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States' Membership in Energy Inter-Governmental Organizations (IGOs): Trade, Alliances and Regulation

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To my Father and Mother, the poles of my life

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Abstracts

Chapter 1

Intergovernmental organisations (IGOs) have emerged as prominent actors in the global marketplace since the median decades of the twentieth century. The unique role of energy in informing global trade flows, supply and demand, and overall wealth distribution renders IGOs interacting with the energy sector particularly critical to shaping the worldwide economic order; and yet, a quantitative system of classifying IGOs has yet to be articulated. Grounded in rational design and rational choice theory, this body of research selects a population of IGOs based on the following criteria: formal agreement between sovereign states, independent institutions or organizations dependent upon IGOs, energy-focused agenda, permanent bureaucratic system, and active-status. Given these criteria, a model is articulated for classifying IGOs interacting within the energy sector, with conclusions drawn regarding links between apparent, participatory variability of IGOs and environmental forces. Key conclusions include the increase in consumption-driven IGOs and decrease of production-driven IGOs which is indicative of the interconnectivity of market trends and the quantity and function of energy-focused IGO agendas.

Chapter 2

Why do states choose to join and form IGOs that regulate energy policy? In this paper we make three specific contributions to the literature on international cooperation and diffusion. First, we show that countries form and join energy IGOs in response to memberships previously gained by direct competitors among oil and gas producers and consumers. Moreover, we demonstrate that energy IGOs diffuse among countries that share oil and gas pipelines. Finally, we provide evidence that the institutional design of established energy IGOs impacts the development of their membership network. To test these hypotheses, we rely on original data on oil and gas pipelines and the design of energy IGOs as well as on a newly compiled dataset that includes 152 countries and covers 38 years (1970-2007). We employ both network analysis and spatial econometrics.

Chapter 3

The goal of this paper is to provide an explanation for the formation of energy intergovernmental organizations (IGOs) among energy consumer or consumer/producer countries, predicated on the need to make alliances for energy security. The paper uses a two-stage model to explain the formation of energy IGOs and following this formation, the actions of the state within the IGO. The first stage, called the bargaining stage, involves the negotiation process for formation of the energy IGO, which is based on existing alliances and shared energy concerns. The second stage, called the enforcement stage, involves the actions of the state within the IGO, including the formation of shared energy security frameworks and common policies, based on shared energy concerns and infrastructure development needs. Two qualitative analytical case studies, the International Energy Agency (IEA) and the Shanghai Cooperation Organisation (SCO), are used to demonstrate the use of this model and provide support for the hypotheses.

Chapter 4

This research addresses the national-level effects on energy competition that occur when a National Regulatory Authority (NRA) enters a European Network of Energy Regulators (ENER) competition in the electricity and gas sectors. The approach chosen uses a policy making model with four actors (NRA, Industry, Government, and European Commission) and one instrument (ENER), based on the previous work of Putnam (1988). This policy model is demonstrated qualitatively using selected case studies of this situation, including the Czech Republic's adaptation to CEER standards and Spain and the creation of ACER. For both case studies, changes in conditions of competition, accountability, independence, and transparency are assessed. These results show that the policy model as constructed does provide explanatory value for an increase in competition in the energy sectors of member states of ENER through the mechanisms of increasing accountability, transparency, and independence of policy decision-making.

A Quantitative Description of Energy IGOs

1. Introduction

The increasing fluidity in movement of people, goods, services, information, and ideas represents the crux of globalization, with evolving forms of governance seeking to enact various policy initiatives in order to regulate these unprecedented, cross-national exchanges (Abbot and Snidal 2009). The energy sector, like all industries, has been forcefully impacted by the new global order, with evolutions in both the energy industry itself as well as mechanisms of regulation visibly changing since the median decades of the twentieth century. Intergovernmental organizations (IGOs) are comprised of various member-states which are bound by treaty; they are legal entities distinguishable from less formal coalitions and task groups, and, more saliently, they represent the relationship of sovereign states connected to one another via treaty, rather than the treaty itself. Emerging as integral to the global marketplace in the twenty-first century, IGOs control the activities of actors within the political, economic, and social spheres, implementing and enforcing laws (Abbot and Snidal 2009). As the global supply chain has shifted and expanded considerably during recent years, rendering IGOs a salient solution to the problem of insufficient mechanisms of regulation, the need for a system of classifying these entities with respect to the energy sector has emerged as both urgent and necessary. This body of research seeks to provide a quantitative system for classifying IGOs working with the energy sector, affording particular attention to the evolution of IGOs' role in the energy sector over time.

