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Title of Dissertation:

**Changes in the energy strategy, energy management and
energy policy of the European Union and China between
2007 and 2017**

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1. Introduction

Energy has become a key area of international policy as the leadership of several countries has realized that the fossil energy sources used so far and underlying energy supply are finite and that the increasing use of fossil fuels has serious long-term environmental, social and economic consequences. The European Union and China, like other economies, are trying to ensure a sustainable energy supply and energy security. Both are net importers, and the continued growth of their economies is based on external energy sources, as their own resources do not currently cover their energy needs. For a long time, the Middle East, Africa and Eurasia were the main energy supply regions in the world, but today the tense political and economic situation in these regions and the growing competition between the EU and China are encouraging the great powers to explore and exploit new energy-rich areas. One such area is the Arctic, which is rich in hydrocarbons and other energy sources that have not yet been used. The EU and China have therefore paid more attention to this region and there has been significant competition for the exploitation of fossil energy resources here, but economic, environmental and social changes in recent years have significantly changed the long-term energy strategy of the EU and China.

2. Background and objectives of the research

The first research project on the subject was carried out in 2007 with the support of Aalborg University, with two other co-authors, who explored the need for a common energy policy for the European Union under the title "*Prospect for the European Common Energy Policy*". Authors: Jukie Hougaard Ostby, Valeria Olga Giber and Witold Sitko.

In the preliminary research, the ever-approaching energy dialogue between the European Union and China was examined, which was designed to soften the competitive situation between the two rival superpowers. We also published our research in the book *“The closer and closer energy dialogue between the EU and China”*, which aimed to explore and compare the energy needs, energy procurement regions, and energy policies and strategies of the two great powers. This work embraced a time span from 1997 to 2007 on the relationship between the two international powers from the perspective of energy security.

Also, as a preliminary research on the same issue, I would like to mention our publication *“Whose policy will win the battle for the Arctic region’s energy sources? The European Union and the Chinese energy policy toward the Arctic”*, which elaborated on the political aspirations of the two great powers to acquire energy sources under the North Pole. The research was carried out as part of the 2007-2009 Arctic research project in Denmark. In 2009, I have continued my studies in Chinese economics, politics and international relations at Lingnan University in Hong Kong for a period of 1 year. Here I visited Malaysia at the office building of Petronas Oil Company in Kuala Lumpur and the Bank of China in Hong Kong, where I managed to ask for general information on my research topic and to visit the institutions with an escort.

In 2014, I conducted research at the University of Gothenburg, one of the topics of which was the mapping of energy production plants and methods in one of the most developed member states of the European Union, namely Sweden. Here, through interviews and visits to institutions, I collected material for my PhD research from the following key energy institutions:

- GlashusEtt, Hammarby Sjöstad, Stockholm. Dr Erik Freudenthal gave an interview on sustainable urban development and the modern use of various alternative energy sources, which are obtained through active houses, waste recycling, and wave energy and heat pump solutions. Furthermore, they are used for biogas-powered public transport, where the gas is produced from the fermentation of organic waste and wastewater sludge generated by buildings and businesses in the entire district. Date of visit: 14 June 2014 (Annex 2).
- ENA Energi AB in Enköping, where electricity is mainly produced from renewable and recycled energy sources (biomass and waste), from which even heating is generated for the surrounding municipalities. This also significantly reduces CO₂ emissions and improves energy efficiency in the area. Here we interviewed Mr. Tomas Ulväng. Date of visit: 17 June 2014 (Annex 3)
- Interview with Professor Guoyi Han, a researcher at the Stockholm Environment Institute, whose speciality is: energy security and China's climate policy, China and its transformation, a broad study of the environmental and social impacts of China's transformation. Date of visit: 12/06/2014
- Nordic Storage, Statoil and Port of Gothenburg, the largest energy port in Northern Europe, which forwards, distributes and partly processes the raw materials arriving there. Here I also visited the oil refinery belonging to the port in addition to the docking points and I also mapped the energy unloading and transportation equipment. I could also visit and study the functions of the oil refinery and

energy storage facilities. Frederik Hallbjörner, senior operations manager was interviewed. Date of visit: 17 June 2014 (Annex 4)

- Gryaab Ryaverket, a water treatment plant which is a demonstration plant in Sweden for water purification and biogas production. I also interviewed development engineer David Want Ons. Date of visit: 19 June 2014 (Annex 5)

Furthermore, at the end of 2014, a report titled: „*The constantly growing energy consumption vs. human health damages and environmental pollution in China*” of my research project was published at the University of Gothenburg.

In 2019, I published an article in the online journal *Ecocycles* on energy sources in the Northern region and new trends in energy security in China and the European Union, entitled: „*The energy policy of the European Union and China toward the Arctic in view of falling oil and gas prices, climate change and increasing carbon reduction policies.*”

My objectives:

As the energy issue has changed a lot in the last 10 years both worldwide, and in the case of the European Union and China, my current research would address the same issue, only in time from 2007 to 2017.

The duration and methodological definition of my thesis is a study based on a comparison of international energy situation in 2007 (which was an outstanding period in the lives of both actors) and 2017 (Fig. 1). For the period from 2007 to 2017, I examine the change in the lives of the two international energy buyers in the political, economic, energy and

geopolitical fields compared to the preliminary research and the year 2007. Two directions of comparison can be identified:

1. With regard to the changes in the energy consumption trends of the two actors in 2007 and 2017, and on this basis to draw conclusions regarding the internal changes in their own policies

2. Relying on the 2017 energy and political data of the two actors, also on the change in their relationship with each other compared to the 2007 data.

The central question of the research can be formulated as follows:

What changes have taken place in the European Union's and China's energy strategy, energy mix and use, energy production and energy policy over the last 10 years?

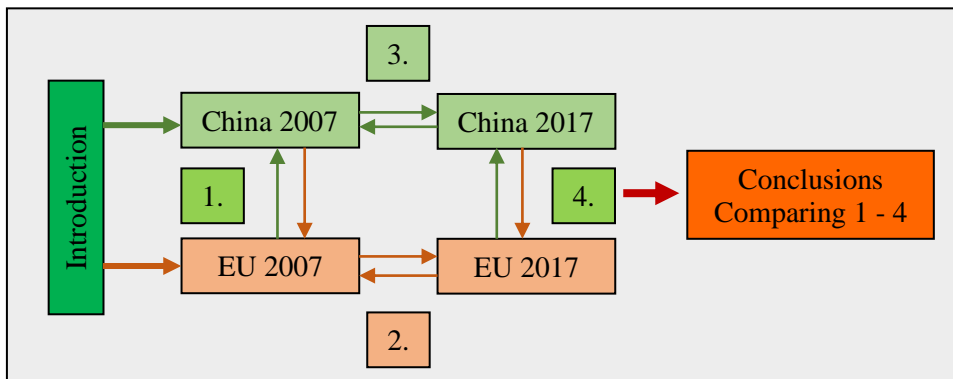


Figure 1. The flowchart of the research (Own design)

Demonstrating the correctness of the following hypotheses may provide an answer to this question.

1. Economic growth in both the European Union and China is increasingly energy dependent. The energy policies of the two powers are vastly different, as unconditional large-scale and rapid energy production is a

prerequisite for China's large-scale economic growth, but in the first period, from 1970 to 2007, this difference was not so obvious. Although the guidelines for sustainable development and sustainable energy policy have been developing since the 1970s (1972 - UN Conference on the Human Environment; 1972 - Club of Rome; 1987 - Brundtland Report; 1992 - Rio Declaration - Agenda 21; 2000 - Millennium Declaration), However, the period from 1970 to 2007 was characterized mainly by competition for fossil fuels, as economic development and the provision of the necessary energy supply were a priority, even if this could be achieved primarily through the use of fossil fuels that harm the environment.

