study will analyse the relationship between the Chinese state and its NOCs.

In order to understand the Sino-Brazilian energy relations the thesis will examine the trade, investment, and finance of China and CNPC towards Brazil. To achieve this objective the study will do the following: first the thesis will examine the trade activities between the two countries to determine the Chinese interest in Brazil. Secondly, it will probe CNPC investments in Brazil's energy sector to highlight the strategic motivations for the company's investments in Brazil. Thirdly, the study will present a case study regarding the development of the Libra and Peroba oil field: a strategically important oil field, which CNPC is developing in a consortium alongside Petrobras⁴, Shell⁵, Total⁶, and CNOOC⁷. The project is CNPC's largest investment in the Brazilian energy sector. The case study of CNPC's activities (from 2013 to 2018) in the Brazilian energy market will highlight the dynamics related to China's 'going out' strategy, and the role of NOCs therein.

Finally, the study will consider the geopolitical economic challenges to the Sino-Brazilian energy cooperation. As the relationship between China and Brazil is marked by various factors (both domestic and geopolitical economic factors) this thesis will seek to survey the domestic factors that influence the Brazilian sector, where CNPC is invested, and the geopolitical economic factors in Latin America. This way the study strives to determine the domestic challenges to the Sino-Brazilian energy cooperation, as well as the geopolitical economic challenges to the energy relationship between China and Brazil.

1.1.2 Research question

The objectives outlined above lead to the main research question:

What are the activities of CNPC in Brazil, and do these activities contribute to sustainable Sino-Brazilian energy relations?

To answer the research question the following sub-questions will be addressed in the thesis, each under a separate chapter:

⁴ Brazil's NOC

⁵ An International Oil Company (IOC) from the Netherlands

⁶ An IOC from France

⁷ A Chinese NOC

1. What is China's energy situation, what are the resulting energy security policies and strategies, and what role do national oil companies play in these strategies?
2. What is the energy situation of Brazil, what are the dynamics between the state and the market in Brazil's energy sector, and what are China's interests in Brazil's energy sector?
3. What is the current state of China's trade, investment, and finance in Brazil's energy sector, and what are CNPC's investments in the Brazilian energy sector?
4. What are the implications of China's geopolitical economic engagement in South America to the Sino-Brazilian energy relationship?

1.1.3 Social and academic relevance

The social relevance of this study is rooted in the finite nature of fossil fuels, and the rising demand for these commodities. In our modern world, food production, transport, households, and enterprises are all dependent on energy, and particularly fossil fuels (Amineh & Yang, 2014, p. 507). For this reason, "Uninterrupted access to such strategic goods as oil and gas is critically linked to national security, economic development, and social peace" (van de Graaf, 2013, p. 3). Hence, reliable energy supply is a primary strategic concern for the well-being of states, and the finite nature of fossil fuels lead states into competition for these resources.

When it comes to control over this strategic resource, NOCs have developed into dominant and influential actors. Amineh and Yang (2017) show that in the 1970s NOCs controlled less than 10% of the world's oil reserves, while in 2012, after a series of nationalisation of oil companies, NOCs controlled 90% of global oil reserves. This phenomenon represents a significant change in the global oil market, where NOCs have become increasingly competitive. Chinese NOCs have also developed into formidable competitors in global energy markets (Amineh & Yang, 2017). Therefore, understanding of these entities is crucial to understanding China's efforts to sustaining its economic growth.

Historically, South America has remained a marginal region in Chinese foreign policy considerations. However, Chinese demand for access to foreign fossil fuel resources and Brazil's potential rise as a major oil exporter has led to an intensification of China's relationship with Brazil and the region. China has risen to become the region's top trading partner, investor, and financier, raising concerns in Washington, D.C. as to China's intentions in the region. On the other hand, Brazil has risen to the sixth largest oil exporter to China.

1.1.4 Delineation of research

This thesis will study the activities of CNPC in Brazil for the period ranging from 2013 to 2018. The starting point for this investigation is 2013 because it marks the starting point of CNPC operations in Brazil, when the company invested, together with CNOOC, 1.2 billion US dollars in exchange for a 10% stake in the development of the Libra field located in the Santos basin. Considering that CNPC is still active in the Brazilian energy sector the study will consider the company's activities up until 2018. In terms of space the study will focus on China (the home country of CNPC), Brazil (the target of CNPC activities in this study), and Latin America⁸. However, major powers such as the United States and Russia will be analysed in the last section of the research in regards to the geopolitical economy of China in Latin America.

1.2 Literature review

This section will discuss the body of literature covering the topics of: China's energy security policy, transnationalization of Chinese NOCs, China's involvement in Latin America, and Sino-Brazilian relations. The review of the current academic literature, ranging from articles published between 2000 and 2019, is aimed at outlining the debates surrounding the above-mentioned themes by categorising the different academic conclusions. The themes are presented in different contexts in the body of literature; nevertheless this review will focus on their application to China's energy security of supply.

⁸ Consult maps 1, 2, and 3

China's energy security policy

China's vast economic development and growth since its 1978 economic reform has led to sharp increases in the country's demand for energy, specifically oil. Although the country's energy mix is mainly dependent on coal, its leaders have expressed a willingness to reduce the significance of coal in favour of oil and gas amidst concerns about air pollution. Nevertheless, the country has been experiencing a widening gap between its oil production and consumption with the latter outpacing the former (Wu, 2014; Leung G. , 2011). Therefore, oil is an important factor in China's energy security.

The main reasons for the importance of oil to China are: 1) oil (especially as transport fuel) is difficult to substitute as oppose to gas or coal, and 2) China's domestic oil fields are aging and nearing their peak, while at the same time its demand for oil is increasing steadily (Yao & Chang, 2014; Leung G. , 2011; Wu, 2014). Therefore China's oil dependency has been increasing firmly since 1993, after the country became a net oil importer (Yao & Chang, Energy Security in China: A Quantitative Analysis and Policy Implications, 2014; Wu, 2014). This phenomenon sparked academic curiosity as to China's energy supply security, especially the supply of oil (Wu, 2014; Leung G. , 2011; Yao & Chang, Energy Security in China: A Quantitative Analysis and Policy Implications, 2014; Jakobson & Daojiong, 2006; Xu Y.-C. , 2006; Jiang W. , 2006)

Authors such as Leung (2011) and Jiang (2006) highlight that when it comes to energy security, the key domestic concern for Chinese leaders is their legitimacy; to develop the country's economy while upholding political and social stability (Leung G. , 2011; Jiang W. , 2006). In order to achieve this goal the government has implemented the "going out" strategy. This strategy implies that Beijing will forge strategic partnerships with suppliers of energy, while it facilitates and support overseas activities from its NOCs. These activities are aimed at increasing China's energy supply security (Yao & Chang, 2014; Wu, 2014; Xu Y.-C. , 2006; Jakobson & Daojiong, 2006). Many academic literatures have endeavoured to assess the implications of this strategy. Some authors claim that China's 'going out' strategy has made the country vulnerable to domestic policies in its oil trading partners including Brazil, Venezuela, and Saudi Arabia whom have traditionally found themselves under

the American sphere of influence (Jakobson & Daojiong, 2006). Yet, the argument that China is not seeking confrontation with the US is prevalent in the literature (Xu Y.-C. , 2006; Jakobson & Daojiong, 2006). Xu (2006) goes as far as to highlight the contributions of a peaceful international environment to China's economic growth to argue that China's intentions are peaceful.

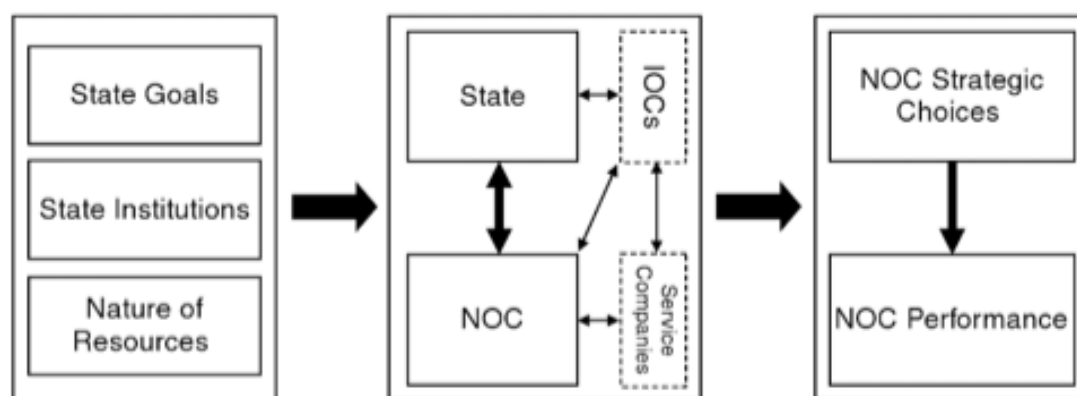
Transnationalization of China's NOCs

The literature relating to the transnationalization of Chinese NOCs provide a range of conclusions that focus primarily on the effectiveness of Chinese NOCs, the principle in NOCs relationship with the state, and the motivations for the foreign activities of these NOCs.

NOCs are important to the global oil market as they control approximately 90% of the world's crude oil reserves and are responsible for two-thirds of global production (Jiang B. , 2012; Vermeer, 2015). Chinese companies started investing in upstream oil projects in the 1990s. These efforts were intensified after in the early 2000s when the government introduced the 'going out' strategy (Yao & Chang, 2014; Wu, 2014; Meidan, 2016). In this sense, NOCs are important tools in China's quest for foreign oil (Vermeer, 2015). There is abundance in literature that studies the overseas activities of Chinese NOCs (Victor, Hults, & Thurber, 2012; Vermeer, 2015; Meidan, 2016; Jiang B. , 2012; De Graaff, 2017; Chalmers & Mocker, 2017; Chen, 2008; Ma & Andrews-Speed, 2006; Downs, 2010; Lai, O'Hara, & Wysoczanska, 2015).

Victor, Hults, & Thurber (2012) have studied the strategic choices of NOCs and designed the following framework that explains their findings.

Figure 1.1 – The role of the state in NOC performance



Source: Victor, Hults, & Thurber (2012)

The authors argue that the relationship between the state and NOCs are determinant to the behaviour of NOCs (Victor, Hults, & Thurber, 2012). When it comes to Chinese NOCs Binbin (2011) and Vermeer (2015) agree: “the key to understanding CNPC is in its relationship to the Chinese Government” (Jiang B. , 2012, p. 392). In China, NOC managers are appointed by the Chinese Communist Party (CCP) and are expected to balance political and commercial objectives (Vermeer, *The Global Expansion of Chinese Oil Companies: Political Demands, Profitability and Risks*, 2015). These arguments lead to the conclusion that the overseas activities of Chinese NOCs are motivated mainly by strategic considerations by the state (such as energy security) (Victor, Hults, & Thurber, 2012; Jiang B. , 2012; Vermeer, 2015).

However, there are literatures that disagree with the idea of the state being the principle in the Chinese state-NOC relationship. These authors claim that NOC overseas investments are the product of economic considerations by NOCs. They also highlight the reforms in the relationship between the Chinese government and its NOCs noting that the former is loosening its grip on the latter, allowing NOCs a certain degree of independence as to their overseas investments (Chalmers & Mocker, 2017; Chen, 2008; Ma & Andrews-Speed, 2006; Downs E. , 2010; Lai, O'Hara, & Wysoczanska, 2015).

On the other hand, De Graaff (2014) and Downs (2010) take a more nuanced position in this debate claiming that state interests are not the primary drivers to the ‘going global’ of Chinese NOCs. While they recognize the role and involvement of the state

in NOC operations, they contend that NOCs operate as International Oil Companies (IOC) (profit seeking entities) abroad, and as NOCs (state led organisations) at home (De Graaff, 2017; Downs E. , 2010). De Graaff (2014) refers to this phenomenon as the ‘two faces’ of Chinese NOCs.

The discussion above highlights the disagreements in the literature as to the motivations of NOCs overseas investments and the exact relationship between NOCs and the Chinese government. Aside from this debate, there is also a discussion as to the effectiveness of these investments. Several articles in the body of literature argue that NOC investments are ineffective at enhancing China’s energy supply security (Chen, 2008; Lai, O’Hara, & Wysoczanska, 2015; Vermeer, 2015). The main argument for this conclusion presented in the literature is that the amount of oil secured through NOC investments is negligible compared to China’s oil imports (Chen, 2008; Chen, 2011). Vermeer (2015) goes a step further and argues that supply contracts contribute more to energy security as oppose to acquisition of equity oil.

China in Latin America

The literature acknowledges that South America is traditionally a marginal region for China that is gradually increasing in importance, especially when it comes to energy relations. This occurrence drove many researchers to study China’s interest in the region. One reason for China’s initial interest in the region that is pointed out in the literature is the Taiwan issue. China’s involvement in Latin American countries, which have traditionally recognised Taiwan, is dependent of their diplomatic recognition of China at the cost of Taiwan. A number of articles refer to this issue as an important reason for China’s initial interest in the region (Pham, 2010; Dumbaugh & Sullivan, 2005; Li, 2007). However, the rising importance of the region is said to be due to two main factors: China’s need for oil and other raw materials like iron and copper (Li, 2007; Pham, 2010; Dumbaugh & Sullivan, 2005; Iturre & Mendes, 2010; Hogenboom, 2014), and the region’s demand for foreign investment (Iturre & Mendes, 2010).

Another topic that has intrigued researchers is the impact of China’s involvement in Latin America (Hogenboom, 2014; Li, 2007; Pham, 2010; Iturre & Mendes, 2010). Some authors claim that China’s involvement in the region brings with it a significant

challenge for the respective countries (Hogenboom, 2014; Li, 2007). Namely, China's global expansion means it seeks raw materials in resource rich countries while it exports manufactured products. This brings China into competition with South American countries for markets in Latin America, United States, and Africa (Hogenboom, 2014; Li, 2007). Hogenboom (2014) refers to this phenomenon as the 'reprimarization' of Latin America's export.

Some authors in the body of literature have suggested the possibility of future conflict between China and the US, due to China's involvement in South America combined with anti US sentiments in the region (Li, 2007). On the contrary, others that have examined this issue argue that conflict is highly unlikely considering: 1) the geographical advantage of the US in the region (Pham, 2010), and 2) that US investments in the region are far superior to the Chinese investments (Dumbaugh & Sullivan, 2005). Therefore, they conclude that Chinese investments do not present any threat to US influence in the region.

Sino-Brazilian relations

Sino-Brazilian relations have intensified after the early 2000s turning Brazil into South America's largest trading partner to China (Cardoso, 2013). Brazil is the largest recipient of Chinese energy investments in Latin America (Hogenboom, 2014). When it comes to Chinese interests in Brazil, the body of academic literature indicates that these are very much in line with Chinese interest in the South American region outlined in the previous subsection. Raw materials including oil dominate the bilateral trade between the two countries and is therefore of vital importance in Sino-Brazilian relations (de Melo & do Amaral Filho, 2015; Cardoso, 2013; Klinger, 2015; Jenkins, 2012).

Cardoso (2013) and Jenkins (2012) outline the weaknesses in the Sino-Brazilian relationship: 1) the quality of bilateral trade and Chinese investments in Brazil, and 2) competition between China and Brazil for Latin American and African markets. The first point has to do with the fact that China imports commodities and natural resources while it exports manufactured goods to Brazil. This phenomenon undermines the sustainable economic development of Brazil, which prompted the country (especially elites and political parties in the opposition) to advocate for

diversification of the bilateral trade between the two countries (Cardoso, 2013; Jenkins, 2012). The second point is related to the Chinese challenge to countries in the region, mentioned in the previous subsection. The globalization of China's economy brought about competition between China and Brazil for markets in Latin America and Africa for their manufactured goods. China is gaining market share in these markets while Brazil is losing market share (Cardoso, 2013; Jenkins, 2012).

Gap in the literature and contribution of the thesis

So far, this section presented the debates in the literature relating to the topics of this thesis. The literature shows that China is compelled by its economic growth and development to seek foreign sources of fossil fuels. As a result Chinese leaders have devised the 'going out' strategy in an effort to alleviate the widening gap between oil production and consumption. The transnationalization of Chinese NOC's is key to this quest. However, the principle actor in the NOC-state relationship remains a point of contention in the literature, as well as the motivations behind the overseas activities of these NOCs. With regards to China's activities in South America and Brazil, the literature points to increasing Chinese interest in the region, guided by Chinese demands for raw materials and the region's demand for investments, with debate on the implications of China's interest on the regions economic development.

However, the body of literature presented in this section comes short in several aspects. Firstly, the relationship between state and market that drive the transnationalization of Chinese NOCs and the interaction with Latin American host country institutions is underdeveloped in the literature. Secondly, there is little evidence in the literature as to how Chinese involvement in Latin American countries contribute to its energy security of supply. The study seeks to contribute to the current body of literature by investigating CNPC's investment activities in Brazil in order to understand China's energy strategy towards the country and whether it contributes to China's energy security of supply. This case study cannot be generalised to explain China's strategy towards South America, but it can contribute towards such an endeavour.

1.3 Theoretical framework

As mentioned before, the objective of this thesis is to analyse the activities of China's NOCs in Brazil, and CNPC's activities in particular. To this end the study will employ the theory of Geopolitical Economy. This section will outline the theoretical concepts relevant to the study.

The three grand theories in International Political Economy (IPE) are: Economic Nationalism, Economic Liberalism, and Critical Theory. Economic Nationalism is akin to Realism in International Relations (IR) theory. The theory is centred on the assumption of the state as a unitary actor in an anarchic world system. Furthermore, the state is conceptualised as an entity in quest for power, in an anarchic system, to guarantee self-preservation. The economy on the other hand is interpreted as a tool employed by states to increase their power, hence the economy is a zero-sum game. Economic Nationalism recognises the role of the state and market actors, however, it argues that the latter is to be controlled by the former (O'Brien & Williams, 2016, p. 10). The second grand theory, Economic Liberalism is closely related to Liberalism in IR theory. Economic Liberalism conceptualise markets as composed of rational individuals seeking mutual gains (as oppose to zero-sum game). The theory argues that markets operate independently from state actors; hence it rejects the assumption that states dominate markets (O'Brien & Williams, 2016, p. 12). Finally, Critical Theory emphasises the nature of oppression both within and across societies and the struggle for justice by the oppressed. The most popular strand of Critical Theory is Marxism; that interpret the economy as the result of human exploitation and inequality. Therefore, the economy and the international system is conceptualised as a zero-sum game. Economic activity is furthermore perceived as the basis of all human activity; therefore economic relations influence the state, instead of the other way around (O'Brien & Williams, 2016, pp. 16-18).

Economic Nationalism is unsuitable for this study, as it perceives the state as a unitary actor. The application of such a theory would thwart attempts at analysing the activities of NOCs in foreign energy sectors. Economic Liberalism, focused on free trade, cooperation, and non-intervention, is also ill suited for this particular study given that both China and Brazil intervene in their respective economies.

The theory of Geopolitical Economy stems from Critical Theory and therefore acknowledges non-state actors in international relations, the constant demand for growth and cross-border expansion for the survival of a capitalist society, and the geo-economic and geopolitical logic that accompany expansionist activities. Specifically the theory is a sub stream of critical geopolitics. Amineh and Yang (2017) classify three streams of geopolitics: a stream that focuses on cultural factors so as to study community borders, a second stream that emphasises discourse analysis to comprehend the political and social environment in which geopolitical power is vested, and a third stream that attempt to connect geopolitics to IPE in order to analyse geopolitical and geoeconomic factors. The following discussion will elaborate Geopolitical Economy, and its application to the study of Chinese energy security of supply (Amineh & Yang, 2017, p. 29).

Geopolitical Economy

The theory of geopolitical economy is inspired by two concepts outlined by Harvey (1985), who endeavoured to explain the survival of capitalism. He argues that the reproduction of capital circulation is contingent on continuous growth. He introduced two logics: 1) the capitalist logic of power (geoeconomic), and 2) the territorial logic of power (geopolitical). The first logic refers to the expansion of capital in order to combat overproduction and devaluation of capital, and the second logic denotes the power projection between states in terms of geography and politics (Harvey, 1985). Mercille (2008) adds that the geopolitical logic involves political, diplomatic, and military strategies employed by states so as to pursue their interests on the international arena, while the geoeconomic logic denotes the practices of production, trade, commerce, and capital flows that facilitate the process of capital accumulation in space and time. In practice, the two logics can diverge as states and capitalists have contradictory objectives; capitalists seek to increase profit in the short-term, while states seek to maintain favourable socio-economic conditions to appease domestic constituents and preserve international credibility (Mercille, 2008, pp. 575-576). Hence, this study will consider the flows of trade, investment, and finance from China and CNPC to Brazil, the political aspects behind these activities, in order to explain China's engagement in Brazil.

The interaction between these two dimensions forms the basic assumptions for the theory of Geopolitical Economy, and “sets the context of the current state of the global (capitalist) system” (Amineh & Yang, 2017, p. 30). This concept implies that China is forced not only by its energy situation, but also by overcapacity in labour and production, to gain access to foreign markets in order to maintain its economic growth and wealth-power structure. Hence, the concept allows this study to analyse the way in which Chinese NOCs contribute to this process.

The unit of analysis in Geopolitical Economy is state-market complex. This concept refers to the interaction between the state and the market, specifically how the state constraints or promotes growth in the market through specialised institutions (Amineh & Yang, 2018, p. 12). This concept will enable this study to analyse the division of power between the state and the market in China in order to clarify the behaviour of the state as well as that of the CNPC. Amineh & Yang (2017) outline two ideal types: 1) the liberal-, and the 2) centralised- state-market complex. Liberal state-market complexes are characterised by self-regulating societies where markets enjoy relative autonomy *vis-à-vis* the state. In these societies market interests are able to direct the orientation of the society through their domination in the policy-making process. In centralised state-market complexes on the other hand, civil societies are “non-existent, underdeveloped or too weak to act independently of state power” (Amineh & Yang, 2017, p. 13). In such states-market complexes these forces are integrated into state power where they enjoy vast control over the executive, legislative, and judicial branches of government. Key-economic sectors are usually nationalised in these societies so as to facilitate development from above (meaning the state, not market forces, determines the orientation of society) (Amineh & Yang, 2017, pp. 11-13).