IGOs are both influential of and informed by global policy sectors, with the structures of IGO networks bound to patterns of production and consumption. Empirical evidence suggests that many IGOs have become industry-specific when they engage primarily in the economic sphere, with IGOs interacting with the energy sector being particularly integral to the existing power differentials between developed and developing nations (Hafner-Burton and Montgomery 2006). Energy represents the most valuable and integral input factor for economic production; it directly informs the nature of trade, distribution of

wealth, and shifts within supply and demand trends across the global marketplace (Brams 1966). IGOs directing energy security policy, by extension, are concurrently informing patterns within the entire, worldwide economy.

This body of research then fills a wide gap in the literature by articulating a means of classifying these organisations which are so informative of the global order. This work first articulates a theoretical rationale for the quantitative classification grounded in rational design and rational choice, before delineating criteria for inclusion and exclusion in the study. The extreme and mounting diversity of IGOs across the sixty-six year period which provided the temporal context for this study was markedly evident, with the evolution of IGOs' influence apparent between 1945 and 2011. Undergirding this study is the reality of IGOs as increasingly influential entities which are shaping not only the energy sector but the entire system of global trade. Consequently, the rationale for this model is the prominent role of IGOs in conjunction with the weighted role of energy as a uniquely regulated commodity.

2. Theoretical approach to the Compilation: Rational Design Theory

This chapter aims to produce an accurate measure of the number and characteristics of the IGOs dealing with the energy sector. Our time frame starts right after the Second World War in 1945 and ends in 2011. We divide this 66-year period into five-year periods, in order to show the variation in number and membership that these IGOs have had throughout the period. Relying on the early compilation by Wallace and Singer (1970), we are particularly interested in three indexes of these energy IGOs: (1) the number of IGOs in each of the five-year periods; (2) the number of nations which are members of each IGO; and (3) a weighted measure of the importance of IGOs' membership from which to derive the relevance of a single energy IGO in the overall energy IGO system at a given time. Each of these points will in turn be discussed, but first it is useful to focus on the criteria to determine the population of IGO examined in this analysis.

We should first deal with the reason that led us to solely focus on international intergovernmental organizations, therefore excluding nongovernmental organizations from our analysis. First, while their influence is increasing, energy NGOs are not as relevant as NGOs

operating in other policy and economic fields and, in most cases, their influence is at best seriously limited in time and space. This means that NGOs do not really correspond to our theoretical interest, which is to study how supranational bodies can continuously interact with national entities. Moreover, their number is yet not sufficient to produce a sound empirical analysis. A second issue touches upon our interest in the number of countries that are member of our pool of organizations at any point of our timeframe. There is not enough material to determine such a measure for NGOs, which is another substantial reason to exclude them from the current analysis. However, we do recognize that the relevance of energy NGOs is growing, and the scholarly community should devote more research to solve the aforementioned measure problems, so that a quantitative description of energy NGOs is possible in the future.

A second aspect to discuss before proceeding with our analysis is the limitation that comes from the energy IGO pool we have selected. We have developed a set of criteria to discriminate among them in terms of their design, providing a theoretical focus to lead us in our inquiry. While this preliminary analysis intends to describe rather than postulate, this quantitative description is the source from which the following chapters stem, and is therefore highly connected to our subsequent hypotheses. Our main theoretical reference can be found in the rational design theory (see Goodin 1998; Koremenos et al. 2001; Wendt 2001; Olsen 2002). The rational design theory situates itself in the middle of the heated debate on the meaning and role of international governmental organizations. The realist school of international relations argues that intergovernmental organizations have little significance in the geostrategic and economic arena because states never allow them to take over control of issues. On the contrary, the constructivist school emphasizes the active and autonomous role that many institutions have been playing in the international environment. The rational design theory acknowledges both claims, tracing their limits and perspectives. On one hand, IGOs have a say in the normative discourse, though they heavily remain anchored to determination of states. On the other hand, states create IGOs with a design that can influence the subsequent state action on the issues treated by the IGOs. As novelists' works are created with a purpose but then autonomously evolve in the interpretation and conscience of readers, states create IGOs with an international configuration in mind,

which is quite likely to change, opening new scenarios for the role of IGOs. Koremenos et al. have crafted a clear-cut definition of what IGOs are and can do: 'states use international institutions to further their own goals, and they design institutions accordingly' and as a consequence IGOs can be defined as ' explicit arrangements, negotiated among international actors, that prescribe, proscribe, and/or authorize behaviour' (Koremenos 2001: 762). It is certainly possible to confront the compilation of energy IGOs from others points of view. Yet, rational design theory and rational choice analysis represent for us a very convincing theory and a compatible system to effectuate our coding. Rational design is suitable to empirical classification, which is the main scope of this section. It is also coherent with our subsequent development of testable hypotheses.

