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## Chinese energy investments in Europe: An analysis of policy drivers and approaches



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#### HIGHLIGHTS

- A timeline of Chinese energy investments in Europe, 2008–2015, is presented.
- Two tables dividing Chinese investments by sector and company type are presented.
- Most Chinese investments concentrate on shares of Europe's fossil fuel sector.
- Chinese investments rest on bilateral agreements with EU members.
- Chinese investments in EU serve 'internationalization' of Chinese companies.

#### ARTICLE INFO

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#### ABSTRACT

Enhancing the understanding of China-EU energy relations, the article examines Chinese energy investments in Europe from 2008 to 2015 and analyzes the energy interests and policy approaches underpinning them. Analysis of this data shows that within the EU, 30 Chinese investments largely focused on the oil and gas sector, especially through the acquisition of company shares. Chinese energy investments in Europe reflect a clear political and commercial strategy that addresses the PRC's need to balance supply chain security of fossil fuels, environmentally friendlier energy production and use as well as to enhance the market position and energy-industrial capabilities of Chinese state-owned or state-supervised energy companies. Based on a comprehensive set of domestic incentives for international investment the Chinese penetration of the European energy sector is embedded within two levels of political cooperation. The first level revolves around bilateral investment agreements between China and 27 EU member states. On the second level, China and the EU have established a variety of formats that guide their energy cooperation. The conclusion of the proposed bilateral investment agreement between the PRC and the EU would create a uniform investment environment across the continent and facilitate mutual economic benefits for both parties.

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#### 1. Introduction

In its 12th Five-Year Plan (2011–2015), the People's Republic of China (PRC) aimed to reconcile short-term economic growth with a more sustainable long-term approach to economic, social and environmental development. The 13th plan (2016–2020) points in a similar direction as it suggests a stronger focus on sustainable growth, environmentally friendlier industrial infrastructure development and a lowered dependence on carbon-emitting fuels and technologies (Xinhua, 2015a, 2015b, 2016; Kennedy and Johnson, 2016).

Against this backdrop, Chinese investments in the European Union's (EU) energy sector need to be understood as part of a

broader strategy that aims to consolidate the PRC's energy needs with economic and environmental goals. Based on data compiled in the China Global Investment Tracker provided by the American Enterprise Institute and the Heritage Foundation (2016), between 2008, when the first investment occurred, and 2015 China invested US\$ 28.2 billion the EU's energy sector. Measured as a share of all global Chinese energy investments between 2008 and 2015, Europe<sup>1</sup> accounted for 6%. Adding to the vast literature on Chinese energy policy and security, this article analyzes the Chinese energy investments in EU member states from 2008 to 2015 as well as the

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energy interests and policy approaches in which they are embedded. Thus enhancing the understanding of Chinese energy interests with regard to Europe, the central questions addressed in this article are: How can general Chinese energy interests and specific Chinese investments in Europe's energy sector be understood, what political drivers underpin them and what is their political context within wider EU-China energy and investment relations?

In order to answer these questions, the following analysis will consist of three parts. First, China's energy requirements will be examined and its energy-related political priorities will be linked to theoretical approaches to energy security. Second, on the basis of the data provided by the American Enterprise Institute and the Heritage Foundation all Chinese energy-related investments within the EU from 2008 to 2015 are thoroughly assessed. Third, the 'toolkit' of government policies and political instruments in place to foster Chinese investments in Europe and structure energy policy relations with the EU will be discussed in order to demonstrate the political context in which they are embedded and supported.<sup>2</sup>

Overall, the paper finds that the Chinese penetration of the European energy sector serves both political and commercial purposes. Supported by a set of domestic incentives the investments reflect the broader energy policy strategy of the PRC as they address the need to balance supply chain security of fossil fuels, environmentally friendlier production techniques as well as increased shares of renewable energy and energy efficiency. Commercially they provide ample opportunity to improve the market position and energy-industrial capabilities of Chinese energy companies. The international political framework that surrounds these investments is largely based on bilateral investment agreements between China and 27 EU member states and increasing energy cooperation between China and the EU as a whole.

#### 2. Methodology

Chinese energy interests are examined in two ways. First, data on the energy use within the PRC as well as with respect to existing import dependencies, human health and environmental concerns will illuminate China's basic energy situation. Second, drawing on conceptualizations of various energy security dimensions this data is then linked to theoretical concepts of energy security in order to illustrate the underlying energy security interests resulting from this energy situation and to provide for an analytical framework in which Chinese energy investments in Europe can be understood. This is done by employing a general distinction between impacts on the energy supply chain and impacts of the energy supply chain put forward by Winzer (2012) as well as the energy security approach developed by Sovacool and Brown (2010) and the industrial and energy efficiency dimensions of energy security as presented in the "Routledge Handbook of Energy Security" (Pakiam, 2011; Trudeau and Taylor, 2011). These are all discussed in more detail in Section 3.

As Chinese investments have increased worldwide over the past decade, a number of different sources have assembled data collections that provide the basis for further analysis. Official government data about Chinese foreign direct investment (FDI) in Europe is published by the PRC's Ministry of Commerce (MOF-COM) and by the EU's statistics agency Eurostat, which assembles information on FDI in the European Union by collecting data from

its member states. Using MOFCOM data Lv and Spigarelli conducted an in-depth study of Chinese foreign direct investment in the European renewable energy sector (Lv and Spigarelli, 2015). In 2012 The Rhodium Group, a U.S. based company specializing on economic research, published a comprehensive report on Chinese FDI in Europe (Hanemann and Rosen, 2012) and in 2015 (Rhodium Group, 2015), partnering with the German think tank Mercator Institute for China Studies (MERICS), put out another study on Chinese FDI in Europe and Germany (Hanemann and Huotari, 2015). A similar report on Chinese overseas direct investment in Europe was published by Jia (2015).

Other data collections include the 2012 report by the Europe China Research and Advice Network, a project funded by the EU from 2011 to 2014, a report by the Antwerp Forum (2013), a platform to foster business relationships between Europe and China, as well as a report by EU SME Centre (2014), an EU initiative that helps small and medium-sized enterprises in preparing business operations in China. All these datasets, and others, differ on the definitions of the investments they cover, the scope of their specific time frames and the inclusion of the types of investments, energy sectors and countries.

