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The Sino-European Relationship on Climate Change and Green Technologies: Cooperation or Conflict?

The Solar and Wind Power

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Abstract

At a time when the world is facing an unprecedented array of environmental degradation, an indispensable global cooperation across borders is required. The European Union and China have long committed in strategic partnerships to tackle climate change. However, renewable technologies experience a number of frictions. This paper analyzes the contradictory relationship between the two sides, China and the EU. The aim is to comprehend whether the Sino-European relationship in promoting renewable energy and, as a consequence, climate change mitigation is cooperative or conflictive.

Table of Contents

List of Figures, Tables and Appendices

List of Figures

List of Tables

Appendix

Abbreviation List

CCP	Chinese Communist Party
CH4	Methane
CO^2	Carbon Dioxide
EC	European Commission
EU	European Union
FIT	Feed-in tariff
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GEWC	Global Wind Energy Council
GW	Gigawatt
IPR	Intellectual Property Right
JV	Joint Venture
LCR	Local Content Requirement
MFN	Most-favored-nation
MW	Megawatt
N2O	Nitrogen Dioxide
NDRC	National Development and Reform Commission
NDRC	National Development and Reform Commission
NME	Non-market economy
NTB	Non-tariff barrier
NTM	Non-tariff measure
OECD	Organisation for Economic Co-operation and Development
PRC	People's Republic of China
PV	Photovoltaic
R&D	Research and Development
RE	Renewable Energy
RES	Renewable Energy Sources
SCM Agreement	Agreement on Subsidies and Countervailing Measures
SEZ	Special Economic Zone

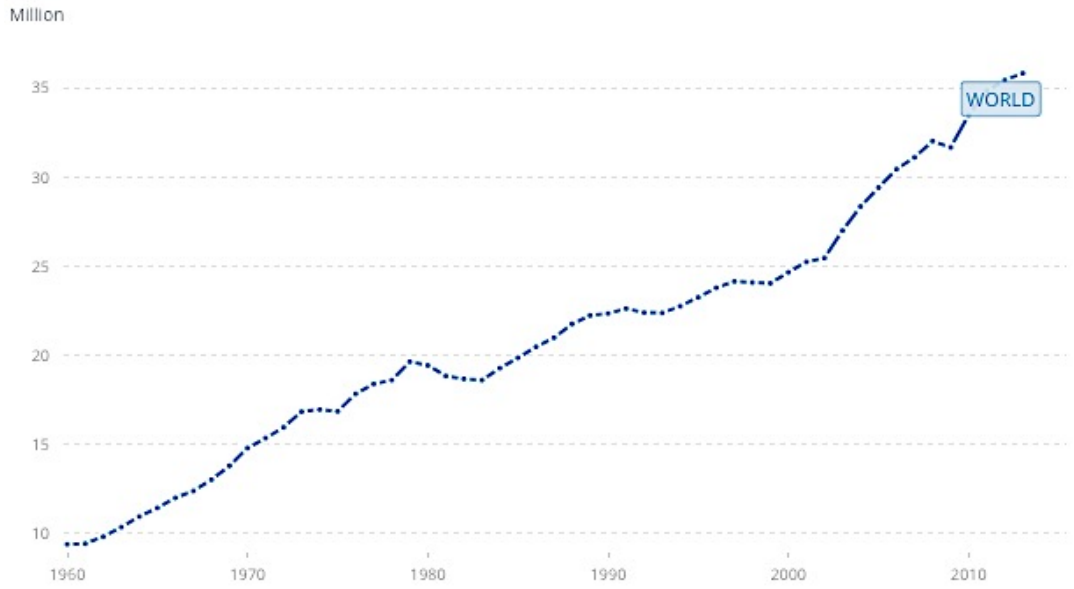
TDI	Trade Defense Instruments
UK	United Kingdom
UN COMTRADE	United Nations Commodity Trade Database
UNFCCC	United Nations Framework Convention On Climate Change
US	United States
WFO	Wholly foreign-owned
WTO	World Trade Organization

1. INTRODUCTION

The evolution of the renewable energy market and the worldwide fear on environmental threats are two key elements in shaping the Sino-European relationship. The global challenge to mitigate climate change has risen awareness among global actors about the urgent need of transiting to low-carbon economies.

According to the WB (2015), increasing amounts of greenhouse gases – CO^2, CH_4, N_2O – are emitted into the Earth's atmosphere, causing an extra heat. Higher temperature has resulted in the greenhouse effect, and thus, climate change. Figure 1 shows the tremendous rise in CO^2 Emissions around the world.

***Figure 1**: CO^2 Emissions (kt)*



(WB, 2015)

At the time when the world is facing an unprecedented array of environmental degradation, an indispensable global cooperation across borders is required. Beijing and the EU have a long out-standing in climate cooperation and strongly engaged in the development and deployment of RES. The EU has long taken the lead in international climate diplomacy, committing to transition to a stronger low-carbon economy (EC,

2014a). Under this perspective, a growing number of European companies have shifted toward the greening of industries, being aware of the potential economic opportunities arising from a green economy (Graaf, 2013). Contrarily, China is the largest producer of emissions in the world in absolute term (Guo & Sharples, 2015) but has also assumed a leadership role in the production of climate-friendly technologies. This development requires that China really gets involved in climate action in the international arena, enhancing its cooperation with foreign actors. From this point of view, the Sino-European cooperation has gained more importance, but has also opened doors to frictions. The Sino-European relationship on climate change mitigation has given way to contradictory interpretations. Both China and EU share a common view on the imperative need to mitigate climate change and have committed on domestic and international level to combat climate change issues. However, the bilateral trade between the two sides has experienced a dramatic increase number of disputes. This paradox arises the question on whether the Sino-European relationship is cooperative or conflictive. Subsequently, the aim of this thesis is to comprehend why the EU cooperates with China for climate change mitigation, whilst employing trade defense measures against China's climate-friendly technologies. The analysis of this paper will focus specifically on two levels. Firstly, several Sino-European strategic partnerships in the fight against climate change and to promote RES will be investigated. Next, an economic analysis of two specific green sectors will follow: the wind and solar industries. Therefore, the goal of this research strategy is to combine both economic aspects as well as values and principles, in order to gain a thorough insight into the matter and to answer the problem statement.

1.1 PROBLEM STATEMENT

The subject of this paper will be the contradictory relationship between the EU and China in the clean energy sector. For this reason, the following problem statement has been chosen:

> ***"Why does the EU cooperate with China in climate change issues, but then using protectionist measures toward China's green industry?"***

Furthermore, following this problem formulation the following sub-questions have been considered relevant to the purpose of this investigation:

- *How does the EU long term goal set the pace to tackle the climate change issues with China?*
- *What are the reasons for the EU whether to implement or not TDIs?*

1.2 SIGNIFICANCE OF THE RESEARCH

The significance of the research stands in China's growing role in the international arena. Its ongoing economic growth and development has led to enhance closer ties with the EU in a wide range of fields. Specifically, the focus of this thesis will be on the Sino-European cooperation in tackling climate change and their bilateral trade in green technologies. Nowadays, disputes involving China-EU trade in RES are a widely discussed topic amongst academics. On the other hand, China and the EU are critically important actors in the transition toward RES. At a time when the world is facing both an economic and an environment crisis, the debate on the contradictory relationship between the two sides cannot be avoided. This paper seeks to understand whether the Sino-European relationship to combat climate change is conflictive or cooperative. Both Beijing and the Union have claimed the urgent need of tackling climate change issues, but the current disputes and concern in renewable energy technologies create a contradictory situation, making the problem statement relevant to understand the current relationship between them.

1.3 STRUCTURE

This paper is organized as follows. In the Introduction section the outline of the study is presented, along with the problem statement and the sub-questions. The aim is to introduce the topic of the paper and the significance of the research.

Following the Introduction will be the Methodological Considerations, which provides the methods and methodology applied for this research. In this section, the choice of the theoretical framework and the structure of the analysis and discussion will be included. These elements are all vitally important to answer the problem statement and to build scientific knowledge.

The Theoretical Framework section will follow the Methodological Considerations chapter, with an introduction of the theories contextually used in the analysis of this paper. Specifically, the chapter introduces the theory of Social Constructivism and the Green Mercantilist Theory.

Next, a Background section will provide a much needed context. The chapter offers a description of the Sino-European bilateral trade and presents the implications of China accession to the WTO and its NME status, from a European standpoint. Furthermore, an overview on the EU member states attitudes toward China, climate change, and RES will be provided.

Analysis, the main part of the paper, will follow the Background section. The chapter provides the analysis of the data collected, testing them through the theories provided earlier in the paper. The analysis will be broken into two parts, all vitally important to answer the problem statement. In broad strokes, various China-EU Strategic partnerships in tackling climate change and the solar and wind power industries

Following the Analysis chapter, a discussion will take place, wherein more personal take on the issues presented and analyzed earlier in the paper will be discussed. The chapter will focus on whether the Sino-European relationship in clean energy is cooperative or conflictive and tries to seek the reasons of this contradictory relationship.

A Conclusions will close this academic paper, where findings from the analysis will be provided and an answer to the problem statement will be presented.

1.4 RESEARCH DESIGN

***Figure 2**: Research Design*

PROBLEM STATEMENT:

"Why does the EU cooperate with China in climate change issues, but then using protectionist measures towards China's green industry?"

SUB-QUESTIONS:

"How does the EU long term goal set the pace to tackle the climate change issues with China?"
"What are the reasons for the EU whether to implement or not TDIs?"
"Why did the EU attitude change towards China's exports of RES?"

THEORIES

- Social Constructivism
- International Trade Theories: Green Mercantilism

DATA

Academic papers, articles, official and scholar statistics

ANALYSIS

China-EU Strategic partnerships	Case studies: Solar Panel & Wind Power

CONCLUSION

DISCUSSION

Source: Author

The model above (see Figure 2) displays the structure of the thesis that will be employed in this specific research to answer the problem formulation and to accomplish the goal of the investigation. The aim of the research design is "*to ensure that the evidence obtained enables us to answer the initial question as unambiguously as possible*" (de Vaus, 2011, p. 9). Presenting the structure, the goal is to enhance transparency of the research process.

2. METHODOLOGICAL CONSIDERATIONS

This chapter shows the basic understanding behind this research. By presenting the analytical procedure of this paper used throughout the research process, the aim is to provide an overview on how the research has been conducted. Furthermore, the methods employed in order to answer the problem statement will be presented. By describing the process of data collection and their analysis, the attempt is to give an overview of the procedure used to reach reliable and valid conclusions in a scientific manner.

2.1 CASE STUDY RESEARCH

This project examines why the EU cooperates with China in climate change issues, whilst using protectionist measures against China's green industry. In doing so, a case study research will be applied in order to better understand the current situation regarding the ambiguous relationship between EU and China. Indeed, despite a high interdependence between the two trade blocks, recent trade frictions have questioned whether the Sino-European relationship in clean energy is cooperative or conflictive.

A research design refers to the strategy used to links the collected data to the initial problem formulation, in order to accomplish the goal of the research (Yin, 2009, p. 24). According to Yin,

> *"…a research design is an action plan for getting from here to there, where here may be defined as the initial set of questions to be answered, and there is some set of conclusions (answers) about these questions."*
>
> (Yin, 2009, p. 19)

Under this perspective, the case study is one of the several ways of doing social science research, and refers to the in-depth analysis of a particular case (Yin, 2009, p. 1). Based on Yin's definition (2009),

"A case study is an empirical inquiry that

- *investigates a contemporary phenomenon within its real-life context, especially when*
  - *the boundaries between phenomenon and context are not clearly evident"*

(Yin, 2009, p. 13)

This research will analyze two particular industries: wind and solar. The choice of these cases has not been casual, but rather logical. Specifically, the analysis of the former will focus on the photovoltaic solar panels due to the relevance on the matter, since these have generated the most trade frictions between China and the EU. Nonetheless, the wind power sector has been selected as second case study due to the dramatic increase in commercial investment in this RES. (Hill D. , Trade and Investment Barriers in Solar and Wind Global Production Networks, 2016).

Depending on the specific problem statement, each research strategy may be used for different purposes – explanatory, descriptive or exploratory – and so does the case study research (Yin, 2009, p. 7-8). Focusing on a *why* question, this paper will employ an explanatory research which involves developing causal explanation (Yin, 2009, p. 8-10) (de Vaus, 2011, p. 2). As presented by de Vaus (2011, p. 2) "*causal explanations argue that phenomenon Y is affected by factor X*". Under this perspective, by analyzing the solar and wind power sectors, the attempt is to understand which factors have contributed in developing trade relations or protectionist tendencies in RES.

In order to answer the problem statement, the historical background of the trade between Europe and China will be taken into consideration. Considering the international arena, an overview of the implications of China's WTO accession will be provided, and its meaning for EU-China trade relations. The analysis will span across several years, specifically the focus will be mainly the 2000s, after the entry of China in the WTO. Therefore, longitudinal aspects will be considered. The effort is to develop a full picture of the phenomenon, looking at the issue from different angles and not focusing on a specific year.

2.2 RESEARCH APPROACH

As presented by Bryman (2008, p. 24), two broad methods of reasoning may be employed whilst doing social research: a deductive approach and inductive approach. By analyzing the researched phenomenon from different perspectives, the relationship between theories and research itself changes. On the one hand, the deductive strategy involves beginning with the theory, developing hypotheses, collecting data and testing the selected hypotheses through the existing theory. Moreover, this practice employs mainly quantitative data (Bryman, 2008, p. 24) (Asaka, 2016, p. 82). The inductive strategy, on the other hand, begins with empirical observations, seeks patterns in those observations and then theorizes about those patterns (Asaka, 2016, p. 82).

However, in order to overcome the disadvantages of *research-then-theory* and *theory-then-research* approaches, a third option is available. Deductive and inductive strategies may be used complementary for a more complete understanding of the phenomenon (Asaka, 2016, p. 82), as in this investigation. As presented by Asaka (2016, p. 82), inductive approaches may begin with a broad base theory, and then develop new concepts throughout the research process. Based on this principle,

> *"researchers should enter the field with the deepest and broadest theoretical base possible and develop their theoretical repertoires throughout the research process* [...] *instead of theories emerging from data, new concepts are developed to account for puzzling empirical materials"*
>
> *(Timmermans & Tavory 2012 cit. in Asaka, 2016, p.82)*

Therefore, a hybrid approach will be the foundation of the analysis of this paper. The attempt is to comprehend the contradictory relationship between the EU and China. Indeed, whilst the EU is pushing ahead to strengthen cooperation with China in climate change, it is then using protectionist measures against China's green industry. Starting by a broad theoretical framework and collecting data, the goal of this strategy is both testing them through the initial theory as well as develop new concepts which may help to answer the problem formulation.

2.3 DATA COLLECTION

Throughout the research process, a substantial amount of data will be analyzed. The focus of the investigation will be on the bilateral relations between China and the EU to promote the clean energy sector and the protectionist measures against China's green industry, particularly the solar photovoltaic sector and the wind power industry will be analyzed.

The collection of document is based on a selective sampling technique, in order to be able to select data with the most relevant information. As presented by Bryman (2008, p. 418),

> *Purposive sampling is a non-probability form of sampling.* […] *The goal of purposive sampling is to sample cases/participants in a strategic way, so that those sampled are relevant to the research questions that are being posed.*
>
> (Bryman, 2008, p. 418)

Under this perspective, the selection of documents will be made based on a document review. A documentary research method will be employed, analyzing those documents that contain information about the researched phenomenon.

As presented by Bryman (2008, p. 543), documents may be distinguished in personal documents and official documents. For the purpose of this research only the latter ones will be taken into account. The attempt is to comprehend the reasons of the ambiguous relationship between the EU and China in the green sector. In doing so, both an economic and diplomatic stance will be taken. Thus, statistics and official documents, such as academic papers, report, and articles will be considered. By using data from different sources and collected through quantitative and qualitative methods, a triangulation approach will be applied in this project to provide reliable data and to produce valid conclusions (2008, p. 644).

The greatest critic of the case study research argues a lack of rigor of this research design. To fill this gap, four criteria will assess the quality of documents in order to answer the research question and to reach the conclusion of this inquiry in a scientific manner: authenticity, credibility, meaning and representativeness (Scott 1990 cit. in Mogalakwe, 2006, p. 224).

Firstly, anonymous sources, paper including biased comments and personal blogs will be excluded from the analysis. This allows the researcher to control authenticity and credibility of the documents. A careful control on the authorship and reputation of the documents collected will be employed. To name but a few, EC reports, academic publications, JCMS, and RECIEL will be the foundation of the empirical data of this paper.

A third criterion for assessing the quality of the documents is made up by meaning. Based on this principle the importance of the comprehensibility and intelligibility of the collected documents is emphasized. To respect the principle, as non-Chinese speaker, only English material has been taken into account.

Finally, representativeness refers to "*whether the documents consulted are representative of the totality of the relevant documents*" (Mogalakwe, 2006, p. 225). Being this a sensitive and recent topic, data on the topic are often not published or available. Furthermore, due to the contradictory relationship, the Chinese and European views on the phenomenon may differ. However, the use of different sources will be able to fill this gap.

In this paper, both qualitative and quantitative methods will be applied. Therefore, to investigate the problem statement different methods will be used. Specifically, quantitative content analysis and secondary analysis of existing data.

2.3.1 QUALITATIVE CONTENT ANALYSIS

Qualitative content analysis has been considered as a suitable method to reach the conclusions of this research. According to Bryman (2008, p. 214), this method emphasizes the role of the researcher in the process of construction of meaning. From this point of view, the researcher plays a bigger role in the documents' interpretation, maintaining anyway a scientific stance on the phenomenon. The core of this method is the use of different categories (Flick, 2009, p. 323-324) (Flick, 2014, p. 170) which will set up the guidelines for the investigation.

The second section of the analysis will focus on the Sino-European trade of PVs technologies and wind power products, and will try to answer the question "*why does the*

EU use protectionist measures against China". In this specific section, the attempt is to analyze the document collected based on specific categories: the protectionist measures used against this sector and the implications. An analysis of the development of the green trade relations is necessary. In doing so, a qualitative content analysis will be employed, in order to focus on certain specific TDI and RE industry support measures relevant for the purpose of this investigation.