Rational design is an extensive model that addresses multiple aspects of foundation and operation of the IGO. It is also extensively structural and institutional in origin, and is often more suited to analysis of a single organization rather than multiple organizations, as is done throughout this compilation. Because of this, many of the variables within the rational design model may seem to fade into the background, while the two variables that have been added (coordinated oligopolistic systems and aid in case of energy shortages) may seem to take precedence. We acknowledge that this is the case, particularly in the qualitative analysis, where there may be some emphasis placed on one or more aspects of the framework in order to progress usefully. However, this does not mean that we have not used the other variables that were included in the original model by Koromenos et al. (2001). Although the variables in rational design can be difficult to operationalize on a grand scale, they posed no such problems for the qualitative analysis in Chapters 2 and 3. Thus, they were used extensively in these chapters to explore particular issues. This is one of the key reasons why this volume includes both qualitative and quantitative analysis. It also showcases the rational design model as an analysis tool that can inform multiple aspects of institutional formation and expansion, as well as operations and interests that take place within the institution.

There are many cases where the rational design model can be seen in action in this analysis. The variables included in the original model were energy shortages, control power, scope, structure, centralization, and flexibility. In many cases, we found these variables difficult to

operationalize in a rational manner that could address the commonalities of all the institutions or states involved in our analysis. For example, flexibility was exceptionally difficult to operationalize on a large scale, despite the description offered by Koromenos et al. (2001). This means that many of these variables are considered either in an implied manner or directly in the qualitative analysis. Energy shortages are of course directly implied in the added functional variable of aid in case of energy shortages. Chapter 4 also addresses aspects of energy shortages, in its discussion of market liberalization and diversification in the Czech Republic and Spain. This market liberalization and diversification through CEER and ACER respectively is directly related to the need to reduce energy shortages. Issues of control power are discussed in Chapter 2 and 3, where conflicts involved in joining energy IGOs are examined and the role of the state and the international arena are considered. Similarly, the scope of energy IGOs and conditions that are necessary and sufficient for their coverage are examined in Chapter 3. Chapter 3 and 4 also address centralization in their qualitative examination of the causes and effects of energy IGO membership on states. Thus, even though the variables included in the rational design model as proposed by Koromenos et al. (2001) are not always explicitly outlined within the framework used in this research, especially in the quantitative work in Chapter 2, the structural and institutional concerns that the model expresses are actually at the core of the analysis and are routinely taken into account and examined explicitly within the qualitative analysis.

3. Prior Works and Scope of this Classification

As far as we can determine, this is the first dataset that lists all the energy intergovernmental organizations that have operated in the 1960-2011 period. However, a number of compilations concerning intergovernmental organizations in general have been completed throughout the decades. Since our period of interest is relatively recent, the quality of data available is good, but not flawless. For example, the Union of International Associations has been publishing the Yearbook of International Organizations since 1910. The Yearbook is generally considered the main source for those scholars interested in the study of IGOs. Yet, as Wallace and Singer had already noted in the 1970s, when they were compiling their early dataset for the Correlates of Wars project, incompleteness characterizes some sections of the post-war

editions of the book. Another issue that impinges on the overall quality of data is the lack of a consistent methodology to determine which IGOs to select and how to model their membership systems. Most of the data are collected through questionnaires compiled by the IGOs' secretariats. This compilation therefore reflected the internal biases of each organization, which basically categorized itself (Wallace and Singer 1970; Abbott and Snidal 1998).