In Section 4 data extracted from the Chinese Global Investment Tracker provided by The Heritage Foundation and the American Enterprise Institute, two U.S. think tanks, will be used for further analysis. They have collected a comprehensive set of data covering 2000 successful and 170 troubled worldwide Chinese investments in various economic sectors from 2005 to 2015. Without further analysis this data does not differentiate between different sources of investment, but it lists different types of investments including direct take-overs of other companies, acquisition of shares, and agreements on construction contracts in various energy subsectors. To limit errors and omissions all investments listed in the data set have been carefully proved. Selecting all Chinese investments within the EU, the data presented in the three tables below allows for cross-referencing between various types of investments, investors, energy sectors and countries and therefore provides a fruitful basis for analysis. In order to determine the policy framework underpinning these investments, Section 5 relies on documents about domestic Chinese incentives to invest overseas, energy and investment agreements between China and Europe as well as literature on EU-China relations more generally.

#### 3. China's energy interests

Before assessing China's investments in Europe's energy sector it is equally important to address the question of what China's energy interests are and what it does not seek in Europe on the one hand, and to put this in the context of the vast literature on energy security on the other. China's economic transformation, the pace of its growth and the need to sustain and increase it, have enormously transformed the country's energy use, the structure of its energy economy and thus respective policy drivers and approaches. Apart from being the world's most populous nation and its second largest economy, China is also the largest energy consumer worldwide. The PRC's energy consumption consists of coal (66% in 2012), oil (20%), hydroelectric power (8%) natural gas (5%), renewable energy (1%) and nuclear energy (less than 1%) (U.S. Energy Information Administration, 2015). The consumption of fossil fuels thus makes up nearly all of the energy consumed in China. Shares of renewable energy are significantly lower than in European countries or the United States. According to data provided by the International Energy Agency, the PRC is the largest coal consumer, producer and importer worldwide in absolute numbers (International Energy Agency, 2015). In 2009 China became a net importer of coal, mostly from Australia and Indonesia

<sup>&</sup>lt;sup>2</sup> For an overview of the institutional framework and the interplay of various bureaucratic actors of Chinese energy policy making and investments more generally see Jiang and Sinton (2011, 25–27), Sauvant and Chen (2014) and Xuantong Zhu (2015, 16, 62, 63).

(U.S. Energy Information Administration, 2015). China began importing natural gas in 2007, and in 2013 32% of its total gas demand was satisfied by foreign sources, mostly from the Caspian Sea and its wider neighborhood in Asia and Russia via pipeline. China imports Liquefied Natural Gas (LNG) from Qatar, Southeast Asia and Australia. When it comes to energy imports, China's most important concern, however, has been securing an adequate supply of foreign oil. After having become a net importer of oil only in 1993, its import dependency has climbed to 57% in 2013. Most of these imports come from the Persian Gulf (52%), Africa (22%), the Americas (11%) as well as the Caspian region and Russia (13%) (U.S. Energy Information Administration, 2015). In 2013 China surpassed the United States and became the world's largest importer of foreign oil (U.S. Energy Information Administration, 2014).

China has reacted towards its dependence in absolute supply and relative shares of oil imports in a number of ways. First, China is currently establishing its own strategic oil reserve with a total storage capacity of 85 million tons by 2020 (Zhang, 2011). Second, the importance of oil imports has led China to encourage global investments by its National Oil Companies (NOCs) as part of a 'Going out'-strategy<sup>3</sup> since the early 2000 s. Since then the NOCs have purchased substantial service contracts, bought equity shares and together with the Chinese government negotiated oil-for-loan deals with foreign countries in all oil-producing regions of the world (Jiang and Ding, 2014; Jiang and Sinton, 2011). Third, China faces the challenge of ensuring the security of transportation routes, most notably the Strait of Malacca, which is China's main concern when it comes to the transportation of its energy imports.<sup>4</sup> In order to decrease the vulnerability of physical supply disruption China has invested in cross-border pipeline projects in Myanmar, Kazakhstan and Russia. Furthermore, in its military strategy, published in 2015, the PRC specifically lists energy security and the security of sea lanes as core national interests that need to be safeguarded and require military attention (The Information Office of the State Council of the People's Republic of China, 2015).

The PRC's energy interests, however, go beyond supply security and the need to import oil, coal and gas. Therefore significant scholarly attention has been devoted to assessments of various Chinese energy security challenges and its respective energy policy measures (Bambawale and Sovacool, 2011; Cao and Bluth, 2013; Ebel, 2009; Jiang and Ding, 2014; Jiang and Sinton, 2011; Leung, 2011; Lu et al., 2014; Meidan, 2014; Paul, 2010; Sun et al., 2014a, 2014b; Wang et al., 2011; Wu, 2014; Yao and Chang, 2014; Yao and Chang, 2015; Zhang, 2010; Zhang, 2011; Zhao et al., 2014). If we follow Winzer's suggestion, a fundamental distinction is required between

"threats that have an impact on the supply chain and impacts of the supply chain on the environment. The concept of energy security could be limited to threats that have an impact on the energy supply chain, while impacts of the energy supply chain on environmental belong to the concept of sustainability" (Winzer, 2012, 41).

As a result of its enormous energy requirements, inadequate

industrial infrastructure and lacking technological expertise, China faces daunting environmental and public health challenges that make the sustainable use of any energy source a priority for policymakers. China is the world's biggest CO2 emitter from fuel combustion and its urban, coastal areas suffer from heavy air pollution. This has led to dramatic consequences for public health: A 2013 study found that people in Northern China on average lose five years of their life expectancy due to the effects of air pollution (Chen et al., 2013). According to a 2015 study each year 1.6 million Chinese citizens die of the consequences of this pollution (Rohde and Muller, 2015, 8). Another study finds that China is the country with the highest number of premature deaths also due to massive air pollution (Lelieveld et al., 2015). These problems arise mainly from the excessive use of coal. Power generation accounts for half of Chinese coal consumption; the rest is largely made up of the industrial sector (41%). Coal is essential for China's economic development, its industrial output and its power generation. However, many coal mines lack sufficient investment, are operated with outdated technology and infrastructure as well as inadequate safety regulations (U.S. Energy Information Administration, 2015). Especially the latter have frequently caused the death of workers, although China has cut down the annual number of coal mine deaths from 7000 in 2002 to 931 in 2014 (Xinhua, 2015c). According to a Pew Research Poll (2013) air and water pollution have risen to the forefront of concerns of the Chinese public. As China's economic growth is likely to continue - even if at lower rates increasing its energy efficiency and the share of renewables in its energy mix are two imperatives for sustainable economic, environmental and ultimately social development. China has therefore not only widened the scope of its imports but also set in place various instruments to move towards a more sustainable use of energy (Martinot and Zhang, 2012; Zhao et al., 2014).