By using different categories, the goal is to focus only on some aspects of meaning of the documents, namely the one related to the analytical concepts mentioned above, and to the overall research question (Flick, 2014, p. 170-171).

2.3.2 SECONDARY ANALYSIS OF DATA

In order to analyze the development of the green trade and disputes, the investigation will take into consideration quantitative data as well. Hence, in this paper, a secondary analysis of data will be employed. According to Vartanian (2011, p. 3), "*secondary data can include any data that are examined to answer a research question other than the question(s) for which the data were initially collected*". This research will be based both on official database as well as data collected by other researchers. To name but a few, statistics available on the website of the EC, WTO, BP and IRENA will be used as main sources.

As already mentioned, longitudinal aspects will be taken into consideration. Indeed, in order to understand the development of the use of these protectionist measures against China, different data measured across several years will be considered, starting by China's accession to the WTO.

2.4 THEORY SELECTION

Due to the dual nature of the research itself, both representative theories in the field of international relations and international business will be employed. By approaching the topic from different perspectives the aim is to develop a full picture of the phenomenon and to answer the problem formulation "*Why does the EU cooperate with China in environment, but then using protectionist measures towards China's green industry?"*.

Although in some instances the identities and interests of the European member states will be analyzed, the project will mainly consider the EU as a single actor. Throughout the analysis, social constructivism will be employed. The goal is to understand how the European ideology and beliefs influence the relationship with China in climate change and RE. This theory has been chosen based on the idea that the reality is social constructed. As presented by Jackson & Sørensen (2013),

> *"The international system is not something 'out there' like the solar system. It does not exist on its own. It exists only as an intersubjective awareness, or a common understanding, among people; in that sense the system is constituted by ideas, not by material forces. It is a human invention or creation not of a physical or material kind but of a purely intellectual and ideational kind. It is a set of ideas, a body of thought, a system of norms, which has been arranged by certain people at a particular time and place."*
>
> (Jackson & Sørensen, 2013, p. 209)

Therefore, social constructivism may explain how thoughts, ideas and practices of the actors coexist with the system of international relations, influencing the world affairs.

Furthermore, by applying international trade theories to the analysis, the attempt is to explain the reasons of the use of protectionist measures against China in green technologies. The effort is to understand whether these measures benefit or harm the European economy and its trade strategy. A core point is the idea that international trade theories have influenced the global economic policymaking and the competitive environment in which international businesses compete (Hill C. W., 2011, p. 159). As the research focuses on the development of the Sino-European relationship in environment and green trade, the green mercantilist theory will be highlighted.

By using these theories, the collected data will be tested and a frame of the investigation is provided. As the research is limited by the theoretical approaches, results will be limited within. Thus, by using different theories or employing them in a different way may lead to different results.

2.5 STRUCTURE OF THE ANALYSIS

In order to answer the research question of this paper, the analysis of this paper will be structured as follows.

- *China-EU Strategic partnerships*:
  This sub-chapter will answer the question "*How does the EU long term goal set the pace to tackle the climate change issues with China?"*. To answer this, the analysis will focus on several strategic partnerships between the EU and China and European strategy. Specifically, the EU-China Comprehensive Partnership in 2003, the EU-China Partnership on Climate Change in 2005, 2006 Global Europe and Europe 2020, with focus on EU-China 2020 Strategic Agenda, will be investigated. This specific partnerships and European strategies were chosen in order to apply social constructivism to this paper, as it helps to understand how ideals, values and principles of the EU influence the relationship with China
- *Case studies: Solar and wind power industries*:
  This subchapter will answer the question "*What are the reasons for the EU whether to implement or not TDIs?"*. The aim of this sub-chapter is to comprehend the European strategy toward trade in green technologies with China, by approaching the analysis with the green mercantilist theory.

2.6STRUCTURE OF THE DISCUSSION

Through the discussion, the attempt will be to comprehend whether the Sino-European relationship to combat climate change and to promote RES is cooperative or conflictive. This chapter will argue the findings of the analysis, discussing how the strengths and weaknesses of the EU strategy on China.

2.7DELIMITATION

Firstly, the topic of this research may be considered as the main limitation due to the significant complexity of the environmental governance between and within China and the EU. Only the bilateral relations between the two parties are taken into consideration, thus influences from major countries in the international arena are not considered. This

means that we only consider information regarding the Sino-European relationships and some implications about their membership into the WTO, which has been considered highly relevant. No matter the outcome of this research, other factors that are not considered here influence the Sino-European relations in tackling climate change and promoting the green sector.

Secondly, the choice of the case study research has limited the inquiry. Indeed, only the solar and wind sectors will be taken into account. Furthermore, being aware of the wide range of partnerships and agreements, just some of them will be analyzed, based on their relevance. Particularly, the analysis will consider the EU-China Comprehensive Strategic Partnership, the 2006 Global Europe and the Europe 2020. The goal of this research is not to describe a definite actual scenario, but to understand why the ambiguous relationship in regards of climate-friendly strategies and technologies between Beijing and the Union.

Next, as non-Chinese speakers, the possibility of reading Chinese material has been excluded. The use of potentially relevant material and knowledge, thus, will be limited to English material due to language barriers.

Further, the collection of documents and the choice of methods represent another limitation. The purposive sampling may cause the loss of relevant materials and the use of a different method may lead to different results. However, in the selective process, an objective stance has been taken – as much as possible – avoiding individual interpretations.

3. THEORETICAL FRAMEWORK

This chapter presents the theories that are applied in the analysis of this thesis in order to provide a theoretical foundation for the paper. Theories are a set of assumptions, propositions and/or accepted facts that "*try to go beyond the phenomena to seek general principles and logical frameworks which can serve as a guide to the understanding of actual events"* (Gandolfo, 2014, p. 4).

Due to the dual nature of this paper, the use of several theories will be required. The chapter will first introduce the theory of social constructivism, and thereafter an international trade theory relevant for this topic will be undertaken. In the research process, social constructivism has been chosen as a representative theory to explain the states' action in the international arena, both at an economic and political level. As fundamental concepts in this paper, a theory of international trade will be presented in order to gain a thorough insight on the matter. The goal is to give a general overview of the political-economic doctrine of protectionism, presenting both arguments in favor as well as against the green mercantilist approach to the policymaking process.

3.1 SOCIAL CONSTRUCTIVISM

This section provides an overview of the concept of social constructivism from an international relations standpoint. This term refers to a set of assumptions on how to study a social science, and thus international relations. As presented by Jackson & Sørensen (Jackson & Sørensen, 2013, p. 229), differently than realism, constructivism argues against a materialist view of the world, and emphasizes the social construction of reality. Under this perspective, human relations as well as international relations are not based on material forces, but otherwise on ideals and identities (Jackson & Sørensen, 2013, p. 229). However, constructivists do not totally reject the importance of the material reality. Rather, the theory introduces the idea that materialist concepts and categories result from social processes and interactions, which contribute to the social construction of meaning (Hurd, 2008, p. 313).

According to Barkin (2010, p. 26), *intersubjectivity* and *co-constitution* are the two fundamental components of this approach. The former term refers to "collective knowledge

and understandings", thus conventions widely accepted that exist beyond the individuals and contribute to build the reality (Barkin, 2010, p. 26). This research focuses on the neoclassical variant of constructivism, which addresses intersubjectivity meanings to social sciences, considering both philosophical and empirical issues before inaccessible. Co-constitution, on the other hand, means that "*people and society construct, or constitute, each other*" (Barkin, 2010, p. 28). In other words, constructivists believe that agents and structures need to be seen as a whole in the study of politics, and not as separate parts. As presented by Jackson & Sørensen (2013, p. 210), the concept *structuration* is a starting point of the constructivist paradigm.

> *"Structures do constrain actors, but actors can also transform structures by thinking about them and acting on them in new ways. The notion of structuration therefore leads to a less rigid and more dynamic view of the relationship between structure and actors."*
>
> (Jackson & Sørensen, 2013, p. 210)

Thus, a mutual relationship exists between agents and structures. As structures exist due to the reciprocal interaction between actors, actors may change them over time through social practices (Jackson & Sørensen, 2013, p. 217). According to constructivists views, people build the social world, thus the reality cannot be considered as given and independently from the ideas of men and women (Jackson & Sørensen, 2013, p. 211).

Several approaches to constructivism exist. On the one hand, systemic constructivists emphasis the role of the international environment in shaping state identities. Other constructivists, on the other hand, believe that the domestic environment is responsible for the national identities (Jackson & Sørensen, 2013, p. 223). In this research, the latter approach has been considered appropriate to answer the problem statement. From this point of view, identities, interests, practices and ideas of individuals shape the international agora: "*They include ideas that are intersubjective (that is, shared among people) and institutionalized (that is, expressed as practices and identities)*" (Hurd, 2008, p. 301). As intersubjective and institutionalized, ideas cannot be merely attribute to individual minds (Hurd, 2008, p. 301). In the international systems, the theory explains that shared meanings by people and states need to be understood in order to gain a whole comprehension of the arena of international relations. Specifically,

"It means beginning from the assumption that how people and states think and behave in world politics is premised on their understanding of the world around them, which includes their own beliefs about the world, the identities they hold about themselves and others, the shared and the shared understandings and practices in which they participate."

(Hurd, 2008)

Constructivism has been criticized on various grounds. The main intellectual opponent of social constructivism may be considered realism, which stresses the misleading importance given to norms by constructivists, at an international level as well. From a realist point of view, these norms exist but continually change based on the interests of powerful states (Jackson & Sørensen, 2013, p. 225). The analysis of change, however, may be considered as a strength due to the given possibility to have a view on the whole social processes and reality.

Constructivism has been here selected as the main suitable theory due to its nature and to the goal of this research. Particularly, this thesis defends that European history, culture and national identity influence its actions, interests and foreign policy, at a political, diplomatic and economic level. The frame of the analysis, thus, is based on the idea that the world of international affairs is socially constructed and influences the way that international relations are carried forward. The claim is that European ideals of *"promotion of democracy, the rule of law, human rights, and respect for the UN Charter's principles and international law"* (EU External Action, 2016) and the sustainable development principle influence its relationship with China to mitigate climate change and to promote RES. The social constructivist theory allows, thus, to see Europe as an international actor in the global arena, and its foreign policy toward China as a product of something social constructed and institutionalized. By approaching the study with social constructivism, it will help to understand the contradictory relationship between the Union and the PRC, as the very nature of the EU will be taken into account. Indeed, despite the European principles, values and beliefs, the EU is rather an agglomerate of its member states' identities.

3.2 INTERNATIONAL TRADE THEORIES

As presented by Irwin (2001), the theory of international trade is one of the oldest branches of international economics. An ongoing debate is whether international trade benefits or harms nations. Through centuries, intellectuals have developed a dual view on the topic: on the one hand, some proponents claim the desirability of free trade between countries; on the other hand, others advocate trade protectionism and/or economic isolationism as a better course of action for nations.

"*Depending upon the weights put on the overall gains from trade or on the losses of those harmed by imports, different analysts have arrived at different conclusions about the desirability of having free trade.*"

(Irwin, 2001)

Therefore, the economic arguments surrounding the advantages and disadvantages of adopting free trade or protectionist measures are primarily based on gains and losses of the productivity of domestic industries and the welfare of consumers (Irwin, 2001).

In the next sections, an overview of protectionist theory in green trade will be explored and defined.

3.2.1 MERCANTILIST THEORIES: GREEN MERCANTILISM

Starting in the late Middle Ages, international trade has played a central role in shaping the global economy. During the seventeenth and early eighteenth centuries, the growth in global trade led to the development of the first economic philosophy on international trade: *mercantilism*. This doctrine was a non-systematic set of thoughts which favored state regulations and centralization of economic activities, including foreign trade. Mercantilists argued for close government regulations of international trade in order to maintain a surplus status of gold and silver in the country, precious metals also known as *specie* (Hill C. W., 2011, p. 162). The principle assertion of mercantilism was that gold and silver reserves were the measure of a country's wealth, prestige and power, and were essential to vigorous commerce (Hill C. W., 2011, p. 162) (Krugman, Obstfeld, & Melitz, 2012, p. 514). Through government intervention, the aim was to both restrict the quantity of imports into the domestic market as well as maximize net exports and income, producing as many things as

possible within its own country's borders (Hill C. W., 2011, p. 162) (Krugman, Obstfeld, & Melitz, 2012, p. 514). In its book *England's Treasure by Foreign Trade* (1664), the mercantilist Thomas Mun well describes the core idea behind mercantilism:

> "*The ordinary means therefore to increase our wealth and treasure is by foreign trade, wherein we must ever observe this rule: to sell more to strangers yearly than we consume of theirs in value.*"
>
> (Mun, cited in Hill, 2011, p. 162)

In order to exercise control over foreign trade and to achieve maximum trade surplus, mercantilists advocates the use of different policy instruments by governments: import regulations such as quotas and tariffs to protect domestic markets, and export subsidies to support foreign exchanges. States, through the use of forms of interventionism, aim at discouraging foreign manufactories from competing with local players. Based on this doctrine, trade was a zero-sum game, meaning that a country's gain results necessarily in a loss by another (Hill C. W., 2011, p. 163). Some mercantilists advocated economic autarky, meaning economic self-sufficiency and almost totally independence in trade. However, the Industrial Revolution brought structural changes both at a socio-economic level, reducing governments power and influence on foreign trade (Czinkota, Ronkainen, & Moffett, 2011, p. 64). Despite the development of a liberal approach to trade, protectionist measures are on the rise across the world. The 20th century saw a worldwide return to protectionism, and many nations have adopted neo-mercantilism as trade strategy. As the ancestor, neo-mercantilism aims to increase national wealth and foreign reserves, boosting exports and reducing to an absolute minimum any reliance on foreign imports (Hill C. W., 2011, p. 163). The new class of mercantilism argues that barriers must again increase, trying to make everything within a country's borders in order to achieve the goal of increasing a nation's wealth. The purpose of trade barriers, in this view, is to protect domestic industries by foreign competition, which challenges and impacts local competitiveness.

Under this perspective, during the last decade a new form of mercantilism concerning the clean energy economy has developed, also known as green mercantilism. According to Stepp & Atkinson (2012, p. 1),

> *"Green mercantilism" – the adoption of policies that give countries an unfair advantage to boost exports and limit imports of clean energy technologies – is a major departure from rules-based clean technology trade. It's represented by "beggar-thy-neighbor" policies, including lax IP enforcement, forced technology transfer, export subsidies, discriminatory standards, barriers to imports, and preferential treatment of domestic firms by their parent governments"*
>
> (Stepp & Atkinson, 2012, p. 1)

Therefore, green mercantilism may be defined as a discriminatory and unfair strategy employed by governments in order to boost domestic production of clean energy goods, especially in the short-term, hurting otherwise other nations (Stepp & Atkinson, 2012, p. 3). As presented by Stepp & Atkinson (2012, p. 3-4) governments may implement four different type of policies which may have different impacts on both the world and the country itself (see Table 1). "Good policies" benefit both the world and the country. "Self-destructive" policies harm the country but benefit the rest of the world. The green shading categories denotes instead green mercantilist policies, namely "ugly" and "bad" policies. Based on this classification, green mercantilist measures benefit the country but damage the rest of the world ("ugly" policies) or harm both of them ("bad" policies) (Stepp & Atkinson, 2012, p. 4).

Table 1: *Classification of policies*

		World	
		Wins	**Loses**
Country	**Wins**	Good	Ugly
	Loses	Self-Destructive	Bad

Source: (Stepp & Atkinson, 2012, p. 4)

As mercantilism, green mercantilist policies advocate thus government intervention through the use of several protectionist measures. The aim is to incentive the domestic production, whilst reducing imports, in order to gain from the clean energy economy.

Next paragraph will briefly introduce protectionist measures used in international trade, from a mercantilist standpoint.

– *GREEN MERCANTILISM: INTERNATIONAL TRADE MEASURES*

The governments may adopt several instruments to conduct international trade. Particularly, protectionist measures may be broken down into two main categories: tariffs and non-tariff measures (NTMs), also known as non-tariff barriers (NTBs). As tariffs, NTMs are measures which aim at restricting trade among countries. As presented by the WTO (2017), using tariffs a country imposes customs duties on import services and goods. Doing so, the nation gives a price advantage to domestic producers whilst rising the government revenues as well. With the decrease of use of tariffs at a global level due to several round of negotiations in the WTO, NTMs have gained importance as measure of protection in international trade tools (WTO, 2017). The table below shows Stepp and Atkinson's categorization of green mercantilist measures employed by nations in international trade (see Table 2) (Stepp & Atkinson, 2012).

Table 2: *Green Mercantilism: Protectionist measures*

Boosting Exports and Reducing Imports	***Discriminating Against Foreign Firms***
Currency Manipulation *Unfair Subsidies and Domestic Content Requirements* *Export Dumping* *Tariffs and Customs Duties*	*Technology Transfer*: – IP Theft – Forced Technology Transfer – Limits on Foreign Investments and Ownership *Restricting Access to the Domestic Market:* – Standards and Technical Barriers – Restricting the Export of Critical Materials – Limiting Government Procurement to Domestic Firms

Source: Author

(Stepp & Atkinson, 2012)

Based on this classification, green mercantilist policies aim at growing the green sectors of the country through the use of several protectionist measures. Boosting exports and decreasing imports, the attempt is to acquire high levels of trade surpluses. On the other hand, the use of a discriminatory treatment towards foreign companies seeks to give advantages to domestic firms (Stepp & Atkinson, 2012, p. 8).

The argument of this theoretical choice is that a return to protectionism has been experiencing by developed countries since the global economic integration. The global financial meltdown and the euro-zone crisis hit have then contributed to the rise of European protectionism. By approaching the topic with the green mercantilist theory, the aim is to comprehend the motivations of the European protectionist tendencies against China's green technologies. The paper will look at the Chinese renewable energy support measures in the solar and wind power industry in order to understand the European attitudes toward China renewable energy sector and what are the drivers of its protectionist tendencies. In doing so, the study of the international trade measures will be applied under the lens of green mercantilism.