These issues demanded a revision of the coding system, both from a qualitative and a quantitative point of view. Qualitatively, it was necessary to clearly determine what the object of the classification was. For example, the classification scheme may or may not include those IGOs open to private memberships as well as to states. It was also important to choose a theoretical reference for the coding that clearly determined the objectives and limits of the whole operation. Quantitatively, it was relevant to collect polished data. This required that we assume a coherent and independent stance in the collection process, so that the derived analysis did not show sign of bias. A limited group of scholars has taken up the challenge posed by these queries (see Alger 1970; Wallace and Singer 1970; Taylor and Groom 1977). However, none of these authors have concentrated on a specific policy sector. Instead, all their analyses have been universalistic in scope and means. On the contrary, we are interested in the specific policy field of energy governance, where IGOs work together with numerous protocols and agreements of various sorts, which are sometimes hard to distinguish from a fully-fledged IGO. Therefore, while we rely on the methodology and considerations of previous universalist analyses and we shaped our research on the rational design approach, our research has been adapted to the peculiar world of energy, where economics, geopolitics and trade and strongly entangled with each other. We hope that this analysis, as simple and plain as it is meant to be, may serve to open the debate on the best methods to code IGOs in sensitive fields where the general coding rules may turn out to be inadequate or insufficient to fully describe the population pool.

4. Determining the Criteria for IGOs Selection

Our population of IGOs was selected on the basis of the following criteria. First, the IGO must be the product of a formal agreement between governments of nation states. They should include at least

three sovereign states. It could be argued that IGOs collecting two members may be included if the organization is in principle open to new memberships. However, we believe that only multilateral energy IGOs allow state a real negotiation on the IGO design. This choice is made to exclude bilateral pacts from our analysis, because inter-governmental organizations imply multilateral relations among their members. Moreover, bilateral pacts tend to be established in the form of contracts, while our approach emphasizes the importance of IGOs' rule making. A two-member IGO is not required to accommodate the interests of multiple stakeholders in the same way as a multilateral IGO. Thus, it does not fall under the guidelines of our theoretical framework, which is concerned with multilateral negotiations.

Second, the included IGOs can be independent institutions or organizations that are dependent on or subordinate to existing IGOs. Third, it should include energy among its founding provisions and one of its main areas of action, if not its sole area of action. Energy IGOs are understood as IGOs that can regulate and legislate on energy matters. This is the most stringent criterion for an IGO to qualify for our analysis. Organizations that loosely refer to energy matters in their records, or which did not have any regulatory force, were therefore excluded. Some organizations, such as the European Union and the Eurasian Economic Community, developed energy chapters later in their existence. Energy provisions were absent at the founding moment, when most states had to decide whether to join or not. Consequently, we dropped these organizations because they are not relevant for our research question, since energy concerns did not drive the foundation or joining of the IGO.

Fourth, the organization should display some sort of permanent bureaucratic arrangement in the form of a secretariat or headquarters. It is acceptable that the secretariat is hosted by a single member or housed in national headquarters, provided that its status allows the secretariat to perform permanent tasks, thus excluding temporary actions or taskforces. For design, IGOs are coded once the secretariat is established; before that moment we do not consider it possible to code the organization. This criterion does not necessarily reflect on the structure of this institution. It is enough that the IGO has a body of people who work on the organizational tasks in a continuous way. On the contrary, we do not consider budget as a relevant measure for determining the IGO status of organizations. Budget is a delicate issue

that most times is not fully public and therefore does not allow for clear measurements. Moreover, we can presume that where there is a secretariat a budget to feed it should be in place (Wallace and Singer 1970: 246).

Finally, the IGO has to be active. That is, it must organize a regular plenary session at least once every two years. We are more interested in the actual life of the organization rather than in the dates established on treaties. Periodic meetings verify the vitality of multilateral cooperation bodies, as they normally present a display of their overall achievements during these meetings. The two-year period seems adequate because it considers that IGOs' activities are most frequently conducted through smaller groups (e.g., ministerial meetings, working groups, steering committees). We start counting the organization when the secretariat is in place and a first plenary meeting has been held. We declare the death of an institution if more than two years pass without any plenary meeting.

In order to select the organizations we included in this study, we first consulted the Yearbook of International Organizations, which is compiled on an annual basis by the Union of International Organizations. This resource offers a comprehensive listing of international non-profit organizations, including intergovernmental and non-governmental organizations, and currently lists over 66,000 organisations across various fields (Union of International Organizations, 2013). The Yearbook of International Organizations has been published on an annual basis since 1910, and as such provided full coverage for the entire period of concern. The online database offers extensive information about the organizations that it profiles, including the location, years active, member states, and area of interest and coverage. This resource allowed us to generate an initial list of organizations that were potentially appropriate for inclusion in the quantitative aspect of this study, as well as providing details surrounding the organizations. The list that was generated from the Yearbook of International Organizations was then checked for completeness using Web searches and comparison to partial lists held by the OECD and other organizations in order to make sure there were no significant gaps that could be identified. While it is possible that this method of data collection did result in some missing organizations (particularly small or short-lived organizations), there were no significant omissions found during the crosschecking process. We

believe that the list used in this research was as complete as possible given the available sources of information.