The development of general conceptualizations and models of energy security with regard to specific energy sectors and countries has received significant scholarly attention over the past years (among many others: Hughes, 2009; Jewell, 2011; Sherp and Jewell, 2014; Winzer, 2012; Sovacool, 2011). As noted above, China's energy situation and its energy policy have also been examined to a considerable extent. When it comes to the Asia-Pacific region the works of Vivoda (2010) and Sovacool (2010) stand out as contributions for identifying and analyzing energy security challenges and providing comprehensive sets of assessment tools and measurement indicators. However, it is not the goal of this article to comprehensively conceptualize Chinese investments in Europe's energy sector along a certain theoretical framework. Nevertheless, in addition to the general distinction put forward by Winzer (2012), the energy security approach by Sovacool and Brown (2010) will be used in order to illustrate various dimensions of Chinese energy security considerations as they serve as important policy drivers underpinning Chinese energy investments and policy approaches in Europe.

According to Sovacool and Brown, the term "energy security should be based on the interconnected factors of availability, affordability, efficiency, and environmental stewardship" (Sovacool and Brown, 2010, 81). As made clear above, Chinese energy security concerns need to balance the availability of urgently needed resources with environmental stewardship. In "The Routledge Handbook of Energy Security" that he edited, Sovacool compiles various dimensions in which energy security can be conceptualized. Among these different approaches, many are applicable to China's energy interests: the diversification, sustainable development, maritime, social, environmental, industrial and energy efficiency dimensions are all part of the PRC's energy security considerations (Sovacool, 2011). Besides 'classic' approaches of framing energy security as security of supply while emphasizing physical supply, transport security and price stability, there is a lot

<sup>&</sup>lt;sup>3</sup> The term 'Going out'-strategy is used here as it is the most prominent expression for this strategy and respective policies. Another term used in several publications by the International Energy Agency (Jiang and Ding, 2014; Jiang and Sinton, 2011) is 'Going abroad'-strategy.

<sup>&</sup>lt;sup>4</sup> The so-called 'Malacca dilemma', coined by then-president Hu Jintao to describe Chinese interests in the secure passage of the Strait of Malacca, has been subject to debate as to whether or not it needs to be perceived as a serious energy security challenge for the PRC or if it has been deliberately exaggerated to serve the interests of individual bureaucratic actors and institutions within China. See also Zhang (2011), Tunsjø (2013, 119), Sun et al. (2014a), Meidan (2014) for further discussion.

of room for additional analytical angles. As China tackles multiple energy security challenges simultaneously, Chinese energy policies must be viewed as the results of balancing conflicting aspects of energy security. These include supply security of fossil fuels, environmentally friendlier production techniques as well as increased shares of renewable energy, energy efficiency and respective market shares, technological know-how and industrial capability.

In 2007 and 2012 China published two White Papers on energy policy. In the 2007 paper China identified three major challenges in the field of energy: First, a shortage of high-quality energy resources and low energy efficiency, second, environmental damage resulting from the consumption of fossil fuels, and, third, an incomplete energy market system coupled with low standards of safety and a severe backlog in the development of regulatory standards and structural adjustments in the energy sector (State Council Information Office, 2007). In order to overcome these obstacles the paper called for intensified efforts to foster energy conservation as well as the use of science and technology to spur innovation and increase energy efficiency, and the "vigorous[...] develop[ment]" of renewable energy as a "strategic choice of China to solve the contradiction between energy supply and demand and achieve sustainable development" (Ibid). International cooperation was identified as an important instrument to reach these goals. This includes investments in foreign energy sectors:

"China supports direct overseas investment by domestic qualified enterprises to engage in transnational operation, and encourage such enterprises to participate in international energy cooperation and in the construction of overseas energy infrastructure, and steadily expand cooperation in energy engineering technology and services in accordance with international practice and the rules of the market economy" (Ibid).

Apart from these goals at the national-political level, the International Energy Agency found that the main commercial objectives of Chinese national oil companies (NOCs) investing abroad were the "expan[sion of] oil and gas reserves and production, [the] diversi[ty of] energy supplies [...], becom[ing an] 'international NOC', develop[ing] an integrated supply chain, [and] gain[ing] technical know-how and streamline managerial capacities" (Jiang and Sinton, 2011, 13).

The 2012 White Paper picked up on these efforts by emphasizing China's importance for the world energy market as "an active and responsible participant in international energy cooperation" (State Council Information Office, 2012), its institutionalization of energy cooperation mechanisms with international partners – explicitly including the EU – and by declaring that

"Chinese energy enterprises are actively involved in international energy cooperation, participating in overseas energy infrastructure projects and expanding cooperation in energy engineering and services. Ninety percent of Chinese enterprise-invested energy resources abroad are sold locally, thus increasing and diversifying supplies in the global energy market. [...] For a fairly long time to come, international energy trade will remain the major way by which China utilizes foreign energy sources" (Ibid).

As main impediments for Chinese energy policy the paper named the continuing lack of resources, low energy efficiency, increasing environmental pressure, the transport security of imported energy supplies as well as reforms in the People's Republic's energy system (Ibid). In order to address these challenges successfully, the paper made a clear distinction between two parallel goals of Chinese energy policy that had not been made in the 2007 paper: "Vigorously Developing New and Renewable

Energy" on the one hand, and "Promoting Clean Development of Fossil Energy" on the other. More prominently than the 2007 paper, the 2012 plan presented a two-track policy of coupling the continued need for fossil fuel supply with the pursuit of technological innovation while also increasing efficiency and the use of non-fossil sources of energy. To do this, China announced plans to "increase the scope, channels and forms of international cooperation" in addition to the international activities of Chinese energy companies (Ibid). Similarly, in its 12th Five-Year Plan, approved by the National People's Congress in March 2011, China identified clean energy, energy conservation and clean energy cars as three key investments areas. The specific goals included in the plan were designed to lead towards achieving the two overarching goals of cutting carbon intensity by 40-45% (relative to 2005 levels) and increasing the share of non-fossil fuels in the country's energy mix to 15% by 2020 (KPMG China, 2011, 1, 2).