4. BACKGROUND

The following section provides a broader perspective of the EU-China trade relations alongside China's opening up policy. Firstly, the development of the Sino-European economic and trade relations will be briefly presented. Next, the EU member states attitudes toward China, climate change and RES will be presented. Then, it will be presented the meaning of the access in the WTO for China and its impact with the global economy.

The goal of this chapter is to provide a general overview on the matter, in order to better comprehend the relationship between the PRC and the Union in RE.

4.1 EU-CHINA TRADE RELATIONS: AN OVERVIEW

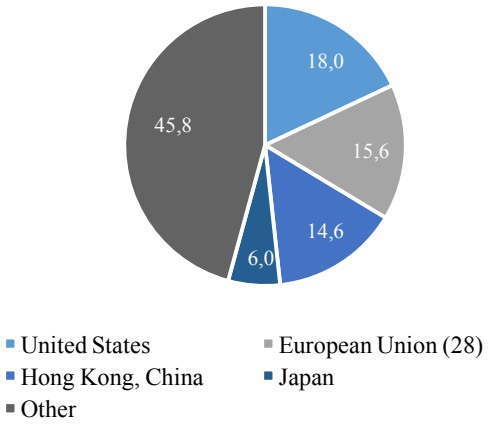
Before the 1980s, China's economy was a relatively closed economy, despite trade relations with Communist Party-led countries and the Soviet bloc during the 1960s (Naughton, 2007, p. 379). However, as presented by Lu et al. (Lu, Yan, & Deng, 2014, p. 1), during the third plenary session of 11th central committee of CCP held in 1978, Chinese central government decided to reform its economic system, quitting the idea of "economy being subordinated to politics". Therefore, beginning in 1978 several reforms have been undertaken, and China's economy has opened itself to the outside world, contributing to its economic boom. Under the open-door policy, China has taken several measures aiming at encouraging foreign capital, establishing SEZs and expanding foreign trade (Fang, Yifu, & Yong, 2009, p. 404).

By acting as a component of the world economy, China has experienced an increase in its share in global trade, both in terms of exports as well as imports. Particularly, trade liberalization has been a major goal during China's transition process towards a market-driven economy (Naughton, 2007, p. 377). Due to the insufficient domestic demand, the export oriented strategy has been considered by the central government as a primary source for its economic development (Lu, Yan, & Deng, 2014, p. 1). Whilst in the early 1970s China's total goods trade (exports plus imports) amounted only 5% of GDP, in 2005 China was the largest trading country worldwide, and its total trade accounted 64%

of GDP (Naughton, 2007, p. 373; 377).

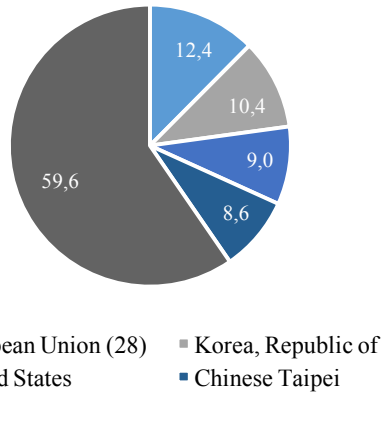
Currently, China is the second exports economy and the third imports economy worldwide (Lu, Yan, & Deng, 2014, p. 1-2). Furthermore, China's principal trading partners are especially advanced country markets, complying the laws of comparative advantage (Rumbaugh & Blancher, 2004, p. 3) (Fang, Yifu, & Yong, 2009, p. 408). Indeed, China's comparative advantage of labor force leads the country to trade with those regions with a higher income level, which have a relative abundance of capital and a shortage of labor force (Fang, Yifu, & Yong, 2009, p. 408). The figures below (see Figure 3 and Figure 4) show the top trading partners with China.

***Figure 3**: China exports by destination (2015)*



Source: Author
(WTO, 2016)

***Figure 4**:China imports by main origin (2015)*



Source: Author
(WTO, 2016)

EU has been an important exports destination and source of imports for China. In 2015, exports to the EU represented about 15.6% of China's total exports, following the US. On the other hand, EU is the largest trading partner of China, accounting 12.4% of China's total imports. Therefore, over the past decades, trade between China and Europe has increased sorely.

Nonetheless, taking into consideration the European perspective, China has become the second trading partner for the EU (EC, 2017a). Particularly, as presented by the table below (see Table 3), China has become the largest source of imports of the EU.

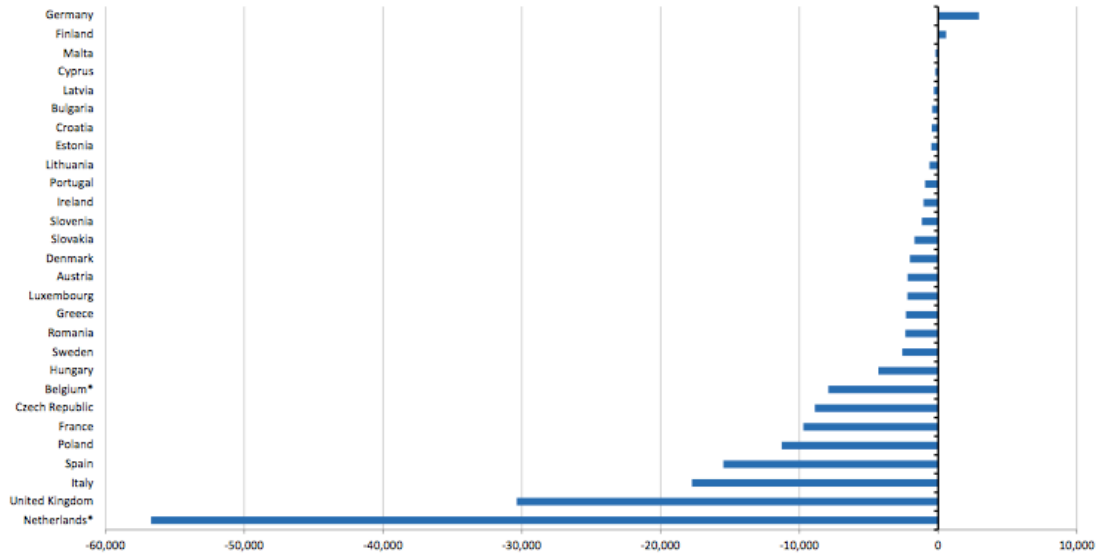
***Table 3**: EU Top trading partners: Total goods, 2016*

	Imports			Exports			Total trade		
	Partner	Value Mio €	% Extra-EU	Partner	Value Mio €	% Extra-EU	Partner	Value Mio €	% Extra-EU
	World	1,706,413	100.0	World	1,745,730	100.0	World	3,452,143	100.0
1	China	344,642	20.2	1 USA	362,043	20.7	1 USA	608,817	17.6
2	USA	246,774	14.5	2 China	170,136	9.7	2 China	514,779	14.9
3	Switzerland	121,608	7.1	3 Switzerland	142,432	8.2	3 Switzerland	264,040	7.6
4	Russia	118,661	7.0	4 Turkey	78,030	4.5	4 Russia	191,089	5.5
5	Turkey	66,652	3.9	5 Russia	72,428	4.1	5 Turkey	144,681	4.2
6	Japan	66,383	3.9	6 Japan	58,136	3.3	6 Japan	124,519	3.6
7	Norway	62,935	3.7	7 Norway	48,371	2.8	7 Norway	111,306	3.2
8	South Korea	41,433	2.4	8 United Arab Emi...	45,847	2.6	8 South Korea	85,951	2.5
9	India	39,265	2.3	9 South Korea	44,518	2.6	9 India	77,065	2.2
	...			...			...		
1	China	344,642	20.2	2 China	170,136	9.7	2 China	514,779	14.9

Source: (EU Directorate-General for Trade, 2017)

Nowadays, the PRC has become one of the major challenge as well as opportunity for the EU. Particularly, Europeans are now echoing concerns about China's trade surplus, which results in a significant trade deficit in goods (Garcia, 2014, p. 323). As presented by Fox & Godement (2009, p. 11), in 2008 EU's trade deficit reached €169 billion and the global financial crisis did not reverse the trend. As presented by the figure below (see Figure 5), in 2015 only Germany and Ireland had a positive goods balance with China, among the other 26 countries.

***Figure 5**:EU Members State trade in goods balance with China, 2015*



Source: (Eurostat, 2016, p. 3)

Therefore, whilst the unquestionable benefits for Europe from the Chinese economic growth, competition from China has raised serious concerns to the EU, especially in

regards of some specific industrial sectors (Lu, Yan, & Deng, 2014, p. 13). Still, the EC (2006, p. 3) believes that there is an ample interest for mutually beneficial trade partnership between Beijing and Europe, enforcing its attitude toward China: "*Closer Partners, Growing Responsibilities*". However,

> *"one of the preconditions for EU and China to maximize their benefits from trade and economic partnership is that both sides must open their markets and ensure fair competition"*
>
> (Lu, Yan, & Deng, 2014, p. 13)

China's export capacity jeopardizes the EU and other trade partners, due to this trade deficit. As a result, protectionist measures towards China by its key partners such as EU arises, aiming at stemming the deficits (Garcia, 2014, p. 323). The relationship between the two parties is still shaped by frictions and trade disputes from both sides. Particularly, in pursuing the relationship, the EU is still concerned by several structural elements of the Chinese economy (EC, 2017a), such as:

- Insufficient protection and enforcement of IPR in China
- Discrimination against foreign companies VS preferential treatment towards domestic firms
- Strong degree of government intervention
- Lack of transparency

4.2 EU MEMBER STATES ATTITUDES TOWARD CHINA

The relations between China and the EU are made more complicated due to the very nature of the EU and the process of integration of European countries. As presented in the Methodological section, in this investigation the EU will be mainly treated as a single actor (see p. 11). However, interests and beliefs of the member states cannot be ignored in the study of the Sino-European relationship on renewable energy and climate change. Indeed, the attitudes toward the PRC change drastically from member to member, and influence the European strategy toward the PRC. The discrepancies among member states on the way Beijing is viewed cause the absence of a clear vis-à-vis China's strategy.

Under a constructivist prism, the material reality is not totally rejected. Climate change is, thus, part of the material reality which exists regardless actors in the social world. However, the way it is perceived differs among agents, as the social reality is constructed, or constituted, by individuals and their understanding of the world around them. As stated by Tim Pfefferle (2014),

> *"While climate change is an objective phenomenon that exists in the world, it matters how subjects perceive it. This perception is partly shaped by the domestic political context in which subjects […] have been socialized."*
>
> (Pfefferle, 2014)

Individuals' beliefs about the reality, their identities about themselves and the others, and the collective knowledge and understanding shared among people influence nations' interests and foreign policy of the EU member states. So does on the perception of climate change and renewable energy technologies. Therefore, as Europe takes action in tackling climate change issues, it is necessary to comprehend the attitudes and behavior of the EU population among member states.

According to data from the Special Eurobarometer 409 (2014b), in 2013 half of the Europeans thought that climate change is amongst the most serious problems, compared to others global issues. However, as presented in Appendix A, perceptions on the issue diverge considerably among EU countries. Particularly, the highest proportion of respondents thinking climate change is one of the most serious issues facing the world were placed in Sweden (81%), Denmark (73%) and Germany (70%). To understand the significant divergence in the perception of the seriousness of climate change, the least likely country to view the issue as dangerous had a gap of 53 percentage points on the answer, Estonia (28%).

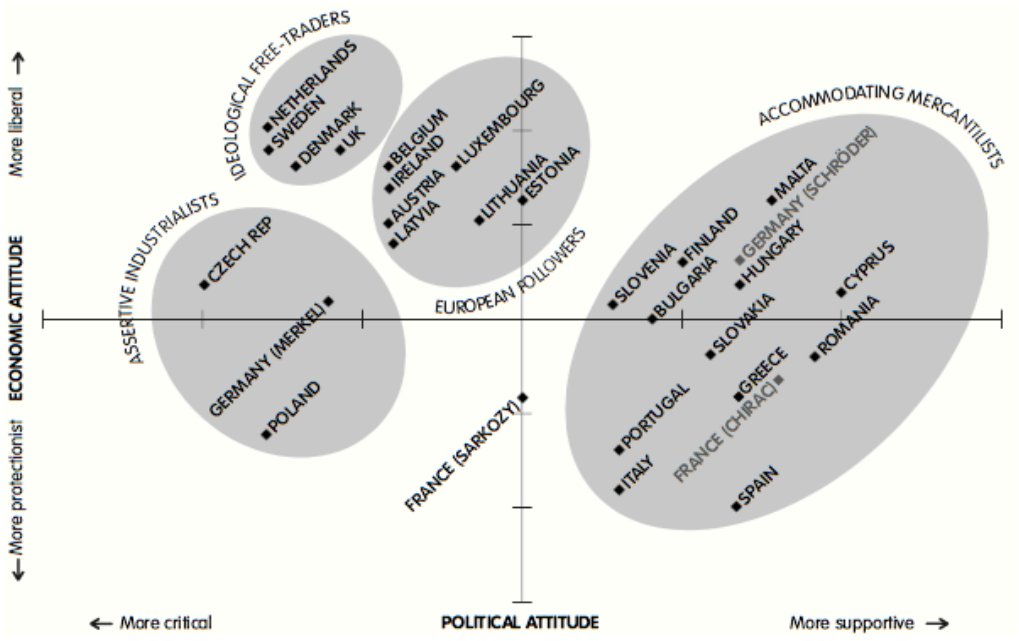
Similarly, in 2011 50% of the Europeans thought that in Europe 2050 an increase in the use of renewable energy sources will be experienced by the Union, particularly of the solar and wind power industries. Again, Denmark (82%), Sweden (79%) and Germany (74%) were the most positive countries about the future of renewable energy. Whilst only 32% of the respondents in Portugal answered that renewable energy will be definitely used more (EC, 2011) (see Appendix B).

In regards to the renewable energy sources, the perception of the seriousness of climate change, and the attitudes toward China different significantly among EU member states. Particularly, the analysis takes into consideration Fox & Godement classification, based mainly on the economic and political relations between specific EU member states and China. These discrepancies amongst member states regarding the attitude towards China causes the weakening of the EU as a whole. Indeed, several national interests and attitudes coexist, creating a non-linear European strategy. As presented by Fox and Godement (2009, p. 3), once a neo-authoritarian Chinese academic, Pan Wei, stated:

> *"The EU is weak, politically divided and militarily non- influential. Economically, it's a giant, but we no longer fear it because we know that the EU needs China more than China needs the EU." China knows its strength and no longer bothers to hide it.*
>
> (Fox & Godement, 2009, p. 3)

The figure below (see Figure 14) shows Fox & Godement classification:

***Figure 6**:EU Member States attitudes toward China*



Source: (Fox & Godement, 2009, p. 4)

According on their views toward China, state members may be divided into four categories: Assertive Industrialists, Ideological Free-Traders, Accommodating Mercantilists and European Followers.

The *Assertive Industrialists* is a small group of counties that do not agree that the Sino-European relations should be shaped by market forces. This group is ready "*to pressure China with sector-specific demands, to support protective "anti-dumping" measures against unfairly subsidized Chinese goods, or to threaten other trade actions*" (Fox & Godement, 2009, p. 6). The group comprehends countries such as Czech Republic, Germany and Poland, which are viewed as more protectionist. However, has presented by Zimmer *et al*. (2005), despite supporting protectionist measures, Germany has mostly a liberal attitudes. Indeed, the choice of employing TDIs stands mainly on its economic and consumer interests.

The *Ideological Free Traders*, contrarily, stresses the importance of not restricting trade with China, whilst creating pressure to combat political issues (Fox & Godement, 2009, p. 7). Netherlands, Sweden, Denmark and UK are part of this liberal group with China.

The *Accommodating Mercantilists* are the largest group which is made up of Bulgaria, Cyprus, Finland, Greece, Hungary, Italy, Malta, Portugal, Romania, Slovakia, Slovenia and Spain. This group of countries agrees to maintain good political relations with China in order to have good commercial relationships then. However, this group sees "*anti-dumping measures as a useful tool and oppose awarding China market economy status"* (Fox & Godement, 2009, p. 7).

Finally, the last category is made of the *European Followers,* such as Austria, Belgium, Estonia, Ireland, Luxembourg, Latvia, and Lithuania. These countries rely mainly on the EU in managing the relationship with China, which is not considered as a core factor in the EU's foreign policy (Fox & Godement, 2009, p. 8).

What makes the case complex is the heterogeneity of attitudes amongst member states,

> "*which translates into divergent preferences that must be reconciled into one policy to be executed by the European Commission (DG Trade) on behalf of the Union in regards state preferences towards China*"

(Garcia, 2014, p. 325)

Indeed, restrictive measures have to be undertaken by the EC's Trade Commissioner, which acts on behalf of all member states, representing the EU as a whole (Garcia, 2014, p. 325). However, European member states maintain an important role in the result of trade investigation, as they have the final say in decisions related to trade investigations. (Boru, 2014)

4.3 CHINA ACCESSION TO THE WTO

On the 11th of December 2001 China became a formal member of the WTO, after 15-year effort and a long negotiation process (Fang, Yifu, & Yong, 2009, p. 425). Indeed, China firstly applied to rejoin the GATT in 1986 (Naughton, 2007, p. 389), an international multilateral agreement and forerunner of the WTO. China's accession to the WTO represents a major step for the integration of the country into the global economy.

The WTO is an intergovernmental organization which regulates trade among member states. The organization was established in 1995 in response to the GATT Uruguay Round, with the aim of adapting to the new global economy. As the GATT, the goal of the WTO is to reduce trade barriers and tariffs, to enforce trade rules and to settle policy disputes, whilst enforcing rules of the trading system under the framework of five basic principles (Fang, Yifu, & Yong, 2009, p. 426) (WTO, s.d.):

- *Non-discrimination principle;*
  Based on this principle, WTO members cannot perpetuate discriminatory treatments towards both their trading partners (MFN principle) as well as their domestic market (national treatment principle).
- *Open market principle;*
  The principle aims to create a more integrate global economy. Lowering trade barriers and opening their markets, WTO members aim at implementing freer trade among trading partners, through negotiations.
- *Fair competition principle;*
  The principle claims the importance to have a fair and undistorted trading system and competition, allowing the use of tariffs and certain protectionist tools in order to protect

member states.