China is best characterised as a centralised state-market complex, where the Chinese Communist Party (CCP) exercises control over political and social relations within China (Amineh & Yang, 2017). Theoretically, the National People’s Congress is the highest power structure in the country. In reality decision making power is vested in the Politburo, the Politburo Standing Committee, and the Party Secretariat. This structure results in a top down form of government with strong control over its economy (Amineh & Yang, 2017, pp. 20-22).

Resource Scarcity

As countries industrialise they become increasingly dependent on energy to maintain economic growth and domestic stability. As the population, GDP, and per capita income rises, so does a country's energy consumption. This phenomenon leads to resource scarcity: the lack of sufficient resource to meet domestic energy demand. Resource scarcity leads to social and economic pressure states and capital markets to expand their economic activity across borders into resource rich regions (Amineh & Yang, 2018, p. 22). Amineh & Yang (2017) identify three forms of resource scarcity, which can threaten energy supply security: 1) demand induced scarcity, 2) supply-induced scarcity, and 3) structurally-induced scarcity. Demand-induced scarcity has three main causes: 1) population growth in energy consuming countries, 2) rising per capita income in both industrialised and industrialising countries, and 3) changes in technology/the price of substitutes (Amineh & Yang, 2017). Supply-induced scarcity entails the exhaustion of available energy reserve. The factors contributing to this form of scarcity are: 1) the number of available reserves, 2) the size of reserves relative to extraction technology, and 3) the cost of extraction relative to price of the refined product. Supply-induced scarcity leads to competition between states that are dependent on fossil fuels imports to control the remaining sources of fossil fuels. The last form of resource scarcity is structurally-induced scarcity, which is inflicted by actions of entities (state or non-state) that control access to fossil fuels (Amineh & Yang, 2018). One example of this would be the blocking of a relevant choke point by a terrorist group. The concepts of energy supply security and resource scarcity are relevant to this study because they help explain the risks to China's energy security of supply. China is experiencing an exponential increase in its oil demand while its domestic reserves are aging and reaching their peak. This situation prompts the country to employ tools such as its NOCs to compete for secure access to fossil fuels overseas.

Energy security of supply

Another concept in Geopolitical Economy that is crucial to this thesis is energy supply security. Currently, fossil fuels are the dominant source of energy and are considered strategic commodities given their finite nature. "States are dependent on fossil fuels in order to preserve their wealth and power structures" (Amineh & Guang, 2018, p. 15). The nature of fossil fuels and their importance to economic growth

makes competition for these resources more likely than cooperation. There are two options when it comes to the energy security of import dependent states: 1) reduction in energy dependency, and/or 2) increase the security of energy imports (Amineh & Yang, 2017, p. 11). This study will concern itself with the second option, focussing on how China secures energy imports from Brazil through the transnationalization of its NOCs.

In order for actors in state-society complexes to gain access to overseas resources and markets they have to engage in cross-border activities: “connecting the domestic society and its institutions to the external world” (Amineh & Guang, 2018, p. 15). These activities are referred to as power projection. However, when developing states project power abroad they encounter a global economic order, created by a hegemonic power or coalition, which might not suit the needs of developing countries. Hence, contender states are “major states that challenge hegemonic, liberal states” (Amineh & Yang, 2018, p. 11). Contender states challenge the liberal order in several ways: 1) by arranging global level transactions under domestic rules that are opposed to the liberal order, and 2) by trying to align global-level arrangements to domestic wealth-power structures (Amineh & Yang, 2018, p. 12).

In regards to energy security, power projection implies activities such as establishing routes to access and protect stocks of minerals (Amineh & Guang, 2018, p. 27). The dimension of control aimed by power projectors is mediated by: 1) timing of power projection, 2) the actors in the target space (in this case Brazil), and 3) the conditions of the society in the targeted space (Amineh & Guang, 2018, p. 15). This makes it important to consider the conditions in Brazil as well, in order to understand China’s power projection in the country. In the case of China, its NOC’s function as policy tools through which the state is able to enact energy policies, and project power overseas (Amineh & Guang, 2018, p. 38). However, state control over NOCs is diminished when these entities venture into overseas activities as the state loses certain degree of control over the firms (Amineh & Guang, 2018, p. 12). The investment behaviour of NOCs are brokered by a complex interaction between officials working in these NOCs and are motivated by profits, and the government officials in institutions associated with the NOCs, who are motivated by with autonomously determined interests (Amineh & Yang, 2018, p. 33).

1.4 Hypotheses

The literature review and the concepts discussed in the theoretical framework relate to the China's energy supply security. It has been argued in the academic literature that China is seeking overseas energy sources through the transnationalization of its NOCs. This occurrence is due to its rising demand for energy prompted by its economic growth, and its shrinking oil production. Nonetheless, as NOCs engage in overseas activities the states control over them decreases.

H1: The activities of CNPC in Brazil did not increase China's energy supply security.

Additionally, the literature has discussed several challenges to the Sino-Brazilian relationship that originate domestically (in Brazil) and challenges that are beyond the confines of the two countries. Chiefly, China's competition with the US is predicted to form a formidable challenge to Chinese involvement in Latin America. Therefore, the second hypothesis considers the geopolitical economic implications of China's involvement in Latin America to the Sino-Brazil energy relationship.

H2: China's geopolitical economy in Latin America does not threaten the energy relationship between China and Brazil.

1.5 Data and Method

This study employs a quantitative case study method. The case study is CNPC's activities in the Brazilian energy sector. First, the thesis will analyse the energy situation of China. To this end the following data sources will be analysed: Energy Information Administration's (EIA) International Energy Statistics, and British Petroleum's (BP) Statistical Review of World Energy 2018. These databases provide statistical information on the production, consumption (total and sector specific), and reserves of energy in China. This analysis captures both the demand and supply side of the resource scarcity concept outlined in the theoretical framework. Furthermore, this part of the thesis seeks to understand China's policy reaction to its energy situation. Therefore, the following sources will be analysed: think tanks such as The Oxford Institute for Energy Studies, and peer review journals including Energy

Policy, China Quarterly and Energy, and Journal of Chinese Political Science. These sources will also provide data for analysing the structure of the Chinese state and the relationship between the NOCs and the state.

Secondly, the thesis investigates the Brazilian energy sector. This will be accomplished by analysing: Brazil's power structure, policies governing the energy sector, as well as the relationship between the state and its NOCs. Statistical data regarding Brazil's energy sector will be derived from Oil, Natural Gas and Biofuels Statistical Yearbook 2018 published by the National Agency for Petroleum, Natural Gas, and Biofuels (ANP). This database contains data about Brazil's energy (including oil) exports, imports, and balance from 2008 to 2017. Reports from the ANP such as The Oil and Gas Industry in Brazil will be employed as well. The study will also consider peer-reviewed articles from sources such as Brazilian Journal of Political Economy to analyse the relationship between the state and its NOCs and the political power structure in the country. Furthermore, policy reports from think tanks will be employed to understand the institutional framework and policies in Brazil's energy sector.

Thirdly, the study scrutinises the Sino-Brazilian energy relationship, and specifically CNPC activities in the Brazilian energy sector. This part will analyse the Chinese trade, investment, and finance in Brazil. Therefore, the section will start with an outline of China's interests in Latin America as well as the energy relationship between China and Brazil (investments, energy projects, and joint ventures between Chinese and Brazilian NOCs). The data for Chinese investments in Brazil will be derived from China Global Index database from The American Enterprise and Heritage Foundation. Data as to Chinese (energy) finance in Brazil is provided by China's Global Energy Finance database. This database keeps track of energy finance from 2000 to 2018 provided by China's policy banks: Chinese Development Bank (CDB) and Export-Import Bank of China (Eximbank). China-Brazil trade data will be supplied by the following sources: BP Statistical Review of World Energy (oil trade between China and Brazil) and World Integrated Trade Solutions (general trade statistics for Brazil and China), which is a database from the World Bank. Additionally the thesis will consider the annual reports by CNPC where they discuss their operations in Brazil.

Finally, China's geopolitical economic engagement in Latin America and the consequent implications to the Sino-Brazilian energy relations will be examined. This analysis will employ peer-reviewed literature to comprehend the challenges facing the relationship between the two countries and CNPC's operations in Brazil.

1.6 Organization of the research

The thesis will consist of six chapters, including introductory (chapter 1) and concluding chapters (chapter 6). The second chapter will outline China's energy security of supply by investigating the country's energy situation and its corresponding policy response. The relationship between the state and its NOCs will be analysed as well. Chapter 3 will survey Brazil's energy sector through thorough analysis of the country's energy situation, energy policy, and the relationship between the state and its NOCs. Chapter 4 looks at Chinese trade, investment, and finance into Brazil, and specifically its energy sector. This chapter will also outline the specific activities of CNPC in Brazil between 2013 and 2018 with special attention to the firm's activities in the Libra and Peroba oil fields. Chapter 5 probes the domestic and geopolitical economic risks and challenges facing the energy relationship between China and Brazil.

Chapter 2 China's Energy Security and National Oil Companies

2.1 Introduction

This chapter is centred on China's energy supply security, with specific attention to the country's energy situation, energy policy, the relationship between the state and the energy sector, and the role of National Oil Companies in its energy sector and strategies. The chapter seeks to answer the question: *What is China's energy situation, the resulting energy security policies and strategies, and what role does National Oil Companies play in these strategies?*

This chapter sets the stage for the remainder of the study by establishing China's need to seek overseas energy sources and the strategies through which it attempts to secure oil resources. These insights will aid in understanding China and CNPC's behaviour in Brazil's energy sector.

The chapter will consist of three parts, each answering a part of the question posed above; section 2.2 will outline China's energy situation and the nature of the country's energy security of supply, section 2.3 will discuss the resulting policies and strategies, finally section 2.4 will examine the role of the country's NOCs in these strategies.

2.2 China's Energy Situation and Energy Supply Security

This section seeks to depict China's energy situation, which in this study refers to the trends in energy reserves, production, and consumption. These trends show the nature of China's energy security of supply, which will be discussed thereafter.

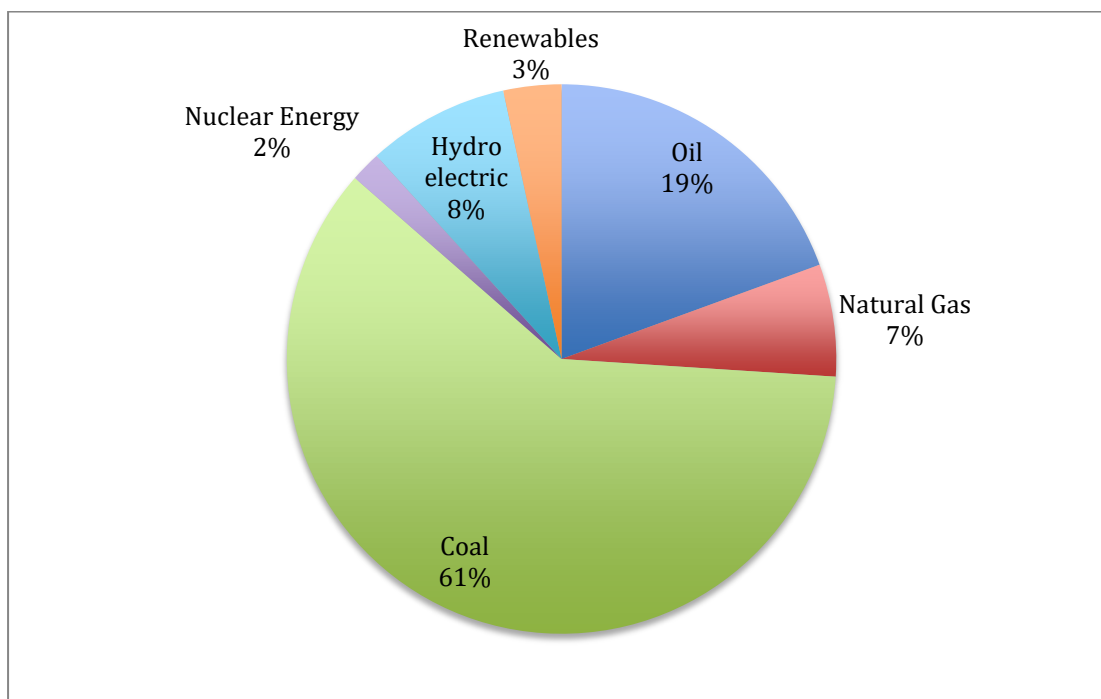
Since the formal inception of the People's Republic of China (PRC) in 1949, the country has undergone significant economic and social developments (Zhang, Sovacool, Ren, & Ely, 2017, p. 634), which led to corresponding modifications to the country's energy strategy (Zhao, 2018, p. 248). China has enjoyed an 8,08% average growth rate in its GDP between 1961 and 2019. This means that in this period China has grown 4,6% more than the world average of 3,4%. At the same time China's population grew at an average rate of 1,28% annually, which is slightly below the

world average of 1,56% (World Bank, 2019). During this time the country's energy production and consumption have expanded rapidly. China was a net exporter of energy and energy self-sufficient until the 1990s. Nowadays, aside from boasting one of the world's largest populous and economy, it is the largest energy consumer in the world, the principal emitter of greenhouse gases, it's the fifth largest producer of oil and the seventh largest producer of natural gas, and it is the world's largest producer of coal (Zhang, Sovacool, Ren, & Ely, 2017, p. 634; EIA, 2015, p. 1).

Since 2014, the country's economy has entered a stage referred to as "new normal"; where China's excess capacity led to significant decreases in industrial energy consumption growth. This reduction in energy consumption growth was more than the decrease in GDP growth. According to Wei (2016) China's economy and energy development path is similar to that of other developed countries like the United States and Japan. He contends that China's electric power consumption growth decreased significantly in the early 2010s and is highly likely to continue this trend in the future, just like US electric power consumption growth dropped in the 1960s. According to Wei (2016) the reasons for the decline in China's consumption growth are enhancement of energy efficiency, and the adjustment of the economic structure and the sharp slowdown in industrial energy usage (Wei, 2016, pp. 7-9).

Since the foundation of the PRC coal has played a dominant role in the country's energy consumption (Dong, Sun, Li, & Jiang, 2017, pp. 214-215; Wei, 2016, pp. 3-4). The dominance of coal led to many issues such as environmental pollution and CO₂ emissions (Wei, 2016, p. 6). China's energy reserves are abundant when it comes to coal. In 2016, the country held 244.010 million tonnes of proven coal reserves, amounting to approximately 21% of world coal reserves (British Petroleum, 2018). However, despite its abundant coal reserves the country became a net coal importer in 2009 (Zhang, Sovacool, Ren, & Ely, 2017, p. 639), while its coal consumption increased from 697 Mtoe in 2000 to 1920 Mtoe in 2015. Despite the increase in coal consumption the government is looking to reduce the importance of coal the country's energy mix.

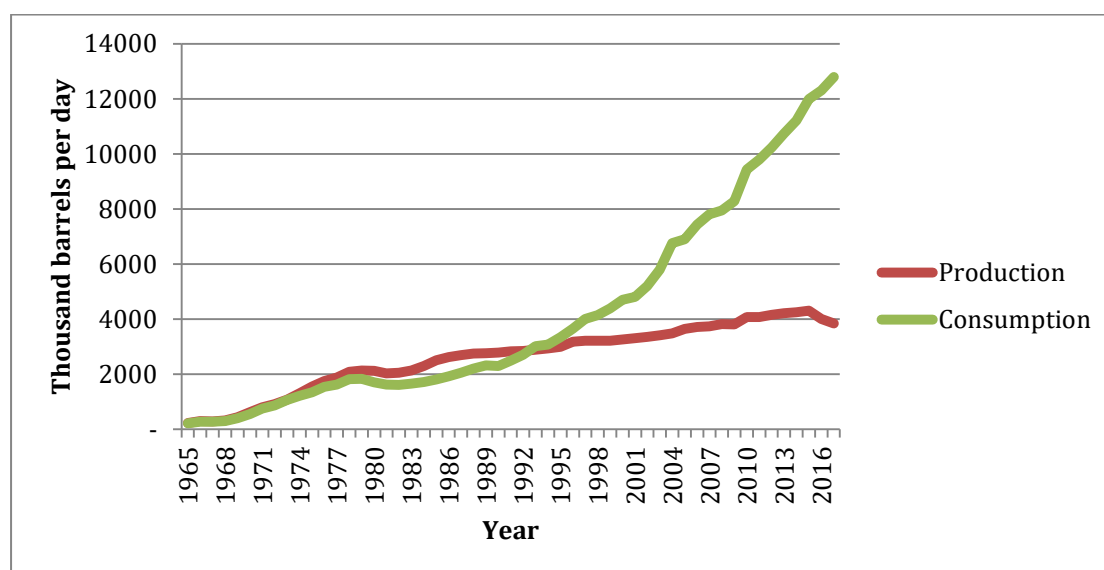
Figure 2.1 - China's energy mix 2017



Source: BP Statistical Review of World Energy 2018

As figure 2.1 depicts, China remains heavily reliant on fossil fuels (mainly coal) for its energy consumption. Oil (19%) is less important than coal (61%) in the country's energy usage. Nevertheless, the demand for oil is the fastest growing component of China's energy demand (Taylor, 2014, p. 5; Odgaard & Delman, 2014, p. 107). *BP Energy Outlook* predicts China's demand for coal will shrink to 36% of demand by 2040, while oil demand is projected to increase to 690 million barrels per day in 2030 (with production remaining at 200 million barrels per day) (CNPC ETRI, 2018). The main challenge related to China's oil consumption is that the country is experiencing significant increases in its demand for oil accompanied by decreasing domestic production (as illustrated in figure 2.2) (Dong, Sun, Li, & Jiang, 2017, pp. 215-216), and the lack of substitute resources for oil (Leung, Cherp, Jewell, & Wei, 2014, p. 318). These phenomena conspire to widen the gap between the country's oil consumption and oil production leading to oil import dependency (Taylor, 2014, p. 6). The country's dependency on oil imports is expected to rise from 63% in 2016 to 72% in 2040 (British Petroleum, 2018).

Figure 2.2 - China's oil production and consumption



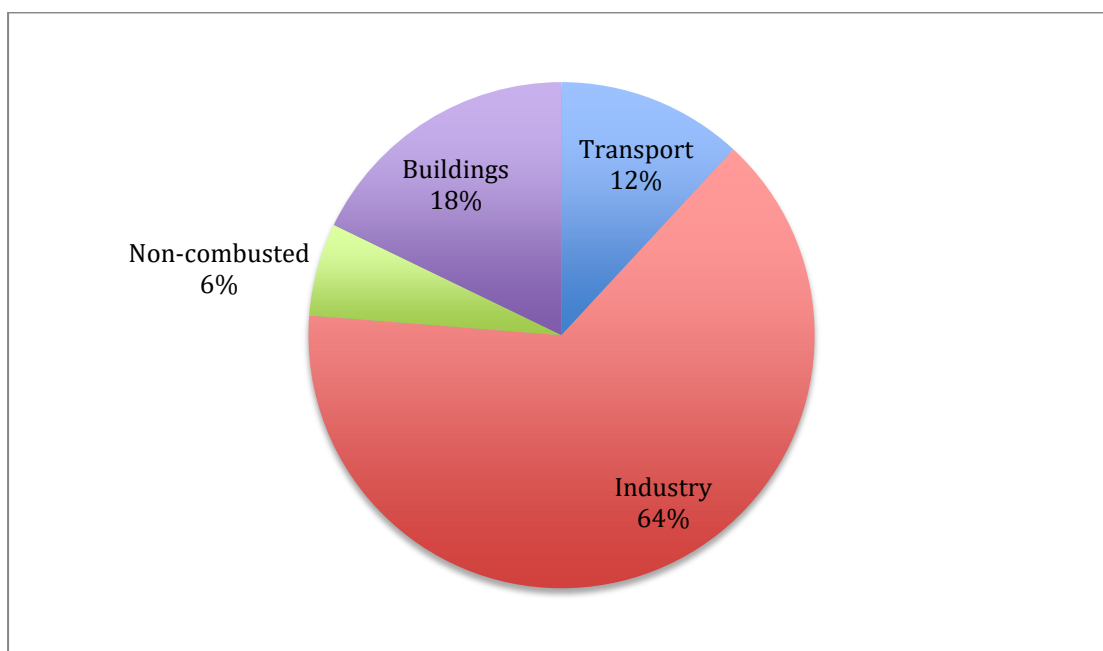
Source: BP Statistical Review of World Energy 2018

However, its reserves of oil and gas are less impressive: in 2016, China possessed proven oil reserves of 257.000 million barrels of oil, accounting for 1.5% of world oil reserves. In the same year the country's gas reserves amounted to 5,4 trillion cubic metres (2.9% of the world's gas reserves) (British Petroleum, 2018). These figures suggest that the country is holding a relatively insignificant amount of oil and gas reserves. They partly explain China's low consumption of natural gas; 7% (British Petroleum, 2018) as oppose to the world average of 24%. Domestically, gas is three times more expensive than coal, while gas power is twice more expensive than coal. Therefore it is difficult for China to follow the rest of the world in consuming power generated by natural gas (Wei, 2016, p. 5).