Following Winzer's distinction it becomes clear that Chinese energy interests equally concern the security of the supply chain on the one hand, while also targeting the threats that result from the structure of the supply chain on the other. In order to understand Chinese energy investments in Europe with respect to the division put forward by Sovacool and Brown, Chinese energy interests and policy guidelines can be subdivided into two fundamental sets of policies: Those concerned with availability of energy, and those in need of environmental stewardship. For the former, affordability is a major concern in attempts to diversify sources and suppliers, for the latter, increased energy efficiency is an integral instrument in making energy use more sustainable in economic and environmental terms. With regards to the various energy security dimensions mentioned above, special emphasis furthermore needs to be placed on the industrial and energy efficiency dimensions of energy security. Greater efficiency in the use of energy results in "reduced investment in energy infrastructure, lower fossil fuel dependency, increased competitiveness, and improved consumer welfare [as well as] environmental benefits by reducing greenhouse gas emissions and local air pollution" (Trudeau and Taylor, 2011, 237). Given the scope of China's environmental challenges, increased efficiency thus offers an attractive way of reducing harmful emissions without decreasing the country's energy demand to a degree that would harm economic and social development. Additionally, as Pakiam (2011, 251) points out, there is a

"complex and overlapping relationship between [...] *energy security*, and the government policies being used to accelerate the development of clean energy technologies, which we call [...] *industrial policies*".

Advancing the use, applicability and effect of clean energy technologies, often directed at a 'cleaner' use of fossil fuels, offers direct benefits for the environment and public health but also profoundly challenges a country's energy industry. Industrial policy understood as "a policy aimed at *particular industries* (and firms as their components) to achieve the outcomes that are *perceived by the state to be efficient for the economy as a whole*" (Chang in Pakiam, 2011, 255) becomes a central instrument of any government's energy policy if the structure of developing and using resources is affected.<sup>5</sup> In the PRC's 2014 climate change plan the

<sup>&</sup>lt;sup>5</sup> While there are many different definitions of industrial policy, the term usually refers to policies directed at "direct state ownership, selective credit allocation, favorable tax treatment to specific industries, tariff and non-tariff barriers to imports, and restrictions on foreign direct investment, local content requirements, special intellectual property rights policies, government procurement, and promotion of large domestic firms" (Dahlman, 2009, 305, 306). Thus, industrial policy is inherently political in its focus on political measures targeted at the economic development of a country's key industries. China has put in place various

adjustment and transformation of its industrial structure are presented as essential instruments to mitigate climate change (The National Development and Reform Commission, 2014, 3). China's energy policy goals, as outlined in the two White Papers, mark the starting point for increased energy efficiency as well as widely used clean energy technology. As the PRC mostly imports energy from other parts of the world and not Europe, Chinese energy investments within the EU are not driven by the prospect of enhancing direct energy availability via imports. Instead, these investments seem more likely to address the effects of the current Chinese energy supply structure as well as the commercial lag in energy-industrial capabilities.

#### 4. China's energy-related investments in Europe

The PRC's strategic guidelines for increased international energy cooperation bore fruit: In 2008 Chinese energy investments in Europe started at a total value of US\$ 4.81 billion, peaked at US\$ 7.77 billion in 2011, decreased in 2012 and 2013 before rising to US\$ 6.89 billion again in 2014 and dropping sharply to US\$ 1.71 billion in 2015. Based on the data assembled in Table 1, between 2008 and 2015, Chinese companies made 30 energy-related investments in 12 EU member states, which had the total value of US\$ 28.2 billion (American Enterprise Institute and the Heritage Foundation, 2016). Most of these investments concerned the acquisitions of shares in European energy companies (18), followed by the investment in energy-related construction contracts and agreements (6) and direct take-overs of European-owned energy companies (2). Four investments cannot be subdivided into a specific type (Italy 2010, Britain 2014, Spain 2015).

Most of the shares, which Chinese companies acquired in the European energy sector, targeted the fossil fuel industry (15) and in all of these cases Chinese companies bought stakes in European oil and/or gas companies. In two of all acquisitions Chinese companies invested in alternative/renewable energy firms. One acquisition remains unspecified. Most of these investments were made in Italy, Britain, France and Portugal. One of the two direct take-overs concerned a European oil company (Britain), the other one was related to the production of electricity via alternative energy or increased efficiency (Germany). Of the six overall investments in energy-related construction projects, four targeted the renewable energy sector and two others the coal sector. These investments were made in Poland, Romania, the Czech Republic and Britain.

As the division by energy sectors in Table 2 shows, most Chinese investments in Europe were directed at the fossil fuel industry. 17 of all the 30 energy investments made between 2008 and 2015, with a total value of US\$ 20.83 billion, targeted oil and gas companies and two, worth US\$ 1.86 billion, were directed at coal companies. Nine investments, totaling US\$ 2.85 billion, were made in the renewable and alternative energy sector, only one in a nuclear power company (US\$ 0.16 billion) and another, totaling US\$ 2.5 billion, cannot be subdivided into a specific type of energy sector (American Enterprise Institute and the Heritage Foundation, 2016). In 15 of the 17 investments in the EU's oil and gas sector, Chinese companies acquired shares of European firms. In this sector, there was only one direct take-over. Another investment cannot be specified by type of investment. Investments are more

(footnote continued)

industrial-political measures, its energy sector is largely state-held and dominated by several national energy companies, and has established a number of financial and regulatory mechanisms to specifically promote the development of its energy sector and to support the internationalization of Chinese NOCs (see Dahlman (2009), Jiang and Sinton (2011, 25–27) and Kong and Gallagher (2016).

diverse in the other sectors: Of the nine investments in the renewable energy sector, there were four investments in construction contracts, two acquisitions of shares, two unspecified investments and one direct take-over (see Curran et al. (2017)). Both of the two investments in the coal sector were directed at construction contracts. The one investment in the nuclear sector was unspecified in type, and the other unspecified investment concerned an acquisition of shares.

All these investments were made by Chinese energy companies, financial investors as well as a number of firms from different sectors of the Chinese economy (Table 3). The vast majority of 26 investments, with a total value of US\$ 26.44 billion, were made by state-owned or state-supervised companies. The remaining four of all investments were made by four different private actors, with a total value of US\$ 1.76 billion. Subdivided by company type, 16 investments were made by energy companies: Eight state-owned or state-supervised energy companies made 12 investments worth US\$ 12.53 billion. Four others were made by four different private actors, with a total value of US\$ 1.76 billion. The remaining 14 investments were made by six state-owned or state-supervised companies from different economic sectors, including construction, engineering, chemical, banking and finance totaling US\$ 13.91 billion. Of all Chinese investments in Europe 9 were made by three state-owned financial investors with a total value of US\$ 12.01 billion, the vast majority by the State Administration of Foreign Exchange (SAFE; 7 investments worth US\$ billion 8.57), which manages the PRC's foreign exchange reserves (American Enterprise Institute and the Heritage Foundation, 2016).