- *Balanced right and obligations;*

  Based on this principle, member states need to improve transparency, stability, and predictability within their business environment.

- *Granting favorable and discriminatory treatment to developing country;*

  The principle encourages economic development and reforms in developing countries and transition economies, members of the WTO. The organization provides a special treatment for those countries, allowing more flexibility in the implementation of WTO rules and commitments.

Based on the WTO principles, member states need to meet the above requirements, and so does China. China's entry into the WTO required radical changes in the economic structure of the country, in order to further liberalize its economy. Over the past decade, China has made progress in implementing the WTO commitments. However, as presented by different authors (EC, 2017a) (Fang, Yifu, & Yong, 2009, p. 426), outstanding issues still shape China's economy and jeopardize its fulfillment of the WTO requirements.

A main pillar in China's membership into the WTO is its status as a non-market economy, which will be further developed in the following paragraph.

4.2.1 CHINA'S NON-MARKET ECONOMY STATUS

The Chinese accession into the WTO have strengthened the implementation of its integration into the world economy**.** As presented by the EC (2017a), both China as well as the other member states have benefited from the entry of China in the global arena. However, its membership has also opened up the possibility to bring disputes to the WTO when China does not comply with WTO rules (EC, 2010). Specifically, the Chinese WTO accession protocol allows other member states to treat China as a NME, using thus "*simpler calculations in anti-dumping dumping investigations and therefore makes it easier to impose duties* (EC, 2010)*"*. This implies that "*domestic prices cannot be used as a reference point and make it much easier to reach a positive finding in an antidumping investigation*" (EC, 2010).

However, under the WTO agreement, China's NME status may expire after 15 years

following accession: on the 11th of December 2001:

> *In any event, the provisions of subparagraph (a)(ii) shall expire 15 years after the date of accession. In addition, should China establish, pursuant to the national law of the importing WTO Member, that market economy conditions prevail in a particular industry or sector, the non-market economy provisions of subparagraph (a) shall no longer apply to that industry or sector.*
>
> (WTO, 10)

However, there is a general consensus in EU that China does not fulfill the general requirement to grant MES, which consists in five principles:

> *"(1) a low degree of government influence in the allocation of resources and in decisions of enterprises, (2) an absence of distortion in the operation of the privatised economy, (3) the effective implementation of company law with adequate corporate governance rules, (4) effective legal framework for the conduct of business and proper functioning of a free-market economy (including intellectual property rights, bankruptcy laws, ...), and (5) the existence of a genuine financial sector."*
>
> (EP, 2015, p. 12)

Since 2003, the Union has initiated more than 100 trade investigations against Chinese products, and more than 50 have resulted into definitive anti-dumping or anti-subsidy measures still in force (see Appendix C). As presented by the EC (2010, p. 2), "*overall anti-dumping duties affect less than 1% of EU trade with China",* due to the huge volume of trade between the two parties. The high number of TDI cases has been highly criticized by Beijing, despite the EU has initiated a less number of investigations compared to US and India (EC, 2010).

5. ANALYSIS

The analysis of this research aims at answering the problem statement "*Why does EU cooperate with China in environment, but then using protectionist measures towards China's green industry?*" with support of two sub-questions:

- *How does the EU long term goal set the pace to tackle the climate change issues with China?*
- *What are the reasons for the EU whether to implement or not TDIs?*

The chapter on strategic partnership seeks to understand how the European values and principles affects the Sino-European cooperation in developing a sustainable development in favor of climate change issues. In doing so, several strategic partnerships between the two trade blocks and domestic policies will be taken into account, in order to understand the European strategy toward China in developing a common strategy. Second, the paper will focus on two case studies: the solar and the wind sector. By investigating alternative renewable energy technologies, the goal is to understand the reasons behind the implementation or non-implementation of protectionist measures. Third, the EU member states attitudes toward China will be analyzed. The aim is to highlight the complex European very nature, and afterwards how this affect the bilateral Sino-European relation in renewable energy trade. The separation in different sections aims at better understanding the complexity of the phenomenon by applying social constructivism and green mercantilism as theories.

4.4STRATEGIC PARTNERSHIPS

This section analyzes the EU-China strategic partnerships in tackling climate change issues and their implications on the trade in green technologies between the two parties. Particularly, the primary goal is to answer the question *"How does the EU long term goal set the pace to tackle the climate change issues with China?"*.

As previously mentioned, the EU has constantly worked in order to develop a low-carbon economy and put in place several policies to reduce the ongoing environmental degradation at a global level (EC, 2014a, p. 7). A major objective has been to tackle climate change at a domestic level as well as through international efforts. On the other hand, China has now realized the importance of environmental protection, overcoming the old model "*development first, protection later, and pollution first, treatment later*" (Fang, Yifu, & Yong, 2009, p. 442). From this point of view, Beijing and the EU have created a constructive relationship in combating climate change, strengthening their dialogue on the issue and exchanging views and experiences. As stated by Miguel Arias Cañete, EU Commissioner for Climate Action and Energy,

> *"Europe has already gone through many of the problems which China is experiencing now - air pollution, environmental degradation, deforestation, urban mobility challenges... and as a result we have extensive experience that we can share with China"*
>
> (Xinhua, 2015)

As collective meanings constitute the structures which organize agents' actions, European values and its historical context cannot be excluded from the study of the Sino-European relationship on climate change. Since China's opening up strategy diplomatic ties were established between the EU and the PRC. The creation of the EU-China Comprehensive Strategic Partnership in 2003 and then the establishment of the EU-China Partnership on Climate Change in 2005 has then strengthen the Sino-European cooperation (Garcia, 2014, p. 330) (EC, 2017d). China and Europe have become highly interdependent, deepening their cooperation in a wide range of areas.

> *"The world of today is experiencing profound and complex changes. As important actors in a multipolar world, the EU and China share responsibility for promoting*

peace, prosperity and sustainable development for the benefit of all. They agree to continue to consolidate and develop their strategic partnership to the benefit of both sides, based on the principles of equality, respect and trust. The EU reaffirms its respect for China's sovereignty and territorial integrity. China reaffirms its support to EU integration."

(EEAS, p. 2)

Therefore, alongside strategic development plans within their borders, both China and Europe are committed to enhance cooperation. EU-China Comprehensive Strategic Partnership has become a centenary goal for both parties, being considered as a win-win strategy. When approached with social constructivism, European external action in general is driven by a set of common values. As stated by Javier Solana, EU High Representative for the Common Foreign and Security Policy, *"values are at the core of our external actions and an expression of our collective identity. We promote them because of who we are. But also because it is in our interest to do so"* (Solana, 2008). Therefore, the European identity and its values matters in developing its relations in the international agora. European values have been primarily incorporated through the Treaty of Lisbon (EU, 2007), which states

"The Union's action on the international scene shall be guided by the principles which have inspired its own creation, development and enlargement, and which it seeks to advance in the wider world"

(EU 2007, Art. 22)

From this point of view, European's strategy toward China emphasizes primarily values-based engagement model, which claims *"the promotion of democracy, the rule of law, human rights, and respect for the UN Charter's principles and international law"* (EU External Action, 2016), such as the 1992 UNFCCC. The goal is to promote a cooperation for mutual benefit in economic, political and social spheres between the two sides. Under this perspective, tackling climate change has become a key mission through internal and external policies, since it is linked to the concept of sustainable development. This supports that the EU's strategy on China may be approached with constructivism, according to the idea that a main EU's objective is to advance in sustainable development,

meaning "*development that meets the needs of the present without compromising the ability of future generations to satisfy their own needs"* (Schaik & Schunz, 2012, p. 174). In occasion of the visit to the PRC in 2017, Commissioner for Climate Action and Energy Miguel Arias Cañete spoke about the importance of a Sino-European cooperation in climate change with quotes such as

> *"Our successful cooperation on issues like emissions trading and clean technologies are bearing fruit. Now is the time to further strengthen these ties to keep the wheels turning for ambitious global climate action. In these turbulent times, shared climate leadership is needed more than ever."*
>
> (EC, 2017c)

By 2006, Europe has set a more aggressive trade policy based on the 2006 Global Europe trade strategy. The aim of this strategy is to adapt to the new challenges coming from the globalized world in order to maintain fair trade and competitiveness amongst foreign countries (EC External Trade, 2006, p. 2). The strategy abovementioned sets as goal the development of these values, in order to adapt to the changes in the new global economic order (EC External Trade, 2006, p. 3). This term, competitive markets, openness and social justice are core principles of the EU, supporting the use of the social constructivist theory in analyzing the European foreign policy on the PRC. Firstly, the EU strategy stresses the importance of creating a single market in order to create globally competitive companies within the EU borders (EC External Trade, 2006, p. 4). Secondly, despite the foreign competition, openness is vital for the European economy, creating jobs and stimulating companies. According to this principle Europe must reject protectionism, but otherwise imposing restrictions in order to defend European interests against unfair trade (EC External Trade, 2006, p. 5). Finally, according to the strategy, Europe must ensure protection for some regions and workforce, jeopardized by the market opening into the global economy. The core point of the paper is the idea that there is a link between a more open market economy and the GDP growth, justifying the choice of EU for a liberal approach towards trade. Indeed, further market opening would lead to "*greater consumer choice and lower prices, and more employment in Europe"* (Garcia, 2014, p. 331). From this point of view, the Union and Beijing may be an opportunity for each other, on a political, social, and economic level.

"China is the single greatest test of Europe's capacity to make globalization an opportunity for jobs and growth. Europe must get China right, as an opportunity, a challenge, and prospective partner."

(EC External Trade, 2006, p. 13)

In understanding European foreign and domestic policies and identity, an important aspect which cannot be ignored is the historical background of the Union. According to social constructivism, *"ideas are important as forces shaping preferences, identity, etc."* and also "*interests and preferences are socially constructed, and hence are flexible rather than enduring"* (Brawley, 2015). Historicity, thus, is a major aspect involved in the construction of social reality and in dynamic of change, influencing agents' beliefs, ideas and actions. The trade regime that the EU is based on finds inspiration in the liberal economic ideas of the classical trade theories. However, despite similarity, the free trade system has emerged in Europe with some peculiarity compared to its predecessor of the 19th century. The fear of returning to the Great Depression have shaped the European view on trade. Under this perspective, GATT regime considerably differed from the previous liberal economic policies. Such laissez-faire system had a detrimental impact on the economy of several nations, willing to sacrifice whole industries in order to pursue the comparative advantage (Bell-Scollan, 2013). Historical value, thus, have influenced the current European economic system. This stresses the importance of a liberal approach at an international level, but allowing government intervention in order to maintain a domestic economic growth and social security.

Further, the EU leaders have committed to achieve new goals for 2020, including China in the strategy. Specifically, Europe 2020 aims at the economic development of the country in all the areas "*for a smart, sustainable and inclusive growth*" (EC, 2014a, p. 7), both at a domestic level and at an international level. A major task is the sustainable development goal in both the parties,

"*addressing climate change, protecting the environment, promoting transparent international energy markets and facilitating resource-efficient, far-reaching, socially inclusive and low-carbon development policies"*

(EEAS, p. 9)

As green sectors highly contribute to sustainable development, green technologies are, thus, a cornerstone of the strategic EU-China cooperation (EEAS, p. 9) (Garcia, 2014, p. 331). Both sides have significant interests in maximizing the mutual partnership. On the one hand, Beijing has interest in developing its ecological sensitivity. The EU, on the other hand, may benefit for the development of its resource efficiency agenda (EEAS, p. 9). Being inspired by the Lisbon Strategy, which aimed at creating a competitive knowledge-based economy in the world, Europe 2020 aims at further increasing exports of high-value-added high technology and services, protection of IP and boosting innovation and education (Garcia, 2014, p. 331). Furthermore, a key goal rely on increasing the use of renewable energy within its own borders (Garcia, 2014, p. 331).

Until the financial crisis, the EU was the world leader of the green sector. The Union as a whole as well as its member states have encouraged the development of this industry. The reasons of the EU efforts in developing the green sectors are various. From a climate action stand point, a major use of climate-friendly goods may result in a reduction of emission targets agreed internationally (Garcia, 2014, p. 331). At an economic level, on the other hand, the green technologies firms may reduce dependency on energy imports and maintain control over volatile global prices (Garcia, 2014, p. 331). Furthermore, promoting clean energy and energy efficiency, may sustain the development of innovative low-carbon technologies, cornerstone of the EU strategy.

However, since the global financial crisis in 2008, the perceived potential of the clean-energy sector to create local jobs has led several countries to rise protectionist measures and policies aimed at protecting the domestic industry (OECD, 2015). Furthermore, globalization have challenged the EU's leadership in the clean-energy sector, rising discontent within the border of the EU member states. Aiming at increasing profitability and market share, European green technologies companies have moved production to other countries, with lower labor costs. Whilst this strategy has risen unemployment rates within the EU in the sector, lower labor costs have helped to reduce prices of climate-friendly goods. Moreover, the higher number of players have contributed in reducing global prices for climate-friendly goods in recent years, facilitating the development of the technology among consumers. (Garcia, 2014, p. 331) These variables have led to a rise in the employment rates in the sector in Europe and "*lower prices and increased competition from manufacturers abroad, particularly in China, have caused strife in the*

manufacturing sector within Europe" (Garcia, 2014, p. 331) The Chinese marketplace has been a strategic partner in carrying on the action, due to the favorable environment. Indeed, *China's government promoted these types of investments so as to facilitate technology transfers"* (Garcia, 2014, p. 331). Next, the increase demand for green power supplies in the global arena has increased the number of foreign companies in the energy field, increasing the competition among the actors in RE. A new wave of fear has, thus, spread among EU member states, discouraging trade with emerging economies, keen EU competitors (Siles-Brügge, 2013). According to Cernat & Madsen (2011), the 2010 Trade Eurobarometer shows that

> *"*[Most] *Europeans believe that the EU has benefited greatly from international trade. However, they are less confident about the future, as* [most] *think that trade will benefit more the emerging economies like Brazil, China, India, and Russia in the coming years."*
>
> (Cernat & Madsen, 2011)

These views have resulted in protectionist tendencies. Thus, a growing number of people and political actors are experiencing a reversing trend in the attitude towards trade policies, resulting in mercantilist ideologies. The constructivist theory allows to comprehend the ambiguous Sino-European relationship in RE as a social construction of reality, considering *"international politics as a sphere of interaction which is shaped by the actors' identities and practices and influenced by constantly changing normative institutional structures"* (Behravesh, 2011). Values and interests play a major role in structuring the cooperation or non-cooperation in climate change between the Union and the PRC. However, these may contrast, jeopardizing the stability of the relation between the two sides. From this point of view, despite principle of sustainable development, the European economic interests are threatened by China's growth in RE, raising overcapacity concerns (Saefong, 2016) and, thus, protectionist tendencies.

PARTIAL CONCLUSIONS

Throughout the analysis of the Sino-European strategic partnerships, the attempt was to answer the question *"How does the EU long term goal set the pace to tackle the climate change issues with China?"*. In doing so, a social constructivist approach has been

employed, emphasizing the social construction of the reality and therefore European ideals and identities.

As emerged in the study, China and the EU has long cooperate in mitigating climate change issues through the use of different domestic policies and partnerships. Particularly, since the new century, the establishment of the EU-China Comprehensive Partnership in 2003 and the EU-China Partnership on Climate Change in 2005 have strengthen the Sino-European cooperation on climate change. As presented in the analysis, in relating with China, Europe seems to take a value-based approach in order to tackle climate change, which emphasizes *"the promotion of democracy, the rule of law, human rights, and respect for the UN Charter's principles and international law"* (EU External Action, 2016), such as the UNFCCC. The European external actions, thus, seems to be driven by values and ideals. Particularly, the principle of *sustainable development* has shaped the Sino-European relationship in creating a "*smart, sustainable and inclusive growth*" (EC, 2014a, p. 7). However, European values may contrast with its interests, creating frictions between the two countries and jeopardizing their cooperation toward a climate-friendly engagement. Whilst analyzing the engagement on climate change by the two sides, thus, their promotion of green technologies need to be taken into account, as a cornerstone of the strategic EU-China cooperation. Despite a common interest by both the parties in developing climate-friendlier technologies the increase competition from manufacturers from China seems to threat the partnerships. In sum up, the EU valued-based engagement collides with its interests, particularly economic, arising disputes and frictions between the parties.

4.5 TRADE OF ENVIRONMENTAL GOODS

This section seeks to analyze trade of environmental goods between China and the EU focusing on the solar panel sector and the wind power industry. Both frictions and advantages of the Sino-European cooperation in the green economy will be highlighted, in order to gain a thorough insight into the matter. The aim is to answer and conclude upon the question "*What are the reasons for the EU whether to implement or not TDIs?"*. By employing the green mercantilist theory in the analysis of the industries, the goal is to understand the factor which lead the EU to the choice of using TDIs. A first introduction on trade in environmental goods between China and the EU will be presented, starting from a broad perspective and then narrow the attention on the two specific sectors.