2. During the 10 years under review, energy policy and energy diplomacy between the European Union and China have changed significantly. The main reasons for this are climate change and the pollution caused by the use of fossil fuels and its ecological and public health consequences, but the cost of exploiting fossil fuels and difficulties in obtaining the right to extract also played a role. This was also reflected in international environmental policy and the international conventions and environmental strategic objectives that underpin it (2012 - Rio Earth Summit; 2015 - Sustainable Development Goals (SDG) - UN General Assembly Resolution). At present, China is the world's largest emitter of greenhouse gases (CO₂, CH₄, N₂O, fluorinated gases: hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆) and nitrogen trifluoride (NF₃), all synthetic industrial products), its energy producer and energy consumer. Therefore, examining energy – climate policy developments and

international positions is crucial to understanding and addressing global energy and climate governance barriers.

3. Energy supply regions and energy strategies have also undergone significant changes over the last 10 years, mainly in terms of increasing the share of renewable energy and saving energy, and to reduce and subsequently eliminate the use of the most polluting fossil fuels first (mainly the use of coal and oil as conventional fuels). Although fossil fuels still predominate among energy sources, the use of renewable energies is increasing in several European countries (depending on their natural resources). In China, this trend is barely perceptible in practice, but the steady rise in pollution over the last decade and its health consequences, the increasingly perceptible effects of climate change and international political pressure have called for new energy strategies, as evidenced by the People's Republic of China's last two five-year-plans. Taking into account changes in energy policy over the last ten years and exponential technological developments, the foreseeable evolution of the energy mix up to 2050 can be estimated, although questions remain unanswered to the best of our knowledge (such as future technological possibilities for fusion energy). The energy policy significance of the circular economy and its political reality are also remarkable, given the energy utilization of the resources that can be obtained in this way.
4. The political relations of the major international powers have also changed, both in terms of energy supply and the division of international markets: in addition to the often worrying signs of unilateral economic and political dominance, there are new

opportunities for common sustainable economic platforms, both globalization and energy interdependence, where, in addition to energy sources, energy-technological developments and international knowledge transfer are increasingly emerging. There is more of a significant change in energy consumption in Europe, but it has already begun in China. The movement of the two powers at the international level is also reflected in the emerging balance of power: China is increasingly seeking to acquire shareholdings or exclusive ownership in large international companies (e. g. the Swedish car division of Volvo is already 100% Chinese-owned). During the period under review, only a rearrangement in the power structure of world politics began, where China is playing an increasing role, although its development is not smooth, with serious environmental, economic and social problems.

3. Material and methodology:

I also used a substantial source of literature and data from international databases to answer the questions. Such international databases include Eurostat, International Energy Agency, Data Europa, Publication Office of the EU, U.S. Energy Information Administration, ScienceDirect, Global Energy Statistical Yearbook, Enerdata, BP Statistic.

The research method is descriptive. Energy mixes were analyzed by distribution ratios, but time series display graphs were used for long-term trends in energy use and imports. The comparative analysis moves on two planes because different time planes have to be compared at the same time (2, 3, and conclusions). On the other hand, it is also necessary to compare the same time planes in analyzes 1 and 3. The research is also supported by

interviews with researchers and experts in the field, as well as visits to and collection of information from plants and research institutes that are relevant in the field of energy and energy policy.

Another significant role in deepening our knowledge is the participation in research projects written in groups during various international research opportunities, which explores the components of current research more thoroughly. Here, the different attitudes of the group members and the international university background often reveal different perspectives within the research topics.

Table 1. Summary of the most relevant questions and answers asked in my primary research

| Name | Questions | Answer 1. | Answer 2. | Answer 3. |
|--|--|---|--|--|
| Mr. Li Xing Professor- Aalborg University | 1. / What are the views of the EU and China on energy procurement regions? 2. / What is your opinion on the EU-China dialogue? 3./What is your opinion on the energy strategy of the two powers? | As the growing energy needs of both powers need to be met for economic stability, they will face increasing “competition” with each other in common energy procurement regions. We can consider the Artic region as a new region, which will play a significant role in the future. | The EU-China energy dialogue will be an increasingly important issue, but for both powers in a different interest. Technology transfer and good diplomatic relations are a driving force for China, while EU is pushing for closer cooperation due to capital, energy-buying competition, and China’s superpower nature. | The Chinese economy is based on rapid, continuous development, dependent on adequate energy supply. Thus, the energy security became a part of state security. State-subsidized NOCs ensure the procurement of the sites, even deploys military support for transportation. In contrast, the EU has a coherent energy strategy and also takes energy security seriously but sees the solution primarily in diversifying resources. |

| Name | Questions | Answer 1. | Answer 2. | Answer 3. |
|--|--|--|---|--|
| <p>Dr. Erik Freudenthal, Hammarby Sjöstad, Stockholm GlashusEtt</p> | <p>1. / What is revolutionary in your part of town?</p> <p>2. / To what extent can your development provide a solution in the field of energy consumption?</p> <p>3. / What innovations have been introduced in the field of transport and transportation?</p> | <p>1. / Our part of the city is completely self-sufficient, as our houses produce energy (solar energy) and we also use wave energy. Heating and cooling are obtained from the sea with a heat pump. We also utilize the waste produced in the houses. Our institution was the first self-sufficient district in the world to serve as a model for the Chinese model cities as well.</p> | <p>2. / We treat energy as a cycle and treat both wastewater and waste from houses, and we produce all the energy needs of the district partly with these and partly with renewable energies (sun, wave, sea temperature), thus making the whole district self-sufficient. . If this system works “small” for a part of a city, then why not extend it to “larger” areas, Eg: an entire city or even a country?</p> | <p>3. / We have good quality public transport, which is powered by biogas in the case of buses. Biogas is produced from organic waste and wastewater from homes. The use of electric means of transport powered by electricity generated by houses and wave energy is encouraged. No waste transport vehicles. The houses are connected by pipelines to the waste processing plant, in which the residents selectively dispose of the garbage, which is automatically transported to the right place by the pipelines. This eliminates the need for garbage collection and does not allow waste to be mixed.</p> |

| Name | Questions | Answer 1. | Answer 2. | Answer 3. |
|--|--|--|---|---|
| <p>Tomas Ulväng, ENA Energi AB Enköping</p> | <p>1. / How different is your power plant from other power plants?</p> <p>2. / To what extent does your power plant offer a solution to the problem of energy efficiency and growing energy demand?</p> <p>3. / To what extent can they promote the development of a settlement in the long run with your model?</p> | <p>1. / Our power plant produces hot water by burning all kinds of waste, which satisfies the heating and hot water needs of the surrounding houses. Thus, there is no need to operate a boiler and boiler for each house, and the power provides much more efficient combustion, thus promoting efficient energy use. In the case of many houses, if we realize only a few percent efficiency difference, we can already show significant energy savings in the case of one settlement.</p> | <p>2. / The growing energy demand can be partially offset by energy efficiency. Our company can use and process much more types of waste than an average household boiler, because the larger firebox and special shredding equipment allow it. We can utilize almost all kinds of municipal and industrial waste in our power plant.</p> | <p>3. / If every larger settlement had such a power plant as ours, the production of heating and hot water for complete regions could be solved much more efficiently, as almost no waste would be discarded or deposited and it would be more economical to produce hot water and heating for an entire settlement by providing more efficient combustion. to produce the same in every household. Respectively, it is also cheaper for residents because they do not have to invest in heating equipment or hot water production machines, and it does not cause import gas dependence, which is an expensive resource.</p> |