These findings echo the IEA's conclusion about the commercial motives of Chinese NOCs. They indicate that also in terms of investments within the EU, Chinese companies want to further accelerate their transformation to truly international energy companies and to expand the integration of their supply chains by making use of the existing market positions of European firms, including access to technology, know-how and running operations worldwide. This seems to apply specifically to the EU's oil and gas sector, most notably in Britain, France and Italy. Especially the energy deals in Britain and France indicate that Chinese investments have "moved beyond the [European] periphery" (Godement and Stanzel, 2015, 3). Investments in oversees gas production in Britain and the acquisition of stakes in offshore oil fields provide Chinese companies with important production shares in the North Sea. Apart from the 2012 deal between Sinopec and Talisman Energy, giving the former a share of 16 kb/d of North Sea production, CNOOC's 2013 acquisition of the Canadian energy company Nexen also enabled it to operate 36,5% of the Buzzard oil field and the Golden Eagle project off the coast of Scotland (expected 2014 output was 70 kb/d), both estimated to be the United Kingdom's largest oil fields (Jiang and Ding, 2014, 19). The CNPC deals with INEOS France and INEOS Britain in 2011 included an "agreement to share refining and petrochemical technology" as well as joint ventures in trading and refining "related to the refining operations in Grangemouth (United Kingdom) and Lavéra (France)" (Ibid, 24). Much more than the acquisition of shares, the direct take-overs of European energy companies targeted the oil and alternative energy sectors likewise and took place in Britain and Germany. The investments related to energy construction contracts were directed at the coal and alternative energy sectors in Poland and Romania as well as in the Czech Republic and Britain. Apart from these genuine energy-industrial motives, financial investors such as SAFE and the China Investment Corporation (CIC) likely directed their investments to successful European energy companies that promised safe returns.<sup>6</sup>

<sup>&</sup>lt;sup>6</sup> The investments by SAFE and CIC took place in France and Britain (SAFE

**Table 1**Timeline of Chinese investments in the European Union's energy sector, 2008–2015. <sup>a</sup>

Year	Value of Chinese Investments in the EU's Energy Sector <sup>b</sup>	Share of total Chinese energy Investments in the EU	Chinese Energy Investments by Country and Company <sup>c</sup>
2008	4.81	17%	<u>France</u> : SAFE acquired 2% of Total (oil), worth US\$ 2.8 billion <u>Britain</u> : SAFE acquired 1% of BP (oil), worth US\$ 2.01 billion
2009	0.98	3%	<u>Britain</u> : Sinochem bought Emerald Energy (oil&gas), worth US\$ 880 million <u>Czech Republic</u> : Sinomach invested US\$ 100 million in construction contracts in the alternative energy sector
2010	0.2	1%	<u>Italy</u> : Jiangsu Zongyi invested US\$ 200 million in unspecified projects in the alternative energy sector
2011	7.77	27%	France: CNPC acquired 50% of INEOS France (oil), worth US\$ 510 million; CIC acquired 30% of GDF Suez (gas, public energy supply), worth US\$ 3.24 billion  Britain: CNPC acquired 50% of INEOS Britain (oil), worth US\$ 510 million  Portugal: Three Gorges acquired 21% of Energias de Portugal (gas), worth US\$ 3.51 billion
2012	5.29	18%	Belgium: Sinochem acquired 35% of Siat (oil), worth US\$ 260 million Portugal: State Grid acquired 25% of REN (gas, public energy supply), worth US\$ 510 million; Three Gorges acquired 49% of Renovaveis (alternative energy), worth US\$ 470 million  Germany: Hanergy bought Solibro (alternative energy), worth US\$ 510 million Britain: Sinopec acquired 49% of Talisman Energy (oil), worth US\$ 1.5 billion Romania: Huadian invested US\$ 1.3 billion in construction contracts with its partner Complexul Energetic Rovinari (coal)
2013	1.29	4%	<u>Poland</u> : China Energy Engineering invested US\$ 560 million in construction contracts with a share of 33%, partnering with Tauran (coal); Sinomach invested US\$ 190 million in construction contracts, partnering with Boska (alternative energy) <u>Romania</u> : Ming Yan invested US\$ 540 million in construction contracts, partnering with Speranta & successful (alternative energy)
2014	6.89	24%	Malta: China Power Investment acquired 33% of EneMalta (oil and gas), worth US\$ 440 million  Italy: SAFE acquired 2% of Eni (oil&gas) and 3% of Enel (gas), worth US\$ 2.76 billion; China Power Investment acquired 40% of Ansaldo Energia (gas), worth US\$ 560 million; State Grid acquired 35% of CDP Reti (energy grid), worth US\$ 2.5 billion; SAFE acquired 2% of Saipem (oil), worth US\$ 100 million  Britain: SAFE invested US\$ 170 million in projects with Statkraft (alternative energy); China General Nuclear invested US\$ 160 million in projects with Électricité de France (nuclear energy)  Poland: Ex-Im Bank acquired 50% of GEO Renewables (alternative energy), worth US\$ 200 million
2015	1.71	6%	<u>Spain</u> : SAFE invested US\$ 730 million in Madrilena Red de Gas (gas) <u>Britain</u> : China Communications Construction invested US\$ 470 million in construction contracts, partnering with Swansea Power (alternative energy) <u>Romania</u> : CEFC acquired 51% of a KasMunayGaz unit (oil&gas), worth US\$ 510 million

<sup>&</sup>lt;sup>a</sup> American Enterprise Institute and the Heritage Foundation (2016).