There is no definition that is internationally agreed on environmental goods, due to the complexity of environmental activities. Indeed, many environmental goods are dual-use products, meaning that serve both environmental and non-environmental uses (EC, 2017b). However, this research refers to the one proposed by the EC, such as:

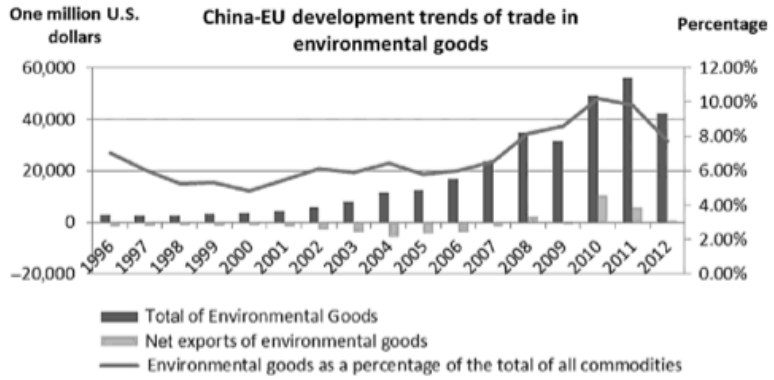
> *"Environmental goods and services are those produced for the purpose of environmental protection (I.e. preventing, reducing and eliminating pollution and any other degradation of the environment) as well as resource management (i.e. preserving and maintaining the stock of natural resources and hence safeguarding against depletion)"*
>
> (EC, 2017b)

Based on this definition, environmental goods and services are those production outputs which aim at reducing, eliminating or preventing any form of environmental degradation. According to OECD (1999, p. 11), environmental goods may be divided into three main categories: *pollution management*, *cleaner technologies and products* and *resource management*. Firstly, the pollution management group comprehends those goods and services which have direct impact in reducing environmental degradation. The cleaner technologies and products group and the resource management group comprise, instead, those products and services which are addressed to other than environmental proposes, but otherwise have a positive impact on the environment.

Over time, China has increased gradually its presence in the environmental industry worldwide. Alongside the development of its green sector, trade in environmental goods with other nations has become a key element for its political and economic strategy, especially with EU countries.

As presented by Qu & Zeng (2016, p. 28-29), data based on the UN COMTRADE show that trade value in environmental goods between the PRC and the EU has increased of an annual growth of 120% between 1996 and 2011, although a drop in 2012 (see Figure 6).

***Figure** 7:China-EU development trends of trade in environmental goods*



Source: (UN COMTRADE database cit. in Qu & Zeng 2016, p.29)

The growth may be a result of the establishment of several policies which have encouraged the development of the green industry both at a national and international level (Qu & Zeng, 2016, p. 29).

As presented in the previous section, despite trade policies seem to be highly relevant to achieve the goal of creating a low-carbon economy in both the trade blocks (Garcia, 2014, p. 331), protectionist measures against China are on the rise. Nonetheless, by cherishing its principle of non-interference in domestic affairs in neighbouring states, China has been surprised by the increasing criticism about trade in green technologies by the EU (Umbach, 2010, p. 69). Table 4 presents support measures for the RE industry used by the EU member states and China.

***Table 4**: Renewable Energy Industry Support Measures, by Country*

Support Measure	Countries Where Utilized
Feed-in Tariff	**EU:** Austria; Bulgaria; Croatia; Cyprus; Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Ireland; Italy; Latvia; Lithuania; Luxembourg; Malta; Netherlands; Portugal; Slovakia; Slovenia; Spain; United Kingdom. **China**
Direct capital subsidy, grant, rebate, or favorable loan	**EU:** Austria; Bulgaria; Croatia; Cyprus; Czech Republic; Denmark; Finland; France; Germany; Greece; Hungary; Italy; Luxembourg; Malta; Netherlands; Norway; Poland; Portugal; Slovakia; Slovenia; Spain; Sweden; United Kingdom. **China**
Local Content Requirement	**EU:** Croatia (Wind/Solar/Others, 2012); France (Solar, 2012); Italy (Solar, 2011); Spain (Wind, 1994) **China** (Wind, 1997)
Financial or Tax Incentives for Local Manufacturing	**EU:** UK (Green Products, 2009)
Use of Customs Duties/Import Tariffs to Favor Domestic Goods or Promote Domestic Manufacturing	**China** (Wind, multiple years)
Export Credit Assistance	**EU:** Denmark (Wind, various years); **OECD** (All RE, 2012)
Research, Development and Demonstration Support for Domestic Companies	**EU:** Denmark (Wind, various years); Germany (Wind, Solar, various years) **China** (Wind, Solar, various years)

Source: Author

(Lewis, 2013, p. 6) (RES LEGAL Europe, 2017)

Interpreting this from the theoretical perspective of social constructivism, the Sino-European relations are shaped by the EU member states' interests and identities. The European main objective is to establish bilateral relations with China in order to develop and protect the domestic arena, which may be considered the interest of the international

society. Under this perspective, in 2012, the Danish Minister for Trade and Investment Pia Olsen Dyhr spoke about the growing protectionist tendencies among European countries in order to support the domestic economy:

> *"All governments distort the green economy in some way, for example with subsidies. All are convinced of the benefits of green trade liberalisation, but all want to protect their industry too. That's why the WTO [World Trade Organisation] process is so difficult"*
>
> (EPC, 2012)

Next section will narrow the focus on the two selected RE industries: the wind power and the solar panel sector.

2.3.1 CASE STUDY: SOLAR PANEL

Over time, the EU has significantly improved its commitment toward cleaner-energy technologies, becoming a worldwide model for the use of clean energy. The principle sustainable development has been emphasized in its relationship with China. With Europe 2020, the Union has set high goals, aiming at developing a low-carbon economy based on renewable energy. The objective is to increase the current share of the EU's energy consumption from renewable sources of 7% up to a binding target of at least 20% (EU ProSun). According to EU ProSun data, the development of the renewable energy sector has created 300,000 jobs in the last decade, rising the employment rate within the EU (EU ProSun, s.d.). Specifically, the photovoltaic sector is the largest renewable energy employer sector, accounting around 2,8 million jobs globally. In 2015, the country with the highest number of jobs in the PV manufacturers was China, with 1,7 million jobs, whilst the EU accounted for 143,000 jobs (IRENA, 2016, p. 2) (see Table 5).

***Table 5**: Estimated Direct And Indirect Jobs In the PVs Sector, By Industry, 2016*

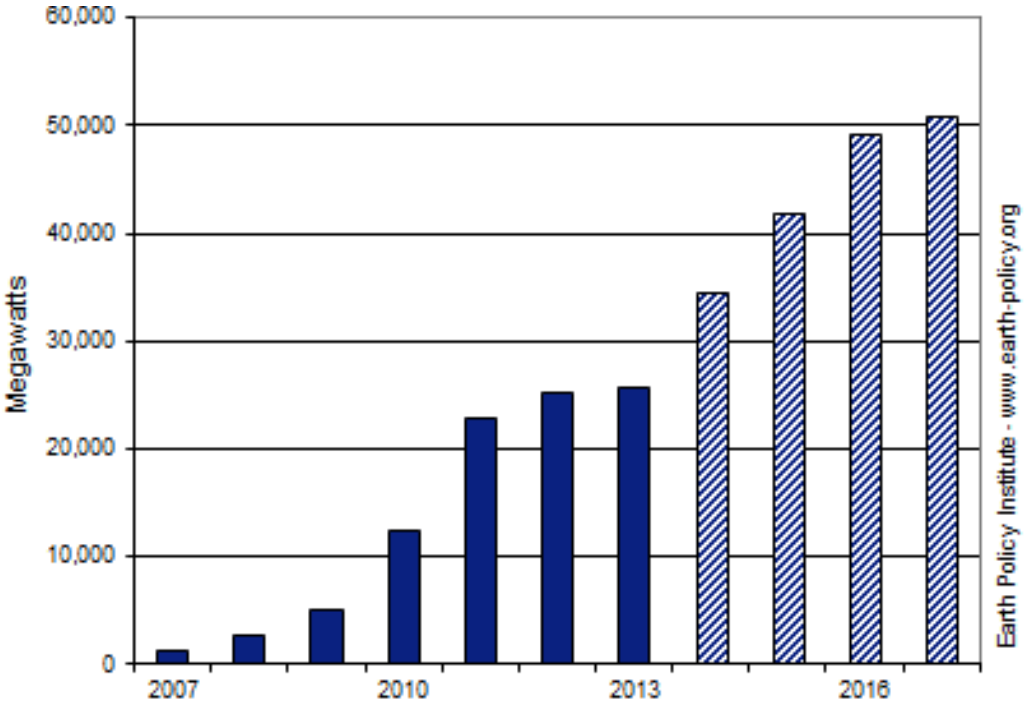
	World	China	European Union		
			Germany	France	Rest of EU
Solar Photovoltaic	2,772	1,652	38	21	84

Source: Author

(IRENA, 2016, p. 17)

As presented in the Background section, China is a major trading partner of the EU and by far the most targeted country of protectionist measures by the EU, especially anti-dumping and anti-subsidies (see Appendix A). According to the figure below (see Figure 7) Chinese solar panels experienced a boom in the production between 2009 and 2013, accounting in 2014 for 64% of the global solar production with an expected upward trend in the next future (Roney, 2014a).

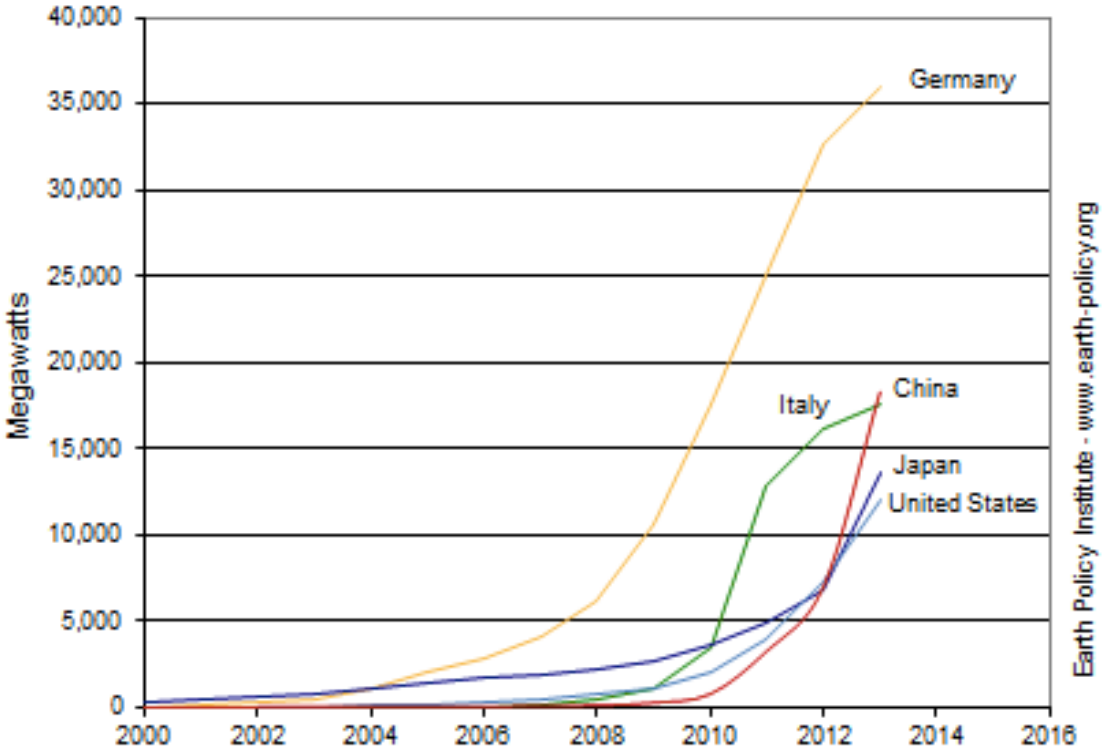
***Figure 8**: Annual Solar Photovoltaics Module Production in China, 2007-2013, with Projection to 2017*



Source: (Roney, 2014a)

Data from Earth Policy Institute (Roney, 2014b) shows that China's PV installed capacity has grown substantially starting by 2010, nearly nine fold. The fact reflects the Chinese commitment to move toward cleaner-energy technologies and environmental protection. Figure 8 illustrates the relatively high concentration of installed solar photovoltaics capacity in just few leading countries. Despite European countries, such as Germany and Italy, dominate this sector and represent a major actor of the global PVs installation, China has made significant progress (Graaf, 2013, p. 4).

***Figure 9**: Cumulative Installed Solar Photovoltaics Capacity in Leading Countries, 2000-2013*

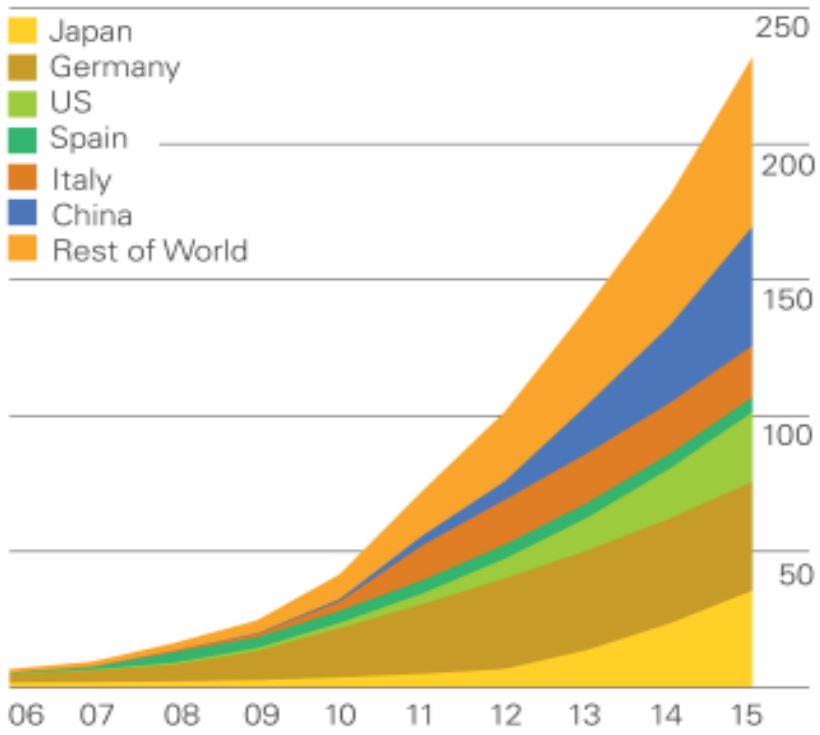


Source: (Roney, 2014b)

According to IEA (2016, p. 13), in 2015 the European total cumulative installed capacity represented approximately 42% of the global installed PVs capacity, whilst in 2011 the European global new installation stood at 75% (EU ProSun). This negative trend is expected to continue in the coming years, due to the global competition coming particularly from Asian countries. Indeed, nations in Asia are currently experiencing a growing installed capacity, particularly China. The country has now broken the record as

highest capacity installed, surpassing the European countries (see Figure 9) (IEA, 2016, p. 5).

***Figure 10**: Solar PV Generation Capacity, 2015*



Source: (BP, 2016b)

China has therefore experienced a drastic changing trend in the last few years. In 2010 China's PVs production stood at 45% of solar panels globally, although only a fragment was installed domestically. This contributed to fuel trade disputes between China and Europe, the most important trade partner of solar PV cells. Indeed, during the last decade, the EU has experienced a surge of imports of such goods from China. Nowadays, China's production of solar panels is around 65% of the global production, despite in 2011 its production capacity was 20 times higher than the domestic demand (EU ProSun). As a result, most of its PVs have been exported, particularly to the EU market – around 80% totally (EU ProSun),"*where consumer demand has often been artificially inflated through various support schemes"* (Graaf, 2013, p. 7). The Sino-European strategic partnership in this sector, thus, has gained importance, creating space for cooperation as well as conflicts. In 2011 "*Chinese companies have captured more than 80% of the European*

market from almost zero a few years ago" (Roney, 2014b), becoming a major challenge for EU solar manufacturers. Furthermore, as a result of the growing production of PVs and the advantages from low labor and raw material costs, in 2014 China's solar panels were almost 45% cheaper than the ones produced in Europe (Roney, 2014b). Frictions have arisen between Beijing and the Union. Since 2012, the EU and China began a tense dispute about trade in solar energy field. The EU-located producers have claimed the unfair trade of China, requesting the use of TDIs from the EC.

> *"The duties will be imposed in two stages, starting with 11.8% for the first two months and followed by 47.6% for another four months to alleviate the harm that is caused to the European industry by this unfair trade practice, dumping."*
>
> (EC, 2013)

However, after imposing punitive import duties on solar panels in 2013, an "amicable solution" on the dispute was reached with China agreeing to reduce exports to the EU and adjusting prices to minimum levels for solar panels imports (Plasschaert, 2016, p. 2). In return, the companies involved in the dispute did not have to pay the anti-dumping duties of 47.6%. Arguably, the interests of EU member states influenced the EC decision, particularly the opposition of Germany to impose duties on Chinese solar panels. Indeed, despite the EC carries on the trade investigations, the Council and therefore EU member states have the final say on the matter (Boru, 2014). Approaching the matter under a constructivist prism, the identities and beliefs of these countries may lead to a less engagement with China in the promotion of wind and solar power technologies. For instance, Germany is ranked high for climate change awareness and RE expectation. This contrasts with Fox & Godement classification. Germany's interests then may explain its position in favor of China during the solar trade dispute. Their bilateral trade covers a too significant importance for Germany's economy.

Despite a common wish to promote clean energy at home, growing trade conflicts in the green sector have been experienced due to conflicts with rules and regulations of the international trade regime. From a green mercantilist point of view, the clean energy sector is viewed by both parties as a *zero-sum-game*, rather than a *positive sum game* (Graaf, 2013, p. 14).

"In the US and the EU, there is growing paranoia about Chinese clean energy. Fears of China have translated into calls for "green protectionism," and new trade frictions. Anti-dumping investigations are met on the Chinese side with counter-investigations."

(Graaf, 2013, p. 14)

From a constructivist standpoint, the EU fears the huge Chinese green market and acts in order to protect its interests and economy. As presented by Graaf (2013, p. 14), this may result in an overuse of green protectionist measures and trade disputes and create a *tit-for-tat* pattern. This happened during the solar trade disputes, when a series of investigations and counter-investigations were launched by both parties, causing a so-called *trade war* over renewables.

According to the green mercantilist theory, several strategies may be employed in order to grow the green sector of the country. Throughout the analysis of the solar trade disputes between China and the EU, the goal is to understand which protectionist measures are used by the two trade blocks and thereafter to understand the reasons of such measures.