| Name | Questions | Answer 1. | Answer 2. | Answer 3. |
|--|--|--|---|--|
| <p>David I'Ons, Gryaab Ryaverket,</p> | <p>1. / What kind of energy does your institution generate and for what purpose?</p> <p>2. / To what extent do you see the energy production mechanism of your model plant as a novelty and what opportunities could your model offer the world?</p> <p>3. / How does the price of the energy you produce compare to the price of energy produced from fossil fuels?</p> | <p>1. / Our plant obtains raw materials for production of biogas from wastewater treatment. The treated water is released into the sea under controlled conditions. The biogas is used for heating and transport purposes. Our plant produces 70 GWh of biogas per year, which covers the annual consumption of about 5,000 cars. Biogas production is prepared by bacterial digestion after pre-treatment. 2/3 of the biogas is CH₄ methane gas, the rest is mostly CO₂ and little (few ppm) H₂S. We sell the biogas to Gothenburg Energy, which after purification produces 95-98% methane from it. In this way, we can produce extremely valuable energy sources from waste.</p> | <p>2. / Our plant can be said to be a combined plant, where we want to connect the necessary with the useful. The sewage of the town must be treated everywhere in the world. We only recycle the waste that is otherwise destined to be discarded, from which we make energy. If each municipality "utilized" its own waste according to our plant, the use of natural gas could be reduced and water management in the environment would be significantly improved.</p> | <p>3. / The price of the energy we produce is not significantly different from the prices of fossil fuels. Because for us, the production raw material does not cost extra and we would have to treat the wastewater anyway, as this is a health standard.</p> |

| Name | Questions | Answer 1. | Answer 2. | Answer 3. |
|---|--|---|--|--|
| <p data-bbox="202 224 376 390">Ministry of Innovation and Technology - Deputy Minister Tamás Schanda</p> <p data-bbox="202 420 376 1054">Unfortunately, I could only ask my questions in writing to the ministry because I was given a date of March 11, 2020, when the country was at the peak of its defense against the Crown virus. Therefore, they were first denied that they did not have time to reply in writing and then even to the VI. They sent concise answers to my questions according to Annex.</p> | <p data-bbox="397 224 564 447">1. / Does the growing global demand for energy do you think will affect the world market price of fossil fuels?</p> <p data-bbox="397 477 564 700">2. / Behind the change in the price of fossil fuels on the world market, what “ingredients” could you list?</p> <p data-bbox="397 731 564 999">3. / Do you think that increasing energy consumption in China has any effect on the European Union's energy market?</p> | <p data-bbox="585 224 752 725">1. / Prices are basically determined by supply-demand relations, but sometimes they are also influenced by political events and geopolitical factors. Historical price data and analyzes are available on the EIA website. (Ex: Breton oil prices)</p> | <p data-bbox="774 224 940 586">2. / Other factors: transformation of consumption structure, technological development, expansion of LNG infrastructure, promotion of renewable energy sources.</p> | <p data-bbox="966 224 1132 390">3. / See 6-8. question, the transformation of supply and demand in the world market.</p> |

The research work was greatly aided by the active participation in international seminars and then the individual research projects written on them, which constitute an essential part of this dissertation. In addition to contacting international authorities, written interviews were conducted with the most competent experts in Hungary. Experts from the Ministry of Innovation and Technology answered my questions sent in advance under the direction of Tamás Schanda, Parliamentary and Strategic State Secretary and Deputy Minister, under the direction of Chief of Staff Dóra Temesi (Appendix 6). In addition, I compiled a table summarizing my primary research into the most important questions asked to our interviewees and the answers they received.

4. Results

In 2007, we were able to show the following results from the comparison of the two great powers:

- **Political and energy divergence between the two great powers until 2007**

China's energy policy has two significant advantages over the European Union's liberal policy. "The first is China's willingness to ignore international views in its relations with" countries of concern "such as Iran, Sudan, Burma, Myanmar, Turkmenistan, Venezuela, Uzbekistan and many Central and West African countries. state (Andrews-Speed, 2006). China's second advantage is its ability to ignore the domestic policies of energy-supplying countries and their potential conflicts. This means that China does not address the domestic policies of the energy-supplying countries in which it has invested, nor does it seek to influence the political life of supplier countries. China does not want to show the way to good politics or democratic rights for energy-supplying countries and does not participate in their internal affairs. This policy undermines the policies of Western countries that seek to encourage good governance, democracy, and help states advance their own interests. China is at odds with EU interests in these countries (China's Energy Outlook, 2004). Africa provides more examples of this. It can be seen that China's foreign direct investment and aid is focused on investments that help transport energy resources from Africa to China. China's foreign direct investment is primarily focused on infrastructure in Africa. China's expansion is detrimental to the European Union's African interests, as China offers higher prices for raw materials and, due to its growing energy hunger, is

able to occupy the capacity of even an entire country. The EU cannot buy enough raw materials at low prices if China continues to expand in Africa. The diplomatic methods and goals of the two powers are sometimes vastly different. The EU is trying to launch projects, protect human rights and liberalize the supplier country. These are laudable goals, but they can be harmful from a purely commercial point of view. China has more utilitarian goals in these countries than the EU, and it does not want to invest energy, money, and efforts in supplier countries to bring about change that may be unfavourable to it later. China is just focusing on business in these situations. Here we can say that the policy of the realistic path followed by China is more effective because it does not rely solely on international negotiations and bilateral or multilateral agreements with service countries along the lines of the neoliberal model, but “buys” either the government or decision-makers with other services, using NOCs to promote efficiency in addition to negotiations. China operates the same developments (infrastructure, port construction) by employing the locals and transporting the raw materials, but only the benefits of the operation remain in his pocket. In contrast, the downside of the neoliberal negotiated method is that it buys only the extracted product (energy) and does not “help” the locals in extraction, does not make other investments in the country, and does not own or operate real estate containing potential energy. Thus, no trump card of any kind other than the price offered will remain in the hands of the EU vis-à-vis the energy-supplying country, while China will be able to use the “blackmail” and ownership tools of realistic policy outside price competition.

Let us also not forget that large Chinese companies smuggled illicit technology and equipment to Iran on May 29, 2002. Since 1995, Iran has

been under an international embargo, even on energy exports. There was a huge scandal in the U.S. from the case and three large Chinese companies were sanctioned. And in 2005, the embargo on Iran was further tightened, but this was certainly not very evident in the Sino-Iran relationship, as China is perfectly capable of ignoring even the views of international powers and actors to achieve its own goals, unlike the EU, which it wants to gain a good position on the international stage through international relations and negotiations, as well as compliance with the rules.

China is not a democracy, while the EU is an alliance of democracies. Thus, the EU is in a relatively better position on the international market and is more recognized in this respect. The EU remains “in the middle” of the West-to-East world order and can act as a mediator between the US and China in the international arena. On the same point, we can also say that China was not yet a member of international organizations in 2007, unlike the EU. An example of such an organization is the International Energy Agency. The outflow of Chinese FDI (largely financed by the Chinese state) through NOCs shows a significant difference from the outflow of EU FDI. The liberalization of the European energy industry has also provided open doors for Chinese capital, with many large energy service companies but also other large companies being acquired by the Chinese in 2007. You could even say that 2007 was the heyday of China’s FDI outflow.

In 2007, China's energy consumption left the EU's energy consumption and was 1.4% higher for the first time in the history of Chinese consumption.

If we look at the energy mix of the two actors, we can draw a very important conclusion. China was self-sufficient in coal production in 2007. Furthermore, in 2007 it was first forced to import from (minimum) natural

gas. The production of hydropower plants is also considered domestic production, so if we add up the proportion of these energy sources, China imported only oil, LNG in minimal quantities and nuclear fuel. That is, the total demand for total energy imports in 2007 can be a maximum of 23-25%, in contrast to the European Union, which imported 57% of its total energy supply in 2007! That is, China was in a much better position in terms of interdependence than the EU in 2007. After all, China was less than half dependent on imports with higher energy consumption than the EU, since the EU was much more exposed to its relations with energy-supplying countries than China. By this time, China already owned a significant amount of energy fields in energy-supplying countries, further reducing its dependence, unlike the EU, which purchased only extracted energy sources and depended on the price and benevolence of the supplying country. This situation fits perfectly with the descriptions of asymmetric interdependence theory, but interestingly, between two energy “buyers” rather than between an energy “provider” and a “buyer” power, as the theory was originally depicted.