Following the generation of the initial list of candidate organizations for inclusion, we created a matrix to determine criteria matching. This matrix collated information from the Yearbook of International Organizations, verified where possible with organizational histories and current announcements and information. These histories were in some cases incomplete, but provided valuable secondary support for the Yearbook information and in some cases filled in missing information. The criteria listed above were used for filtering organizations. We first excluded all organizations that were not active, based on a date of the last general meeting within the past three years. Second, we excluded organizations that did not have a permanent secretariat or headquarters (either independently or under the auspices of a parent organization). Third, we eliminated organizations that did not include three or more member states, based on the inclusion criteria that the organizations must be multi-lateral organizations and not bilateral organizations. Following this initial filtering of the results set obtained from the Yearbook of International Organizations, we undertook a more detailed assessment of the remaining organizations. The first step was identifying the formal agreements that the organizations were based on. This was primarily done through assessment of the organization's own information, including organizational histories, founding charters, and other available information. If no formal agreement could be found that was associated with its founding, then the organization was excluded. The final stage of assessment was the determination of whether energy was a foundational aspect of the organization's founding. This stage was somewhat more subjective than assessment of other criteria, since there is no clear delimitation of where energy as one of the issues involved, or as a peripheral issue, and focus on energy as a main concern of the organization should be divided. However, with most of the organizations it was reasonably simple to determine whether energy was significant enough for inclusion in the study.

Building on the rational design theory outlined by Koremenos et al. (2001), we developed a coding scheme that takes care of the variance in the population of energy inter-governmental organizations. Our questions, illustrated in table 1.b, did not simply look for positive or negative responses, but were developed to ascertain different levels of

design refinement, providing two to five different possible answers for each. With the aim of uncovering the linkage between the strength of the design features and the success in the diffusion of the corresponding energy IGO, we considered eight dimensions: membership, coordinated oligopolistic systems, aid in case of energy shortages, control power, scope, structure, centralization, and flexibility. Some of these dimensions were further refined in two different questions. This coding scheme is distinct from the coding scheme used in the original rational design theory (Koromenos et al., 2001), in that we included several functional variables that were not included in the original study. Specifically, we include coordinated oligopolistic systems and aid in case of energy shortage. These two additions were made based on a review of the literature review and consideration of the structures and functions of the organizations involved, and determination that these two features serve as a growing part of the energy IGO's structure and purpose.

Although they were not included in the original model proposed by Koromenos et al. (2001), we feel that these variables add increased depth and breadth to the assessment of design features of the IGO and its development. The addition of functional variables was initially proposed based on the observation that the original variables were primarily structural or institutional, and did not reflect the actual methods of operation of the IGO. This was an inadequate view in our opinion because it did not take into account the differences in energy IGO function and operation. The inclusion of coordinated oligopolistic systems is important because it speaks to increased market coordination and regulatory coordination generated by the energy IGO between member states in the IGO, which is one of the key points of this research. The inclusion of aid in case of energy shortage is also highly relevant because of increasing importance of energy security in national security policies. Thus, these two variables represent some responses to the changing conditions that member states may be facing in setting energy policy. This is not an exhaustive list of potential variables, and others could have been included. However, coordinated oligopolistic systems and aid in case of energy shortage were some of the most common conditions that were identified, as well as some of the most relevant. Thus, the expansion of the rational design theory described by Koromenos et al. (2001) using these two variables is justified as an innovation that adds specific functional variables to the

model that address the changing conditions in the energy market and potentially relevant conditions to the energy IGO's formation and structure. In this article we concentrate on the enumerative aspects of the coding, but these questions will be explored and used in the following chapter of the dissertation.