According to the green mercantilist theory, boosting exports and reducing imports is one of the main strategy employed by green mercantilist countries. Doing so, the goal is to either artificially raising the prices of imports whilst reducing the prices of exports (Stepp & Atkinson, 2012, p. 8). Both parties employ different mechanisms in order to protect and somehow hurt the other economy. From this point of view, as presented in the Background section, the EU criticizes China due to several structural elements of the Chinese economy, such as strong degree of government intervention. This term, a major green mercantilist practice consists in the unfair subsidies. China has used this strategy in order to increase its global share of solar panels. Chinese solar panels were accused of flooding the European market and being produced through the use of unfair subsidies by the government. As presented by Stepp and Atkinson (2012, p. 8): "*under the WTO, subsidies can be considered harmful if it is proven that the subsidy distorts international trade*". Therefore, subsidies are not always mercantilist in nature. Based on the theory, this mechanism may help green technologies to gain market share, whilst, on the other hand, give an unfair export advantage on the clean-technology goods. Under this perspective,

"China utilizes subsidies to not just expand energy access to its citizens, but to also unfairly gain global market share for its clean energy producers by leveraging its first-generation technologies, like crystalline solar panels, as a market leader not on merit, but on subsidized price."

(Stepp & Atkinson, 2012, p. 8)

Therefore, an "ugly" green mercantilist policy is employed by China. Indeed, the country has used this mechanism both to benefit its own population increasing the level of energy, but also to gain global share in the solar panel industry. By using mercantilist subsidies, China is able to gain a price advantage against foreign competitors, damaging their market. Under this perspective, the EC carried on the solar dispute as it found that Chinese panels were entering the European market at an 88 percent price reduction, damaging the financial and operational performance of European producers in the solar panel manufacturers (EC, 2013). The Industry Trade Advisory Committee Member of the US Timothy Brightbill once stated,

"[China's] *rapid and unprecedented expansion* [of its solar industry] *was the direct result of the Chinese government's support, including its granting of an extraordinary range and amount of subsidies to the industry. Some companies in China's solar industry are SOE's; many others are effectively state-controlled because of close connections to the government, or because they are dependent on the government for subsidies."*

(Brightbill, 2012, p. 8)

By explicitly subsiding domestic manufacturers or by absorbing losses of SOEs, the Chinese government aims to lower the production costs of green technologies, such as PVs. Doing so, the country is able to sell solar panels at a lower price than foreign competitors. Export dumping, thus, is a green mercantilist strategy which aims to sell green products at below-market prices in order to undercut competitors and dominate foreign markets (Stepp & Atkinson, 2012, p. 8).

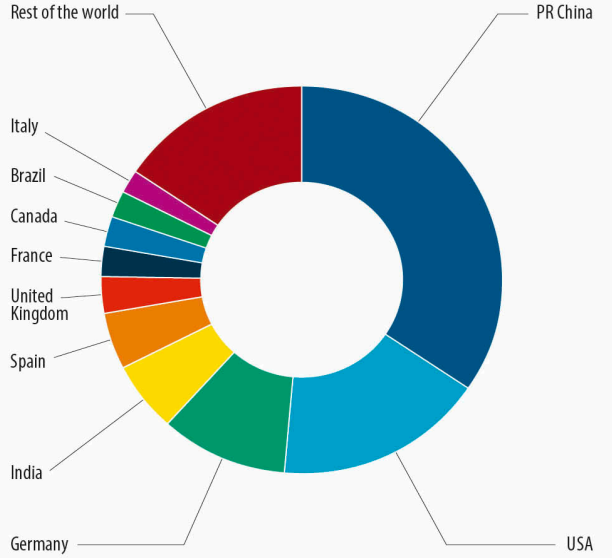
With apparent *tit-for-tat,* China responded to the EU questioning the legitimacy of renewable energy feed-in tariff (FITs) programs. The FITs were accused to be inconsistent with the WTO rules in certain EU member states, particularly against Greece

and Italy. FITs are widespread policy tools employed to promote renewable energy with a premium electricity price on to renewable energy producers. The objective of this policy instruments is to foster a low-carbon economy, making "*renewable energy more economically attractive and competitive against fossil fuels*" (Kulovesi, 2014). The complaint focused on the local content requirement of those tariffs, which violated the WTO non-discrimination principle and equal treatment among trade partners. Indeed, "*the payment of the feed-in tariff to renewable energy producers* [was] *linked to requirements that they use locally produced components*" (Graaf, 2013, p. 11) (Garcia, 2014, p. 333). China accused certain EU member states of an unfair use of these schemes, mainly employed to promote local solar manufacturers and job creation in the sector. Under this perspective China claimed the use of green mercantilist measures against its companies by the EU member states. Simultaneously, China filed a WTO trade complaint over European exports of polysilicon to China. The material, used in solar panels, came under anti-dumping and anti-subsidy investigation.

2.3.2 CASE STUDY: WIND POWER

In the annual report by the Global Wind Energy Council (GWEC, 2017) is shown a significant growth of the wind power industry worldwide. Leading the increase of the global cumulative capacity was China, followed behind by the United States, India and certain EU member states – specifically Germany, Spain, the United Kingdom, France and Italy which performances accounted for 22.4 % of the total share (see Figure 10). In 2016, together these countries accounted for 76,9 % of the global wind turbines installed capacity.

***Figure 11**: Top 10 Cumulative Capacity December 2016*



Country	MW	% Share
PR China	168,732	34.7
USA	82,184	16.9
Germany	50,018	10.3
India	28,700	5.9
Spain	23,074	4.7
United Kingdom	14,543	3.0
France	12,066	2.5
Canada	11,900	2.4
Brazil*	10,740	2.2
Italy	9,257	1.9
Rest of the world	75,576	15.5
Total TOP 10	**411,214**	**84**
World Total	**486,790**	**100**

(GWEC, 2017)

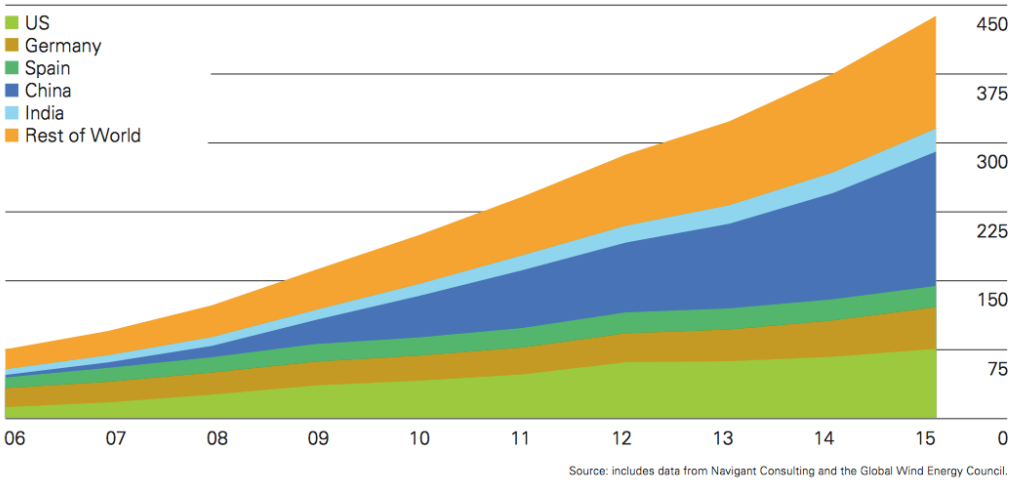
As stated by the GEWC Secretary General Steve Sawyer, China has played a major role in the development of the total cumulative capacity in 2016, although a decrease in the installed wind power capacity compared to the previous year.

"Chinese installations were an impressive 23,328 MW, although this was less than 2015's spectacular 30 GW, which was driven by impending feed-in tariff reductions. Also, Chinese electricity demand growth is slackening, and the grid is unable to handle the volume of new wind capacity additions; although we expect the market to pick up again in 2017."

(Sawyer 2017 cit. in Hill, 2017)

The feed-in tariff programs which were introduced in 2009 have significantly contributed to the development of the industry in China. The figure below (see Figure 11) illustrates the development of China's domestic wind power capacity.

***Figure 12**: Wind Capacity - Gigawatts, cumulative installed capacity, 2006-2015*



Source: (BP, 2016a)

The wind technology sector has rapidly grown over the last decade in the P.R.C., experiencing more than a 20-fold increase in the wind cumulative installed capacity between 2006 and 2015 (Graaf, 2013, p. 4). As the solar photovoltaic industry, the wind power sector has contributed to create new jobs worldwide (EU ProSun). In 2015 the sector accounted 1 million jobs globally. The country with the highest number of jobs in the wind power manufacturers was China, with 507,000 jobs, followed behind by the EU with 331,000 jobs (IRENA, 2016, p. 2) (see Table 6).

***Table 6**: Estimated Direct And Indirect Jobs In the Wind Power Sector, By Industry 2016*

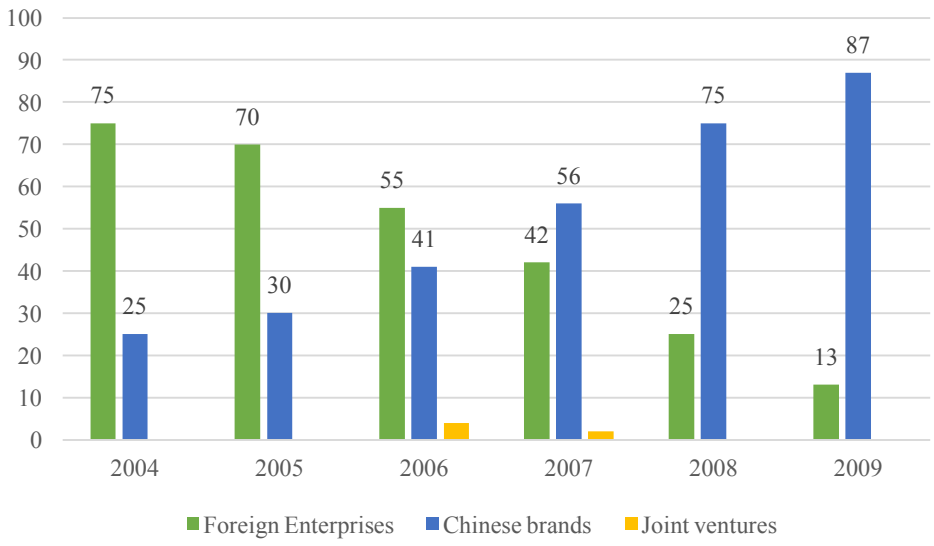
	World		European Union		
		China	Germany	France	Rest of EU
Wind Power	1,081	507	149	20	162

Source: Author

(IRENA, 2016, p. 17)

Furthermore, as presented by Graaf (2013, p. 5) until 2005, the wind power market was highly dependent on foreign production. Thereafter, a shift toward Chinese local producers has been experienced by the country, reducing its reliance on foreign turbine manufacturers: "*By 2009, the market share of local enterprises increased to 87 percent"* (2013, p. 5) (see Figure 12).

***Figure 13**: Domestic and foreign shares in newly installed wind capacity in China, 2004-2009*



Source: Author

(Li et al. 2010 cit. in Graaf, 2013 p. 8)

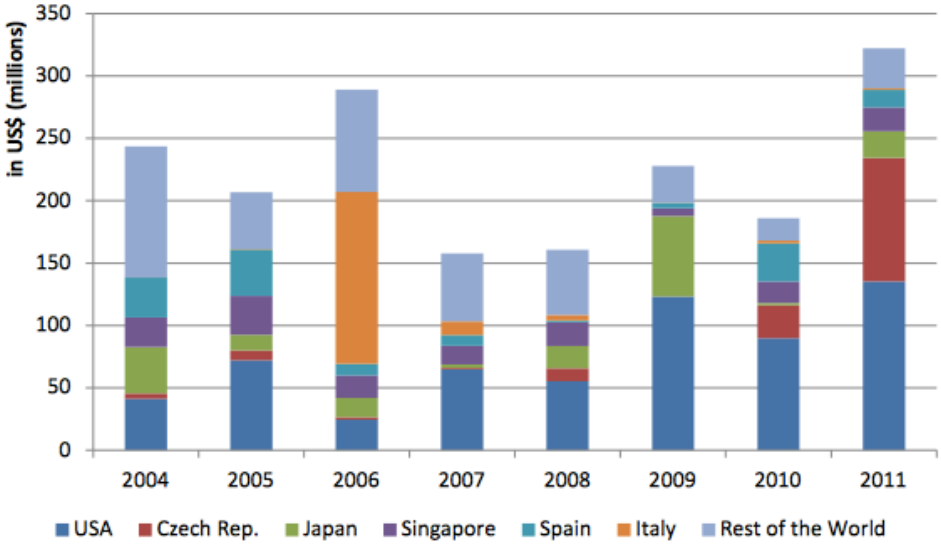
The rapid shift toward a development of the domestic wind energy firms was facilitated by

several domestic policies and regulations, some of which collides with the established principles of international trade law and may be questioned under the WTO rules. China has, indeed, employed different green mercantilist measures in order to boost the domestic market such as joint ventures and technology transfer, customs duties and import tariffs, local content requirements and wind-power related subsidies (Graaf, 2013, p. 7). By reducing imports of wind power goods and localizing the production at a domestic level the aim is to national wealth and foreign reserves. When approached with green mercantilism, the purpose of employing RE support measures is to protect domestic wind power industries by foreign competition. The reduction of foreign shares in newly installed capacity in China by 2004 may be seen under this light, as it has been accompanied by an increase of the presence of Chinese brands (see Figure 12)

Firstly, since the second half of the 1990s, China has considerably encouraged the wind power industry as an area of investment. Although China allows foreign companies to establish in its domestic market as wholly foreign-owned enterprises – WFOs –, several foreign companies choose to enter into joint ventures with domestic firms (Wrest, 2016). The choice is a result of the fact that domestic companies have the monopoly in the wind power market, as presented in the Figure 12. This strategy has been employed by different European multinational corporations such as the German company Siemens, which established in 2011 a JV with Shanghai Electric in 2011. Pursuing joint ventures partnerships does not imply the violation of international trade law, meaning that green mercantilist policies are not a direct consequence. Under an economic perspective, JVs may be considered as a *win-win* strategy, as foreign companies can get direct access to the market, new resources, distribution network, IPRs, and so forth. However, in certain cases, the creation of joint ventures has been permitted in exchange for technology transfer of foreign turbine technologies to local companies. Under this perspective, a good policy may be treated as an ugly one, in order to safeguard the national interest. Transfer of foreign state-of-art technologies is one of the pillars of China's strategy toward becoming an innovation-driven economy by 2020 (EU SME Centre, 2014). The Chinese government has stimulated the innovation of the local wind power industry through incentives to innovate locally and absorb foreign technologies, based on the principle catching up first and then competing. Under this point of view, joint ventures are attractive for Chinese companies, since the partnership involves new and complex technologies. If pre-condition for doing business in the Chinese wind sector, this strategy may be questioned under WTO rules, as China had agreed in eliminating any technology transfer

actions to access the organization (Graaf, 2013, p. 8) (Lewis, 2013, p. 2).

***Figure 14**: China's Top Import Partners for Wind Technology 2004-2011*



Source: (Gandenberger, Unger, Strauch, & Bodenheimer, 2015)

Figure 13 shows the leading import partners from which China received wind technologies between 2004 and 2011. Throughout this period, whilst US maintained a leadership position almost every year, the contribution of the other country significantly changed from year to year. However, certain EU member states such as Czech Republic, Spain and Italy have been major trade partners as well. According to Gandenberg et al. (2015, p. 23), the significant variation of trade partners from year to year does not allow China to absorb tacit knowledge from other countries. From this point of view, joint ventures assume considerable importance in the knowledge spillover. Under the "*Ride the Wind Program*" of 1997, the Chinese government has privileged countries which allowed the transfer of state-of-art technologies in the wind power industry. The Spanish *Made* and the German *Nordex* wind companies were among the first to establish joint ventures with local Chinese enterprises, respectively *Yituo* and *Aero Engine Cooperation* (Lewis, 2013, p. 2). The foreign companies agreed to transferred wind turbine technologies in exchange for getting access to the Chinese market and financial support by the government technology funds (Lewis, 2013, p. 2) (Graaf, 2013). However, as presented in the EU SME Centre guidelines, "*sharing technology and producing locally will not automatically open doors to the Chinese market – in particular, not in economic sectors that depend on government procurement*" (2014, p. 2).

Along with JVs and technology transfer, important industrial policies to support the Chinese

wind industry are the customs duties and import tariffs on wind turbines. As the previous one, this policy support mechanism which in certain cases collides with the international trade law. China has adjusted import tariffs and custom duties alongside the development of the wind sector in order to increment domestic production of this RE source. Whilst in the early years of wind energy development, between 1990 and 1995, customs duties and import tariffs were low and in some cases also duty-free, since 1996 the tariffs were adjusted to support local enterprises (Silva & Klagge, 2014) (Graaf, 2013, p. 8) (Lewis, 2013, p. 3). The shift demonstrates a change in the Chinese strategy: whilst the first stage was direct at attracting foreign companies, during the second stage China has turned into a green mercantilist country. Indeed, prior 1996, the goal of Beijing' strategy was to promote the domestic wind power market, boosting the economy through foreign production facilities. From a green mercantilist point of view, a "good" green mercantilist policy was put into practice, as both the country as well as foreign countries benefited from the regulation. By 1996, China has set the tariffs rate at 12% on imported turbines and a lower duty of 6% on important components in order to encourage the local industry (Graaf, 2013, p. 8), shifting toward an "ugly" green mercantilist strategy. After a revision process, in 2008 the Chinese government restricted the high duties on import turbines with a capacity lower than 2.5 MW (Silva & Klagge, 2014). However, current customs duty regulations vary significantly across the import components of the wind-power related products and are applied differently based the different ownership structures of the firms (Lewis, 2013, p. 3).

> *"The aim of this differentiation is to explicitly reserve the market for smaller wind turbines to domestic manufacturers and at the same time open up the market "for important technological equipment" such as larger high-output turbines"*
>
> (Silva & Klagge, 2014)

Again, the discriminatory treatment toward foreign companies contributes to perpetuate barriers to international trade, violating the WTO principle of non-discrimination on the basis of nationality.