The country's oil production is going through a prolonged period of stagnation as most of the country's oil fields have reached or passed their peak (Yao & Chang, 2014; Zhang, Sovacool, Ren, & Ely, 2017, p. 641). At the same time Chinese demand for oil is rising sharply as the product of its economic development and the changing industrial profile (Taylor, 2014, p. 6). In 1997, the central government enacted economic policies (ranging from state financing to tax incentives) to support mass industrialisation out of fear for economic depression caused by the Asian Financial Crisis. Heavy industry grew as an effect of the country's urbanisation efforts, which created demand for steel, cement, and other industrial materials (Taylor, 2014, pp. 6-

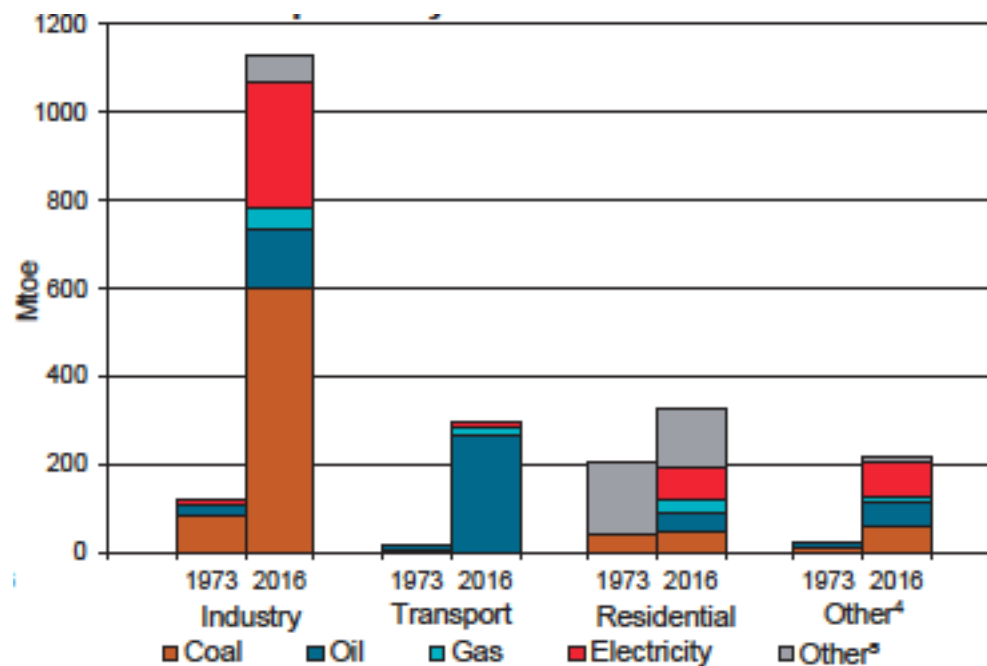
8). As shown in figure 2.3, industrial activities accounts for 64% of China's energy consumption. At the same time oil is gaining prominence in the industrial sector (as shown in figure 2.4). In 2005 China's industry accounted for 35% of world steel production, 50% of the world's cement and glass production, and approximately 33% of global aluminium production (Taylor, 2014, p. 8). Further upward pressure is added to the country's demand for oil when the country's ballooning consumer class and rising demand for civil aviation and motor vehicles is taken into account (Collins, 2016, p. 38). The transport sector is currently the principle driver of China's growth in oil demand through rising demand for gasoline, diesel, and jet-fuel (as depicted in figure 2.4) (Dong, Sun, Li, & Jiang, 2017, p. 217). During the period between 2000 and 2009 the transportation sector accounted for an average of 9% per year increase in oil demand, while the industry sector only contributed an average 5% growth per year (Leung, Cherp, Jewell, & Wei, 2014, p. 318).

Figure 2.3 - China's energy demand by sector



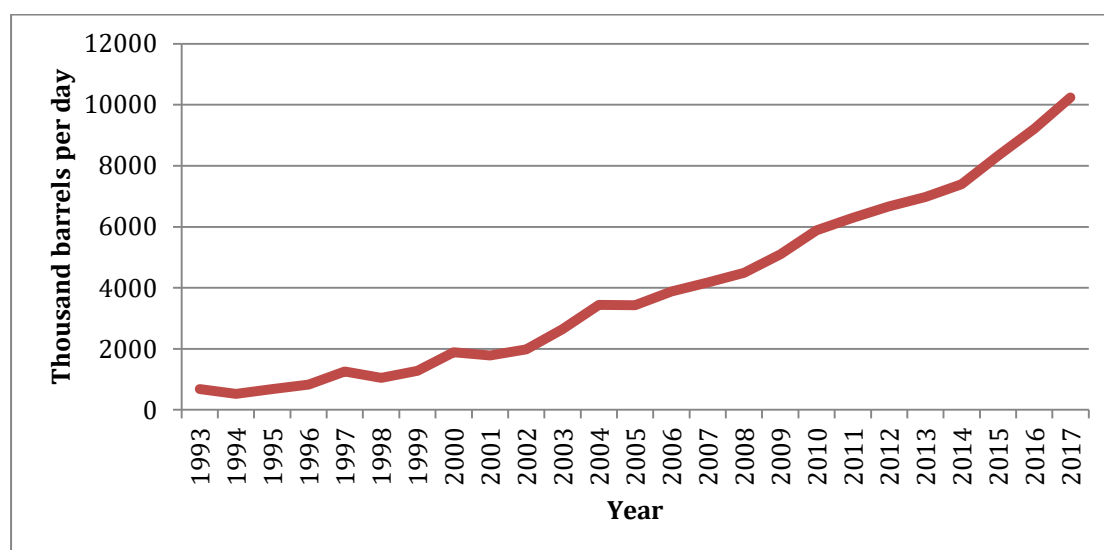
Source: BP Statistical Review of World Energy 2018

Figure 2.4 - Sectorial consumption by source (1973 and 2016)



Source: IEA World Energy Balance 2018

Collins (2016) contends that this phenomenon means that China's demand for crude oil is decoupling from the industrial economy and becoming increasingly consumer-driven. Whereas traditionally oil demand was dictated by the country's Five Year Plans (FYP), the rapidly expanding demand for cars and civil aviation render a significant part of the country's crude oil demand hostage to consumer sentiments, which would raise the short-term volatility of China's oil demand (Collins, 2016). This raise in volatility represents a challenge to China's state-led approach to energy security because in this scenario the government will lose a certain degree of control in managing the country's oil demand. Figure 2.5 depicts the dramatic rise in China's oil imports since 1993 when the country moved away from energy self-sufficiency.

Figure 2.5 - China's oil imports (1993-2017)

Source: BP Statistical Review of World Energy 2018

In sum, China's industrialisation process, characterised by an industry intensive economy, growth in GDP and population, led to sharp increases in energy demand. Oil has been the most important aspect in this rising energy demand. However, China holds a trivial share of the world's reserves of oil and gas, while its oil industry is experiencing stagnation in oil production.

2.2.1 China's energy security of supply

Since the 1990s Beijing faces two prominent energy security challenges: 1) oil import dependency, and 2) the volatility of world oil prices. The first challenge emerged in 1993 after China shifted from net oil exporter to net oil importer. Furthermore, it confronted Chinese policymakers with geopolitical considerations such as instability in oil-producing countries (Zhang, Sovacool, Ren, & Ely, 2017, pp. 634-635). The second challenge became obvious in the period between 2003 and 2008 where oil prices rose 500% (from US\$30 to US\$147) in only five years. In this period China was developing its heavy industries, which are fossil fuel intensive (Taylor, 2014, pp. 8-9). According to Taylor (2014) this event propelled oil security to the top of Beijing's energy policy agenda.

This dependency accompanied by volatility in world oil prices, strategic chokepoints in China's oil supply, political instability in oil-exporting countries, and international

competition for oil render the commodity the paramount challenge to China's energy security of supply (Taylor, 2014; Odgaard & Delman, 2014; Zhang, Sovacool, Ren, & Ely, 2017; Leung, Cherp, Jewell, & Wei, 2014, p. 323). Therefore, Beijing tends to conceive its energy security concerns in terms of the dilemma of growing oil import dependency and shrinking production, and the country's energy policies are often centred on this particular issue (EIA, 2015; Wu, 2014; Taylor, 2014, p. 144).

2.3 China's Energy Strategy and Policies

As illustrated in the previous sub-section (2.2.1), China's energy security is centred on the country's dependence on oil imports. Additionally, the deliverance of economic growth is paramount to the legitimacy of the CCP and a secure and stable energy supply is fundamental to achieving this objective. This section will explore the strategies and policies of the Chinese state to securing energy supply, and oil supply in particular. It brings the strategies and policies into focus by examining the framework of institutions and policies that govern the energy sector in China.

2.3.1 China's energy policies

One of China's priorities in terms of energy policy is to control total energy consumption while decreasing coal consumption (Zhao, 2018, p. 253). In order to address these challenges the Chinese authorities are taking the economic nationalist (or state-centred) approach to their energy supply security as oppose to the market approach. As Kong (2005) elegantly stated: "Distrust of the market, and suspicious of the major energy players in the international market, the Chinese leadership relies on the state-centred approach, or economic nationalism, rather than a market approach to its energy security." (Kong 2005, p 56) Hence, the Chinese approach is characterised by state-led production and distribution both at home and abroad, and government-to-government contracts to secure foreign oil assets (Taylor, 2014, p. 9).

In the 1990s, increasing domestic outputs so as to avoid imports was the main focus of Chinese energy security policies. To achieve this the country aimed to stabilise its eastern oil fields and develop its western and offshore oil fields. China also aimed at conserving oil through the Energy Conservation Law passed in 1997, by modernising its larger refineries, and by closing down hundreds of inefficient smaller refineries.

Additionally, the government mandated that the country's power generation be switched from oil to other sources. But all these measures were sterile in avoiding the increasing dependency on oil imports (Leung, Cherp, Jewell, & Wei, 2014, p. 322). According to Leung, Cherp, Jewell & Wei (2014) these failures brought about a change in policy doctrine in the early 2000s: from self-sufficiency to 'going-out'.

China's current energy policy is largely based on The Tenth and Eleventh Five Year Plans (FYP) issued in 2000 and 2006 respectively (Taylor, 2014, p. 144). During this time Beijing's energy strategies have emphasised four specific characteristics: 1) the development of various sources of oil imports, 2) the accumulation of oil reserves to reduce the risk of interruption, 3) the promotion and strengthening of regional and bilateral energy cooperation, and 4) participation in the Energy Charter Treaty (Xu Y.-C. , 2006, pp. 273-274). The first aspect is to be achieved by diversifying Beijing's imports away from the Middle East, and by increasing oil imports from Russia, Central Asia, Africa, and Latin America (Yao & Chang, 2014, p. 145).

The Tenth FYP advocated specifically for diversification of energy supply, establishment of Strategic Petroleum Reserves, and the 'going out' policy. The Eleventh FYP emphasised energy efficiency and conservation, showing Beijing's desire to tackle the demand side of its energy security issues. Taylor (2014) classifies Beijing's current strategies addressing its energy security of supply as follows: 1) increase domestic oil production, 2) procurement of equity oil abroad, 3) geographical diversification of foreign oil supply, and 4) combining energy security objectives with foreign policy and diplomatic efforts (Taylor, 2014, pp. 144-145).

China's initiatives to diversify its oil supplies have had success within a short period of time after the formulation of this policy. Despite the growth in Beijing's oil import volumes, rather than increasing China's dependency on Middle Eastern imports, these import volumes remained steady, while imports from Africa, South America and Central Asia have increased. In the case of South America, although the region is not a chief supplier to China, it is still strategically relevant to Chinese energy security as it contributes to: transport security, equity production, and in increasing global supply (Koch-Weser, 2015, p. 14).

Taylor (2014) highlights how China is pursuing a “multi-pronged and integrated approach to securing sources of oil supply abroad, combining energy security goals with foreign policy initiatives and oil diplomacy” (Taylor, 2014, p. 146). These endeavours are part of China’s ‘going out’ (*zou chuqu*) policy introduced in 2001 (under the Tenth FYP) and spearheaded by Chinese NOCs. The ‘going out’ strategy entails that the Chinese state encourages its NOCs to invest in oil projects overseas: preferably in equity oil and long-term supply contracts (Vermeer, 2015, p. 8). In this case, although most of the oil originating from equity oil is sold on the international market, these can be redirected to China in the event of major supply disruptions or international conflict (Taylor, 2014, p. 166; Meidan, 2016a, p. 2). Between 2003 and 2009 the overseas investments of Chinese NOCs increased 1.400%, with most of these being concentrated in Latin America, Africa, and Asia.

Since the introduction of the ‘going out’ policy it has become a key priority to the state that the overseas activities and investments of Chinese NOCs remain in the service of the country’s domestic interests (Taylor, 2014, p. 168). However the motivations of the NOCs in supporting the ‘going out’ policy is based on commercial interests, specifically becoming a multinational oil company, enhancing their expertise, exporting Chinese labour and technology, and access to greater profits. Given these conditions there is no guarantee that Chinese NOCs will obediently follow state orders. Especially considering that since their corporatisation they have become responsible to shareholders⁹ (Chen, 2008, pp. 90-92).

In the context of the ‘going out’ policy, the most important form of state assistance to the NOCs are the inexpensive financing for energy and natural resources. Two state controlled policy banks grant these loans: China Development Bank (CDB) and Export Import Bank of China (Eximbank). The banks are responsible for advancing China’s national interest; hence they support the ‘going out’ policy (Taylor, 2014, p. 168). Apart from aiding NOC in oil equity purchases, the policy banks engage in arrangements called ‘loan-for-oil’ deals with the NOCs and government of oil exporting countries. This deal entails that the recipient country is to pay back the loan

⁹ The process of corporatization of Chinese NOCs is explained in section 2.4

with oil. The revenues from oil deliveries of a Chinese NOC secure these oil-backed loans (Meidan, 2016a, p. 10).

Another important aspect to China's energy strategy is its oil diplomacy. Chinese oil diplomacy supports the 'going out' policy through diplomatic efforts aimed at oil rich countries in the developing world. These efforts obey some principles that adhere to China's foreign policy doctrines of non-interference and non-intervention in the domestic affairs of foreign states: 1) 'no political strings attached' policy of engagement, and 2) financial incentives for cooperation. The importance of China's oil diplomacy led some analysts to dub it the corner stone of Chinese foreign policy (Taylor, 2014, p. 169).

The following sub-section (2.3.2) will illustrate how China's energy institutions work in the context of the 'going out' and oil diplomacy strategies.

2.3.2 State institutions and China's energy sector

As explained in Chapter 1, China is a centralised state market complex, meaning that the society's orientation is dictated from above. Since the energy sector is not an exception to this rule, this section will discuss the power structure of the Chinese state in regards to the country's energy sectors (with special attention to the oil sector) by outlining the institutions, and mechanisms involved in policymaking. This sub-section will illustrate the fragmented nature of China's energy governance.

On the one hand, authors like Green and Kryman (2014) claim that the amount of ministries and agencies involved in policymaking in China, in combination with the lack of capacity of these agencies, amounts to a portfolio approach where policymakers attempt to appease as many stakeholders as possible (Green & Kryman, 2014, p. 137). On the other hand, China's energy governance structure can be perceived as decentralised based on the fact that provinces in China are able to experiment with different policies before electing the best fitting policies. In this view the provinces act like 'laboratories of democracy' (Zhang, Sovacool, Ren, & Ely, 2017, p. 642). However, an examination of the policy process and the responsibilities of the varying

energy institutions reveal a fragmented yet collaborative policymaking process in China.

Taylor (2014) notes: “When looking at China’s oil sector it is important to recognise that all the key actors involved in China’s oil policymaking, including the NOCs, are located within the party-state sphere” (Taylor, 2012, p. 38). Therefore, societal actors lack direct influence on this process, which is not to say that societal pressures and expectations do not affect policymaking (Taylor, 2012, p. 38). The policymaking process in China is best characterised by collaboration and consensus among the different institutions responsible for different aspects of energy policy (Taylor, 2012, p. 75; Meidan, Andrews-Speed, & Xin, 2009, p. 595; Zhang, Sovacool, Ren, & Ely, 2017, p. 641). The interactions between the different actors (which are often driven by their own political or economic interests) in this process determine the energy policies for the country (Meidan, Andrews-Speed, & Xin, 2009, p. 595).

The main priorities are outlined by China’s top leadership and form the framework of energy policy for the country. This framework is related to the country’s overall macroeconomic objectives (Meidan, Andrews-Speed, & Xin, 2009, p. 595). Within the context of this framework government institutions will add their input according to their political clout and their areas of responsibility in order to form energy policies. These institutions are allowed to alter policy decisions at the drafting phase when policy initiatives are circulated amongst the different stakeholders for approval and amendments. Additionally the government institutions have the capacity to intervene at the implementation phase to stall or stimulate projects in line with their interests (Meidan, Andrews-Speed, & Xin, 2009, pp. 596-597). The following are the actors that participate in this policymaking process.

The chief policymaking, planning, and regulatory institution in China’s energy sector is the National Development and Reform Commission (NDRC) (EIA, 2015). The NDRC is in charge of the design and implementation of policies in the oil and gas sectors. It is also tasked with the approval of certain investments projects (Sun & Zhang, 2018). The NDRC is a department of the State Council (the chief administrative authority in China). The National Energy Administration (NEA), linked with the NDRC, performs regulatory undertakings and is responsible for

implementing the energy policies of the central government. Its responsibilities include approving new energy projects in China and setting domestic wholesale energy prices, amongst others. The national energy commission is tasked with: 1) the consolidation of energy policies among the numerous agencies under the State Council, and 2) analysing major energy issues (EIA, 2015).

Other notable institutions in China's energy policy framework include: the Ministry of Water Resources (MWR), in charge of hydro reserve management and other areas pertinent to hydroelectric power; the Ministry of Science and Technology (MOST), involved in research and development; the Ministry of Railways, in charge of transporting energy commodities within China; the Ministry of Construction, involved in issues related to urban planning such as energy efficiency; the State Commission of Science, technology, and Industry for National Defence, involved in developing nuclear power; and the State Environmental Protection Administration (SEPA), responsible for environmental regulation (Meidan, Andrews-Speed, & Xin, 2009, pp. 596-597).

According to Meidan, Andrews-Speed & Xin (2009) SOEs (including NOCs) are also part of this system of policymaking. However, they are mostly involved at the agenda-setting phase, which precedes actual policymaking. Finally, local governments are also important players in this process, possessing the power to impede or facilitate the implementation of national policy measures within their area of jurisdiction (Meidan, Andrews-Speed, & Xin, 2009, p. 598).

2.4 China's National Oil Companies

Chinese NOCs are pivotal to the country's energy supply security since they play a crucial role in China's 'going out' policy (as explained in the previous section of this chapter). Hence, this section will discuss the origins of China's NOCs, and the current relationship between the state and the NOCs. The section will close with a brief discussion of CNPC to set the stage for the following chapters.

China has three large NOCs operating in its energy sector: China National Petroleum Corporation (CNPC), China Petroleum & Chemical Corporation (Sinopec), and China

National Offshore Oil Corporation (CNOOC). Each of these companies enjoys functional specialisation born out of their Ministerial origins: CNOOC is specialised in offshore oil development, Sinopec specialises in oil refining, and CNPC focuses on onshore upstream exploration and production (Taylor, 2014, p. 77; Jiang & Sinton, 2011, p. 9).

NOCs emerged from the former Ministries of Petroleum and Chemical Industry as dictated by the economic reforms of the 1980s (Leung, Cherp, Jewell, & Wei, 2014; Jiang & Sinton, 2011, p. 9). The main objectives of these reforms were: 1) to separate the government from its enterprises, 2) create institutions in charge of governing the market economy, and 3) to transform China's SOEs into modern corporations. To this end the central government created three NOCs that were to replace the industry's line ministries (Taylor, 2012, p. 76; Liao, 2015, p. 47). Established in 1982, CNOOC was tasked with offshore exploration and production, cooperation with International Oil Companies (IOC) on overseas projects. Sinopec, established in 1983, usurped the petrochemical assets of the Ministry of Petroleum Industries (MPI), the chemical enterprises from the Ministry of Chemical Industry, and synthetic fibre manufacturing from the Ministry of textile Industry. Finally, in 1988 the CNPC was established. This NOC is the product of the restructuring of the remaining functions of the MPI: onshore exploration and production, administration, and governmental responsibilities. Sinopec and CNPC operate under the direct supervision of the state council. However, CNOOC does not enjoy the same supervision given that it was founded to cooperate with foreign oil companies, and was therefore not bestowed the same administrative and social responsibilities as its counterparts (Taylor, 2012, p. 76). Despite the formal divorce between government and NOCs, the former maintains control over the latter as will be illustrated in section 2.4.1.

Taylor (2012) characterises China's domestic oil market as oligopolistic in nature, where three large firms participate in limited and managed competition with each other. This system was established in 1998 through the oil industry reform. The goal of this reform was to break up monopolies and institute limited competition in the oil market so as to improve efficiency and prepare the NOCs for international competition (Meidan, 2016b, pp. 25-26). This structure endows China's NOCs with two characteristic features: 1) to improve performance they rely on top-down policies

and reform agendas instead of market discipline, and 2) their vast profits are the result of monopolisation advantages instead of market competition strategies (Taylor, 2012, pp. 84-85).