We need to highlight the discrepancies found for oil-importing regions, as in 2007 Norway supplied the European Union with the second largest amount of oil after Russia. In contrast, China’s second largest supplier was Angola, which was still its largest supplier the previous year. China purchased the largest amount of oil from the Middle East region and secondarily from Africa, according to Figure 21. Europe prefers to buy from Russia and Norway, so we can say that it bought the most from the Eurasian region and only obtained oil secondarily from the Middle East (Iran, Libya, Kazakhstan) and, thirdly, at least from Africa (Nigeria).

In terms of natural gas imports, we did not find any similarities between the energy-supplying countries of the two powers in 2007, although there is a fairly simple explanation: the EU already needed 11,478,737 TJ of gas imports in 2007, while China did not need them at all until 2006. because its domestic production covered its consumption. The first LNG imports were covered by China exclusively from Australian sources. In contrast, the EU got its significant demand mainly from Russia, then secondly from Norway, thirdly from Algeria and fourthly from Nigeria. Then in fifth and sixth place were Libya and Qatar, the two Middle Eastern countries. Finally, it is ninth in Egypt and tenth in Trinidad and Tobago.

- **Political and energy similarities between the two great powers in 2007**

Since 1998, relations between the two powers have taken place in the form of dialogues at three different levels of power, meaning regular summits, energy conferences and sectoral dialogues. The highest degree of cooperation is the summit, which is the annual meeting of ministers. This is the widest forum for cooperation. Participants will discuss topics compiled by sectoral dialogues and working groups and will not only address issues related to energy trade, but also all other issues that have arisen in EU-China relations during the year. The second level is the EU - China Energy Conference, which is held every two years. This conference is only about various energy issues, organized by the China Ministry of Science and Technology Directorate-General for Transport and Energy. Joint projects, such as SYNERGY or the EU-China Energy and Environment Program (EEP), are agreed to run in parallel with the conferences. The third level is the sectoral dialogues that prepare the issues

and plans for summits and energy conferences to be discussed. Sectoral dialogue is a constant communication between the EU and China: in 2007, 24 sectoral dialogues took place between the two powers. At the end of the summits and energy conferences, the participants sign a joint declaration on the subject and future plans agreed at the actual meeting.

The areas of cooperation have been constantly expanding from the beginning. Relations were initially based on technology transfer and energy policy assistance. The cooperation focused on oil, gas and coal resources. Later, renewable energies and other alternative energy sources were also added to the topics of the conferences. The next common areas identified at the energy conferences were environmental and energy efficiency issues. More specific joint projects have been set up and concrete joint actions have been decided in the same energy supply regions. The next big step was a clear and transparent exchange of views on energy supply and security. The most recent major change in their strategies has been the deeper cooperation proposed in energy supply areas such as Africa or the Middle East. This was first discussed in 2006, recognizing that rivalry in common sourcing regions has no beneficial effects on either side. It was a big step for both parties and a huge change in their energy strategies. This represents a better representation of related interests, and the EU has acknowledged that China's economic growth has been a driver of rising oil and other resource prices, although China has made strong efforts to refute this.

China's energy consumption surpassed that of the EU by 2007, and now China is the world's second largest consumer. This fact reminds both parties of the need to maintain a favourable relationship with each other as

they import their energy sources from the same energy supply regions. This competitive situation, in parallel with rising oil demand, has led to rising oil prices, and rivals are hindering rather than helping each other in those regions. This was a problem for both the EU and China, which could have motivated them to take joint action. The EU and China intensified their cooperation at the 9 September 2006 summit. As mentioned in our chapter analysing power supplies, Africa, Myanmar, Iran, the Middle East and Kosovo are jointly present as “buyers” and this “rivalry” has resulted in the parties agreeing to hold joint consultation and coordination in these regions. If we compare EU and Chinese oil importers, we will see similarities. Russia is the EU's largest supplier and supplies small quantities of oil to China. This is unlikely to be a problem, as Russia also meets the import needs of many other countries. Saudi Arabia exports 7.2 percent of European oil imports, and most of China's imports come from here. It is particularly important that Iran is a joint supplier of the EU and China: it accounts for 6.2 percent of Chinese imports and thus the third largest share. Chinese energy policy methods also seem to have influenced the EU. China has long had good relations with Iraq, Iran and other Middle Eastern countries, but the need to diversify energy sources seems to have forced the EU to give up its principles and follow the economic need. Kazakhstan is also a joint oil exporter of the two countries. China also buys oil from Sudan, and this country is also on the list of countries on the blacklist. China also imported from Venezuela, which in 2007 was one of the countries that wanted to “annoy” the United States and was therefore not very popular in international politics. This is not surprising from Chinese policy, but the EU's relationship with Iran is all the more interesting, not least because Iran was under an embargo until 2018, which was tightened

in 2005. And the EU has "maintained a good relationship" with the United States. In addition, China announced in 2007 that it intended to replace the missing part of its gas consumption in the form of LNG and had a 25-year agreement with Iran to purchase LNG.

Summarizing the reasons for ever closer and closer energy cooperation between the EU and China, it has become clear that cooperation is essential for their common political and economic interests. These interests, such as political pressure from the US, the shift of the center of the world economy towards Asia, common energy procurement regions, and declining amounts of energy resources, have resulted in China gaining legitimacy in the international political space. These reasons forced diplomatic cooperation between the two powers to a higher level in 2006.

Another point of agreement is that, independently of each other, both powers have set broadly the same future goals for energy policy, such as diversification of energy sources, reduction of CO₂ emissions, and the development and increasing share of renewable energy in the energy mix.

Another important area of convergence is FDI, which means facilitating inflows into the EU and, to a lesser extent, the flow of European capital to China. This ratio tipped the flow of Chinese capital to Europe sharply in 2007.

Trade agreements have also led to rapprochement between the two powers, as China has tried to break down customs and administrative barriers to the influx of Chinese goods through agreements. Such protective and punitive tariff problems against the United States also hampered increasing sales of Chinese products, which would have reduced the growth of the Chinese

economy through production restrictions and the accumulation of inventories.

Technology transfer in 2007 was a serious issue that was very much needed by China. China needed the technology developed in the EU and introduced it into China through closer agreements, either in the form of European FDI, or legalized its acquisition through interstate agreements. There have been many scandals around the Chinese NOC around the world that China has been able to obtain technology even through cyber attacks and technology thefts.

In the case of coal-importing countries, we were able to show a partial agreement, although the situation is similar to that of natural gas, as China had minimal imports in 2007 and imported only high-calorific metallurgical black coal. In contrast, the EU imported 214,358,000 tonnes of coal. Obviously, importing more energy sources requires a larger quantity of importer. As a common importer, we can present Russia, which was the number one importer in the EU and the number one importer in China in 2007. Furthermore, Australia was the third largest importer in the EU and China the second largest. The EU's second largest importer is South Africa, fourth is Colombia, fifth is the US and finally Indonesia. In contrast, China imported most of its coal from Mongolia and Canada as its third largest importer. Thus, with the exception of Russia and Australia, we have not yet been able to show a similarity in coal imports in 2007.