A third dubious industrial policy to support China's wind industry is the local content requirements, in place in China for a long time. Borrowing the OECD definition, *"LCRs are a type of localisation barrier to trade that requires solar- or wind-energy investors to source a certain share of inputs locally, to be eligible for public support"* (OECD, 2015). During the Ninth Five-Year Plan, in the years between 1996 and 2000, a wind-farm related project was

approved by the NDRC, requiring a 40% of LCRs for wind turbine products purchased. Starting by 2003, the LCRs have been growing first with 50% local requirement, then moving to 70% local content. The increase in the LCRs was a result of a program launched by the NDRC, which started to auction off the right to develop large wind firm. The LCRs was a key determinant to evaluate the feasibility of the project and to select the winning bids for these concessions (Graaf, 2013, p. 8) (power-technology, s.d.). Later in 2005, the requirement was extended not only on government-run wind manufacturer, but to all type of wind farms in China (Graaf, 2013, p. 8) (Lewis, 2013, p. 3). The main aim of this strategy was to encourage the domestic production of wind power equipment, in accordance with green mercantilist principles. Indeed, the major obstacle in the development of this industry was the high dependence on imported wind turbines. Reducing the dependence on import of wind-power related goods have allowed an increase in the domestic production and a development of technical expertise of local players (power-technology, s.d.). In 2009 China eliminated the LCRs, even though the local content is still a main factor in the selection process for awarding the *Wind Concession* (power-technology, s.d.). Due to the requirement, foreign companies face difficulties in establishing and receiving wind farm concessions. Consequently, several international manufacturers have developed different strategies in order to meet these requirements (Lewis, 2013, p. 3). Despite the positive impact on the domestic market, this supportive measure is dubious under international trade law, and violate Article III: 4 of the GATT:

> *"The products of the territory of any contracting party imported into the territory of any other contracting party shall be accorded treatment no less favourable than that accorded to like products of national origin in respect of all laws, regulations and requirements affecting their internal sale, offering for sale, purchase, transportation, distribution or use."*
>
> (General Agreement on Tariffs and Trade, 1994)

Under WTO rules, members cannot grant any subsidies which encourage export performance and their clean energy producers to the detriment of imported goods. With China's accession to the WTO, the country agreed to remove all prohibited subsidy programs.

A policy instrument which have played a critical role in the development of the Chinese wind industry are wind-power related subsidies, including *"direct subsidies for government capacity building, subsidized R&D, tax-related incentives, and pricing incentives"* (Lewis,

2013, p. 4). Again, some of these subsidies may be questionable under WTO law and contested as non-tariff barriers. Indeed, whilst certain government subsidies are equally available for both foreign and Chinese producers, others targets specifically Chinese wind turbine manufacturers, such as the ones related to research and development (Lewis, 2013, p. 4) (Graaf, 2013). Furthermore, certain green technology subsidies have promoted locally produced technology, damaging foreign wind manufacturers. China's green technology subsidies are comparatively high to the rest of the world, accounting for almost half of the total green energy stimulus spent globally (power-technology, s.d.), resulting in a negative impact for green energy firms in other countries. By employing green mercantilist practices, China has gained advantages whilst damaging many other foreign markets. Indeed, by using subsidies, Chinese manufacturers have increased their market share, gaining a price advantage against foreign companies and leading to an increase of the trade imbalance in the green sector.

> *"As a result, green energy firms in other countries* […] *have suffered a decline in their export businesses, job losses, decreases in domestic market share and a fall in market-driven prices, thereby largely affecting their profit margins."*
>
> (power-technology, s.d.)

From this point of view, wind-power related subsidies are questionable under WTO law, violating Article V of the Agreement on Subsidies and Countervailing Measures: *"No Member should cause, through the use of any subsidy* […]*, adverse effects to the interests of other Members"* (SCM Agreement, 1999).

Surprisingly, the EU has not pursued any action against the above China's industrial policy. As stated by Keith Bradsher,

> *"Companies like Gamesa have been so eager to enter the Chinese market that they not only bow to Beijing's dictates but have declined to complain to their own governments, even when they see China violating international trade agreements."*
>
> (Bradsher, 2010)

Prior 2005, European wind firms had a significant share in newly installed wind capacity in China. The rate has decreased alongside the development of the Chinese wind power market. Nowadays, European wind companies face difficulties in entering the market, due to the numerous trade barriers mentioned above. Once European enterprises access the

Chinese high-end wind energy equipment market, they do not want to lose out the attractive market.

PARTIAL CONCLUSIONS

The second section of the analysis seeks to answer the question *"What are the reasons for the EU whether to implement or not protectionist measures"*. In order to comprehend which are the leading drivers of trade investigations implemented by Europe in RE technologies, two major sector have been analyzed: the wind and solar power industry. The investigation of these industries has been carried on through the use of the green mercantilist theory. According to the theory, different policies may be employed by countries in international trade. Particularly, the green mercantilist ones, namely ugly and destructive policies, employ different mechanisms in order to boost exports and reduce to minimum levels imports. Throughout the study, therefore, these measures have been analyzed in order to comprehend the European external action toward international trade with China.

The EU has long committed in moving toward RE technologies, becoming a model for the use of clean energy. On the other hand, China, the largest producer of emissions in the world, has recently assumed a leadership role in the production of climate-friendly technologies. During the last decades, the PRC has increased the installed capacity of both solar power and wind power within its border, increasing its domestic share and the competitiveness at a global level. The analysis shows that the Chinese government has promoted the clean energy sector through the use of several mechanisms which may be questionable under WTO rules, in order to boost the domestic production and exports whilst reducing imports. In doing so, the EU share in RE has decreased, causing economic losses within the member states. However, has shown in the analysis, whilst the Chinese solar panel industry has under trade investigations by the EU, the wind sector has not experienced trade disputes. According to the findings, this may be a result of the European interests in the sector. Indeed, during the "trade war" Chinese solar panels were accused to enter the market at a 45 % price reduction, as a result of the government subsidies. Furthermore, in 2011 Chinese companies captured more than 80 % (Roney, 2014b). This has lead the EU-located producers to claim the unfair trade, requesting the use of TDIs.

However, after imposing provisional import duties, disputes were solved through an amicable solution. Arguably, the interests of EU member states influenced the EC decision. Indeed, despite the EC carries on the trade investigations, the Council and therefore EU member states have the final say on the matter. As presented by (Boru, 2014), Germany has played a key role in the settlement of the dispute. Indeed, despite solar panels are a key business for the country, Germany had higher interests in maintaining positive economic and diplomatic relations.

Throughout the analysis of the Chinese wind power, it emerged that the country employs different ugly policies in order to boost the domestic market. Numerous RE industry support measures may be questionable under international law. However, trade disputes between EU and the PRC do not shape the sector. Again, the EU member states play a major role. Indeed, according to the findings, China has made more difficult for foreign wind power companies to access and compete in the market, due to the high number of green mercantilist measures previously analyzed. The European companies that have entered the market, thus, do not want to lose out the attractive economy.

6. DISCUSSION

Throughout the research project, several aspects were analyzed in order to reach a conclusion and to answer the initial problem statement:

"Why does the EU cooperate with China in climate change issues, but then using protectionist measures towards China's green industry?"

In the analysis chapter it has been discussed how the Sino-European strategic partnership in tackling climate change issues has developed throughout the last century. Furthermore, the analysis of two case studies has been considered has a suitable strategy in order to understand the reasons of the current European protectionism in the green technologies market. Specifically, the solar trade industry and the wind power industry have been analyzed. This chapter will argue the findings of the analysis, discussing the possible reasons of the ambiguous strategy employed by the EU. Furthermore, it will be discussed whether the Sino-European relationship to combat climate change and promote green technologies is conflictive or cooperative. The weaknesses and strengths of the European attitude toward China will be discussed.

Firstly, the Sino-European strategic partnerships in setting the pace to tackle the climate change issues will be debate, highlighting the motivations of the two parties in carry on the cooperation. Despite divergences in some area such as China's government intervention in economic, social and political affairs, China is a natural strategic partner for the EU. During the last century, China and EU have developed closer ties in a wide range of areas both at the bilateral and multilateral levels. Particularly, the China-EU Comprehensive Strategic Partnership in 2003 has led the two parties to become more interdependent, deepening their cooperation in order to promote prosperity and sustainable development at a global level. The engagement towards a sustainable economy and green energy has been taken by both sides through international cooperation as well as domestic strategies, such as the EU 2020 Strategy and China's 12th Five Year Plan. Thus, the partnership seems to offer mutually beneficial outcomes, both economically and politically. Indeed, climate change may cause extreme economic losses and a reduction in the general well-being of the world population, loosening political and

social stability. As a result, both China and EU have listed the shift towards climate-friendlier technologies as a main objective in their political agenda. From this point of view, the EU and China are critical actors in the transition towards the development of low-carbon economies and green technologies. On the one hand, the EU has long set the pace in tackling international climate change issues and has taken a leadership role in developing an international climate change diplomacy. China, on the other hand, is the world's largest polluter in absolute term, but its engagement to build a harmonious society has now led the country to take the lead in lowering the level of pollution domestically and globally. The country has assumed a leadership role in the production of green technologies, such as wind power technologies and solar photovoltaic panels. According to the analysis, China has increased its cumulative installed capacity of green technologies over the past decade. Moreover, whilst in the previous year China's green market was mainly based on the production and exports of green technologies, over the past decade China has become an important buyer and consumer of clean energy, reducing its reliance on foreign technologies.

Despite strategic partnerships between the two sides, the Sino-European relations have been jeopardized by the EU's valued approach to dealing with China, with a principled, practical and pragmatic engagement (Saarela, 2017). Arguably, the EU objective to influence the Chinese domestic policy in the green energy field have challenged the Sino-European cooperation. The core idea is that China's environment degradation does have historical parallels with Western countries as well as European member states. Basically, China is now at a certain stage of its industrialization which has been already experienced by those states. Under this perspective, it may be argued that Europe is trying now to influence Chinese domestic policy in order to have control on the outcomes, whilst it may be more fruitful to build common interests with the country. The strategy collides with the Chinese principle of non-interference in domestic affairs in neighbouring states, creating a growing number of frictions between China and the EU. The Union expects China to assume responsibilities in the area of climate action not only locally but also in the international arena, whilst supporting the rule-based international order. The EU strategy on China is based on the concept of principles and norms. This principle has contributed the development of the EU's policy toward China in four key areas of interests: global governance, trade and investments, technical assistance and political and

social changes (Jie & Yu, 2013). China seems to have committed itself with the Union in order to achieve sustainable development and prosperity, which has become a main pillar of the Sino-European bilateral relationship. The cooperation on climate change between Beijing and Europe has been mainly based on the principle of promoting sustainable development through interdependent global governance. In line with the strategy, policy tools in trade and investment and technical assistance have been employed in the cooperation in RE field. From a European standpoint, global integration into economic, political and social affairs is a main pillar of its strategy toward China. Arguably, the Sino-European relationship has been developed over time on this principle. Since the 1990s, the Union has employed a non-confrontational engagement strategy with China, in order to promote its participation into the world economy. In line with this strategy, the EU has long supported China's accession in the WTO, moving toward a more constructive engagement between the two trade blocks. As normative power, EU had interest in promoting China's deepening economic reform. Arguably, a more globalized economy in line with international trade law would have created a spillover effect in other area of interests, such as the promotion of a more sustainable environment. This confluence of ideas led the Union to establish a comprehensive strategic partnership with Beijing in 2003. However, the EU's engagement with China contrasts with China's national interest. Indeed, a major European goal is to engage China into the international market, whilst promoting EU's value and enforcing existing rules. Against China's non-interference principle, the EU seems to have focused more on influencing China's domestic arena, rather than promoting mutual interests. The Chinese primary interest, on the other hand, is to develop the country's economy in order to catch up the other world power and establish rule which are in favor of China's strategy itself. This term, the European value-based engagement mismatched with China's priorities and interests, leading the two countries to experience fictions. It may be argued that a shift away from a values-based approach to an interest-based approach is needed, in order to promote interdependence between the two trade blocks.

Since the EU-China bilateral trade has experienced several disputes, the Sino-European clean energy relationship may be even considered as conflictive, rather than cooperative. Throughout the analysis both the solar photovoltaic sector and the wind power market have been taken into consideration. The analysis highlights that both the trade blocks have

implemented over time different measures and regulations to promote the domestic market and safeguard their economy. Thus, China is by no means the only country to implement protectionist measures in the clean energy sector. The main objective of implementing green mercantilist measures is to spur green industrial innovation, although some of these mechanisms and measures clash with the international trade law. According to the findings, things are made even more complicated due to the very nature of the Union. Whilst China is a superpower, the Union has more complex institutional settings. This unique nature has provided fertile ground for divisions among member states, resulting in policy incoherence and a lack of a strategy vis-à-vis China. Furthermore, the complexity of the Union has challenged the Chinese government, which has always been puzzled by the EU's unique nature. As a result, Beijing has developed greater bilateral relationship with major states. Despite the main goal of the EC is to protect its own market and to ensure fair trade with China, several member states have developed a great mutual interest with Beijing, and prefer not to enter in conflict with the Chinese government. For instance, during the solar trade disputes a shift from a punitive approach toward a more flexible one has happened once member states' interests interacted with the dispute. In the case of the solar trade dispute, Germany has played a major role, being against such punitive measures. Indeed, despite the negative impact of importing cheap PVs, Germany's main interest was to protect its own market and diplomatic relationships. Unsurprisingly, thus, EU has not initiated any disputes with China's wind power sector. According to the findings, several EU multinational corporations have struggled to enter the market and have high interest in maintaining their favorable treatment within the country, even if Chinese measures may be questionable under international trade law.

7. CONCLUSION

The aim of this thesis was to investigate whether the Sino-European relation in tackling climate change is cooperative or conflictive. In order to conduct the study and to reach the conclusion of the problem statement two case studies were chosen as suitable cases. Specifically, the solar panel industry and the wind power sector were analyzed. By applying social constructivism and green mercantilism, the findings of this research paper are based within a theoretical framework. This choice was made in order to comprehend the EU-China strategy mitigating climate change and promoting green technologies.

The attempt of the following paragraph is to answer the initial research question

"Why does the EU cooperate with China in climate change issues, but then using protectionist measures towards China's green industry?"

In order to answer the problem formulation, three different sub-questions have been developed:

"*How does the EU long-term goal set the pace to tackle the climate change issues?"*
"*What are the reasons for the EU whether to implement or not protectionist measures?"*

Firstly, by answering the question "*How does the EU long-term goal set the pace to tackle the climate change issues?",* it emerged that the EU's foreign policy toward China is mainly based on a value-based engagement. Ideals and principle such as sustainable development and a smart and inclusive growth have led the country to strengthen the cooperation, as foundation of a global governance to combat the climate change threat. However, European values may contrast with its interests, particularly economic, creating frictions between the two actors and jeopardizing their cooperation toward a climate-friendly engagement. Indeed, the findings shows that European green industries. Findings show that specific EU member states' interests may enter in conflict with the European strategy as whole, reversing the trend toward protectionist tendencies.

To answer the sub-question "*What are the reasons for the EU whether to implement or not protectionist measures",* mainly economic interests. Depending on the economic pro

and cons, the EU initiates trade investigations. However, it is important to highlight that China is by no means the only country to implement protectionist measures. As revealed in the analysis, numerous renewable energy support measures are adopted also by European governments, in order to protect the market from the global competition. However, the paper shows that China employs different strategies in order to boost its domestic market of green technologies which may be questionable under international trade law. The core idea is that both the PRC and the EU do not see climate change and renewable energy policies only through the lens of environmental policy, but rather as an industrial policy which may bring several benefits to their economy.

Through the analysis it can be concluded that the peculiar nature of the EU leads to contradictory interpretations of the Sino-European relationship to combat climate change and promote green technologies. The absence of a real strategy vis-à-vis China results in the weakening of their cooperation and in a rising number of frictions. Europe, unlike China is not a superpower, but rather an economic and political union of countries. The complexity of the European environment affects the Sino-European relations in the RE field. As presented in the discussion, therefore, rather than using a value-based approach, Europe needs a higher integration in the domestic arena, and to find common interests with Beijing. Both values and interests are the main driver behind the cooperative and conflictive relationship.