EU member states neither supply China with significant amounts of coal, oil or natural gas, nor do they play a part in setting up a network of physical supply infrastructure to China. Given the aforementioned numbers of Chinese investments, Europe nevertheless plays a growing part in Chinese energy security by providing opportunities to further internationalize Chinese energy companies and by offering them safer market conditions than direct activities in the Middle East and Africa, from where China imports significantly more oil but where political turmoil and instability make these companies' operations and planning more difficult and risky (Ibid, 19). The Chinese investments serve the goal of advancing the country's energy

(footnote continued)

2008; CIC 2011), Italy and Britain (SAFE in 2014) and Spain (SAFE in 2015). Analyzing the economic context conditions for financial investments in the Eurozone and specific EU member states goes beyond the scope of this article. However, I thank one of the reviewers for pointing out that Eurozone countries' towards any foreign investment in their energy sectors might have changed over the course and aftermath of the financial crisis from 2008/9 and onwards.

supply chain by increasing its share in foreign production and thus global supply, the construction of energy infrastructure and technology exchanges. More specifically, on the one hand Chinese investments target the established and advanced oil and gas sectors of highly industrialized member states of the European Union via the vast acquisition of shares and direct take-overs. On the other hand they are selectively directed at the alternative energy sector across the continent and at the coal sector in the EU's eastern periphery. Investments in the fossil fuel sector are more clearly targeted in their type and geographical location than the renewable energy sector. Notwithstanding the specific energy sector, several investments offer safe returns to Chinese financial investors. The great variety of mainly state-owned or state-supervised companies investing in the European energy sector, suggest an overall Chinese interest in improving the energy-related supply chain and the specific energy-industrial abilities of Chinese companies altogether.

In supporting these investments in the European energy sector, the Chinese political leadership has long noticed the "nexus between actual policies driven by energy security concerns and those

<sup>&</sup>lt;sup>b</sup> In billion US\$.

<sup>&</sup>lt;sup>c</sup> Details on specific energy sectors of investment or partnering companies are included where given in the original data set. Depending on the company's profile, the main source of its energy portfolio is provided where possible.

**Table 2**Chinese investments in the European Union by energy sector, 2008–2015.

Energy Sector	Value of Chinese Investments <sup>b</sup>	Share of total Chinese Energy Investments in the EU	Chinese Energy Investments by country, number and total value
Oil and Gas <sup>c</sup> (17)	20.83	74%	Britain: Nr. of investments: 4 / Total value: US\$ 4.9 billion  Italy: Nr. of investments: 4 / Total value: US\$ 3.42 billion  France: Nr. of investments: 3 / Total value: US\$ 6.55 billion  Portugal: Nr. of investments: 2 / Total value: US\$ 4.02 billion  Belgium: Nr. of investments: 1 / Total value: US\$ 260 million  Malta: Nr. of investments: 1 / Total value: US\$ 440 million  Romania: Nr. of investments: 1 / Total value: US\$ 510 million  Spain: Nr. of investments: 1 / Total value: US\$ 730 million
Coal (2)	1.86	7%	<u>Poland:</u> Nr. of investments: 1 / Total value: US\$ 560 million <u>Romania</u> : Nr. of investments: 1 / Total value: US\$ 1.3 billion
Renewables (9)	2.85	10%	Britain: Nr. of investments: 2 / Total value: US\$ 640 million Poland: Nr. of investments: 2 / Total value: US\$ 390 million Portugal: Nr. of investments: 1 / Total value: US\$ 470 million Germany: Nr. of investments: 1 / Total value: US\$ 510 million Romania: Nr. of investments: 1 / Total value: US\$ 540 million Italy: Nr. of investments: 1 / Total value: US\$ 200 million Czech Republic: Nr. of investments: 1 / Total value: US\$ 100 million
Nuclear (1)	0.16	0.1%	Britain: Nr. of investments: 1 / Total value: US\$ 160 million
Unspecified (1)	2.5	9%	<u>Italy:</u> Nr. of investments: 1 / Total value: US\$ 2.5 billion

<sup>&</sup>lt;sup>a</sup> American Enterprise Institute and the Heritage Foundation (2016).

**Table 3**Chinese energy investments in the European Union by company type, 2008–2015 <sup>a,b</sup>.

Type of Investment / Type of Company	Energy Companies		Financial Investors and other Companies All state-owned or supervised	
	Private <sup>c</sup>	State-owned or supervised <sup>d</sup>	Financial investors <sup>e</sup>	Others <sup>f</sup>
Acquisitions of shares	1 / US\$ 0.51 billion	9 / US\$ 10.51 billion	7 / US\$ 11.11 billion	1 / US\$ 0.26 billion
Direct Take-overs	1 / US\$ 0.51 billion			1 / US\$ 0.88 billion
Construction Contracts	1 / US\$ 0.54 billion	2 / US\$ 1.86 billion	_	3 / US\$ 0.76 billion
Other Investments	1 / US\$ 0.2 billion	1 / US\$ 0.16 billion	2 / US\$ 0.9 billion	<u>-</u>
Total	4 / US\$ 1.76 billion	12 / US\$ 12.53 billion	9 / US\$ 12.01 billion	5 / US\$ 1.9 billion

<sup>&</sup>lt;sup>a</sup> By number and value in billion US\$.

driven by imperatives to build industrial capabilities to produce and deploy energy technologies" (Pakiam, 2011, 251). The domestic policy framework for international investment, cooperation with single European countries and the EU as a whole reflect these approaches and the extent to which energy policy has become an important part of overall Chinese-European relations.

### 5. The policy framework of Chinese energy investments in Europe

In order to encourage domestic energy companies to go abroad and invest internationally, China has put in place a comprehensive set of incentives (see also Sauvant and Chen (2014)). On an international level China has established economic ties bilaterally with European countries as well as with the European Union as a whole. In 2004 the National Development and Reform Commission (NDRC),

which oversees the country's energy sector, and the Export-Import Bank of China introduced a credit support mechanism for overseas investment, including specifically "overseas resource development projects which can make up for the relative insufficiency of domestic resources" and "overseas enterprise acquisition and merger projects which can improve the international competitiveness of enterprises, and accelerate exploration of international markets" (Bernasconi-Osterwalder et al., 2013, 49) as two of four key areas for investments. This influential step led to the provision of equity loans for these investment fields by the State Development and Reform Commission and the State Development Bank of China in 2005 (Ibid, 53). In 2005 the Chinese Ministry of Commerce published a set of 'Detailed Rules for the Examination and Approval of Investments to Open and Operate Enterprises Abroad'. This involved a priority for investments in host countries with "infrastructure such as water, power, gas, transportation and telecommunication facilities as well as the conditions for energy supply; and [...] It has a corresponding labour force" (Ibid,

b In billion US\$.