- **Differences in energy-politics between the two powers in 2017**

China's diplomacy has changed over the last 10 years, driven by many factors, including a change of presidency. China once begins to partially give up its long-established realist foreign policy and has realized that it is

forced to open up its neo-liberal policies. It is forced to establish international partnerships (of which we have presented 4 varieties) and is forced to find partners at the state level because it needs official international support in the face of the growing influence of the U.S. and other great powers. China, also legitimizing its own expansion and trade networking, as well as the placement of capital, has found a novelty in diplomacy that it seeks to promote “development peace” in the Middle East, as opposed to its policy of “intervening” with the European Union. By developing the MENA region, China wants to end its hostility, not by the European method, which is working to create legal and democratic foundations in the region. I would say this in the increased role of state diplomacy and the more moderate diplomatic role of Chinese large corporations, which is a mere change of strategy for the self-conscious MENA countries that already require the existence of Chinese state diplomacy. But the goal is the same as in 2007, so that they can make further investments in the MENA countries, from which the vast majority of energy imports come, and that these strategic investments can later be used to gain market share as the 'silk road'. Furthermore, there is a double benefit to the same investment. They also provide significant work to Chinese companies through preferential capital outsourcing. Indebted states, if they are not yet able to repay the loan, then gaining strategic points could also be the third benefit of the project for China (eg. the port of Piraeus or Colombo). Energy flows from these partner countries, from several different sources (in a diversified way), and Chinese goods are already flowing outwards. In fact, Europe will be a much easier prey for Chinese products. The European Union has not changed much in its energy diplomacy in 10 years, unlike the Chinese. The EU’s energy strategy shows

strong US influence, but the “expansion” of negotiation strategies, partnerships and foreign affairs is far from as intense as China’s. There seems to be so much effort to try to forge a stronger relationship with China, which is particularly pronounced for the MENA countries, as it is very important for the EU in terms of energy supply. But there is no change in the fact that the EU is still buying energy carriers, while the Chinese are either producing the energy they have already bought, or institutions that provide a significant economic advantage or are contributing to extraction in the country.

The involvement of large companies in foreign policy, as a unique feature of China's energy policy, has remained, they are only slightly more covert than companies building infrastructure and investment, and at the diplomatic level, the Chinese state has come to the fore. Despite the fact that a substantial number of large companies have become privately owned or even tried to open up the energy sector somewhat and to outsource unprofitable or non-cardinal businesses from state ownership, the importance of large companies has increased again as construction of certain points on the Silk Road has begun. Around 2007, China deployed its warships only to protect its merchant ships (especially energy ships), but today it is used in many more places to provide demonstrations of force on the one hand and cardinal trade routes on the other. It also already has an armed center in Djibouti, China. China has also carried out armed operations in the Middle East to protect its citizens. The EU has so far not engaged in any military presence or armed trade support, unlike China, for energy interests.

Contrary to EU policy, China's model of authoritarian capitalism impresses most Middle Eastern powers, who see cooperation with China as an opportunity to withstand Western pressures that demand government reforms and human rights for development aid and development aid. in return for investments. Products exported by China and advanced technologies are more likely to strengthen the ruling regime in the Middle East. The US has already recommended that the EU follow China's actions in the Middle East closely. (Lons, et al., 2019)

Sometimes Middle Eastern countries use China to cut back or bargain with the EU or the US.

China supplies weapons and military drones to MENA countries.

China recognized the potential of LNG in 2006 and began to build LNG terminals with great force, and intends to become an LNG distribution center, while the EU only recognized the importance of this energy source in 2014.

China's position in international politics requires some support vis-à-vis the US, so it seeks to know the EU as a strong and legitimate international player as closely as possible on its side, and at the same time the EU is a significant market. And what is a significant problem for the US is that China, unlike the EU, also sees Russia as its highest-level partner. When the US forced China to choose, China chose Russia. Unlike the EU, when under pressure from the US, the EU sought to exclude Russia from all aspects of its energy strategy.

Significant amounts of Chinese FDI have arrived in the EU energy sector, mainly in the energy supply sector. The EU has failed to gain a significant stake in the energy sector in China. (Huang, 2018)

While the EU has been able to reduce its energy consumption, China has increased its energy consumption and managed to generate significant surplus imports from energy sources that place it in a multiple-dependent relationship, making it significantly more vulnerable than in 2007.

China has made overwhelming efforts in the field of renewable energy and aims to become the leading power of innovative energies. Although technology transfer from the EU is a great help in this, it also calls for closer cooperation with the EU.

- **China has become the largest natural gas importing country**

Until 2019, China, with the exception of Qatar and the US, procured its natural gas needs from completely different sources than the EU. According to the 2017 energy import table, China relied much more on gas imports from Middle Eastern countries, Asia and Australia than the EU. The EU relied mainly on Russia, Norway and African countries. Libya was the only country in the Middle East on the list of importers. Even in the case of coal imports, we find a difference between the 2017 importers of the two great powers. The EU's largest importer is Russia, while Indonesia is China's largest importer. Australia's old importer, along with China and Indonesia, can also cover 2/3 of Chinese imports. Australia and Indonesia are among the EU's coal importers, but in significantly smaller quantities, making Australia only fourth and Indonesia sixth among the EU's 2017 coal importers.

Interestingly, I would highlight the US as a common importer, only the third largest for the EU and only the fifth largest for China. China imports significant quantities from Mongolia, while Colombia is the EU's second largest importer and Canada the seventh largest. Thus, we can say that China relies more on Asian and Australian regions as opposed to the EU, which relies predominantly on the Americas and Russia and only to a small extent on Asia and South Africa.

- **Similarities in energy-politics between the two great powers in 2017**

Unfortunately, China can no longer pursue a foreign policy of non-intervention, but, like the EU, as a great power, is forced to choose a side in the internal affairs of certain countries. Such was the case with Syria.

In order for the EU to keep up in the MENA countries, it is trying to push China into the closest possible partnership to which China is a partner, but in fact because of its trade benefits. That is why it happened that in May 2012, at the regular EU-China high-level energy meeting, they agreed on a further development of their energy cooperation. The National Energy Directorate of the People's Republic of China and the European Commission have signed a China-EU Joint Declaration on Energy Security. It laid down in this that they are both “energy consumers”, i.e. buyers and strategic partners. So far, China has not entered into a strategic partnership with non-energy suppliers! The EU-China Energy Security Working Group was established in July 2012 and held its first meeting in February 2013 in Beijing. Here they set out their cooperation agenda based on their short-term cooperation goals, which are mainly natural gas infrastructure, smart grid, grid connection to renewable energies, safe operation and high performance grid operation, offshore wind energy, solar

energy utilization, incentive mechanisms to model renewable energy and energy strategy problems. A Europe-China Clean Energy Center will be set up with EU support, and a China-EU Energy Cooperation Roadmap 2020 will be drawn up, consisting of four sections describing different areas of cooperation, but two of which will focus on energy cooperation processes. Which analyzes government-led joint research and business projects. It also outlines critical issues in the field of energy cooperation between the two powers and proposes to address them together. Finally, it provides an overview of the use of common material between the EU and China in different cooperation models. The other sections also contain points of interest such as energy security, energy transport, energy suppliers, the main common steps are contained in section four, which they intend to implement between 2015 and 2020, and how they want to implement this agreement in their own legal order. (Europe-China, 2015)

Some European companies are experimenting with cooperation with China in African countries. While extending these collaborations to the Middle East could help the EU understand Chinese development practices and help spread European views, some researchers say. Europeans could provide know-how, experience and networks that could be turned back into economic benefits.

The energy strategy of both powers was aimed at diversifying import energy suppliers and transit routes. Both powers want to promote environmental protection and reduced CO2 emissions through increased use of natural gas and renewable energy sources. They want to emphasize energy efficiency and the development and more frequent use of renewable

energies and alternative energies. To achieve these goals, both powers have also made significant progress.

Both great powers have recognized the energy potential of the Northern Region and have therefore taken steps to obtain energy resources there as well. They both set out to gain observer status at the Arctic Council.