The 1998 reforms were followed up by reforms that targeted the competitiveness and financial profitability of the NOCs. These reforms involved splitting the core assets from the NOCs, and restructuring these assets in subsidiary companies (joint stock limited companies for initial public offering financing): CNPC established PetroChina Company Limited, Sinopec founded Sinopec Limited, and CNOOC created CNOOC Limited. The non-core assets such as human resource functions and non-performing financial claims were left with the parent companies. Controversial overseas projects such as CNPC's holdings in Sudan were also left to the holding companies. The performing core assets of the companies were transferred to their respective subsidiary companies. Subsequently, between 2000 and 2001 these subsidiaries were listed on stock exchanges in New York, London, and Hong Kong (Taylor, 2014, p. 78). The listing of these subsidiaries enabled NOCs to raise funds through international capital markets, which they could subsequently invest in further exploration, production, and refining projects. Furthermore, the listings provide managers with clear incentives to focus on profitability. It was this reform of Chinese NOCs that set the stage for China's 'going out' (*zou chuqu*) policy explained in section 2.3.1 (Taylor, 2014, p. 79). Table 2.1 depicts the major shareholder in the subsidiary firms and the percentage of the total shares owned by the major shareholder. As the table depicts, the State Asset Supervision and Administration Commission¹⁰ (SASAC), hence the Chinese state, is the major shareholder in all the subsidiaries. Individual and institutional investors hold the rest of the shares (Marketscreener, 2019).

¹⁰ This state institution will be discussed in section 2.4.1

Table 2.1 - Major share ownership of Sinopec, PetroChina, and CNOOC in 2019

Company	Major shareholder	% of shares owned
Sinopec Ltd	SASAC	90.5%
PetroChina Company Ltd	SASAC	93.3%
CNOOC Ltd	SASAC	64.4%

Source: MarketScreener, 2019

*Note: * State Assets Supervision and Administration Commission (SASAC) is the institution in charge of ownership and regulations of China's state owned firms*

There are other state-owned oil firms that have entered and grown within China's oil sector in the past decade, such as Sinochem Corporation, CITIC Group, and Yanchang Petroleum. However, these firms have remained relatively small compared to the 'big three' NOCs. Additionally there are several independent and private firms operating in China's oil sector. Except the size of these firms have remained limited due to state policies that favour the national champions (EIA, 2015).

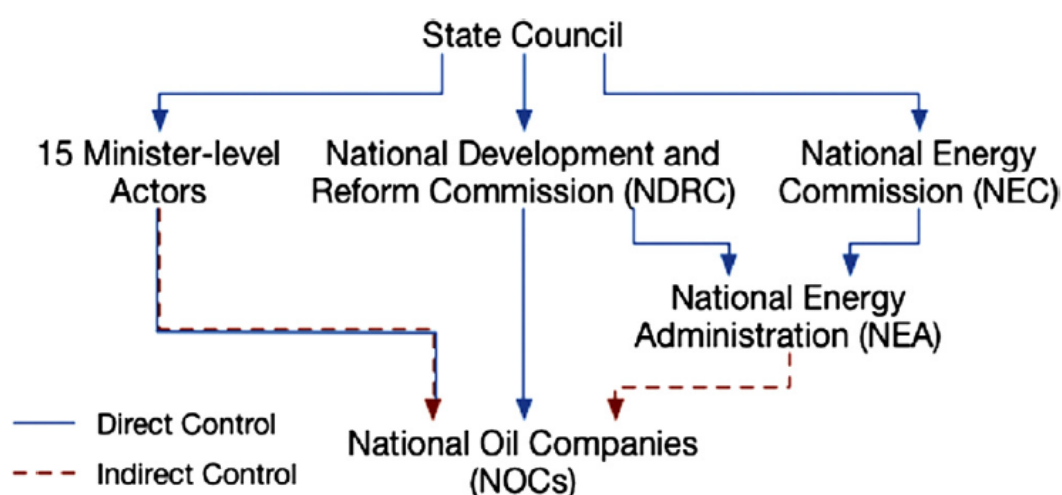
2.4.1 Relationship between state and market in China's oil industry

The rise in international activities of China's NOCs have attracted much academic attention to the relationship between the Chinese state and its NOCs. Authors such as Downs (2008) and Houser (2008) have argued that NOCs have grown increasingly independent from the Chinese state and hence make up a formidable interest group within China's political system. While Houser grounds his argument in the independence of NOC whom he claims operate according to commercial as oppose to political considerations (Houser, 2008, p. 149). Downs (2008) bases her argument on the perceived weakening of the party-state's influence on NOCs brought about by the following factors: internationalisation of senior management, the establishment of publicly listed subsidiaries, and the decentralised and fragmented nature of state energy institutions and policy-making (Downs E. S., 2008, pp. 125-129). These arguments are guided by the Fragmented Authoritarianism model, which was developed to explain the operation of the policy process in China's economic sectors. However, this model neglects: 1) China's extensive efforts in countering decentralisation through reform, and 2) reforms that have strengthen the CCP's ruling capacity and its ability to overcome bureaucratic inertia (Taylor, 2012, pp. 73-74).

Jiang and Sinton (2011) also argue that state influence is weakening in the state-NOC relationship in China stating that Chinese NOCs are “owned (mainly) by the state, but not run by the state” (Jiang & Sinton, 2011, p. 25). This section will examine the institutional arrangements between the Chinese NOCs and the state in order to argue that the party-state in China is still a dominant force in the operation of Chinese NOCs, but that this influence is weakened when it comes to the firms’ international operations¹¹.

As can be derived from the discussion in section 2.3, NOCs find themselves in a hierarchical relationship with the Chinese central government where the flow of authority is top-down. In this relationship NOCs enjoy advisory competencies with which they influence developments in the oil industry, as well as operational autonomy in terms of day-to-day business activities (Taylor, 2012, p. 75). The relationship between NOCs and the state institutions that regulate them is portrayed in figure 2.6. The energy governance structure of China shows that the State Council is the highest authority on energy matters. The state council exercises direct control over fifteen ministerial actors related to energy, the NDRC, and the National Energy Commission (NEC). The NDRC and the NEC both wield direct control over NEA. Finally, the minister level actors and the NEA exert indirect control over the NOCs.

Figure 2.6 - NOC governance in China



Source: Leung, Cherp, Jewell, & Wei (2014)

¹¹ As shown in 2.3.1

When it comes to political control over NOCs and their publicly traded subsidiaries, Chinese authorities possess two major sources of power: state shareholdings (ownership rights) and government administration (Taylor, 2012, pp. 80-81). Beijing considers its oil industry a ‘strategic industry’, meaning that like other strategic industries (telecommunications, banking, transportation, and Utilities) the authorities closely control and nurture the state-owned players in these industries in order to maintain stability in these sectors, while also striving to achieve social goals (listed in The Management Law of State-Owned Assets), protect national security, and prevent foreign dominance of the Chinese economy. In the oil sector China’s central government has opted for the establishment of large NOCs (national champions) that enjoy market protection and financial support from the central authorities in exchange for a stable supply of oil. To this end, domestic social, geopolitical, and strategic considerations influence the decisions and undertakings of NOCs. Therefore, the Chinese state is hesitant to relinquish control of its oil companies (Taylor, 2012, p. 70).

The key to the central government’s control over NOCs is share ownership in the companies. Chinese corporate governance structures allow very restricted roles for institutional investors, financial institutions, and other forms of ownership, thereby permitting the state to dominate the ownership of companies. The most important product of state ownership is the ability to define the composition of the board of directors and the management of NOCs. The government institution responsible for the ownership and regulation of Chinese NOCs is the State Assets Supervision and Administration Commission (SASAC). Established in 2003, the SASAC was created to unify the state’s ownership representation of large SOEs in strategic sectors of the economy (currently amounting to 117 state firms and their subsidiaries) (Taylor, 2012, p. 81).

When it comes to hiring staff, the CCP enjoys the power to appoint the top NOC executives through the party’s Central Organisation Department (COD); an external institution responsible for personnel appointments, promotions, and dismissals in SOEs and regulatory bodies of the central government (Taylor, 2012; Hardus, 2017).

Foreign investments and other overseas activities by NOCs are regulated by: the NDRC, the State Council, the Ministry of Foreign Affairs (MOFA), and the Ministry of Commerce (MOFCOM). The NDRC, apart from its policy, planning, and regulatory responsibilities (outlined above), is also in charge of approving overseas investments that exceed one billion US dollars. The commission is also responsible for the approval of overseas investments in strategically important sectors, and investments in countries that either have no diplomatic relationship with China, are subjected to international sanctions, or are involved in conflicts. However, investments that meet these criteria and exceed two billion US dollars require additional approval by the State Council (Hardus, 2017).

With regards to the overseas activities of Chinese NOCs two ministries are of particular importance: MOFA and MOFCOM. The MOFA is tasked with the analysis of political risks regarding foreign investments of Chinese SOEs and with providing political support to NOCs when bidding on energy projects abroad (Hardus, 2017). The MOFCOM on the other hand is responsible for advice as to opportunities in foreign investment, the management of overseas bids and projects in which NOC are engaged, and to manage China's grant and loan projects (Hardus, 2017).

The structural arrangements discussed so far show a significant level of power by the Chinese party-state on its NOCs. However, Downs (2008) points out some elements that accompany the listing of publicly traded subsidiaries that are worth considering. Her argument states that by listing subsidiaries on the stock exchanges of New York and Hong Kong, opens Chinese NOCs to influences from actors other than the party-state. These actors include the Stock Exchanges, the US Securities Commission, independent shareholders, international auditing, and members of the subsidiaries' board of directors (Downs E. S., 2008, p. 125). Furthermore, as chapter 4 will show, Chinese NOCs have to adjust to the regulations of the countries in which they seek to operate, which can limit the power of the state on NOCs' decision making.

In conclusion, this section shows that state ownership and administration of NOCs enable China's state-led approach to its oil sector. It shows how the state controls the NOCs through state ownership and state administration, and how CCP is able to influence staff hires as well as state regulation of the NOCs. The centralised nature of

the governing structures related to energy also serve as facilitating factor to China's state-led approach. However, the state-led approach to energy is weakened as NOCs venture overseas.

2.4.2 China National Petroleum Corporation

CNPC is the leading player in upstream activities in China. Together with its publicly listed arm PetroChina, they account for approximately 54% of the country's crude oil output and 77% of the natural gas output (EIA, 2015). The company is also active in over 30 countries and offers services in the oil and gas sectors including: petroleum exploration and production, petroleum equipment manufacturing, new energy development, capital management, finance, and insurance (CNPC, 2017). As of 2017 the company's yearly output figures in China are as follows: 102.54 million tons of crude oil, 103.27 billion cubic meters of natural gas output, and 152.45 millions tons of crude runs. CNPC runs 21,399 service stations in China, along with 68.9% of the country's crude oil pipelines, 76.2% of China's natural gas pipelines, and 43.2% of the country's pipelines dedicated to refined products (CNPC, 2017). Tables 2.2 and 2.3 depict the financial highlight and CNPC's overseas oil and gas operations respectively, so as to provide an indication of the size of the firm's operations.

Table 2.2 - CNPC Financial Highlights in RMB Yuan (2015-2017)

	2015	2016	2017
Total assets	4,034.10	4,069.76	4,098.72
Total revenue from operations	2,016.76	1,871.90	2,340.30
Total profit	82.47	50.73	53.30
Net profit	56.24	26.80	17.60
Taxes and fees paid globally	375.70	349.70	377.40

Source: CNPC, 2018, Key Figures

Table 2.3 - Overseas Oil and Gas Production (2015-2017)

	2015 [1]	2016 [1]	2017 [1]	% of world 2017 [2]
Crude Production*	115.50	121.51	136.18	3%
CNPC's share*	55.15	57.53	68.80	2%
Natural gas production**	28.65	31.10	33.30	1%
CNPC's share**	21.19	23.19	25.45	1%

Source: [1] CNPC, 2018, *Key Figures*, [2] BP Statistical Review of World Energy 2018

* Amounts depicted in Million Metric Tons

** Amounts depicted in Billion Cubic Metres

As previously mentioned in this chapter the CCP enjoys significant control over China's NOCs. This is evident by the numerous reshuffle of oil executives at the country's NOCs. According to Meidan (2016a) this practice is typical of the CCP and is intended as a means to: 1) manage competition between firms, and 2) prevent top leaders at NOCs from accumulating too much power (Meidan, 2016b, p. 46). A look at CNPC's board of directors confirms Meidan's (2016a) findings. Mr Wang Yilin heads CNPC's board of directors. He also functions as the chairman of PetroChina (CNPC, 2018). In the past Mr Yilin has held leadership functions at CNOOC, CNPC, and the Petroleum Management Bureau in Xinjiang (China Vitae, 2015). The same dynamic can be observed amongst all the top management at CNPC, whom all enjoy between 20 and 35 years of experience in different firms in China's oil and gas industry, except Mr Liu Yuezhen (the Chief Financial Officer) who has 30 years of experience in corporate finance in various industries (CNPC, 2018).

2.5 Conclusion

Chapter 2 focused on the PRC's energy security of supply with special attention to its energy situation, energy strategies, and the dynamics between the state and the energy sector. This chapter addressed the question: *What is China's energy situation, what are the resulting energy security policies and strategies, and what role do national oil companies play in these strategies?*

The chapter started with an examination of China's energy situation. The country's production and consumption of energy was discussed, and it was found that China is experiencing significant increase in energy demand, specifically in its demand for oil. Due to China's limited endowments in energy resources and the composition of its energy demand, China's energy security of supply is best conceptualised in terms of a growing dependency on oil imports. The resulting lateral pressure forces China to seek oil supplies across its borders. Guided by the nature of the country's energy security of supply, Beijing has devised strategies focused on securing foreign oil supplies. Chinese energy strategy is supported by the country's 'going out' policy and oil diplomacy. The country's oil diplomacy, which is the corner stone of Beijing's international relations, functions in support of its 'going out' policy by adopting a 'no political strings attached' approach to oil rich countries and by offering financial rewards in exchange for cooperation.

The chapter concluded with a discussion on the role of NOCs in the Chinese energy sector. NOCs are vital components to the 'going out' strategy as they are charged with engaging foreign oil sectors; with the objective of acquiring equity oil and/or long term supply contracts. To this end they are assisted by the state through institutions such as policy banks, and other ministerial agencies. Considering the importance of the NOCs in Beijing's energy strategy it is keen to maintain control over these firms and their overseas activities. Nonetheless, the market character of these firms renders their motivations to be dominated by commercial interests, which makes state control over their overseas activities more difficult. The chapter also found that the state class in China, enshrined in the CCP, is pivotal to China's state led development by effectively controlling both the state and the market.

The following chapter will elaborate on the Brazilian energy sector, specifically its oil industry, before discussing Sino-Brazilian relations and the dynamics of China's engagement with Brazil.

Chapter 3 Brazil's Economy and Energy Sector

3.1 Introduction

This chapter focuses on Brazil and aims to paint a picture of the country's energy situation, energy sector, and the Sino-Brazilian relations. This chapter will answer the question: *what is the energy situation of Brazil, what are the dynamics between the state and the market in Brazil's energy sector, and what are China's interests in Brazil's energy sector?*

The examination of Brazil presented in this chapter will highlight the constraints for China when operating in the Brazilian energy sector. Hence, in combination with chapter 2, this chapter will provide the background for the following chapter where the energy relationship between these two countries will be investigated.

The chapter will be composed of three parts: section 3.2 will discuss Brazil's energy sector including the policies and institutions that govern the sector, a brief discussion as to the energy situation of the country, and Brazil's National Oil Company. Section 3.3 closes the chapter with a discussion on the Sino-Brazilian relationship by analysing the diplomatic, economic, and security relations between the two countries.

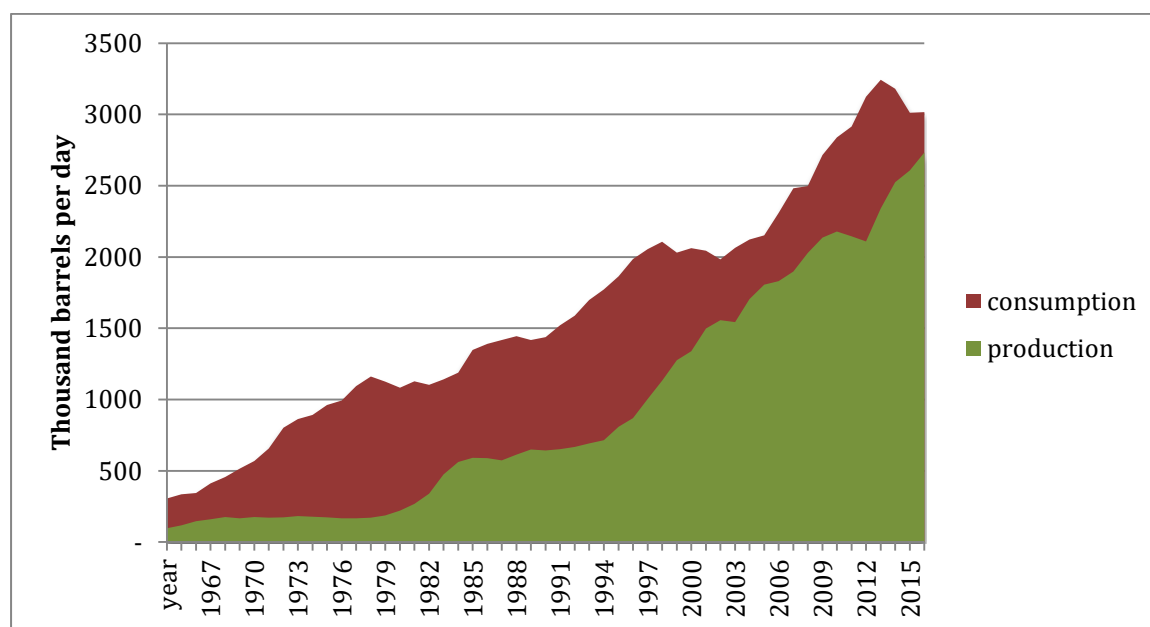
3.2 Brazilian Energy Sector

Brazil is a formidable producer of petroleum products. With a production volume of 3.24 million barrels per day in 2016, the country is the ninth largest producer in the world, and the third largest producer on the American continent trailing the US and Canada (EIA, 2017). This section will highlight how Brazil rose in importance with regards to energy production, the role of the energy sector in the country's economy, and the institutions and policies that regulate the sector, with special attention to the oil industry.

Since the 1930s, the main priority in Brazil's development strategy was the reduction of the country's dependency on energy imports, especially oil (Schutte, 2013, p. 56). Figure 3.1 depicts the evolution of Brazil's import dependency on petroleum imports. The figure shows the country's oil consumption in the red area, and oil production in

the green area. The difference between production and consumption is depicted in the red area visible above the green zone, which indicates the country's net imports. According to the figure, Brazil's net imports are shrinking gradually: in 2017 oil imports reached their lowest levels since 1970: 283 thousand barrels per day (British Petroleum, 2018). Due to the country's historical dependence on oil imports, the country has emphasised hydroelectric power and ethanol in its energy mix, and the increase of domestic oil production (Schutte, 2013, p. 49; EIA, 2017). As a result Brazil's energy usage presents a unique balance between fossil (64%) and non-fossil (36%) energy sources. The fossil fuels include oil, natural gas, and coal, while the non-fossil sources of energy include hydroelectric, wind, and solar energy. Brazil's usage of hydroelectric power has been especially remarkable, accounting for 28% of the country's energy consumption compared to the world average of 7% in the same year. In 2017, oil and hydroelectric sources accounted for the lion's share (74%) of the country's total primary energy consumption, while renewables accounted for 8% (British Petroleum, 2018).

Figure 3.1 - Evolution of Brazil's oil consumption and production (1965-2017)



Source: BP Statistical Review of World Energy 2018

Additionally, failure in finding onshore oil reserves pushed the government to start exploring the technologically challenging area of offshore oil fields in 1964. In 1969, these efforts led to the first discovery of offshore oil fields (Hester & Prates, 2006, p.

65). Hence, Brazil's oil and gas industry has historically been highly dependent on the country's offshore rather than onshore oil fields. Table 3.1 illustrates the vast share of offshore reserves and production to the country's total reserves and production in the last decade. In 2017, Brazil's proven oil reserves stood at 12,793 million barrels of oil. However, 12.196 million barrels or 95% of the total proven oil reserves were located offshore, a 2% increase from the share of offshore reserves in 2008 (ANP, 2018). The same situation can be perceived in the country's proven gas reserves: 369.432 million cubic metres of proven gas reserves of which 303.294 million cubic metres or 82% are located offshore (ANP, 2018). Table 3.1 depicts the same trend in the country's oil and gas production; respectively, 95% and 80% of Brazil's oil and gas production is located offshore (ANP, 2018).