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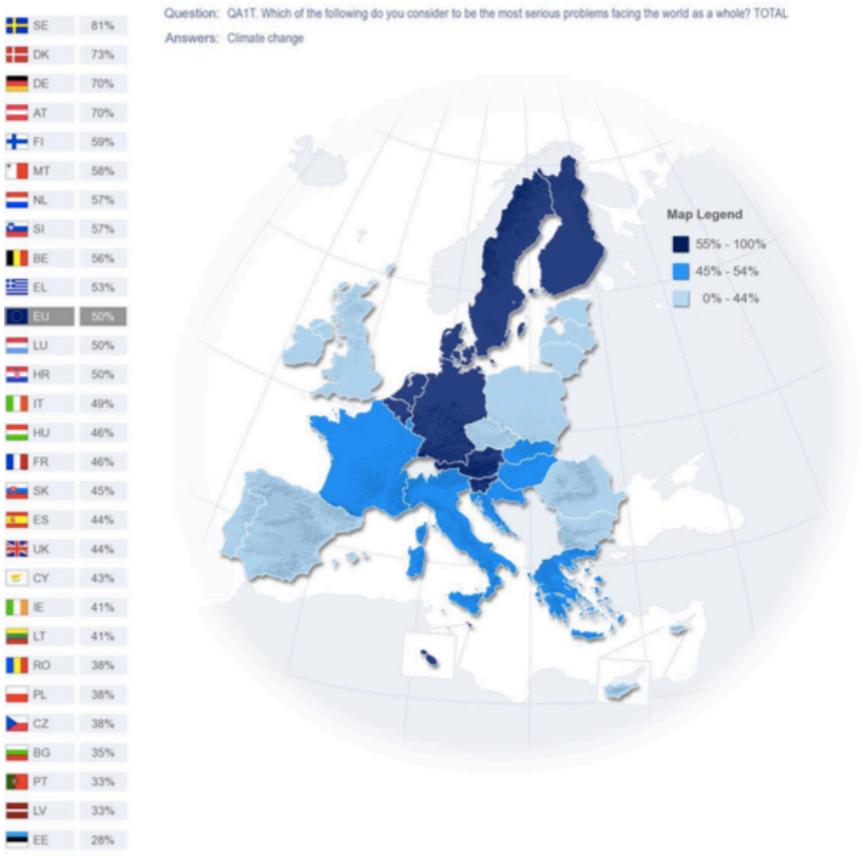
APPENDIX

Appendix A: EU Member States Attitude toward Climate Change, 2012

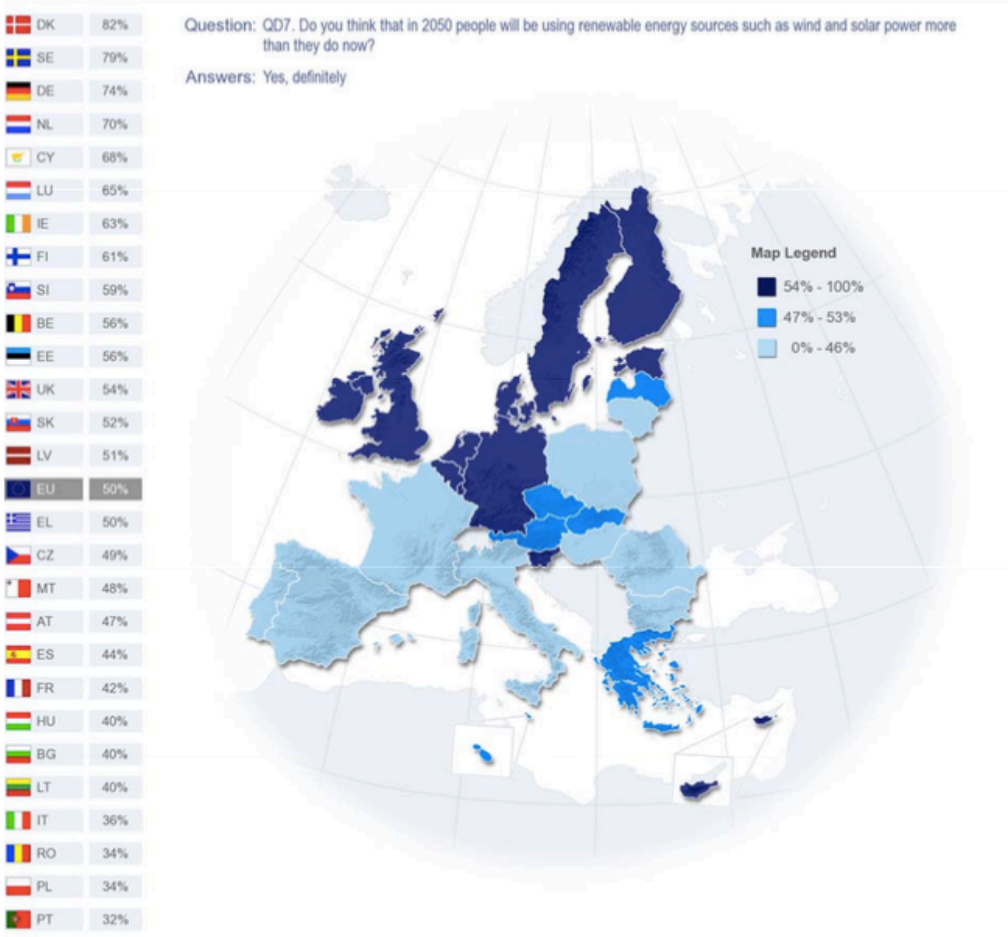


Note: In this report, countries are referred to by their official abbreviation. The abbreviations used in this report correspond to:

ABBREVIATIONS			
BE	Belgium	LT	Lithuania
BG	Bulgaria	LU	Luxembourg
CZ	Czech Republic	HU	Hungary
DK	Denmark	MT	Malta
DE	Germany	NL	The Netherlands
EE	Estonia	AT	Austria
EL	Greece	PL	Poland
ES	Spain	PT	Portugal
FR	France	RO	Romania
HR	Croatia	SI	Slovenia
IE	Ireland	SK	Slovakia
IT	Italy	FI	Finland
CY	Republic of Cyprus*	SE	Sweden
LV	Latvia	UK	The United Kingdom
		EU28	European Union – 28 Member States

Source: (EC, 2014b)

Appendix B: *EU Member States Attitude toward RE Sources, 2012*



Note: In this report, countries are referred to by their official abbreviation. The abbreviations used in this report correspond to:

ABBREVIATIONS			
BE	Belgium	LT	Lithuania
BG	Bulgaria	LU	Luxembourg
CZ	Czech Republic	HU	Hungary
DK	Denmark	MT	Malta
DE	Germany	NL	The Netherlands
EE	Estonia	AT	Austria
EL	Greece	PL	Poland
ES	Spain	PT	Portugal
FR	France	RO	Romania
HR	Croatia	SI	Slovenia
IE	Ireland	SK	Slovakia
IT	Italy	FI	Finland
CY	Republic of Cyprus*	SE	Sweden
LV	Latvia	UK	The United Kingdom
		EU28	European Union – 28 Member States

Source: (EC, 2011)

Appendix C: European Investigations against China 2003-2016

Product	Countries Investigated	Proceeding	Measures	Status	Initiation
Polyester staple fibres (PSF)	People's Republic of China, Saudi Arabia	Anti-dumping	Expired	No investigation ongoing	2003
Polyethylene terephthalate (PET)	Pakistan, Australia, People's Republic of China	Anti-dumping	Expired	No investigation ongoing	2003
Okoumé plywood	People's Republic of China	Anti-dumping	Measures in force	No investigation ongoing	2003
Castings (certain)	People's Republic of China	Anti-dumping	Expired	No investigation ongoing	2004
Granular polytetrafluoroethylene (PTFE)	Russian Federation, People's Republic of China	Anti-dumping	Expired	No investigation ongoing	2004
Magnesia bricks	People's Republic of China	Anti-dumping	Expired	No investigation ongoing	2004
Polyester filament fabrics (certain finished)	People's Republic of China	Anti-dumping	Expired	No investigation ongoing	2004
Stainless steel fasteners	Thailand, Philippines, Malaysia, Indonesia, Taiwan, People's Republic of China, Vietnam	Anti-dumping	Expired	No investigation ongoing	2004
Barium carbonate	People's Republic of China	Anti-dumping	Measures in force	Investigation ongoing	2004

Hand pallet trucks	People's Republic of China	Anti-dumping	Measures in force	Investigation ongoing	2004
Tartaric acid	People's Republic of China	Anti-dumping	Measures in force	Investigation ongoing	2004
Trichloroisocyanuric acid (TCCA)	People's Republic of China	Anti-dumping	Measures in force	Investigation ongoing	2004
Plastic sacks and bags	Thailand, Malaysia, People's Republic of China	Anti-dumping	Expired	No investigation ongoing	2005
Chamois Leather	People's Republic of China	Anti-dumping	Measures in force	No investigation ongoing	2005
Lever Arch Mechanisms	People's Republic of China	Anti-dumping	Measures in force	No investigation ongoing	2005
Tungsten electrodes (certain)	People's Republic of China	Anti-dumping	Measures in force	No investigation ongoing	2005
Compact disks (CD-Rs)	People's Republic of China, Hong Kong, Malaysia	Anti-dumping	No measure	No investigation ongoing	2005
DVD +/- R's	People's Republic of China, Hong Kong, Taiwan	Anti-dumping	No measure	No investigation ongoing	2005
Footwear with protective toecap	India, People's Republic of China	Anti-dumping	No measure	No investigation ongoing	2005
Certain Saddles	People's Republic of China	Anti-dumping	Expired	No investigation ongoing	2006

Coke 80 +	People's Republic of China	Anti-dumping	Expired	No investigation ongoing	2006
Compressors (certain)	People's Republic of China	Anti-dumping	Expired	No investigation ongoing	2006
Dicyandiamide (DCD)	People's Republic of China	Anti-dumping	Expired	No investigation ongoing	2006
Silico-manganese	Ukraine, People's Republic of China, Kazakhstan	Anti-dumping	Expired	No investigation ongoing	2006
Strawberries	People's Republic of China	Anti-dumping	Expired	No investigation ongoing	2006
Ferro-silicon	Russian Federation, People's Republic of China, Egypt, the former Yugoslav Republic of Macedonia, Kazakhstan	Anti-dumping	Measures in force 1	No investigation ongoing	2006
Ironing boards	Ukraine, People's Republic of China	Anti-dumping	Measures in force 1	No investigation ongoing	2006
Peroxodisulphates	United States of America, Taiwan, People's Republic of China	Anti-dumping	Measures in force 1	No investigation ongoing	2006
Pentaerythritol	Turkey, People's Republic of China, United States of America,	Anti-dumping	No measure	No investigation ongoing	2006

	Russian Federation, Ukraine				
Polyvinyl alcohol (PVA)	People's Republic of China, Taiwan	Anti-dumping	No measure	No investigation ongoing	2006
Television picture tubes (cathode-ray colour)	Thailand, Malaysia, Republic of Korea, People's Republic of China	Anti-dumping	No measure	No investigation ongoing	2006
Citric acid	People's Republic of China	Anti-dumping	Measures in force	No investigation ongoing	2007
Citrus fruits (namely mandarins)	People's Republic of China	Anti-dumping	Measures in force	No investigation ongoing	2007
Monosodium glutamate	People's Republic of China	Anti-dumping	Measures in force	No investigation ongoing	2007
Steel fasteners (certain iron and steel...)	People's Republic of China	Anti-dumping	Measures in force	No investigation ongoing	2007
Welded tubes and pipes of iron or non-alloy steel	Belarus, People's Republic of China, Bosnia and Herzegovina, Russian Federation	Anti-dumping	Measures in force 1	No investigation ongoing	2007
Galvanized steel	People's Republic of China	Anti-dumping	No measure	No investigation ongoing	2007
Candles (certain candles, tapers and the like)	People's Republic of China	Anti-dumping	Expired	No investigation ongoing	2008

PSC wires and strands (certain pre-and post-stressing wires and wire strands of non-alloy steel)	People's Republic of China	Anti-dumping	Measures in force	No investigation ongoing	2008
Seamless pipes and tubes, of iron or steel (certain)	People's Republic of China	Anti-dumping	Measures in force	Investigation ongoing	2008
Aluminium foil (certain)	Armenia, People's Republic of China, Brazil	Anti-dumping	Measures in force 1	No investigation ongoing	2008
Wire rod	Turkey, People's Republic of China, Republic of Moldova	Anti-dumping	Measures in force 1	No investigation ongoing	2008
Stainless steel cold-rolled flat products	People's Republic of China, Taiwan, Republic of Korea	Anti-dumping	No measure	No investigation ongoing	2008
Cargo scanning systems (certain)	People's Republic of China	Anti-dumping	Expired	No investigation ongoing	2009
Aluminium road wheels (certain)	People's Republic of China	Anti-dumping	Measures in force	No investigation ongoing	2009
Glass fibre products (certain continuous filament)	People's Republic of China	Anti-dumping	Measures in force	No investigation ongoing	2009
Ironing boards	People's Republic of China	Anti-dumping	Measures in force	No investigation ongoing	2009
Molybdenum wires (certains)	People's Republic of China	Anti-dumping	Measures in force	No investigation ongoing	2009

Sodium gluconate	People's Republic of China	Anti-dumping	Measures in force	No investigation ongoing	2009
Polyester yarn (High tenacity)	People's Republic of China, Taiwan, Republic of Korea	Anti-dumping	Measures in force 1	Investigation ongoing	2009
Ceramic tiles	People's Republic of China	Anti-dumping	Measures in force	Investigation ongoing	2010
Coated fine paper	People's Republic of China	Anti-subsidy	Measures in force	Investigation ongoing	2010
Coated fine paper	People's Republic of China	Anti-dumping	Measures in force	Investigation ongoing	2010
Glass fibres (certain open mesh fabrics)	People's Republic of China	Anti-dumping	Measures in force	Investigation ongoing	2010
Melamine	People's Republic of China	Anti-dumping	Measures in force	Investigation ongoing	2010
Seamless pipes and tubes of stainless steel	People's Republic of China	Anti-dumping	Measures in force	Investigation ongoing	2010
Graphite electrode systems (certain)	People's Republic of China	Anti-dumping	No measure	No investigation ongoing	2010
Tris (2-chloro-1-methylethyl) phosphate (TCPP)	People's Republic of China	Anti-dumping	No measure	No investigation ongoing	2010
Wireless wide area networking (WWAN) modems	People's Republic of China	Anti-subsidy	No measure	No investigation ongoing	2010

Wireless wide area networking (WWAN) modems	People's Republic of China	Anti-dumping	No measure	No investigation ongoing	2010
Footwear with uppers of leather	Vietnam, People's Republic of China	Anti-dumping	Expired	No investigation ongoing	2011
Aluminium foil in small rolls	People's Republic of China	Anti-dumping	Measures in force	No investigation ongoing	2011
Aluminium radiators	People's Republic of China	Anti-dumping	Measures in force	No investigation ongoing	2011
Organic coated steel products (certain)	People's Republic of China	Anti-dumping	Measures in force	No investigation ongoing	2011
Oxalic acid	India, People's Republic of China	Anti-dumping	Measures in force	Investigation ongoing	2011
Glass fibre fabrics (woven and/or stitched)	People's Republic of China	Anti-dumping	No measure	No investigation ongoing	2011
Sodium cyclamate	People's Republic of China	Anti-dumping	No measure	No investigation ongoing	2011
Soy protein products (certain concerntrated)	People's Republic of China	Anti-dumping	No measure	No investigation ongoing	2011
Tartaric acid	People's Republic of China	Anti-dumping	No measure	No investigation ongoing	2011
Bicycles	People's Republic of China	Anti-subsidy	Expired	No investigation ongoing	2012

Stainless steel fittings	People's Republic of China, Taiwan	Anti-dumping	Expired	No investigation ongoing	2012
Organic coated steel products (certain)	People's Republic of China	Anti-subsidy	Measures in force	No investigation ongoing	2012
Solar panels (Crystalline silicon photovoltaic modules and key components)	People's Republic of China	Anti-dumping	Measures in force	Investigation ongoing	2012
Solar panels (Crystalline silicon photovoltaic modules and key components)	People's Republic of China	Anti-subsidy	Measures in force	Investigation ongoing	2012
Tableware and kitchenware (ceramic)	People's Republic of China	Anti-dumping	Measures in force	Investigation ongoing	2012
Malleable tube fittings (MTF)	Thailand, Indonesia, People's Republic of China	Anti-dumping	Measures in force 1	Investigation ongoing	2012
Agglomerated stone	People's Republic of China	Anti-dumping	Expired	No investigation ongoing	2013
Polyester staple fibres (PSF)	India, People's Republic of China, Vietnam	Anti-subsidy	Expired	No investigation ongoing	2013
Seamless pipes and tubes (large)	People's Republic of China	Anti-dumping	Expired	No investigation ongoing	2013
Glass fibre products (certain filament)	People's Republic of China	Anti-subsidy	Measures in force	No investigation ongoing	2013
Solar glass	People's Republic of China	Anti-subsidy	Measures in force	No investigation ongoing	2013

Solar glass	People's Republic of China	Anti-dumping	Measures in force	No investigation ongoing	2013
Stainless steel cold-rolled flat products	People's Republic of China	Anti-subsidy	Expired	No investigation ongoing	2014
Tartaric acid	People's Republic of China	Anti-dumping	Expired	No investigation ongoing	2014
Acesulfame Potassium (ACE-K)	People's Republic of China	Anti-dumping	Measures in force	No investigation ongoing	2014
Grain-oriented flat-rolled products of electrical steel (GOES)	Russian Federation, Japan, Republic of Korea, People's Republic of China, United States of America	Anti-dumping	Measures in force	No investigation ongoing	2014
Stainless steel cold rolled flat products	People's Republic of China, Taiwan	Anti-dumping	Measures in force	No investigation ongoing	2014
Aluminium foil (certain)(CAF)	People's Republic of China	Anti-dumping	No measure	No investigation ongoing	2014
Ceramic foam filters	People's Republic of China	Anti-dumping	Expired	No investigation ongoing	2015
Aspartame	People's Republic of China	Anti-dumping	Measures in force	No investigation ongoing	2015
Cold-rolled flat steel products (certain)	Russian Federation, People's Republic of China	Anti-dumping	Measures in force	No investigation ongoing	2015

Rebars (high fatigue performance steel concrete reinforcement)	People's Republic of China	Anti-dumping	Measures in force	No investigation ongoing	2015
Sodium cyclamate	People's Republic of China	Anti-dumping	Measures in force	No investigation ongoing	2015
Tubes and pipe fittings of stainless steel (butt-welding fittings)	People's Republic of China, Taiwan	Anti-dumping	Measures in force	No investigation ongoing	2015
Heavy plate of non-alloy or other alloy steel (certain)	People's Republic of China	Anti-dumping	Measures in force	No investigation ongoing	2016
Hot-rolled flat products of iron, non-alloy or other ally steel (certain)	People's Republic of China	Anti-dumping	Measures in force	No investigation ongoing	2016
Seamless pipes and tubes of iron (other than cast iron) or steel (other than stainless steel), or circular cross section...(certain)	People's Republic of China	Anti-dumping	Measures in force (Prov.)	Investigation ongoing	2016
Cast iron articles (certain)	India, People's Republic of China	Anti-dumping	No measure	Investigation ongoing	2016
Corrosion resistant steel (CRS)	People's Republic of China	Anti-dumping	No measure	Investigation ongoing	2016
Hot-rolled flat products of iron, non-alloy o other alloy steel	People's Republic of China	Anti-subsidy	No measure	Investigation ongoing	2016

Source: Author

(EC, 2017e)