Both powers are in need of significant imports of oil and gas, which was not yet true for China in 2007 (as it did not need gas), but by 2017 they will have the same increased dependence on imports. Their common oil importing countries: Russia was the number one importer of both powers in 2017, Iraq the EU's third, China's fourth largest importer, Saudi Arabia the EU's fourth, China's second largest oil supplier, and Iran the EU's seventh, China's fifth largest importer. Norway is the only major oil supplier to the EU, but its second largest importer. And Angola was China's third-largest importer in 2017 and does not ship to the EU. It also shows that China relies more on MENA countries for oil exports than the EU.

In the case of common gas suppliers, we can highlight Qatar as China's third and EU's fifth largest LNG importer in 2017, but another common supplier, albeit a small percentage, but the U.S. is (partially) hidden in the EU's third largest figure. as an importer, since at that time US LNG was still available at a competitive price. According to 2017 import data, Russia does not yet appear on the Chinese side as a major importer, even though small quantities of LNG were procured from them even then. But by then, the EU's significant import dependence on both oil and gas imports can be clearly seen in our research in 2017. After the construction of the "Power of Siberia" gas pipeline between China and Russia in 2019, Russia will already appear in the 2018 energy mix due to the increase in LNG

transportation. Although China's dependence on Russia will not reach the level of the EU, it will be one of China's most relevant suppliers. This will be the point where China's import dependence will be in agreement with the EU!

5. Conclusions

1. Economic growth in both the European Union and China is increasingly energy – dependent. The energy policies of the two powers are vastly different, as unconditional large-scale and rapid energy production is a prerequisite for China's large-scale economic growth, but in the first period, from 1970 to 2007, this difference was not so obvious. Although the guidelines for sustainable development and sustainable energy policy have been developing since the 1970s (1972 - UN Conference on the Human Environment; 1972 - Club of Rome; 1987 - Brundtland Report; 1992 - Rio Declaration - Agenda 21; 2000 - Millennium Declaration), 1970 However, the period from 2007 to 2007 was characterized mainly by competition for fossil fuels, as economic development and the provision of the necessary energy supply were a priority, even if this could be achieved primarily through the use of fossil fuels that harm the environment. Based on our research, our answer to the first hypothesis is yes. That is, indeed, until 2007, the fight for fossil fuels was the primary goal of the EU and China, and this pursuit determined both their energy security and their energy strategy.

2. During the 10 years under review, energy policy and energy diplomacy between the European Union and China have changed significantly. The main reasons for this are climate change and the pollution caused by the use of fossil fuels and its ecological and public health consequences, but

the cost of exploiting fossil fuels and difficulties in obtaining the right to extract also played a role. This was also reflected in international environmental policy and the international conventions and environmental strategic objectives that underpin it (2012 - Rio Earth Summit; 2015 - Sustainable Development Goals (SDG) - UN General Assembly Resolution). At present, China is the world's largest emitter of greenhouse gases (CO₂, CH₄, N₂O, fluorinated gases: hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆) and nitrogen trifluoride (NF₃), all synthetic industrial products), its energy producer and energy consumer. Therefore, examining energy climate policy developments and international positions is crucial to understanding and addressing global energy and climate governance barriers.

Based on our research, our second hypothesis also proved to be true. With so many additions, fossil fuels still dominate the market, due in part to their current irreplaceability, but also in the background of huge economic interests. And as a complement to the fossil fuel trade, the product trade has also emerged. Thus, the two are now intertwined in the world economy. This is borne out by the two-function silk road and the EU's good energy relationship with MENA and African countries, so that trade relations can be built on it in the future.

3. Energy supply regions and energy strategies have also undergone significant changes over the last 10 years, mainly in terms of increasing the share of renewable energy and energy saving, as well as reducing the use of the most polluting fossil fuels and then eliminating them later (mainly the use of coal and oil as conventional fuels). Although fossil fuels still

predominate among energy sources, the use of renewable energies is increasing in several European countries (depending on their natural endowments). In China, this trend is barely perceptible in practice, but the steady rise in pollution over the last decade and its health consequences, the increasingly perceptible effects of climate change and international political pressure have called for new energy strategies, as evidenced by the People's Republic of China's last two-year plan. . Taking into account changes in energy policy over the last ten years and exponential technological developments, the foreseeable evolution of the energy mix up to 2050 can be estimated, although questions remain unanswered to the best of our knowledge (such as future technological possibilities for fusion energy). The energy policy significance of the circular economy and its political reality are also remarkable, given the energy utilization of the resources that can be obtained in this way. Our third hypothesis also proved to be true, which is supported by the technological developments that have shown great development over 10 years and the greater emphasis on the technology transfer.

The political relations of the major international powers have also changed, both in terms of energy supply and the division of international markets: in addition to the often worrying signs of unilateral economic and political dominance, there are new opportunities for common sustainable economic platforms, both globalization and interdependence based on energy supply, where, in addition to energy sources, energy-technological developments and international knowledge transfer are increasingly appearing. There is more of a significant change in energy consumption in Europe, but it has already begun in China. The movement of the two powers at the international level is also reflected in the emerging balance of power: China

is increasingly seeking to acquire shareholdings or exclusive ownership in large international companies (e.g. the Swedish car division of Volvo is already 100% Chinese-owned). During the period under review, only a rearrangement in the power structure of world politics began, where China is playing an increasing role, although its development is not smooth, with serious environmental, economic and social problems.

Based on our research, we also need to give a very answer even to the fourth hypothesis.

6. Further research findings

The Chinese economy has begun a prolonged process of slowdown since early 2017, which is not over yet. This slowdown was best felt in energy-supplying countries. The Chinese economy is currently sending with several difficulties, which can be traced back to the fact that during the economic transformation, the Chinese state did not reform its economic policy, but the economy through its direct interventions. Thus, in the course of economic development, much distortion has arisen in the Chinese economy as it has evolved, which is now becoming more visible. Although an excellent example of distortion is China's debt problem, much of which has been caused by large-scale (not necessarily always economically operating) financing of Chinese companies by state banks. It is already economically a problem for the state to finance certain market participants, but it is especially a problem if it is not from the public finances but through the banks. Another such distortion is the middle-income trap. According to the literature, because of these distortions, China should consider developing a new growth model, as the old model only exacerbates the distortions. The economic slowdown would be prevented by more

innovative production. "China's future success, or even its failure, depends on its ability to increase its capacity to move up the value chain in line with the country's resources and institutional capabilities." (Huang, 2018) It follows that China has recognized the greater need for new technologies than ever before, either in energy production (renewable energy), energy extraction (innovative extraction of hard-to-reach energy sources) or energy transfer (pipelines, distribution hubs, infrastructure developments on land and waterways), but also in industrial production. After all, the demand for energy sources is primarily the basic bastion of industrial production and transportation. Thus, by 2017, the demand for technology has greatly increased, which has been accompanied by an intensification of technology transfer. The way out for technology transfer is, on the one hand, the production of high-end products in China, through investments by foreign companies that have agreed to outsource their production to China (in accordance with Chinese regulations, which requires Chinese shareholding in these institutions). Thus, both technology and manufacturing know-how entered the country, without the so-called (not unjustifiably) Chinese intellectual property being "stolen". The other way to transfer technology is through international cooperation with a more technologically advanced country or power that shares its research results with China for other benefits. And this is where the European Union comes into play. The joint Europe-China Clean Energy Center and enhanced innovation cooperation between the EU and China all seek to create a legal way for technology transfer in China's favour. After all, it is no secret that China aims to be a great power for innovation and production in the field of renewable energy. A good example of this is the fact that in a few years, solar panels will become a great power in China, or become a battery

manufacturer due to the control of Lithium resources, as well as its expansion in the field of electric cars. Even in the MENA countries, the EU is trying to engage in joint developments with China, so that even more innovation will be transferred to China.