Table 3.1 - Share of onshore and offshore basins in Brazil's oil and gas reserves and production (2008-2017)

	2008	2012	2016	2017
Oil reserves*	12.801,4	15.314,2	12.633,7	12.793,9
Onshore	7%	6,01%	5,12%	4,67%
Offshore	93%	93,99%	94,88%	95,33%
Oil production**	663.274	754.407	918.731	956.928
Onshore	10%	8,75%	5,95%	4,84%
Offshore	90%	91,25%	94,05%	95,15%
Gas reserves***	364.236	459.403	377.406	369.432
Onshore	18,20%	15,75%	16,39%	17,90%
Offshore	81,80%	84,20%	83,61%	82,10%
Gas production***	21.592,7	25.832,2	37.890,5	40.117,4
Onshore	29,05%	23,70%	22,96%	19,56%
Offshore	70,95%	76,30%	77,04%	80,44%

Source: ANP Statistical Yearbook 2018

* In million barrels

** In thousand barrels

*** In million cubic metres

Table 3.2 – Proven oil reserves, production, and consumption in Brazil (1980-2017)

	Proven reserves	% of world total	Production*	% of world total	Consumption**	% of world total
1980	1.317	0,19%	0,188	0,30%	1,125	1,84%
1990	4.513	0,44%	0,651	1%	1,417	2,13%
2000	8.464	0,65%	1,276	1,70%	2,029	2,64%
2010	14.246	0,86%	2,137	2,56%	2,716	3,07%
2017	12.793	0,75%	2,734	2,95%	3,017	3,07%

Source: BP Statistical Review of World Energy 2018

* Oil production in million barrels daily

** Oil consumption in million barrels daily

Table 3.3 – Proven gas reserves, production, and consumption in Brazil (1980-2017)

	Proven reserves	% of world total	Production	% of world total	Consumption	% of world total
1980	100	0,14%	1	0,07%	1	0,07%
1990	100	0,09%	3,2	0,16%	3,2	0,16%
2000	200	0,14%	7,8	0,32%	9,9	0,41%
2010	400	0,22%	15,3	0,48%	28	0,88%
2017	400	0,21%	27,5	0,75%	38,3	1,04%

Source: BP Statistical Review of World Energy 2018

Nowadays, Petrobras is a world leader in offshore production and exploration technologies. The country's geographical endowment in offshore reserves, as discussed above, and the country's dependency on oil, which was tested in the 1970s, were contributing factors to Petrobras' current dominance in offshore technology. The 1970s was a challenging period for Brazil, as the import dependent country faced two global oil crises (in 1973 and 1979) that raised oil prices significantly. The two most notable measures taken by the government and Petrobras during this time was: 1) to create international subsidiaries of the NOC to explore and produce outside Brazil so as to guarantee supply, and 2) Petrobras invested significantly in research and development. These measures were prescribed by the country's II National Development Plan (*II Plano Nacional de Desenvolvimento*) (Schutte, 2013, p. 56). After the crises the government and Petrobras continued their investments in ground-breaking technologies for the offshore oil sector. These investments have set the stage

for Petrobras' current dominance in offshore production and exploration technologies (Hester & Prates, 2006, pp. 66-67). Hester and Prates (2006) point to the spectacular rise in Petrobras' production in oil and gas to argue for the importance of its investments in R&D in the area of offshore to: 1) the expansion of Brazil's oil and gas production (as shown in tables 3.2 and 3.3), and 2) to Petrobras ascension to the world leader in deep and ultra-deep offshore exploration and production since the end of the 1990s (Hester & Prates, 2006, p. 67).

However, the country's energy orientation was to change drastically after 2006. In that year Brazil declared itself energy self-sufficient after Petrobras' efforts in offshore oil exploration, which started in the 1970s, resulted in the discovery of vast oil reserves in ultra-deep waters under the salt layer commonly referred to as Pre-Salt (*Pré-Sal*) (Schutte, 2013, pp. 49-50). Pre-Salt oil is typified as "oil reserves situated exceptionally deep, below the ocean, under thick layer of rock and salt, requiring substantial investments to extract" (EIA, 2017, p. 6). The vast depth and pressure associated to pre-salt production bring about significant technical challenges to the endeavour. The breakthrough discovery of pre-salt oil fields was due in part to Petrobras' vast experience and advanced technology in offshore exploration in ultra-deep waters. This event transformed the country from an import dependent country in terms of energy, to a potential major oil exporter (EIA, 2017). In fact, the world's largest oil discoveries in recent years have occurred in Brazil's pre-salt oil fields (EIA, 2017, p. 6). When announcing the existence of the newly discovered oil fields President Lula da Silva referred to these reserves as: "the second independence of Brazil". In 2011, Lula da Silva's successor President Dilma Rouseff declared: "the Pre-Salt is our passport to the future" (Schutte, 2013, pp. 50-51). These statements show how prominently the Brazilian government perceived the new source of oil and its role in the economic development of the country. Hence, after the discovery of the Pre-Salt oil fields the government developed a framework of policies specifically for this area of the oil sector¹². These policies were intended to stimulate production in the pre-salt basins. Table 3.4 shows how the share of pre-salt in Brazil's oil and gas production has steadily increased since their negligible share in 2008 to account for almost half of the country's oil and gas production in 2017 (49% and 45%

¹² The policies will be discussed in section 3.2.2

respectively) (ANP, 2018). The rapidly increasing share of pre-salt production in the country's oil and gas production speak to the rising importance of pre-salt to Brazil's oil and gas output.

Table 3.4 - Share of post-salt, and pre-salt in Brazil's oil and gas production (2008-2017)

	2008	2012	2016	2017
Oil production*	663.274	754.407	918.731	956.928
Post-Salt	99.61%	91,72%	59,43%	50,89%
Pre-Salt	0,39%	8,28%	40,57%	49,11%
Gas production**	21.592,7	25.832,2	37.890,5	40.117,4
Post-Salt	99.45%	91,96%	61,84%	54,70%
Pre-Salt	0,55%	8,04%	38,16%	45,30%

Source: ANP Statistical Yearbook 2018

* In thousand barrels

* In million cubic metres

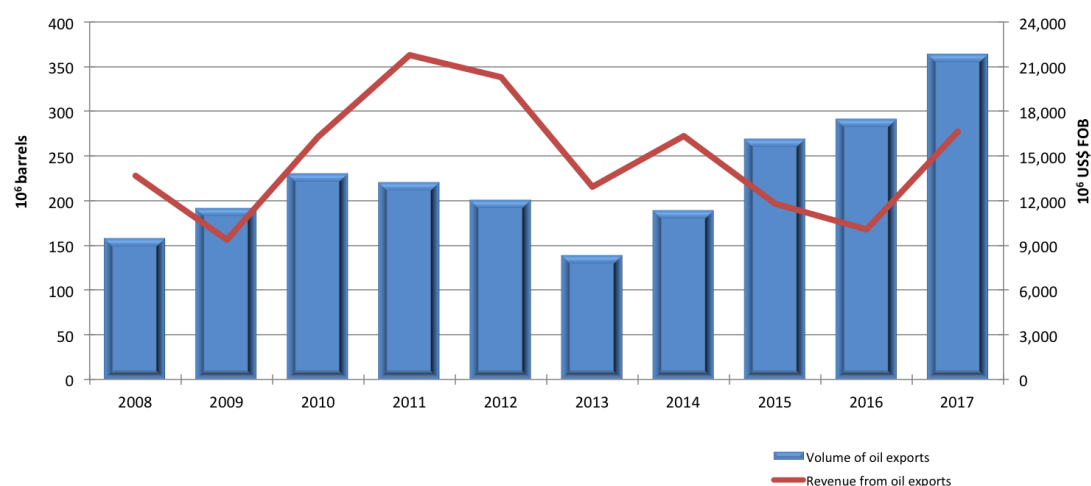
The following sub-sections will outline the role of the energy sector in Brazil's economy, as well as the evolution of Brazil's energy policies and objectives. The goal is to present Brazil's current energy policies in relation to the country's economic objectives.

3.2.1 The role of the energy sector in Brazil's economy

In order to determine the role of the energy sector in the Brazilian economy this section will examine the following variables: the share of oil exports in the country's total exports, the share of oil rent to state income, and the share of the energy sector in the country's GDP.

In 2016, Brazil surpassed Mexico and Venezuela to become the top oil producer in the Latin American region (EPE, 2018). In 2017, Brazil's revenues from oil exports amounted to 16.6 billion US dollars (ANP, 2018), which accounted for 9.7% of the country's total exports (Trading Economics, 2019). Figure 3.2 illustrates the volume of Brazilian oil exports (in bars) and the revenue from these exports (the line) from 2008 to 2017.

Figure 3.2 - Evolution of oil exports and revenue from oil exports (2008-2017)



Source: ANP Statistical Yearbook 2018¹³

The share of oil rents (oil revenue minus the cost of production) in Brazil's GDP was 1.25% in 2017, which is slightly above the world average of 1.1% (World Bank, 2019).

3.2.2 Energy policies and regulatory institutions

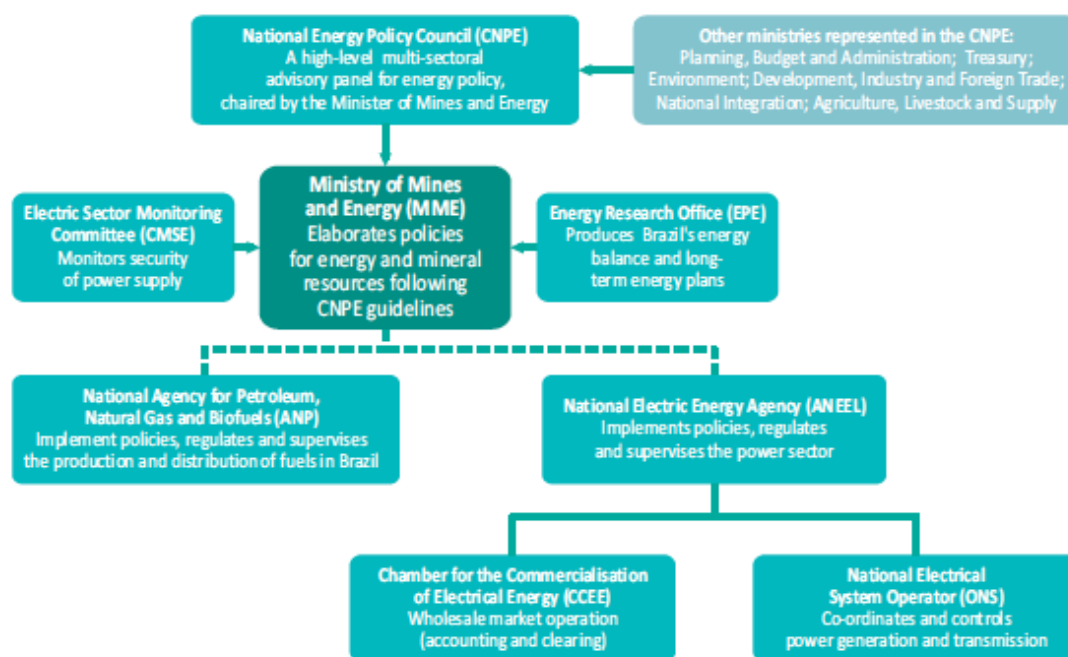
According to Brazil's constitution, the state holds the rights to the minerals in the country (Hester & Prates, 2006). Hence, the ruling of the sector is the exclusive responsibility of the federal government (Costa, de Sá Ribeiro, Junior, & Gabriel, 2018, p. vi). Figure 3.3 illustrates the governance structure in relation to Brazil's energy sector. The main executive body in the energy sector is the Ministry of Mines and Energy (MME). The ministry is responsible for the regulation of all aspects related energy in the country, and it receives input from the Electric Sector Monitoring Committee (ESMC) and the Energy Research Office (EPE). These institutions monitor the security of power supply and make energy balances and long-term energy strategies respectively. Furthermore, The MME contains two of the most important regulatory bodies in the country: 1) the National Agency of Petroleum, Natural Gas and Biofuels (ANP), and 2) the National Electric Energy Agency (ANEEL). The latter agency is focused on the regulation and supervision of the

¹³ Retrieved from: <http://www.anp.gov.br/publicacoes/anoario-estatistico/oil-natural-gas-and-biofuels-statistical-yearbook-2018>

production, transmission, distribution, and sale of electric energy (including hydraulic, wind, and solar electricity). The ANP, on the other hand, is responsible for regulating, supervising, and controlling the operations in the oil, gas, and biofuels industries (including the derivatives of these resources) (Costa, de Sá Ribeiro, Junior, & Gabriel, 2018, pp. vi-vii).

The formulation of energy policies is the responsibility of the National Council for Energy Policy (CNPE). The council is an advisory committee to the country's president (Costa, de Sá Ribeiro, Junior, & Gabriel, 2018, p. vi). Various ministries¹⁴ that are related to energy policy enjoy representation in CNPE. The represented ministries provide the CNPE with their input in order for the latter to devise energy policies.

Figure 3.3 - Brazil's energy and regulatory institutions



Source: IEA World Energy Outlook 2013, p. 322

In 1953 Brazil's government established its NOC, Petrobras, which was to exercise state monopoly on exploration, production, refining, and transportation of petroleum

¹⁴ The ministries of Planning; Budget and Administration; Treasury; Environment; Development, Industry and Foreign Trade; National Integration; Agriculture; Livestock and Supply

products. In 1963 the government extended Petrobras' monopoly to include import and export of crude oil and petroleum products (Hester & Prates, 2006, p. 66).

However, in 1997 the federal government introduced the Petroleum Law and established the National Petroleum Agency (*Agência Nacional do Petróleo, Gás Natural e Biocombustíveis (ANP)*), effectively introducing a concession regime in the exploration and production of oil and gas (Belchior & Alves, 2017). The concession regime entailed that the granting of exploration rights will be subject to competitive bidding. Costa, de Sá Ribeiro, Junior, and Gabriel (2018) argue that the concession regime's most important feature was that it guaranteed to investors the stability of the rules of the game concerning the government (Costa, de Sá Ribeiro, Junior, & Gabriel, 2018, p. 15). The state maintained its ownership rights on mineral resources under the new regime, while the newly enacted ANP was put in charge of all aspects of oil and gas regulation in the country (Hester & Prates, 2006, p. 67). Under the new policy regime the market was opened to foreign oil companies, and the granting of exploration and production licences was executed by the ANP through auctions (Belchior & Alves, 2017). Furthermore, the National Energy Policy Council (CNPE) was established, as an advisory body to the President entrusted with formulating policies and guidelines for the rational employment of energy resources. Given that this agency's policy jurisdiction includes the exploration blocks, all bidding rounds managed by the ANP became dependent on the CNPE for approval (Costa, de Sá Ribeiro, Junior, & Gabriel, 2018, p. 13). The CNPE is also responsible for defining the local content: the minimum percentage of the project's needs that must be purchased from local providers (Belchior & Alves, 2017). Through these policies the government halted the legal monopoly of Petrobras on all aspects of the country's oil and gas sector.

The 2006 discovery of the Pre-Salt oil reserves in Brazil prompted an additional round of reforms in the oil and gas sector. The government established a working group tasked with studying and recommending ways in which to exploit the newly discovered oil fields. The effort of this working group led to a new policy framework titled the Pre-Salt Law introduced in 2010 (Belchior & Alves, 2017). Another important law enacted during this period was the Production Sharing Law, which became a standard feature in Brazil's oil and gas industry (Almada & Parente, 2013,

p. 230). The two laws brought forth four major features to the regulation of the pre-salt oil fields: 1) the capitalisation of Petrobras where the government granted the firm five billion barrels in unlicensed pre-salt oil reserves in exchange for a larger share in the NOC, 2) the introduction of a sharing system in the pre-salt areas, 3) the creation of a new NOC, Pre-Sal Petróleo S.A. (PPSA), which was put in charge of protecting the government's interests through the management of shared contracts and the sale of the government's share of oil and gas, and 4) the creation of a social fund in charge of managing the government's oil revenues (Schutte, 2013, pp. 57-58; EIA, 2017, p. 7).

Under the Production Sharing Law all pre-salt oil fields must be developed under a Production Sharing Agreement (PSA) between IOCs and the MME, where the state is intrinsically involved in managing these operations through Petrobras and PPSA. The most important features of this contract are: firstly, the investors carry the operational costs. Originally Petrobras was to be the sole operator, with a minimum participation 30%, of all blocks that fall under the production-sharing regime. However, this requirement was abolished in 2016. Secondly, the winner of the bidding rounds should join a consortium with PPSA, and Petrobras (only if Petrobras is interested in joining the consortium). Lastly, after the exploration phase, if there is a commercial discovery and the production is successful the oil will be paid in kind to the contractor (Costa, de Sá Ribeiro, Junior, & Gabriel, 2018, pp. 15-16). The production-sharing regime applies only to areas in the economy deemed “strategic areas” by the country's President. The pre-salt area of the oil and gas sector was declared a strategic area and hence the production-sharing contract is a standard feature (Almada & Parente, 2013, p. 231).

According to Schutte (2013) these reforms were introduced to achieve two overarching objectives: 1) to enable the state to capture rents, and 2) to exercise control over the exploration and production. After Congress approved the new pre-salt law in 2010, President Lula stated that the new regulation will allow the state more control over three main elements: 1) timing and pace of extraction, 2) the ability for Brazil's domestic industry to meet the demand for services and equipment, and 3) the destination of rents from the pre-salt basins (Schutte, 2013, p. 59).

Additionally, the reforms of 2010 have centralised power of the oil and gas sectors around the President. Before the reforms the President enjoyed the power of appointment regarding ANP's Board of Directors whilst the Federal Government owned at least 50% of the shares in Petrobras plus one share of the voting capital. The reforms of 2010 enhanced the power of the president by reforming the CNPE; the role of the agency was strengthened given that all its proposals were to be sent to the President for approval (Costa, de Sá Ribeiro, Junior, & Gabriel, 2018, p. 14). The MME became vital to the decision making regarding energy policy after the 2010 reforms. The ministry executes the production sharing contracts on behalf of the Federal Government. The ministry provides the technical and economic parameters of the contracts to the CNPE, which subsequently make recommendations to the president, who makes the final decisions on the execution of production sharing contracts (Costa, de Sá Ribeiro, Junior, & Gabriel, 2018, p. 14). This process illustrates the centralised nature of decision-making regarding the country's energy path.

The last round of reforms in the oil and gas sector took place in 2016, when the role of Petrobras in the pre-salt area was altered. Under the reformed regulations Petrobras is no longer the sole operator of pre-salt oil fields, enjoying instead the option of participating in production sharing contracts as an operator, with a minimum stake of 30% (EPE, 2018). These measures were enacted in an attempt to attract new investors in the oil and gas sector.

This section showed how the country's energy sector is managed by the state. The above discussion on the relationship between the state and the energy market in Brazil shows how the government exercises control in the oil and gas market through its NOC and different government agencies, instead of allowing developments in the energy market to be subjected to market forces. Hence, the state dictates the orientation of Brazil's energy market. Although Petrobras' monopoly ended in 1997, the NOC is still vital to the operation of Brazil's energy sector, as evident in the nature of the PSA contracts in the oil and gas sector. With regards to the role of Petrobras in Brazil, Hester and Prates (2006) argue that the NOC was established with the aim of ensuring state control over the inputs to drive economic development and to capture the rents generated by the industry (Hester & Prates, 2006, p. 65). Schutte

(2013) adds that although Petrobras is a mixed company in terms of its ownership structure, it is still critical to the country's industrial and technological strategy in the future (Schutte, 2013, p. 67). Therefore, Schutte (2013) argues that the Brazilian state plays a key role in the Brazilian economy by promoting dynamics in the domestic market and social equality, by creating opportunities to invest in strategic sectors of the economy, engaging international markets while defending domestic industries, and by promoting national development strategies (Schutte, 2013, pp. 54-55). The role of the state in the Brazilian economy described by Schutte (2013) is perceivable in the country's oil and gas sector; the policy regime in this sector is based on production sharing contracts, local content guidelines, and a Social Fund that is supposed to ensure fair distribution of government revenues from the sector. In sum, this section illustrates how the Brazilian government directs the country's energy sector from the top-down in order to achieve the country's developmental objectives.

3.2.3 Brazil's National Oil Companies

The chief NOC in Brazil is Petróleo Brasileiro S.A. (Petrobras), which was incorporated in 1953, and holds a dominant position in the production of oil and natural gas in the country. The oil firm enjoyed a monopoly position in Brazil's oil sector until the late 1990s when the sector was opened for competition, as discussed in the previous section (EIA, 2017). Petrobras is the largest deep-water drilling operator in the world (Schutte, 2013, p. 58), and a world leader in offshore exploration and production technologies (Hester & Prates, 2006). The federal government of Brazil owns 50,3% of the shares in the company (Petrobras, 2019).

3.3 Sino-Brazilian Relations

As discussed in the literature review the relationship between these two countries arise chiefly from China's need for natural resources and Brazil's demand for foreign investment. This section will examine the relationship between China and Brazil by analysing the diplomatic, economic, and security relationship between the two countries, as well as their multilateral relations with other countries.

3.3.1. Diplomatic relations (2000 – 2018)

Diplomatic relations between China and Brazil were established in 1974, when Brazil signed a Joint Communiqué in support of Beijing's 'One China' policy effectively severing diplomatic relations with Taiwan (Ministry of Foreign Affairs, 2018). In 1993, the two countries elevated their relationship to a Strategic Partnership during the visit of Chinese Prime Minister Zhou Rongji to Brazil. Xu (2017) argues that China's strategic relationship with Brazil is different from Beijing's other strategic partnerships in three ways: 1) the Sino-Brazilian relationship is China's most important relationship in the Latin American region, 2) they share a common identity as developing countries striving for economic development, and 3) both countries are regional as well as global powers with rising influence global affairs (Xu Y. , 2017, p. 45). The Sino-Brazilian strategic partnership is a comprehensive cooperative path encompassing areas including trade, energy, finance, agriculture, technology and innovation, amongst other areas. The strategic partnership was renewed and upgraded to a comprehensive strategic partnership in 2012 (Xu Y. , 2017, p. 45). These events indicate an intensification of the relationship between the two countries since 1993. Beijing and Brasilia have established different institutions to solidify their diplomatic relationship.

In 2004, after Brazilian President Lula da Silva visited China, they established the China-Brazil High-Level Coordination and Cooperation Committee (COSBAN), and in 2012 the Global Strategic Dialogue (GSD) during Premier Wen Jiabao's visit to Brazil. These are bilateral dialogue and cooperation forums where the two parties meet to discuss and regulate different aspects of the Sino-Brazilian relationship. The COSBAN, co-chaired by Brazil's Vice-President and China's Vice Premier, is the highest ranking of the two bilateral forums dealing with issues related to the areas of economic, financial, and political relations, agriculture, energy and mining, science, technology and space cooperation, culture, and education (Ministry of Foreign Affairs, 2018). These institutions have produced the following guiding documents; The Joint Action Plan (2015-2021) and the 10-Year Cooperation Plan are the guiding documents in the relationship between the two countries. The Joint Action Plan defines the objectives and guidelines for the bilateral relations, while the 10-Year Cooperation Plan outlines the long-term actions in key areas including economic, cultural, and scientific cooperation (Ministry of Foreign Affairs, 2018).