<sup>&</sup>lt;sup>c</sup> As the original data does not specifically indicate if Chinese investments are directed at either the oil or gas operations in some companies' portfolio, all investments in oil, gas and oil/gas companies are comprised in a single category.

<sup>&</sup>lt;sup>b</sup> American Enterprise Institute and the Heritage Foundation (2016).

<sup>&</sup>lt;sup>c</sup> Jiangsu Zongyi, Hanergy, Ming Yan and CEFC.

d CNPC, Three Gorges, State Grid, Sinopec, Huadian, China Power Investment, China General Nuclear and China Energy Engineering.

e SAFE, CIC and the Ex-Im Bank.

f Sinochem, Sinomach and China Communications Construction.

55). In 2006 NDRC, MOFCOM, the Ministry of Foreign Affairs, SAFE and other entities published the Guiding Policy on Outward Investment Industries, also encouraging investments that "can acquire resources or raw materials for which there is a domestic shortage and an urgent need for the national economic development; [...and] can significantly improve China's capacity in technology, research, and development, and can utilize global cutting-edge technologies, advanced management expertise, and professionals" (Ibid, 68).

Following this strategic guideline, the oil and gas sectors of other countries in particular became attractive areas for Chinese overseas investment. As outlined above, the two White Papers on energy policy stressed the importance of international investments by Chinese companies and in 2010 the newly established National Energy Commission placed the goal of "securing energy supply through international co-operation' as one of six major areas of focus" (Jiang and Sinton, 2011, 12). In the 12th Five-Year Plan China set out to "deepen the development of international energy resources and mutually beneficial processing cooperation" (Bernasconi-Osterwalder et al., 2013, 13). Sovereign Wealth Funds investing in energy-related real and financial assets overseas are also part of PRC's energy strategy (Sun et al., 2014b; Kaminski, 2017). Thus, a domestic system of incentives and support mechanisms actively encourages and supports Chinese investments in overseas energy sectors, including the European ones.

Although Europe is not a significant source of Chinese energy imports, as the 2012 White Paper on energy shows, China views the EU as an important cooperation partner in the realm of energy and attaches significant importance to existing bilateral cooperation structures. This view was stressed further in 2014 when the PRC published its second policy paper on EU-China relations after 2003. In this document China emphasizes its view of Europe as "one of its most important trade and investment partners", explicitly promotes the idea of a China-EU free trade agreement and calls upon EU members to open their markets for financial investments from China (Ministry of Foreign Affairs of the People's Republic of China, 2014). In addition to its domestic policy landscape, the PRC has concluded bilateral investment treaties (BITs), that set terms and conditions for mutual investment, with 27 of the EU's 28 member states.<sup>7</sup> All 12 European states, in whose energy sectors Chinese companies made investments, have signed such treaty with the PRC. Given the lack of a comprehensive investment agreement between China and the EU as a whole. Chinese energy investments in Europe are so far largely based on individual bilaterally agreed rules and procedures. As Europe does not offer a level playing field for investments, Chinese companies can make use of varying investment conditions in the pursuit of their individual objectives.

Energy plays an increasingly important part in the relationship between China and the EU. Enhancing energy cooperation with respect to supply security, science and technology, infrastructure, urban development, power generation and environmental protection is a goal explicitly mentioned in the PRC's 2014 policy paper on Europe (Ministry of Foreign Affairs of the People's Republic of China, 2014). Both the development of China-EU energy relations as well as external factors shaping it have received scholarly attention (Holzer and Zhang, 2008; Umbach, 2010; Amineh and Guang, 2012; Xinlei, 2013; Daojiong, 2016). The main political forum of Chinese-European energy cooperation is the mutual Energy Dialogue that is part of the pillar Economic & Sectoral Dialogue within the three pillar-EU-China dialogue

structure (European External Action Service, 2015).8 Established in 1994 this dialogue focusses on cooperation in renewable energy, smart grids, energy efficiency in buildings, clean coal, nuclear energy and energy legislation (European Commission, 2015a). In a Joint Declaration on Energy Security in 2012 both parties emphasized that "the sustainability of our energy security and socioeconomic development is increasingly an issue of mutual concern", agreed "to secure our energy needs and achieve mutually beneficial objectives" and announced "to engage into a strategic energy consumer partnership through aligning concepts of energy security, increasing exchanges about energy infrastructure construction and promoting open dialogue and cooperation" (European Commission, 2012). Again, core areas of common interests are energy efficiency, the development of clean technologies and renewable energy, energy systems and grids as well as cooperation on common standards (Ibid).

As part of their EU-China 2020 Agenda for Cooperation adopted in 2013, both parties also put special emphasis on increased energy efficiency and clean energy technologies and agreed to develop a "roadmap for EU-China energy cooperation" (European Commission, 2013, 10). Stressing their "mutual interest and role to promote low-carbon development, protect the environment, address climate change and encourage clean energy development" (European Commission, 2016a) China and the EU adopted the EU-China Roadmap on energy cooperation in 2016 to foster their collaboration in the management of energy supply and demand as well regulatory policy and environmental protection. The roadmap explicitly includes the "improve[ment] [of] trade and investment conditions in the energy sector" (European Commission, 2016a) as a goal of the intended mutual efforts. Furthermore the EU and China also work together to improve the environmental quality of cities and urban spaces, and have established a Europe-China Clean Energy Centre to foster the exchange of knowledge as well as to promote the use of clean energy in China (European Commission, 2015c).

In addition to these institutionalized forms of energy cooperation, three observations clearly indicate that China is eager to strengthen investment policy ties with the EU which would also affect future Chinese energy investments. First, in 2014 China and the EU began negotiating a bilateral investment treaty, which is intended to serve as a major step on the way to a comprehensive free trade agreement. Given the differences in existing bilateral treaties with China and varying interests among European member states, it has been difficult to reach consensus on the negotiating mandate within the EU. As the PRC can build on its web of bilateral treaties, China has "a great bargaining advantage while denying Europe any leverage to open up China itself for investment and public procurement" (Godement and Stanzel, 2015, 5). This also applies to the realm of energy investments. In May 2015 the Chinese Premier Li Keqiang declared that "China is willing to push forward talks for a bilateral investment treaty' built on the idea of equal treatment for investors and Chinese companies" (Yinan, 2015). In the joint statement of the EU-China Summit in 2015 both parties stressed their desire "to seek convergence on the scope of the Agreement and establish a joint text by the end of 2015" (European Commission, 2015b). By January 2016 both sides had agreed on the scope of the agreement but had not yet finished negotiations for a text of the document (European Commission, 2016b). The successful conclusion of a bilateral EU-China investment treaty would supplant the web of bilateral treaties and

<sup>&</sup>lt;sup>7</sup> China has concluded bilateral investment treaties with Sweden, Germany, France, Belgium, Luxembourg, Finland, Italy, Denmark, The Netherlands, Austria, the United Kingdom, Poland, Bulgaria, Portugal, Spain, Greece, Estonia, Slovenia, Slovakia, Croatia, Lithuania, Romania, Cyprus, the Czech Republic, Latvia and Malta. Of all EU member states Ireland is the only exception.