This theory is confirmed by a very recent event that occurred at the completion of our dissertation, but it is an important and highlights event to justify our conclusion. The crown virus, which evolved into a pandemic in 2020, has many benefits for the world economy, coinciding with the “oil war”. China has bought shares in all companies that have produced high-end products and brought significant (foreign) innovation to the country. When their stock prices plummeted when the virus broke out and raged in China!

A partnership with China is almost impossible, as China pursues its foreign and domestic policies solely in its own interests, following realistic principles. That being said, it sounds very strict, but let’s look at the “two-faced policy” we have formulated for China. Following the neo-liberal path, China is negotiating with the EU as two major powers in accordance with international protocols. And at the same time, it is negotiating with each Member State and concluding partnership agreements following a realistic path. It uses the Member States against each other in the hope of more revenue and with the prospect of a privileged partnership, so that they can reach the markets of all the Member States. And unfortunately, our finding would be supported by a sad example from 2020 as a topicality, as China was the first to provide “selfless” aid to the European Member State most affected by the crown virus, Italy. It will then bring ample market

benefits to the supply of medical equipment to all European Member States in distress, for which Member States.

In our view, the European Union has not recognized an important feature of the Chinese nation in partnership research and projects, as well as in other business collaborations. Our Chinese studies also suggest that it is possible to enter into a joint venture (which actually generates profit) with a Chinese, but it is almost out of the question that the partnership will survive in the long run. Because sooner or later, if the business is really profitable, the Chinese business partner will do everything it can to get a full stake. The same strategy can be observed for the strategic points of the Silk Road to fall into Chinese hands and the Chinese share acquisition.

The importance of the Arctic region as a new energy supply region must be emphasized. Both great powers under study have high hopes for it. The European Union has an interest in the extraction of fossil fuels in order to find even more energy suppliers in the diversification of service providers. Unfortunately, due to its environmental and animal welfare principles, it has managed to turn several European members against itself in the Nordic Council. While China is interested in the northern region in several ways, mainly due to the acquisition of fossil fuels. Russia is an excellent ally in this area. Other interests include the extraction of minerals under the northern region and the transport of cargo in the North Sea, which would make it possible to transport both goods and energy carriers much more cost-effectively. China is not popular in the Nordic Council either, but Russia is a very good ally.

Thus, the two most important factors influencing future energy policy are determined by two opposing processes: increasing economic, social and

political pressures due to climate change and the ecosystem damage associated with climate change, and the opposite trend of growing global energy demand and fossil energy resources. characterized by its current high use (Figure 2). This can only be resolved by using the elimination of fossil fuels, mainly coal and oil-based technologies, the temporary strengthening of less environmentally harmful natural gas and nuclear energy, in parallel with the development of renewable energy systems and their integration into production and user systems.

In essence, this means the creation of a circular economy, the structural framework of which is determined by the energy-raw material / finished product / service-zero waste system. The scientific and technological foundations of this system are already in place and are evolving extremely rapidly (electric vehicles, solar energy, geothermal energy, direct and indirect solutions such as heat pump systems). A very important factor is carbon sequestration, the methods of which can be integrated organically into complex energy systems, given that in many cases these technologies also involve the production of new fuels (methanol, biofuel).

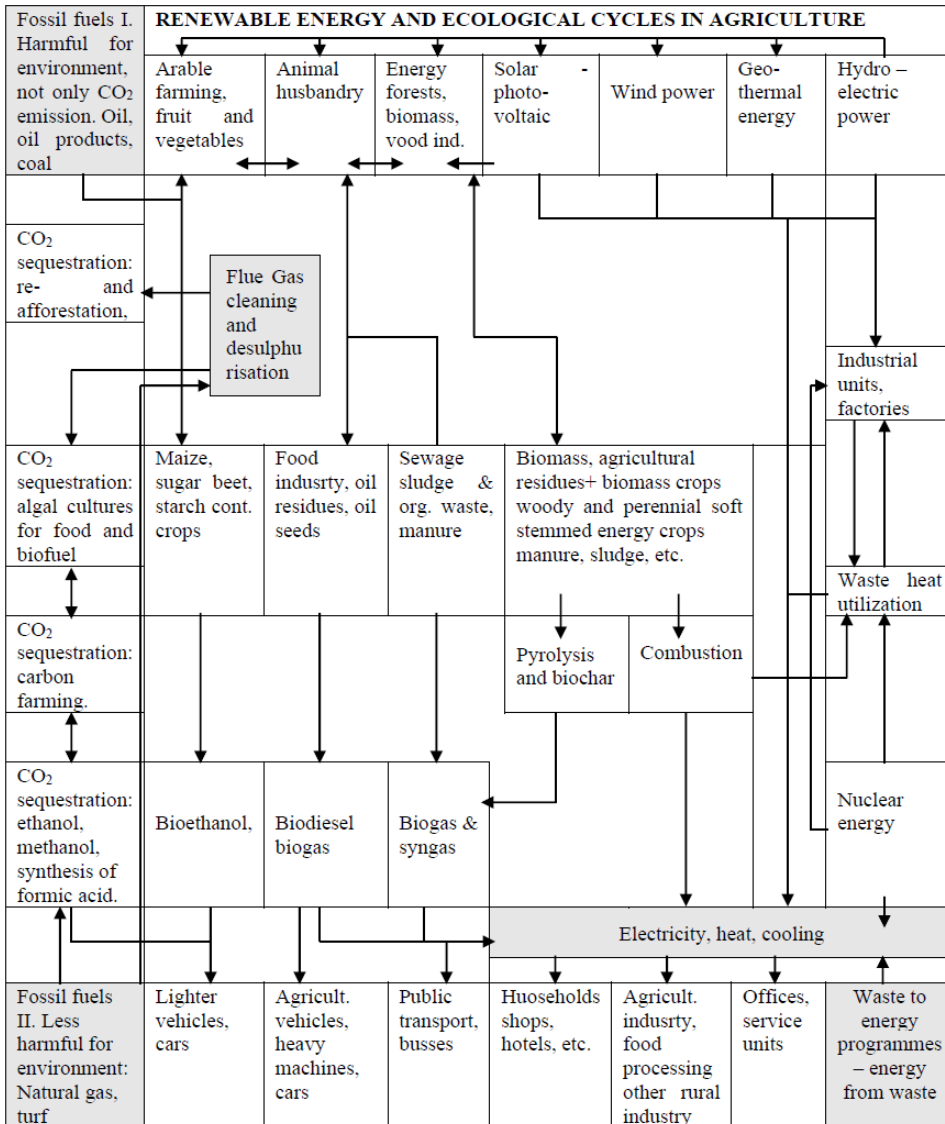


Figure 1. The relationship of fossil fuels with complex renewable energy systems and the capture of pollutants from their utilization, the integration of nuclear and hydropower, and the integration of carbon sequestration (carbon capture) methods into one system. Source: Own design based on Némethy (2018).

7. New research results:

Scenarios for the near future based on our research:

1. The most likely scenario in the 15-20-year term is that fossil fuels will continue to dominate the energy mix of the two powers, with an increasing percentage of renewables. CO₂ emissions will be reduced, but we believe that fossil fuels will continue to be the main focus, especially in freight and transport. In electricity generation, we will see a breakthrough in renewable energy.

2. We see the solution of the factors that have caused the barriers of renewable energy so far as a less probable but possible scenario. One such barrier has so far been the unresolved storage of the energy produced. As the batteries are not able to store large amounts of energy in the long run, at a cost-effective price, without significant loss, it was not possible to store energy. If, on the other hand, a solution can be found for energy storage for the next 15-20 years, the share of renewable energy can go up to 50% in the energy mix of the two powers.

3. The least likely scenario is that new energy sources are discovered during innovation and technological research, or that the appropriate use of already invented energy sources (eg hydrogen cell, fusion energy) is spread to the world, even in 15-20 years. could be pushed into the background.