The first Joint Action Plan (2010-2014) signed between Brazil and China outlined the objectives of both countries in 13 areas of interest in the economic, cultural, and scientific sphere (Cardoso, *China-Brazil: A Strategic Partnership in an Evolving World Order*, 2013). In terms of energy the joint plan focused on strengthening cooperation in oil, gas, and alternative energy sources (Alves, Steiner, Dunda, & Xavier, 2018, pp. 65-66). In 2011 and 2012, China and Brazil issued Joint Communiqués articulating their commitment to the expansion and diversification of mutual investments in several areas of interest, including the energy sector. In 2015, Beijing and Brasilia updated the first action plan into the Joint Action Plan (2015-2021). This plan expanded the scope of economic sectors defined in the preceding joint plan (Alves, Steiner, Dunda, & Xavier, 2018, p. 66).

In sum, the Sino-Brazilian diplomatic relationship is one characterised by increasing intensification since 1993, and complementary interest in their foreign policies. The countries have established institutional frameworks to promote and regulate their cooperation with each other. These frameworks have clear objectives and areas of interest based on the partners' needs. The complementarities of this relationship, the label of developing nations and status of rising powers, seem to have facilitated the strengthening of the Sino-Brazilian diplomatic relationship. However, as illustrated in the next subsection, despite complementarity of interests and significant gains in bilateral trade, the trade relationship has also posed challenges to Brazil's economic prospects and foreign policy.

3.3.2 Economic relations (2000 – 2018)

This section will outline the economic relationship between China and Brazil by examining the trade, investment, and finance between the two countries.

Trade between China and Brazil

Ever since the inception of the Sino-Brazilian relationship Brazil has perceived China as a relevant economic partner. From 1974 to 1985 trade between the two countries consisted mainly of Brazil importing oil from China and exporting industrial and petrochemical products. In 1985, Brazilian exports to China reached a record high

accounting for USD 817 million in exports, compared to USD 453 million in 1984. Nevertheless, late 1980s saw Brazil orient its foreign policy more towards the USA (a traditional Brazilian foreign policy doctrine), while China became preoccupied with domestic issues (Cardoso, *China-Brazil: A Strategic Partnership in an Evolving World Order*, 2013, p. 41).

The re-intensification of the trade relationship took place at the beginning of the 2000s. Brazil's President at the time, President Lula da Silva, saw China as an alternative to Brazil's traditional foreign policy doctrine, which focused on Latin American countries, the USA, and Europe. China was an attractive partner for Brazil to realise two objectives: economic development and reform in the mechanisms of international governance (Cardoso, *China-Brazil: A Strategic Partnership in an Evolving World Order*, 2013, p. 41). On the Chinese side two factors played a crucial role in the rapprochement between the two countries: 1) China's entry into the WTO in 2001, and 2) China becoming a net importer of commodities in 2003. The first factor brought about reforms to China's trade policies and the implementation of market access concessions, while the latter increased the pressure on Beijing to gain access to these products. This presented Brazil with an opportunity to internationalise its economy in pursuit of national development objectives (Cardoso, 2013, p. 42; Xu Y. , 2017, p. 44).

China is Brazil's most important trading partner since 2009. Between 2001 and 2015 the trade flow between the partners have increased from USD 3.2 billion to USD 66.3 billion. During this time Brazil has accumulated a USD 46 billion in trade surplus (Ministry of Foreign Affairs, 2018). Furthermore, Trade data from 2017 indicate that China is Brazil's most important export market, amounting to US\$47.5 billion and 22% of Brazil's total exports. Other top destinations for Brazilian exports in 2017 were the US (11%), Argentina (8%), Netherlands (3,5%), and Germany (2,8%) (United Nations, 2017). In that same year crude oil amounted to roughly 16% (US\$7.35 Billion) of Brazil's exports to China (United Nations, 2017). These numbers indicate a rising level of economic interdependence between the two countries.

However, the trade relationship is not without its complications. The main challenge to the Sino-Brazilian economic relationship is Chinese competition faced by Brazil's manufacturing in both domestic and international markets. Another notable challenge to the alliance is the asymmetrical nature of the Sino-Brazilian trade relationship, which favours China. After a lucrative period for the partners, since the turn of the century the trade relationship has been shifting in China's favour (Xu Y. , 2017, p. 57). China imports mostly oil and food from Brazil, while it exports chiefly manufactured products to Brazil. This phenomenon, termed commodities-for-manufacturing, is illustrated in tables 3.5 and 3.6. With data from the Observatory of Economic Complexity, table 3.5 depicts the products that made up 85,2% of Brazil's exports to China in 2017, while table 3.6 illustrates the products that amounted to 78,3% of Brazil's imports from China in the same year. Mineral products include commodities such as iron ore, crude petroleum copper ore, refined petroleum, and other ore materials; vegetable products is comprised of soya beans, coffee, corn, fruits, and other agricultural products; and machines include manufactured products. Throughout the period depicted in the table 3.5, vegetable and mineral products have dominated the share of Brazil's exports to China accounting for 82% of the exported value in 2017, and 65% in 1995. Mineral products experienced the greatest growth in share, growing from 13% in 1995 to 39% of exports in 2017. At the same time, despite increases in the value of machine exports to China, the share of these products dropped from 6,2% in 1995 to 1,1% in 2017. On the other hand, machines have dominated Brazil's imports from China, with its share rising from 20% in 1995 to 48% in 2017. Hence, tables 3.5 and 3.6 indicate that the literature is correct in highlighting challenges to the Sino-Brazilian trade relationship.

Table 3.5 - Share of products in Brazil's exports to China in million USD (1995-2017)

		1995	2000	2005	2010	2015	2017
Vegetable products	Value	561	343	1.750	7.170	15.800	20.400
	% of total value	43%	30%	21%	23%	44%	43%
Mineral products	Value	162	329	3.860	17.800	11.300	18.600
	% of total value	13%	28%	46%	58%	31%	39%
Metals	Value	160	56.3	595	904	1.350	991
	% of total value	12%	4,9%	7,1%	2,9%	3,8%	2,1%
Machines	Value	80.6	47	383	312	668	513
	% of total value	6,2%	4,1%	4,6%	1%	1,9%	1,1%
Other	Value	326,4	384,7	1.752	4.814	6.782	7.496
	% of total value	25,8%	33%	21,3%	15,1%	19,3%	14,8%
Total value of exports		1.290	1.160	8.340	31.000	35.900	48.000

Source: Observatory of Economic Complexity, 2019, "What does Brazil Export to China?" 1995-2017

Table 3.6 - Share of products in Brazil's imports from China in million USD (1995-2017)

		1995	2000	2005	2010	2015	2017
Machines	Value	91,3	573	2.880	13.500	13.600	12.900
	% of total value	20%	44%	53%	51%	45%	48%
Chemical products	Value	50,4	198	581	1.990	3.260	3.760
	% of total value	11%	15%	11%	7,5%	11%	14%
Textiles	Value	87,7	72,2	400	2.100	3.240	2.670
	% of total value	19%	5,5%	7,4%	8,2%	11%	9,9%
Metals	Value	18,1	63	231	2.390	2.430	1.740
	% of total value	3,9%	4,8%	4,3%	9%	8,1%	6,4%
Other	Value	218,5	393,8	1.318	6.420	7.470	5.930
	% of total value	46,1%	30,7%	24,3%	24,3%	24,9%	21,7%
Total value of exports		466	1.300	5.410	26.400	30.000	27.000

Source: Observatory of Economic Complexity, 2019, "What does China Import from Brazil?" 1995-2017

Due to this commodities-for-manufacturing trade relationship, not all sectors of the Brazilian economy are able to benefit from trade with China, while the manufacturing

industry experience competition from Chinese imports (Xu Y. , 2017, p. 46). Furthermore, with high-tech Chinese brands like Huawei and Lenovo entering markets such as the US, South America, and Africa, Brazil's knowledge and technology intensive industries will lack competitiveness in international markets (Xu Y. , 2017, p. 47).

Chinese investment in Brazil

China is the main source for foreign direct investment (FDI) in Brazil, particularly in the areas of energy, mining, iron and steel, and agribusiness (Ministry of Foreign Affairs, 2018). Brazil is also the main destination for Chinese FDI in South America, accounting for USD 60 billion of the USD 110 billion cumulative Chinese investments in the region between 2013 and 2016 (Avendano, Melguizo, & Miner, 2017, p. 6). Most of the Chinese investments in Brazil, 81%, are made by Chinese SOEs (Avendano, Melguizo, & Miner, 2017, p. 10). Figure 3.4 shows the importance of the oil and gas sector in Chinese investments in Brazil. The sector is the largest recipient of Chinese FDI; of the USD 60 billion Chinese investment in Brazil from 2003 to 2016, almost USD 14 billion was invested in this sector. The second largest beneficiary of Chinese FDI is the sector of electricity and utilities. If Chinese investments in oil and gas, alternative energy, and electricity/utilities were summed up China's energy investment in Brazil from 2003 to 2016 would amount to USD 28 billion.

Figure 3.4 - Chinese FDI in Brazil by industry (2003-2016)

INDUSTRY	AMOUNT (US\$ BILLIONS)
Oil & Gas	14
Mining & Metals	8
Transport	6
Automotive	7
Finance	6
Electricity/Utilities	9
Alternative Energy	5
Information & Communication Tech	2
Consumer Products/Electronics	1
Agriculture	1
Machinery & Equipment	0.6
Chemicals/Rubber	0.1
Construction & Construction Materials	0.1
Other Services/Wholesale	0

Source: (Avendano, Melguizo, & Miner, 2017, p. 11)

Other sectors of interest to China are manufacturing, automotive industry, and the service sector. Brazil has the largest automotive markets in the world, as well as high import taxes. For this reason China's automotive firms are investing in Brazil to gain access to this vast market whilst avoiding high import tariffs. Additionally, as the automotive industry is a strategic sector in China, Beijing encourages its automakers to expand abroad (Avendano, Melguizo, & Miner, 2017, pp. 13-14).

On the other hand, Brazil has significant investments in China in the areas of aeronautics, mining, feed, iron and banking (Ministry of Foreign Affairs, 2018). The most significant cooperation between the two countries in the area of investments is the establishment of the Brazil-China Cooperation Fund for the Expansion of the Production Capacity. The fund has US\$ 20 billion in capital and is intended to encourage investments in infrastructure and logistics, energy, mining, manufacturing, and agriculture. The Fund finances investments projects in Brazil that are of interest to both China and Brazil (Ministry of Foreign Affairs, 2018). This fund was signed into existence in May 2015 when Chinese Prime Minister Li Keqiang visited Brazil (Ministry of Foreign Affairs, 2018), and was officially launched in May 2017 (Jie, 2017). During the signing ceremony Chinese Ambassador to Brazil Li Jinzhang stated: "Brazil is a priority country for China's strategy of expanding productive capacity. The fund reflects a higher level of cooperation for both countries, and will create a new model of financial cooperation" (Jie, 2017).

Chinese loans to Brazil

Brazil is the second largest recipient of Chinese loans in the Latin American region behind Venezuela (USD 67.2 billion). Based on data from China-Latin America Finance Database, table 3.7 depicts China's investments in Brazil from 2007 to 2017. The table shows that since 2007 Brazil has received USD 28,9 billion in loans from China's policy banks: China Development Bank and China Export Import Bank (Gallagher & Myers, 2019). As shown in table 3.7 USD 26,1 billion of the total investment was destined to the energy sector. Chinese loans to Brazil show the same trend as the Sino investments in the country: a significant concentration in the energy sector. Chapter 4 will elaborate on China's energy related loans in Brazil and their contribution to Beijing's energy security.

Table 3.7 - Chinese loans to Brazil (2007-2017)

Year	Type	Purpose	Lender	Amount
2007 [1 and 2]	Energy	GASENE pipeline	CDB	\$750M
2008 [1 and 2]	Energy	Coal plant	CDB	\$356M
2009 [1]	Energy	Pre-Salt oil field development	CDB	\$7B
2009 [2]	Energy	Loan for oil (10 year deal) with Petrobras	CDB	\$10B
2014 [1]	Energy	Bilateral cooperation agreement	CDB	\$3B
2015 [1 and 2]	Energy	Bilateral cooperation agreement	CDB	\$1.5B
2015 [1]	Infrastructure	Soy processing industrial line	CDB	\$1.2B
2015 [1 and 2]	Energy	Bilateral cooperation agreement	CDB	\$3.5B
2015 [1]	Other	Sale of E-195 aircrafts	Eximbank	\$1.3B
2015 [2]	Energy	Oil export	CBD	\$3.5B
2015 [2]	Energy	Oil cooperation with Petrobras	Eximbank	\$3.1B
2015 [2]	Energy	Oil Exploration	CDB	\$1.5B
2016 [1]	Energy	Debt financing	CDB	\$5B
2016 [2]	Energy	Loan for oil	CDB	\$10B
2017 [1]	Other	China-Brazil trade financing	Eximbank	\$300M
2017 [1 and 2]	Energy	Oil export	CDB	\$5B

Sources: [1] *China-Latin America Finance Database*, 2019, and [2] *China's Global Energy Finance*, 2018

In sum, the Sino-Brazilian relationship in trade, investment, and finance shows that Chinese power projection in Brazil is concentrated to the energy sector. The trade relationship discussed in this section implies a move towards Brazilian commercial specialisation as an exporter of commodities and an importer of manufactured goods from China, referred to as commodities-for-manufacturing relationship. Furthermore, China's investment and loan activities in Brazil display signs of consolidation in the extractive sectors. This represents a complication for the economic relationship between the two countries, because trade specialisation imposes costs on Brazil's

domestic industries that are affected by Chinese manufactured goods. This sector is forced to compete with low-cost Chinese imports (Vadell, 2013, p. 51).

3.3.3 Security relations (2000 – 2018)

The security cooperation between Beijing and Brasilia has not been an exception to the continuing approximation of the two countries. The first serious security agreement between the two countries was the agreement on peaceful use of nuclear energy, signed in October 1984 after the two countries signed a memorandum of understanding (MOU) on the subject in May that same year. In 1985 China opened a defence attaché's office in Brasilia, and Brazil followed suit in 1988 with its own attaché office in Beijing (Marcondes & Barbosa, 2018, p. 147). During the 1990s several high level military visits between the two countries increased mutual knowledge and fostered exchange initiatives. Since 1995, Brazilian officers attend courses at the Chinese National Defence Academy.

However, in the early 2000s under the guidance of Presidents Lula da Silva and Rousseff the Sino-Brazilian security relationship entered a new phase. The countries established the Joint Commission for Exchange and Cooperation (JCEC) and signed the Framework Agreement on Defence Cooperation (FADC). The JCEC was established in 2004 during the visit to Brazil of China's Defence Minister Cao Gangchuan, and launched officially in 2009 during Brazil's Defence Minister Nelson Jobim's visit to China. JCEC is concerned with the area of education and personnel training. The FADC was enacted in 2011 during President Dilma Rousseff's visit to China. The agreement covered a wide range of areas including; training and education, exchange of defence technology, services and products, cooperation on military operations, and humanitarian assistance. The main motive for Brazil in its security relationship with China is to revamp the country's defence industry (Marcondes & Barbosa, 2018, p. 148).

The amount of security related visits between the two countries since 2009 (after the official launch of the JCEC) and the statements during these visits shows the high level of importance that both parties attach to their security relationship. The parties emphasised the importance of connecting their defence industries during Jobim's visit

to China in 2009 and in 2010 during Chinese Defence Minister Liang Guanglie's visit to Brazil (Marcondes & Barbosa, 2018, p. 148). Following these visits and statements President Xi Jinping signed several agreements, during a 2014 visit to Brazil, regarding the strengthening of Brazil's Amazon Protection System. These agreements encompass defence contractors, banks, and government departments from both countries. Building on these activities, China went on to build a Brazilian Navy ship in 2015, and started building the Brazilian Antarctic Base in 2016 (Marcondes & Barbosa, 2018, pp. 148-150).

Despite the increasing levels of cooperation between China and Brazil in the area of security, the trade in weapons related products between the two countries remains negligible. According to data from the OEC Brazil only started exporting weapons related products to China in 2016, and exported USD 1.09 thousand and USD 109 thousand of worth of weapons to China in 2016 and 2017 respectively. At the same time the country exported a total value of USD 606 million in 2016 and USD 555 million in 2017 (Observatory of Economic Complexity, 2019a). On the other hand, Brazil's imports of Chinese weapons grew from USD 1,77 million in 2010 to USD 6,87 million in 2017 peaking at 7,5 million in 2013 and 2014 (Observatory of Economic Complexity, 2019b). Brazil's weapons imports from China only accounted for 2% of China's total weapons exports in 2017.

In sum, the Sino-Brazilian security relationship is solidified in the JCEC and the FADC. The two institutions allow the countries' militaries to cooperate on the areas of education, training, and technological know how. However, the trade of weapons between the two countries remains low.

3.4 Conclusion

This chapter concentrated on the dynamics of Brazil's oil sector and Sino-Brazilian relations. The chapter addressed the question: *what is the energy situation of Brazil, what are the dynamics between the state and the market in Brazil's energy sector, and what are China's interests in Brazil's energy sector?*

Section 3.2 examined Brazil's energy sector and found that the sector is undergoing significant changes related to the discovery of pre-salt oil fields that have increased the country's reserves and production levels, and is likely to convert Brazil into a major oil exporter in the future. The section also depicted the state's involvement, through its NOC and regulatory institutions, in the country's oil sector. The findings in this respect point to state led management of the oil sector. Section 3.3 examined the nature of China's power projection in Brazil, and found that China became the largest trade partner, investor, and source of finance to Brazil. The section also discussed how the interests of the two countries are addressed across a range of bilateral institutions and action plans created by the partners to advance bilateral cooperation. However, China's interests in extractive resources led to a situation where its economic activities in Brazil are concentrated chiefly on extractive resource sectors while it competes with Brazilian manufacturing in Brazil and abroad.

After close examination of China's energy security of supply, Brazil's oil sector, and the Sino-Brazilian relations, the following chapter will consider the energy relationship between the two countries and CNPC's activities in the Brazilian oil sector.

Chapter 4 CNPC Activities in Brazil

4.1 Introduction

To this point, chapter 2 outlined the forces behind China's quest for foreign energy resources and the strategies and policy tools to achieve this end. Subsequently, chapter 3 showed the dynamics of the Brazilian oil sector. This chapter builds up on these insights by examining China's engagement in the Brazilian energy sector, with special attention to CNPC's activities. The chapter will answer the following sub-question: *what is the current state of China's trade, investment, and finance in Brazil's energy sector, and what are CNPC's investments in the Brazilian energy sector?*

Section 4.2 will elaborate on China and Brazil's energy relations by exploring Chinese trade, investment, and finance in the Brazilian energy sector, with emphasis on the oil sector. Section 4.3 will discuss CNPC's investments in Brazil's oil industry from 2013 to 2018, before section 4.4 looks at the contribution of the Brazilian oil sector and CNPC's investments therein to China's energy security of supply.

4.2 Sino-Brazilian energy relations

Up until 2005 the presence of Chinese companies in Brazil's oil industry were limited (de Almeida & Consoli, 2014).

There are a complementary of interests between China and Brazil; Brazil possesses the fossil resources that China lacks, China holds the financial resources to contribute to Brazil's economic development (Husar & Best, 2013, p. 13). In terms of the energy sector, Brazil's main challenge is to develop the large pre-salt oil fields. These oil and gas resources require significant investments in exploration, production, and infrastructure over the next decades. Despite the discovery of major pre-salt oil reserves, the country is committed to maintaining its characteristically low-carbon energy mix by expanding its hydropower capabilities and diversifying into wind energy. This signals that Brazil intends to become a major oil exporter. However, the geographical distance between the renewable energy resources and the local markets coupled with the lack of investment in Brazilian transmission grids present a challenge for the country's plans of maintaining a low-carbon energy mix while

increasing their oil and gas exports (Husar & Best, 2013, pp. 12-13). Chinese SOEs are involved in several construction projects to aid Brazil's domestic energy challenges¹⁵.

On the other hand, China is interested in diversifying its oil suppliers and developing competitive transnational enterprises. Hence, China's investments in Brazil are aimed at gaining control over energy resources, gaining access to technology, and securing a market for production and services (Husar & Best, 2013, pp. 12-13). As shown in chapter three, Brazil's NOC Petrobras is a world leader in technology related to deep-water exploration and production. The Joint Action Plan (2015-2021) emphasises cooperation in technology development showing the interest of both countries in the transfer and development of technology.

The following sub-sections will illustrate China's involvement in Brazil, and how its activities address both partners' objectives.

Energy trade

As discussed in chapter 3, China is Brazil's largest trading partner. This same trend is observable in the oil trade between the two countries. According to statistics from the International Trade Centre of 2019 displayed in table 4.1, in 2018 Brazil became the 6th most important oil supplier to China. That year Brazil supplied USD 16,2 billion worth of oil to China, a significant enhancement from the Brazilian position in 2014 where the country was the 12th largest supplier of oil to China, exporting USD 4,9 billion worth of oil (International Trade Centre, 2019).