<sup>&</sup>lt;sup>8</sup> The relationship between the EU and China is structured into three pillars: Political dialogue, headed annually by the High-Level Strategic Dialogue, the Economic & Sectoral Dialogue, headed annually by the High-Level Economic and Trade Dialogue, and the People-to-People Dialogue, headed biennially by the High-Level People-to-People Dialogue.

would thus establish the first European-wide rules-based framework for Chinese investments, including those in the European energy sector.

The second indicator of China's interest in increased cooperation with Europe is the PRC's announcement that it planned to contribute to the European Commission's "Investment Plan for Europe" in September 2015. This € 315 billion initiative aims to spur investment in Europe, create jobs and increase the European GDP. China is the first non-EU member to commit to this plan and a joint working group will work to increase investments in all areas, including energy (European Commission, 2015d). Third, the PRC also views Europe as an integral part of its Silk Road initiative ('One Belt, one Road'), put forward by President Xi linping in 2013. Europe is set to be the final destination of both the envisioned land and maritime route. Land-based trade is set to reach Duisburg, Germany through the existing railway from Chongqing, China via Central Asia and Eastern Europe. Further railway connections between China and Europe end in the Czech Republic, Poland, Spain and Germany. As the railway between China and Europe shortens transport times around two thirds (European Union Academic Programme, 2015), it offers an attractive option for trade between the two regions and could potentially be used for Chinese energy imports from Europe. The port of Rotterdam will be the final maritime destination for Chinese ships passing through the Indian Ocean and the Eastern Mediterranean arriving via the port of Piraeus in Greece. In order to connect the PRC's 'One Belt. one Road'-Initiative with European connectivity initiatives both parties also agreed on an EU-China Connectivity Platform (European Commission, 2015d). If negotiations for the bilateral investment treaty were to succeed, China's willingness to increase investments in Europe and to enhance infrastructural and trade connections with Europe will affect China's energy investments as well. All these three steps stress the importance of Chinese investments in Europe and pave the way for a more structured and better coordinated investment climate between both parties.

#### 6. Conclusion

The PRC faces numerous energy security challenges at once. Not only does China need to secure the supply of vast amounts of fossil fuels, notably oil and coal, to sustain economic development, but it also needs to confront severe environmental pollution resulting from the country's power generation and industrial energy consumption. As this article has demonstrated China therefore follows a political strategy directed at enhanced supply security, increased energy efficiency, the development of clean energy technologies and increased shares of renewable energy sources to address these challenges.

The article found that Chinese energy investments in Europe from 2008 to 2015 mainly concentrated on the fossil fuel sector and largely consisted of the acquisitions of company shares in Northern and Central Europe. Investment in other energy sectors was more diverse by country and type of investment. Europe is not an important source of Chinese energy imports. Mostly by acquiring company shares, but also by building and buying energy infrastructure or direct take-overs of European energy firms, Chinese investments serve political and commercial goals. Against the backdrop of rising energy demands and long-term import dependencies, the penetration of the European energy sector serves the political goals of enhancing the supply chain security of fossil fuels, promoting environmentally friendlier production techniques as well as increasing the shares of renewable energy and energy efficiency. Commercially, Chinese companies, especially by acquiring shares in established European companies in the oil and gas sectors, gain stronger global market positions, increase their energy supply chain and establish themselves further as truly international actors on the global energy markets. Additionally, as the large share of state-owned or state-supervised companies investing in EU member states implies, by accessing Europe's fossil and renewable energy sectors, they make use of European technology and know-how, thus strengthen their energy-industrial capability and improve their international competitiveness. Enhanced energy-industrial capability is economically beneficial as well as part of Chinese attempts to tackle climate change as presented in the PRC's 2014 climate change plan. As it offers safer market conditions than other regions, the European energy sector has also attracted state-owned financial investors from China seeking safe returns and revenues.

Chinese investments in the European energy sector rest on a system of substantial domestic incentives and are embedded in two levels of international political cooperation. On the first level, bilateral agreements with 27 EU member states guide the various investments of Chinese companies in Europe's energy sector. On the second level China and the EU have established a variety of formats that guide their energy cooperation and China has demonstrated its interest in strengthening energy and investment relations. Building on the EU-China energy dialogue and the Joint Declaration on Energy Security in particular, the actual implementation of the roadmap for energy cooperation provides a clear framework for the future. However, until the EU and China agree on an accord that sets the rules for mutual investments, the "commercial EU-China FDI relationship [... will continue to be...] foremost a relationship between individual Member States and China" (Clegg and Voss, 2012, 11). Given the Chinese energy interests and the challenges in advancing energy security, European countries can benefit from China's interests:

"For China even more than the EU, the primary challenge in the years and decades ahead remains how to transition to a more secure and a low-carbon energy system by taking action without weakening economic and social development" (Umbach, 2010, 67).

Chinese companies have a lasting interest in gaining additional market shares and advancing technological expertise and knowhow with respect to all sources of energy. European policymakers and companies should take up on these interests. Mutually beneficial political progress can be made in two areas: First and foremost, by aligning existing disparities between EU members to pave the way for the conclusion of the EU-China investment treaty. Within the EU this requires a common definition of FDI, an agreement on streamlining the existing BITs into a single legal framework for Chinese investments, a decision on whether or not to grant China Market Economy Status, and a selection of national infrastructure and economic sectors that need special status when it comes to Chinese investments. Furthermore the EU should push the PRC to remove investment barriers and improve market access for European companies, to end discrimination against European firms in favor of Chinese state-owned companies and to safeguard intellectual property rights and company data within China. Second, in addition to such a truly level playing field for investments, the successful implementation of the 2020 roadmap for EU-China energy cooperation would ultimately facilitate mutual economic and energy-political benefits for both parties.

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