Based on our study, we can say that in the case of China, we thought we had discovered a strong “tactic” shift in its energy policy. This may be the result of a change of president (Xi Jiping coming to power in 2012) or a shift from economic power to great power, but in our view, both are more together. So far, the state has only appeared to key foreign policy partners

as a participant in diplomacy. Not necessarily for important energy partners, but for internationally important players, as has the EU. Energy diplomacy for the lion's share was carried out by large corporations (NOCs) for "national champions," apparently following strict state instructions, mostly with state funding. By 2017, the state, as a diplomatic actor, has taken over most of energy diplomacy, and NOCs will carry out their tasks from the background (albeit on the basis of state instructions and capital, of course). In fact, the investments and infrastructural developments of the Silk Road, followed by their possible incorporation (in the event of the insolvency of the partner or its acquisition by other tactics) are carried out by the NOCs. (Piraeus, ports of Colombo)

The other change that China, as a great power, can no longer make is the policy of what we call "opt-out". So far, he has tried hard to stay away from the internal affairs of the countries and the conflicts between the countries. Unfortunately, as he joined the great powers, he inadvertently found himself in a situation where he had to choose a side and thus interfere in the domestic politics of the countries, which in turn affected international politics as well. That is, the hitherto impartial economic actor has moved one level higher among the great powers of the world.

In contrast, the European Union did not significantly change its energy "tactics", but rather urged internal changes, as did China, but it could not show much new outside in reducing its dependence on Russia. On U.S. advice, it is trying to follow China's diversified activities in the Middle East and North Africa, but unfortunately in many cases, China's policy of strengthening the regime is more effective than the EU's "critical" policy of prioritizing democracy and human rights.

As a result, our study shows that both major powers (only to varying degrees) have begun to incorporate trade into their energy policies. China is clearly planning the Silk Road for two functions, but the EU is also looking to use its energy partnerships for trade purposes in the future. Thus, we can conclude that we are not talking about a clean energy policy for 2017, but about an energy trade policy. We can also stop that this duality will only increase in the future, especially in the case of China, which sees not only its industrial products but also energy (in terms of LNG and natural gas) as a commercial product in the future.

China does not want to negotiate either the "clinging" of its partners or the peaceful coexistence of its partners like the EU. In his view, development can bring peace to its partners (Arab states) and build a trade and energy network for itself through capital injections (aid and soft loans) and infrastructure development. Furthermore, China has also deployed military force for its trade and energy purchases, which can also be seen as a covert demonstration of strength (which India also notes in response to the Silk Road plan).

They also show similarities in external energy strategy. Both powers have a strong focus on building good and close partnerships with MENA countries. Although we have also discovered that China is more dependent on the Middle East (Arab) states for energy sources, while the EU is more dependent on African countries, including North African countries.

The countries relevant to the two powers were divided into 3 groups based on the results of our research:

1. The energy supply countries that are essential for both powers today are: Russia, Saudi Arabia, Iraq, Iran

2. Energy supplying countries important for both powers: USA, Indonesia, Australia, Qatar

3. Both powers also have so-called “own” energy supplying countries in 2017, which supply only to it:

the. For China: Mongolia, Turkmenistan, Papua New Guinea, Angola

b. For the EU: Norway, Colombia, Nigeria, Kazakhstan

The European Union has fared much better in terms of energy efficiency than China. While China has not been able to curb the growth of its energy consumption either, the EU has downplayed its energy consumption with its effective internal energy strategy, the principles of which are broadly the same as China's internal energy strategy.

In the relationship between the two great powers, asymmetric interdependence has also intensified greatly from 2007 levels, in favor of China. In the case of the two energy-buying powers, we also discovered a change of aspect that the reason for their dependence is not reciprocal according to our results! Respectively, the reasons became two levels. While the EU is primarily in need of energy from an energy point of view (as China is in a much better relationship with energy-supplying regions), China is in need of trade from the EU in terms of trade, which it is trying to achieve on the back of energy cooperation. A secondary reason for the EU towards China is infrastructure development, which China is pushing for as part of the Silk Road project (partly with equity) and in return it wants to satisfy China's hunger for technology from the EU (technology transfer).

And in their external dependence, we found a match that was beautifully outlined, especially in the case of China. While the EU has not been able

to free itself from Russian dependence, China has struggled to take a heavy toll on Russian imports from 2017, triggered by its growing dependence on gas and oil.

Thus, we can say that China has multiplied its dependence on increased energy demand since 2007, when it was even better at energy dependence than the EU. He also managed to build a significant dependence on a supplier! And the EU has tried to reduce its dependence, which has had very little effect, but it can already source natural gas from a new supplier, from 2019 in Azerbaijan as well. There was a strong US influence here to prevent additional Russian gas from entering the EU. Thus, we can say that by 2017, compared to 2007, both powers have developed a strong dependence as a wait-and-see with Russia, which is a powerful energy supplier.

We discovered a further asymmetric interdependence between the two powers that applies to their internal energy supply sector. China acquired a significant part of the EU's energy supply sector (FDI) during the global economic crisis and recovery period. In contrast, European FDI was unable to access China's domestic energy services sector, which consisted of the 3 major Chinese companies and their listed subsidiaries. In China, there are still disproportionate conditions for investing foreign capital (in addition to having a certain amount of Chinese ownership in all foreign investment). Despite the high level of cooperation on capital flows between the EU and China. Thus, we found that a significant amount of divergence in ownership of the energy sectors created an asymmetric dependency in favor of China to the detriment of the EU.

There has also been a change in energy use and energy production. While the use of coal (mainly for environmental reasons) decreased in both powers at the same time, by 2017, the use and production of renewable energy has definitely increased. These changes are in sync with the internal energy strategies of both powers.

But while gas consumption increased in China, gas consumption in the EU decreased minimally. This is exactly what we have said about oil, with the difference that consumption in the EU has fallen significantly. The use of nuclear energy has increased in China, while it has decreased minimally in the EU. China is uniquely producing relevant hydropower, the amount of which it has further developed over the past 10 years.

As a nondemocratic country with no more Member States than the EU, China is responding significantly faster and more flexibly and forward-looking, as well as being more sensitive to economic and global economic needs. Because it operates under a single management, it is more able to manage the country and its future needs than the EU, where fragmented committees and Member States find it difficult to formulate (slower) their needs and solutions to potential problems. Respectively, the needs and problems and capabilities of the Member States are not coherent, and so are their interests and needs. Thus, due to much slower demand formation, the EU can respond significantly more slowly to any international situation than a united China, which represents all the interests of the whole country at the international level, while the EU only represents Community policies.

As we have said before, China has become a great power, which can be read from several sources, and it is also a known fact that power is shifting

from west to east. But we now want to state, based on our research, that we no longer have a bipolar world order, but a four-pole world order in which three of the actors are also strong energy market players. This is because the US and Russia are known poles of the world, which also own a significant amount of energy, but third is China, which also has a significant amount of energy under the country, which has been continuously explored in recent years, but more importantly, incredible you have (owned) accumulated foreign investments containing energy sources! Thus, in many cases, the energy quantities declared for import come from the energy fields they own! By the time the “Going Global” program was announced, China had already invested at least as much energy in the world as the United States! The fourth pole is the European Union, an international force that is dependent on all three other powers but is an excellent mediator between the other three powers. Furthermore, it is a significant market for everyone, so the EU also plays a kind of 'balancing' role between the other three poles.

8. Scientific publications, educational publications and lectures on the topic of the dissertation

1. Julie Hougaard Ostby, Valeria Olga Giber, Witold Sitko (2007): Prospect for the European Common Energy Policy. Research project report, Aalborg University, Denmark, 2007.
2. Valeria Olga Giber (2011): The closer and closer energy dialogues between the EU and China. Book, ISBN: 978-3-8443-0451-0, Lap Lambert Academic Publishing GmbH & Co. KG.
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