¹⁵ The most significant of these projects, the Belo Monte Transmission Lines is discussed in section 5.3

Table 4.1 - Top 10 ranked oil suppliers to China and percentage of China's total oil imports

		2010	2012	2014	2016	2018
1	Russia	9%	8%	9%	8%	6%
2	Saudi Arabia	19%	20%	16%	13%	12%
3	Angola	17%	15%	14%	12%	10%
4	Iraq	5%	6%	9%	9%	9%
5	Oman	7%	7%	10%	10%	7%
6	Brazil	3%	2%	2%	5%	7%
7	Iran	9%	8%	9%	8%	6%
8	Kuwait	4%	4%	3%	4%	5%
9	Venezuela	3%	5%	4%	4%	3%
10	United States	0%	0%	0%	0%	3%

Source: International Trade Centre, 2019

Table 4.2 depicts the interdependence between China and Brazil in oil trade. The table denotes that Brazil's oil exports to China have increased three-fold between 2014 and 2018 and four fold from 2010 to 2018. This phenomenon points to China's increasing dependency on Brazil in terms of oil imports. In fact, as table 4.2 illustrates, the value of Brazil's oil exports to China has experienced a continuous rise since 2010¹⁶.

Table 4.2 - Evolution of Brazil's oil exports to China in billion of US dollars (2010-2018)

	2010	2012	2014	2016	2018
Value*	4,2	4,7	4,9	6	16,2
% of Brazil's total oil exports	26%	22,9%	29,9%	59,9%	64,5%
% of China's total oil imports	3,1%	2,1%	2,1%	5,2%	6,8%

Source: International Trade Centre, 2019

However, table 4.2 shows that oil exports to China are becoming increasingly important to Brazil, making up 64,5% of Brazil's total oil exports in 2018 compared to 26% in 2010. At the same time the share of Brazilian oil in China's total oil imports are marginal; from 3,1% in 2010 to 6,8% in 2018. These findings suggest that

¹⁶ The rise in Brazilian oil exports to China is enabled by the increase in Brazil's oil production, as indicated in table 3.2 in section 3.2

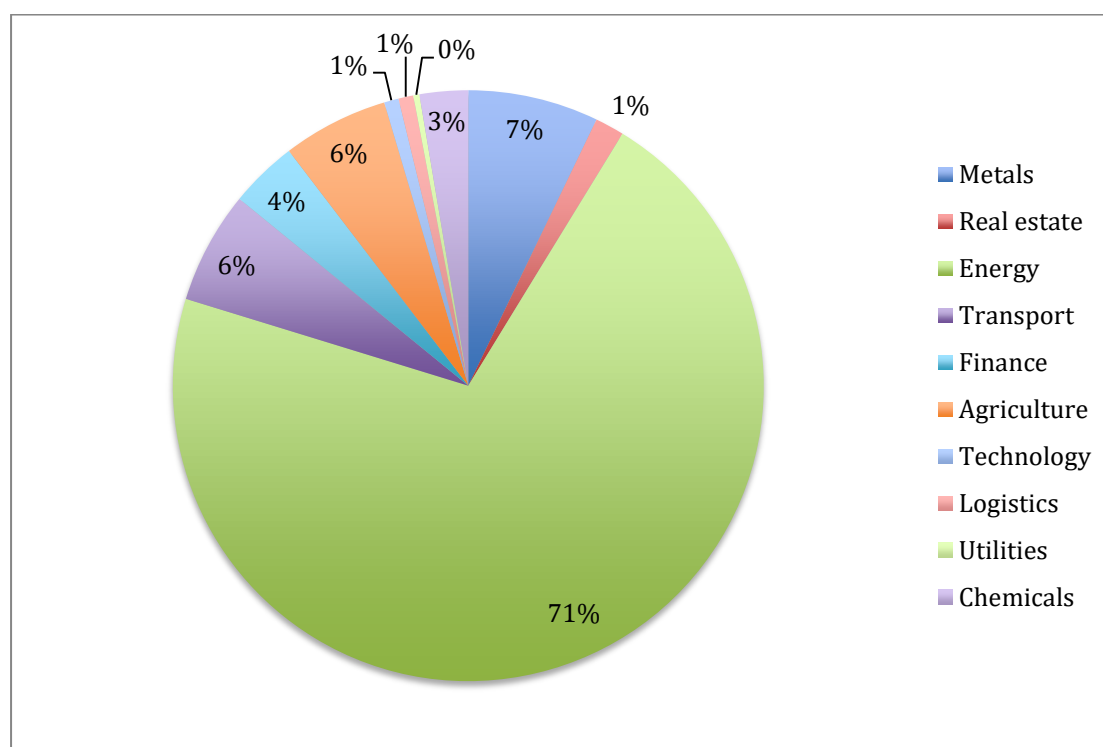
Brazil has become more dependent on the Sino-Brazilian oil trade than China, rendering their relationship in oil trade an asymmetrical one in China's favour.

In sum, the oil trade between Brasília and Beijing display clear signs of the intensification in the Sino-Brazilian energy relationship. Brazil is becoming increasingly important to Chinese oil imports, although the relationship is showing signs of asymmetrical interdependence in Beijing's favour.

Energy investments

In addition to being China's top trade partner in Latin America, Brazil is also the largest market for Chinese foreign direct investments. From 2009 to 2018 China has invested USD 56.6 billion in Brazil. Figure 4.1 depicts the sectorial share of these investments. The investment profile depicted is similar to the trade relationship described in section 3.2 in that it shows a high concentration of Chinese activities in the commodities sectors with little diversification into other economic sectors. The lion share of Chinese investments in Brazil was made in the energy sector: 71% of total Chinese foreign direct investment in Brazil, valued at USD 40 billion. Nonetheless, Chinese investments in technology and transportation remain relatively negligible. This finding, in combination with the findings in the countries' energy trade, support the argument that China's OFDI is motivated primarily by the need to secure foreign resources. In the case of Brazil, this is achieved by investing mainly in the country's energy sector.

Figure 4.1 - Sectorial share of Chinese FDI in Brazil (2009-2018)



Source: China Global Investment Tracker, American Enterprise Institute & The Heritage Foundation, 2019

Energy finance

According to Kong and Gallagher 2017, the goals of China's energy finance in general are: 1) to address the domestic gap in oil supply, 2) to stimulate China's exports, and 3) to gain access to foreign technology (Kong & Gallagher, 2017, pp. 341-342). In this way, China's energy loans are in accordance to the country's "going-out" policy¹⁷.

In the case of Brazil, most of Chinese energy loans to Brazil take place in the area of exploration and extraction (Gallagher, 2018). An important component of the energy loans are the loans-for-oil¹⁸. Brazil was granted this form of loan from the CDB in 2009 and 2016, both valued at USD 10 billion (Gallagher, 2018). The loan in 2009 was granted to Petrobras in exchange for: 1) a ten year oil delivery contract to supply Sinopec with 0.15 to 0.20 million barrels per day (mb/d), and 2) a MOU between Sinopec and Petrobras aimed at deepening cooperation between the firms (Meidan,

¹⁷ The policy is discussed in section 2.3.1

¹⁸ As discussed in section 2.3.1

2016a, p. 14). CBD's USD 10 billion loan to Petrobras in 2016 is to be paid back in oil or cash at China's request (Blount, 2016).

The loan-for-oil deals between CDB and Petrobras led to increases in Brazil's oil exports to China, albeit for ten years after the signing of the loans. In this sense, these financing activities in Brazil do contribute to China's energy security of supply, albeit for the medium as oppose to the long term.

In sum, the trade, investment, and financial activities of China in Brazil's energy sector is very much in line with Chinese energy strategy and the 'going out' policy. The findings shows: 1) increased interdependence in the countries' oil trade, although to China's favour, 2) Beijing's FDI in Brazil is concentrated to the energy sectors, and 3) Chinese loans in the energy sector contributes towards increasing its energy supply from Brazil.

4.3 China National Petroleum Corporation activities in Brazil

CNPC reports 2013 as their entrance into the Brazilian oil and gas sector, however the firm did have a construction contract with Petrobras in 2006 to construct a pipeline: Petrobras-CNPC Gascav natural gas pipeline deal (Xu Y. , 2017, p. 51). Although, this is not an investment in Brazil's energy sector, it does represent activity of CNPC in Brazil. According to the China Global Investment Tracker, a database produced by American Enterprise Institute and The Heritage Foundation that keeps track of China's global foreign direct investments, CNPC has made two investments in Brazil's energy sector since 2013. These investments are illustrated in table 4.2.

Table 4.3 - CNPC investments in Brazil in million USD (2013-2018)

Year	Value	Fuel	Local party	Location	Status	Contract Form
2013	\$1.280*	Oil	Petrobras	Libra	On-going	Production sharing contract
2017	\$120	Oil	Petrobras	Peroba**	On-going	Production sharing contract

Source: China Global Investment Tracker, American Enterprise Institute & The Heritage Foundation, 2019

** Collective investment between CNPC and CNOOC*

*** Source: (ANP, 2018)*

CNPC made its first investment in Brazil in 2013, when the consortium comprising of CNPC (10%), CNOOC (10%), Shell (20%), Total (20%), and Petrobras (40%) won a bid to develop Brazil's offshore Libra oil field (CNPC, 2013). The Libra block was discovered in 2010 and is a vast pre-salt oil field covering approximately 1.550 square kilometres. The field is located 170 kilometres off the coast of Rio de Janeiro, in the Santos Basin ultra-deep waters (CNPC, 2013). This block is the largest ultra-deep water oil fields in the world, and the largest oil reserve in Brazil. The recoverable volume of oil is estimated to vary between 3 and 15 billion barrels, the most probable estimate being 7,9 billion barrels. By 2021 the Libra oil field is expected to produce 1.4 million barrels per day (ANP, 2010).

The project was granted to the consortium, named Libra Oil & Gas, by ANP under a 35-year production-sharing contract to be managed by Pré-Sal Petróleo S.A. (Offshore Technology, 2019). Under the production sharing contract the consortium is obliged to grant the state 41,95% of the oil generated by their activities in the Libra oil field. This undertaking was CNPC's first deep-water project (CNPC, 2013). CNOOC and CNPC have invested USD 1.28 billion cumulatively for their stake in the Libra Oil & Gas Consortium (American Enterprise Institute & The Heritage Foundation, 2019). First oil from the Libra field flowed in November 2017 (Reuters, 2017).

In 2017 CNPC invested USD 120 million in acquiring the Peroba block; a pre-salt oil field located 300 kilometres of the coast of Rio de Janeiro. In this case the firm was part of a consortium where it held 20% interest, Petrobras (the operator) and British

Petroleum (BP) each held 40% interest in the consortium (Oil and Gas Journal, 2017). Same as the Libra project, the consortium will develop the Peroba oil field under a production-sharing contract. The consortium's winning bid included a 76,96% profit oil for the state (ANP, 2018). The Peroba block is estimated to hold 5.3 billion barrels of oil. This project is still in the exploration phase as the consortium has started drilling activities in the Peroba block in 2018 (The Oil & Gas Year, 2018).

The latest CNPC venture in Brazil is the signing of an integrated project business model with Petrobras to form a strategic partnership. This partnership intends to complete the Comperj refinery in Rio de Janeiro. As part of this agreement the parties are to conduct feasibility studies to evaluate the technical status of the refinery, conduct business valuation, and determine the necessary investments to conclude the refinery. After the benefits and costs of this refinery are assessed the parties will advance to the creation of a joint venture to complete and operate the refinery. Petrobras will own 80% of the venture and CNPC will own 20% (Brelsford, 2018). This project holds significant potential to Sino-Brazilian energy relations as it can contribute towards reducing the weight of oil shipments to China (Koch-Weser, 2015, p. 15).

This section showed that CNPC projects in the Brazilian oil sector are in the exploration phase. The motivation for CNPC to invest in these projects stem from commercial considerations; CNPC can make much more profit from securing oil-producing rights overseas¹⁹. One of the reasons for Chinese loans and investments in the energy sector is to circumvent the strict local content regulations in Brazil (de Almeida & Consoli, 2014, p. 3). The activities of the CNPC depicted in this section display the geoeconomic logic of power. CNPC seeks to export excess labour and production from China. However, they are restricted by local content regulations in Brazil. Therefore, they adopt a strategy were they are acquiring Brazilian service firms and forming joint ventures in order to bypass strict local content regulation.

¹⁹ Producing oil abroad is less costly for Chinese NOCs as oppose to importing oil to China or producing in Chinese oil fields. Hence, there are high profits for CNPC because market oil prices are composed of: cost of crude oil, refining costs, and distribution costs. The last two costs are relatively stable. However, crude costs fluctuate regularly. The Chinese government sets oil prices in China; hence CNPC can raise its profits by restraining costs. As a result when the world oil prices rise, their profits go up. When world oil prices fall, NOCs could lobby the government to set prices that cover their costs (Chen, 2008, p. 92).

These projects show CNPC's interest in: 1) gaining technological know how through technology transfers, and 2) gaining experience in deep-water E&P.

4.4 Contribution to China's energy security of supply

The volume of crude oil exports to China can serve as measure to the extent to which the Sino-Brazilian relationship contributes to China's energy security. Traditionally Brazil supplied marginal amounts of crude oil to China. However, in the first decade of the 2000s the two countries established institutional frameworks to intensify their relationship in several areas, including energy and political relations²⁰. At the same time economic relations intensified leading to increased Chinese trade, investment, and finance activity in Brazil's oil industry. As a result, in 2018 Brazil has become significantly more important to China's oil imports, exporting USD 16.2 billion worth of oil to China. Hereby, the country positioned itself as the sixth most important oil exporter to China, surpassing Middle Eastern suppliers such as Iran and Kuwait. Since 2014 Brazil has grown its oil exports to China by 231%. Hence, it is evident that Brazil is rising in importance in regards to its contribution to China's energy security of supply (International Trade Centre, 2019).

China's economic objectives *vis-à-vis* Brazil included the export of excess labour and production, while its geopolitical objectives included access to energy resources. The diplomatic efforts referred to above formed the geopolitical engagement of China in Brazil, which was to be followed by the geoeconomic engagement²¹.

With regards to CNPC's contribution to Brazil's oil supply to China, the findings show that these are negligible due to the early stages of CNPCs Pre-Salt projects. The maturity of these projects will lead to increasing oil exports to China (de Almeida & Consoli, 2014, p. 3), and as a result increase CNPCs contribution to China's energy security of supply. Nonetheless, CNPC does contribute indirectly towards Brazil oil supplies to China by contributing to PPSA's aggregate supply, intended for export, in accordance with the production sharing contracts in the Pre-Salt area²². Hence, CNPC's pre-salt oil play remains a potential contributor to Chinese energy security of

²⁰ These efforts are discussed in section 3.3.1

²¹ Made up of the efforts discussed in section 3.3.2 and those discussed in this chapter

²² Koch-Wesser argues that adding to the international aggregate supply of oil contributes to a stable oil market (Koch-Wesser, 2015, p. 15-18)

supply from Brazil. Another project that holds potential as to China's energy security is the Comperj Refinery, which would contribute in lowering the weight of oil shipments and reduce the cost of transportation (Koch-Weser, 2015, p. 15).

Additionally, CNPC's activities in Brazil contribute to China's energy strategy²³. However, this contribution stems from commercial rather than political motivations. Its activities in the pre-salt area grant it access to technology, and potentially vast profits when the pre-salt oil fields are up and running.

4.5 Conclusion

This chapter focused on CNPC's contribution to China's energy security of supply by addressing the questions: *what is the current state of China's trade, investment, and finance activities in Brazil's oil sector, and CNPC investments in the Brazilian oil sector?* Section 4.2 answered the first part of the question regarding Chinese trade, investment, and finance in Brazil's energy sector. Its principle findings were: 1) that the Sino-Brazilian oil trade is characterised by asymmetrical interdependence where Brazil is more dependent on China than the other way around, 2) China's investments and loans are increasingly confined to the energy sector, and 3) CNPCs activities in Brazil's oil sector contributes marginally to China's energy security of supply while holding the potential for improved contributions in the future.

²³ As discussed in section 2.3.1, China's energy strategy aims at: 1) increase domestic oil production, 2) procurement of equity oil abroad, 3) geographical diversification of foreign oil supply, and 4) combining energy security objectives with foreign policy and diplomatic efforts

Chapter 5 Domestic and Geopolitical Economic Challenges

5.1 Introduction

So far, the study outlined China's energy situation and the corresponding strategies as well as the role of NOCs therein. Subsequently, the constraints of the Brazilian oil sector were examined, before an analysis of the Sino-Brazilian energy relations. This Chapter will elaborate on the domestic and geopolitical economic challenges to the Sino-Brazilian energy relationship. The chapter will seek to answer the question: *What are the implications of China's geopolitical economic engagement in South America to the Sino-Brazilian energy relationship?*

Section 5.2 will address the geopolitical economy of Latin America after the Cold War by discussing the activities of the US, Brazil, and China in the region. Subsequently, section 5.3 will consider the implications of Chinese involvement in South America to the Sino-Brazilian energy relationship. Finally the chapter will analyse Brazil's domestic challenges to its energy relationship with China.

5.2 Geopolitical economy in Latin America after the Cold War

This section will discuss the power projection of the US, Brazil, and China in South America. The section will start with an examination of the interests and involvement of the US in the Latin American region, and its role as hegemon. Thereafter, Brazil's interests in the region will be discussed along with the role of Brazil as a regional power. Subsequently, China's rise in the region, its interests, and the implications to the region's geopolitical economy will be discussed.

5.2.1 The US in Latin America

Ever since its conception America has been active in the South America eventually turning into a predominant actor in the region (do Carmo & Pecequillo, 2016, p. 56). US interests in Latin America can be categorised along strategic, economic, and political lines. In strategic terms, US interest in Latin America are: 1) to prevent the rise of any military threats to the US territory arising from the region, and 2) to prevent hostile powers from gaining influence in the region and threaten US political and economic interests. Economically, the US is interested in promoting economic development in Latin America that is compatible with US economic interests: policies

that keep the region's markets open to US goods and capital. Politically, US interest lies in preventing significant instabilities with the potential to cause large waves of immigrants, or negatively affect its trade and investment activities in the region (Coll, 1997, pp. 45-46). American engagement in the region has always been aimed at furthering these interests.

After the Cold War, and the end of bipolarity, the US embarked on an integration process to incorporate South American countries in its sphere of influence. The resulting American hegemony in South America was based on three pillars: 1) the Washington Consensus, emphasising reduction in the role of the state, trade liberalisation, deregularization and privatization, reduction in social expenditures, and flexible exchange rates, 2) regional integration, emphasising proposals such as the creation of the Free Trade Area of the Americas (FTAA), and 3) a shared security concept, rooted in the demilitarisation of the region and common agendas for addressing issues like human rights, drug trafficking, immigration, and good governance (do Carmo & Pecequilo, 2016, p. 56).

American interest in South America is embedded in the Washington Consensus, defined by Vadell (2013) as “a hegemonic articulation of a model of adjustment and reform that includes the rapid unilateral liberalization of trade and finance and privatization of state-owned companies to adapt nations to “correct” form of modernity in relation to the first world” (Vadell, 2013, p. 40). The model became prevalent in the wake of the Cold War, and the countries in the region adopted the model with the aid of international institutions including the International Monetary Fund (IMF) and the World Bank. These institutions supported the Washington Consensus by providing loans to participating countries conditioned on structural adjustment policies in line with the recommendations that included deregulation of the economy, financial liberalisation, unilateral trade liberalisation, privatisation of public firms, and cuts in state spending and budget adjustment (Vadell, 2013, p. 41).

US attempts at regional integration in Latin America has revolved around bilateral Free Trade Agreements (FTAs) and multilateral treaties. The most important multilateral efforts included the FTAA and North American Free Trade Agreement of United States, Canada and Mexico (NAFTA). The FTAA was intended to connect the

economy of the US to that of the Latin America and the Caribbean (LAC) countries to progressively eliminate trade and investment barriers between the countries involved. However, the efforts that started in 1998 failed in 2005 in light of ideological differences between the North and South American countries (Valadao, 2009, pp. 211-212).

However, in early 2000s, as the US embarked on a “global war on terror” after the September 11, 2001 terrorist attacks on its soil, it distanced itself from the region creating a power vacuum. This phenomenon set the stage for autonomous proposals among South American states that excluded the US, and focused on the interest of South American countries (do Carmo & Pecequillo, 2016, p. 57). These efforts included mainly; Union of South American States (UNASUR) initiated by Brazil, and the Bolivarian Alternative for the Americas (ALBA) initiated by Venezuela (Kellogg, 2007, p. 189). Furthermore, the US distancing from Latin America created the conditions for China’s rise in the region.

5.2.2 Brazil in Latin America

Brazil is the most important trading partner to several Latin American countries. Latin America’s geographical composition presents a serious challenge not only to Brazil, but the region as a whole, as it presents technical challenges and raises the costs involved in infrastructure projects (Stratfor, 2012). This phenomenon is depicted in figure 4.2; the physical map of South America. The map shows that the Andean mountain chain along the continent’s western edge reaches heights of seven thousand metres, and that most of the continent is composed of mountains and jungle. The southern cone is a contrast to the rest of the continent; it is a vast stretch and mostly flat territory of which the bulk lies in Argentina (Stratfor, 2012). These geographic configurations have led to low road density, which instigates low levels of intraregional trade, and high costs to the economies in the region²⁴ (Scholvin & Malamud, 2014, p. 17). Consequently, as a regional power, one of Brazil’s main objectives in Latin America is to integrate the region so as to facilitate its participation in the global economy and power projection in the region. Brazil has

²⁴ For a comprehensive analysis on Latin America’s infrastructure deficit and the economic costs associated with it, consult the report issued by ECLAC titled “Identificación de Obstáculos al Transporte Terrestre Internacional de Cargas en el MERCOSUR” by Ricardo Sanchez and Georgina Tomassian (2003)

sought to achieve this objective primarily through: 1) *Mercado Comun del Súr* (Common Market of the South (MERCOSUR)) established in the 1991, and 2) the Initiative for the Integration of the Regional Infrastructure of South America (IIRSA) established in 2000 (do Carmo & Pecequilo, 2016, pp. 54-56). MERCOSUR consists of Brazil, Argentina, Paraguay, Uruguay, and Venezuela. The organisation was established as an attempt by Brazil and Argentina to withstand US offensive in the region after the end of the Cold War and bipolarity. The objective of regional integration requires transport infrastructure to connect the regional markets, and access to the Pacific Ocean to connect Brazil with the emerging Asian markets (Scholvin & Malamud, 2014, p. 31). Therefore the creation of the IIRSA represents a key step in regional integration of Latin America as the initiative aims at regional integration through transportation, energy, and telecommunication infrastructure (Scholvin & Malamud, 2014, pp. 18-21).

So far, the findings show that Brazil and the US pursue the illusive goal of Latin American integration with differing objectives. With the Washington Consensus, the US aimed to dominate Latin American countries through integration into its economic model, while Brazil sought to become a global power and connect its economy to regional and international markets. Hence, for Brazil the Pacific Consensus²⁵ introduced by China in Latin America represents an attractive alternative to the Washington Consensus.

²⁵ The Pacific Consensus is discussed in section 5.3.3

Map 4 – Physical map of South America



Source: www.worldatlas.com²⁶

5.2.3 China in Latin America

China has three fundamental objectives in Latin America: 1) the establishment of a new international economic and political order, 2) diversify Beijing's export and import markets to reduce economic dependency on the US, Europe, and Japan, and 3) secure access to natural resources in support of its economic growth (Cheng, 2006, p.

²⁶ Retrieved from: <https://www.worldatlas.com/continents/south-america.html>

512; Vadell, 2013, pp. 39-40). Therefore, peaceful-development and non-intervention are prominent in China's foreign policy (Amineh & Houweling, 2010, p. 248; Cheng, 2006, p. 505). China's approach to LAC, like many of its global relationships, has predominantly relied on soft rather than hard power. This section will show that China's rise in Latin America is based on cooperative exercises in international and regional institutions, as oppose to military alliances and mobilisation.

The economic crises Latin America went through in 1980s, 1990s, and 2008 have rendered states in the region disillusioned with the Washington Consensus. First, the programme failed to generate higher economic growth rates and improve social indicators. Second, the region's dependence on institutions such as IMF and World Bank accompanied with the privatisation of state-owned firms led to policy constraints and indebtedness amongst countries in the region. Hence, China is able to push for its own Pacific Consensus: "a commercial and investment movement toward the pacific geo-economic area" (Vadell, 2013, p. 40). Contrary to the Washington Consensus, the Pacific Consensus does not prescribe any specific development model. Instead it allows for political manoeuvring by developing states through: 1) serving as a commercial and financial alternative to the Washington Consensus, 2) refraining from imposing political conditions on its investments, and 3) employing a bilateral strategy to its trade and investment negotiations with developing nations (Vadell, 2013, pp. 42-43). This way the Pacific Consensus is in direct competition with the US led neo-liberal economic model, by proposing initiatives that allows for state-led development. Nowhere is this competition more apparent than the constitutional crisis in Venezuela²⁷, where Opposition leader Juan Guaidó²⁸ challenges President Nicolás Maduro²⁹.

China's rise in the international arena has been accompanied by the rhetoric of win-win cooperation. In the case of China's relationship with LAC, the affairs have been referred to as South-South cooperation appealing to a collective sense of identity as developing nations (Iturre & Mendes, 2010, p. 137). China is currently a major trade

²⁷ Venezuela is of strategic importance to China. Beijing provided USD 67.2 billion in loans to Venezuela between 2005 and 2018 (Gallagher & Myers, 2019), and over USD 12 billion in investments from 2010 to 2016 (American Enterprise Institute & The Heritage Foundation, 2019). A significant portion of the loans involved loans-for-oil deals (Sullivan & Lum, 2019).

²⁸ Opposition leader Juan Guaidó is backed by the US

²⁹ President Maduro is backed by China

partner, investor, and in many cases a top lender to LAC countries (Nolte, 2013, p. 587). PRCs trade with Latin America ballooned from USD 17 billion in 2012 to nearly USD 306 billion in 2018 while becoming the top trade partner to Brazil, Chile, Peru, and Uruguay. Chinese total FDI in the region reached USD 200 billion in 2017 (Sullivan & Lum, 2019, p. 1). Furthermore, China's policy banks have become the largest lender in the region handing out a total of USD 140 billion between 2005 and 2018 (Gallagher & Myers, 2019). Therefore, China aims at promoting stability in the region so as to protect its investments and trade (Vadell, 2013, p. 42).

In practice China pursues bilateral as well as multilateral platforms to challenge US hegemony globally, and in the LAC region specifically. In South America, China forges relationships with states under the rhetoric of cooperation between developing nations, or south-south cooperation, and offers a counterbalance to the traditional reliance on the US (Piccone, 2016, p. 6). Chiefly, China's efforts included: 1) the formation of the China-Community of Latin American and Caribbean States (CELAC) Forum³⁰ in 2010, 2) establishment of the BRICS (a multilateral cooperation mechanism between Brazil, Russia, India, China, and South Africa) in 2006, and 3) the Belt and Road Initiative (BRI) initiated in 2013. The creation of the China-CELAC Forum did two things for China: it formally included the region in Chinese foreign policy, and it established a political and strategic character to China-Latin American relations (do Carmo & Pecequilo, 2016, p. 65).

The BRICS is an alliance between Brazil, Russia, India, China, and South Africa described by Carmona (2014) as a "tactical alliance in favor of the transition to multipolarity, in that it corresponds to the national interest of its members in the aspiration to change the relative position of these countries in the international system" (Carmona, 2014, p. 39). The most important multilateral cooperation between China and Brazil takes place within the BRICS initiative. The initiative was formed in 2006, and since the member's first meeting in 2009 the heads of state have been meeting annually (Abdenur, 2014, pp. 86-87). The main reason for forming the group was the common interest among the member states in the reform of the global

³⁰ The forum grants China the ability to guide the agenda of relations with the region (do Carmo & Pecequilo, 2016, pp. 66-67)

governance structure dominated by the US³¹. The BRICS offer two key benefits to its members: 1) it provides the opportunity for coordinated positions within the group to be adopted in other multilateral settings, and 2) it functions as a platform for specific initiatives in areas of common interest (Abdenur, 2014, pp. 87-88). In 2014, the BRICS Development Bank and the Contingency Reserve Fund Arrangement were founded to enhance the means of obtaining funds for development projects as well as to shield member countries from the negative effects related to imbalances in their balance of payments (Ministry of Foreign Affairs, 2018).

Chinese policy makers have identified the area of infrastructure as a vital area for economic cooperation in Latin America: 1) to transnationalize the capital and industrial capacity in China's domestic infrastructure sector, and 2) it addresses the regions infrastructure deficit, responsible for damaging the regions economies (Niu, 2018, p. 182). To this end the BRI is a pivotal component of Chinese power projection in South America. The BRI refers to a global initiative by China comprising more than 900 infrastructure projects ranging from ports, roads, to digital infrastructure. At the moment the project is valued at approximately USD 1.3 trillion. The objective of the BRI is to develop a web of infrastructure projects to promote connectivity³², while improving prospects for economic development among partner nations³³ (Myers, 2018, p. 293). The only conditions for participating in the BRI are: 1) recipients of loans must adhere to the 'One China' policy, and 2) recipient states must purchase Chinese products, contracting services, and labour. As part of the BRI, China established the Asia Development Bank (ADB) and the Asia Infrastructure Investment Bank (AIIB) to support the initiative's projects. These institutions were developed to address Chinese grievances with the existing global financial order³⁴ characterised by: dominance of the US dollar, and China's underrepresentation at the IMF and World Bank (Aoyama, 2016, pp. 13-14). The BRI did not target Latin America until 2017. The most significant projects under the BRI in Latin America are: 1) the Nicaragua Canal (which has been delayed for environmental and financial

³¹ This phenomenon is discussed further in "China in Latin America" in section 5.3

³² Connectivity in the form of trade, investment, and security

³³ The Chinese objectives are in line with Brazilian objective of addressing the region infrastructure deficit in Latin America, as discussed in section 5.3

³⁴ Based on the Washington Consensus

reasons), and 2) the Bi-oceanic Railway³⁵. The latter project has been agreed on by Brazil, Bolivia, and Peru in 2018. With these projects, China is assisting the region in addressing its infrastructure deficit while improving its access to Latin American resources (Niu, 2018, pp. 186-188).

As to China's relationship with the regional power, Brazil, there are several areas in which the interests of the two countries coincide: both countries are undergoing vast industrialisation led by the state, and both seek to alter the US dominated global order to enable their economic growth. In this sense, the countries can be categorised as contender states. Amineh & Yang (2018) define contender states as "major states that challenge hegemonic, liberal states (Amineh & Yang, 2018, p. 11). Contender states are usually situated outside the influence of the hegemon, and enjoy a faster pace of economic growth compared with the hegemon (Amineh & Houweling, 2010, p. 228). In their development these states have to cope with an existing global order, which they had no part in creating. Hence, contender states challenge the liberal order in a variety of ways: 1) by arranging global level transactions under domestic rules that are opposed to the liberal order, and 2) they try to align global-level arrangements to domestic wealth-power structures (Amineh & Yang, 2018, p. 12).

The findings in this section indicate that China's Pacific Consensus represent the counter-hegemonic component of China's policies in Latin America as a contender state to challenge the Washington Consensus that has dominated the region since the end of the Cold War. Parallel institutions that address regional interests to challenge US hegemony in the region support the Pacific Consensus. After the US disengagement from the LAC region in 2001 China increased its power projection in South America. Thus, Chinese encroachment in the LAC region can be perceived as competition between the US, an industrialised and hegemonic state, and the contender states led by China and Brazil. The US seeks to maintain its influence over a region it considers its "back yard" (Nolte, 2013, p. 587), however China's engagement in the region has increased the regional autonomy of Latin American states to the detriment of US leverage to influence their policies (Nolte, 2013, p. 588).

³⁵ The project has originally been considered by the IIRSA, but financing and coordination related challenges prevented the realisation of the project (Myers, 2018, p. 241)

5.2.4 US Reaction to China's presence in Latin America

The US has not remained idle in the face of Chinese incursions into the South America. The US reaction started in the strategic arena, before extending to the political-economic area. Under the administrations of Presidents Bush and Obama the US made changes to its Southern Military Command: 1) it reactivated the Fourth Fleet in the South Atlantic in 2004, 2) it increased its investment in the Southern Military Command, and 3) created a new military command in charge of projecting power over the African region and the South Atlantic (do Carmo & Pecequilo, 2016, p. 69). These decisions reaffirmed US maritime presence in the South American Region.

On the political-economic front the US has engaged in trade related negotiations to counter Brazil and China in South America. In this regard US actions include chiefly: 1) the support for the establishment of the Pacific Alliance, a forum aimed at free trade to counter Brazilian efforts at regional integration, and 2) the launch of the Trans Pacific Partnership (TPP) in 2015, and 3) the negotiations for the Trans Atlantic Trade and Investment Partnership (TTIP). The TTP comprised Australia, Brunei, Canada, Chile, the US, Japan, Malaysia, Mexico, New Zealand, Peru, and Singapore. Do Carmo and Pecequilo (2016) argue that aside from being a trade agreement aimed at excluding the BRICS, the TTP was a strategic treaty that allowed for the repositioning of US troops aimed at pressuring China, Russia, and India. Similarly, the authors argue that the TTIP, which was unsuccessfully negotiated between the US and the European Union, was an attempt at limiting emerging markets' access to the north (do Carmo & Pecequilo, 2016, pp. 69-70).

Since the BRI's extension to Latin America in 2017, the US reacted in several ways. First, after Panama, El Salvador, and the Dominican Republic³⁶ switched their recognition from Taiwan to China and signed on to the BRI, Washington issued explicit warnings to these countries by temporarily recalling its ambassadors (Stevenson, 2018, p. ix). These actions were followed by the establishment of initiatives that parallel the BRI: *America Crece* (The Americas Grow) (Office of Fossil Energy, 2018), and US International Development Finance Corporation

³⁶ Panama changed its recognition to China in 2017; El Salvador and the Dominican Republic did the same in 2018.

(USIDFC). *America Crece* is an initiative aimed at promoting trade and investment in energy and infrastructure. Coincidentally, Panama was the first country to sign a MOU under the initiative. The USIDFC, signed into law by President Trump in 2018, is a bank worth USD 60 billion that is intended to take equity stakes in infrastructure and other projects in developing countries. The bank is aimed at tackling what American legislators refer to as China's 'debt trap' (Stevenson, 2018, p. ix; OPIC, 2018).

The findings in this section illustrate that China, Brazil and the US³⁷ compete for influence in Latin America. The competition takes place in the economic, strategic, and diplomatic fronts. The area of infrastructure has risen to become the object of power projection from the competing powers for the following reasons: 1) geographic constraints have caused an infrastructure deficit in the region that harms their economic development, 2) after the US detachment from South America China moved into the region with special attention to extractive sectors and infrastructure development through BRI initiatives, 3) the US countered the BRI with parallel initiatives *America Crece* and the USIDFC.

5.3 Geopolitical economic implications to Sino-Brazilian energy relationship

After examining China, Brazil and the US' engagement in Latin America, this section will examine the implications to the Sino-Brazilian energy relationship. Section 5.2 showed that the US, China, and Brazil project power in South America through the employment of geoeconomic (mainly free trade agreements) as well as geopolitical (mainly political forums) tools. The US uses both forms of tools in its engagement with Latin America, while China and Brazil employ primarily geoeconomic tools of such as trade, investment and loans and the BRI.

Latin America is important in Chinese energy policy because it allows China to: 1) diversify its oil supply base away from the Middle East³⁸, and 2) enhance its transport security³⁹. The BRI⁴⁰ plays a pivotal role in achieving these objectives. Several

³⁷ US as the global and regional hegemon, China and Brazil as the contender states

³⁸ The Middle East has been historically unstable, and contains numerous chokepoints that allow the hegemon in the region (the US) the ability to induce structural scarcity (Koch-Weser, 2015, p 14-15)

³⁹ Transport across the Pacific Ocean is significantly more difficult to block

infrastructure projects in the region that connect Brazil's domestic markets with international markets in the region fall under the BRI umbrella. Hence, the BRI has a direct impact on the Sino-Brazilian energy relation. The most significant energy projects in Brazil under the BRI umbrella are: 1) the Belo Monte Transmission Lines, and 2) the Twin Oceanic Railroad Project (Hiratuka, 2018, p. 130). The first project involves Chinese construction companies State Grid and China Three Gorges (CTG). The company is building transmission lines to connect the Belo Monte dam in the state of Para to the southeast regions of the country including São Paulo. The transmission lines will connect Brazil's largest markets (22 million people) to electricity. The Twin Oceanic Railroad project is an attempt to link Brazil's Atlantic ports with Peru's Pacific ports with the aim to improve efficiency and speed of transporting products like soybean, iron ore, and copper from Brazil and Peru to the Asian markets. The rail link would significantly reduce transportation costs for two main reasons: 1) the travel time between Peruvian ports and Asia is significantly shorter than Atlantic routes from the Brazilian ports, and 2) the route will bypass the cost of fares to cross US' panama canal. Furthermore, this rail link is an upgrade from the Bioceanic Highway constructed in 2011 (Hiratuka, 2018, pp. 130-138).

However, the risk to the Sino-Brazilian energy relation lies in China's ability to maintain the infrastructure investments necessary to develop more efficient links between Brazil's energy production and the Chinese market ⁴¹, amidst the geographical challenges and US counter initiatives in the region. The failed projects in the region, discussed in section 5.2.3 speak to the difficulties in maintaining infrastructure investments and integrating the regional markets.

Given that the BRI is a pivotal component of China's foreign policy and its involvement in Latin America, an important implication to the Sino-Brazilian energy relationship is that Brazil is able to benefit from the infrastructure projects to build better connections with regional and Asian markets. As mentioned in this section Brazil is directly benefitting from 2 major infrastructure projects in the region under the BRI's umbrella. Furthermore, these projects have the potential to solidify the Sino-Brazilian relationship. China and Brazil have a complementary of interest and

⁴⁰ Part of China's efforts in the region as discussed in section 5.2

⁴¹ With the objective of reducing transportation costs (Koch-Weser, 2015)

are both contender states that challenge US hegemony in the region. Furthermore, both countries' economies are managed by the state.

5.4 Domestic challenges to the Sino-Brazilian energy relations

Another pivotal implication involves the polarisation of Brazil's business elite in terms of cooperation with China. The nature of China's economic engagement with Brazil brings about several challenges to the energy relationship between the two countries⁴². This phenomenon brought about: 1) intensifying competition in the manufacturing sector between the partners⁴³, and 2) polarisation in Brazil's business elites.

The most significant domestic challenge to further cooperation between China and Brazil in general is the polarised nature of the Brazilian business elites as a consequence of China's economic engagement with the country. The intensification of Sino-Brazilian economic relations produced winners and losers in the Brazilian economy. On the one hand, there are firms that benefit from relations with China, especially those in the agricultural and mining sectors. These companies have formed the *Conselho Empresarial Brasil-China* (CEBC) in 2004, with the goal of enhancing the economic relations between Beijing and Brasilia. On the other hand, there are firms negatively affected by Chinese competition, predominantly those in the manufacturing sector. Various sectorial associations represent these companies; most prominently *Federação das Indústrias do Estado de São Paulo* (FIESP), that call for protective measure against China (Xu Y. , 2017, pp. 46-47; Strauss, 2012, pp. 150-151). This polarisation presents several risks to the energy relationship with China: first, it raises challenges for the Brazilian government to attain unanimous support from its business elites in regards to its policies towards China, and second, given Brazil's competitive political system, disgruntled elites are able to organise and compete for political power. In such a scenario the countries orientation towards

⁴² China's economic engagement with Brazil is discussed in section 3.3.2

⁴³ Section 3.3.2 discusses the growing competition between China and Brazil in the manufacturing sector

5.5 Conclusion

After examining China's energy relationship in chapter 2, Brazil's energy sector in chapter 3, and CNPC's activity in Brazil's oil sector in chapter 4, this chapter analysed the implications of China's geopolitical economic engagement to the Sino-Brazilian energy relationship. The chapter addressed the question: *What are the implications of China's geopolitical economic engagement in South America to the Sino-Brazilian energy relationship?*

The first part of the question is addressed in section 5.2, which discusses the domestic challenges to China's involvement in Brazil. Section 5.3 depicts China's rise in the Latin American Region and the consequences for the US. The section employed critical geopolitics in order to interpret Chinese, Brazilian, and US power projections in the region, and argues that China's rise in Latin America was facilitated by a relative distancing from the region by the US, and the demand for autonomy from the US by South American countries. Furthermore, the section examined the US reaction to China's rise in South America, which included economic, and security measures in the region.

In general, China's efforts in the region are in accordance to the theoretical concept of contender states; because of China's positioning in the region as an alternative to the Washington Consensus.

Chapter 6 Conclusion

The thesis aimed at investigating the role of CNPC in the Brazilian energy sector. To this end the study presented a thorough analysis of the Sino-Brazilian energy relationship, as well as the activities of CNPC in the Brazilian energy sector between 2013 and 2018. The study probed China's energy situation, energy security, and energy policies in order to explain Beijing's "going out" strategy. In order to address the country's rapidly increasing oil demand Beijing seeks to increase its oil supplies. The relationship between the Chinese state and its NOCs, enable NOCs to play a pivotal role in the country's quest for overseas oil supply.

In this thesis, the case study was CNPC's activities in the Brazilian energy sector. Considering the geographical distance between the two countries, the fact that Brazil is not a major oil exporter, and Latin America's traditional position as a peripheral continent in China's foreign policy, the Sino-Brazilian energy relationship is expected to be of marginal concern to China. However, major technological breakthrough in ultra deep water E&P by Brazilian NOC Petrobras has transformed Brazil into a potential major oil exporter. During the past five years the country has risen to become the sixth largest source of Chinese oil imports.

The research was guided by the theory of Geopolitical Economy. The theory's consideration for state as well as non-state actors, and the concepts of *state-market complex*, and *resource scarcity*, *contender states* have contributed to the analysis of the Sino-Brazilian energy relationship. Furthermore, the combination of geopolitical and geoeconomic logics allows for the analysis of political/territorial variables as well as economic ones.

The theory of Geopolitical Economy was employed to test the following hypotheses: 1) the activities of CNPC in Brazil did not increase China's energy supply security, and 2) China's geopolitical economy in Latin America does not threaten the energy relationship between China and Brazil.

The findings in this study confirm the first hypothesis: H1 *the activities of CNPC in Brazil did not increase China's energy supply security*. CNPCs activities in Brazil contributed marginally to China's energy security of supply in terms of oil shipped to China. This finding is related to the novel nature of pre-salt E&P and the fact that first oil only started flowing in late 2017. Hence, it is safe to assume that this contribution will increase in the future. The findings show that there is significant potential for CNPCs activities in Brazil to contribute to China's energy security of supply. However, in order to realise this potential China must deal with domestic challenges in Brazil, and challenges related to the geopolitical economic conditions in Latin America.

As to the second hypothesis of this study, the study found that China's geopolitical economic involvement in Latin America benefits the Sino-Brazilian energy relationship. China's approach to Latin America is balanced in that it challenges US hegemony without seeking a direct confrontation with the hegemon. China's presence in the region is intensifying, especially through the recent expansion of the BRI to Latin America. In response, the US is reacting with initiatives that mimic the configurations of the BRI. The most significant challenge in the South American region is its inherent infrastructure deficit. This phenomenon renders the BRI very attractive to the countries in the region. However, China's ability to aid Brazil's into a significant supplier of its oil imports will depend on China's ability to maintain the significant infrastructural investments required to connect the Chinese market to Brazilian oil supplies.

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