Table 1 lists the energy IGOs that have been coded for design. We enumerate the original documents we coded and the energy-related provisions that led to the inclusion of the IGO in the population. For this coding, we considered all the energy IGOs that satisfy the criteria detailed above, independently from their year of creation. The coding was performed based on the original treaties of the IGOs. However, three exceptions exist – the Energy Charter, the African Union, and the Agency for the Cooperation of Energy Regulators. In the cases of the Energy Charter and the African Union, the coding could not be carried out from the original treaties due to the considerable modifications that have been made to those treaties. The African Union is a successor of the Organization for African Unity (OAU), the Agency for the Cooperation of Energy Regulators is a successor of the European Regulators' Group for Electricity and Gas (ERGEG), and the Energy Charter is a direct derivation from the European Charter Treaty. Since these three IGOs did not considerably change the core of their founding energy provisions within these revisions, we decided not to exclude them from the analysis. Yet, to give an account of the radical changes in the overall functions and organization of the IGOs, we coded the revised treaties. Both versions of the name are reported in the table.

[Tables 1.a and 1.b about here]

5. List of Energy IGOs and Individual Nation Memberships

The list of energy IGOs above (Table 1) was used to generate a list of individual nation memberships. We divided our 51 years of analysis into five-year periods and then proceeded to ascertain the nations that were members of each IGO during each of the 11 periods under analysis. The identification of state entities that are part of the international system relied on already existing codes (see in particular Singer and Small 1966). To qualify for inclusion, a national political entity must have standard characteristics of national sovereignty, a population of more than half million people and be recognized by the United Nations as a state, as understood by international law and

practice. Application of these criteria results in a population that ranges from 152 states in 1950 to 170 in 2011.

We next verify if the nation qualifies for membership in a given energy IGO. Nations have to meet three criteria. First, the nation has to nominate a representative delegation to the IGO. This delegation must have full voting rights, regardless of the voting system. Second, the nation's delegation must actively participate in the activities of the IGO, i.e., it must not miss more than two plenary sessions in a row. If the delegation fails to attend three consecutive general meetings, we consider its membership expired, even if the IGO or the nation concerned still considers the membership valid. This is because, we are interested in the actual participation of nations to the life of the organizations rather than their legal condition. Finally, we do not account for delegations that represent territorial entities that are not recognized as states.

We decided to pick the five-year cluster to balance between accuracy of the data and a sufficient precision in determining the nations' IGOs membership. For some energy IGOs it was in fact difficult to ascertain the exact participation of countries in all general assemblies. At the same time, a five-year period seemed to be brief enough to make sure not to lose any significant change in time for IGOs' composition. Clearly, if a nation quit an organization during one of these half-decade periods, its membership is withdrawn only at the end of the period. The limitation of this approach is that figures derived from this analysis cannot be interpreted as a representation of existing nation memberships at any period in time, but may include expired memberships.

In graph 1 we show the active nation memberships held by each nation in the system for all our 13 periods. Graph 1 covers the period from 1960 to 2010. Graph 1 offers an overview of the IGOs' membership distribution throughout the global system, on a state-by-state basis.

[Graph 1 about here]

While compiling this membership index, we noticed that energy IGOs did not experience any significant turnover in their evolution. That is, the IGO population changed through time but most IGOs did not experience much change in their internal composition. We therefore determined that including a measure for change would be appropriate

to provide a sense of the evolution in the energy IGO population. Table 2, columns 1 to 4, systematizes these results both in absolute and percentage changes. The IGO net change, i.e. the number of IGOs created minus the amount of IGOs eliminated from the system, is a concrete measure of the constant increase in the number of IGOs dealing with energy issues during our period of analysis.

[Table 2 about here]

The IGO population percentage change is more sensitive as it focuses on the size of changes. We note that the increase in the energy IGO population happens gradually throughout the most part of the periods considered. The two noticeable exceptions are in the 1990 and 2000 periods, where we have a sudden increase in the number of energy IGOs. These fluctuations can be explained by two main international relations determinants. First, at the beginning of the 1990s a number of regional economic and free trade agreements were signed, which included relevant energy provisions. Some of the major free trade agreements signed during this period included the North American Free Trade Agreement (NAFTA), the ASEAN Free Trade Area (AFTA), the Mercado Común del Sur (MERCOSUR), and the European Union (EU) (Findlay and Urata 2010). These free trade agreements all created new multilateral trade arrangements, or extended previously existing trade arrangements, and reduced the scope of trade limitations in the area (Findlay and Urata 2010). Also significant during this period was the formalization of the World Trade Organization (WTO). The WTO, which was formalized as a replacement for the previous General Agreement on Tariffs and Trade (GATT) in 1995, plays a significant role in the energy trade as well as in the formulation of economic structures that the energy trade must account for (Selinova, 2011). These free trade agreements and others all resulted in an increase in the need to arrange regional cooperation and cooperation between trading partners specifically focused on the development of energy resources. Thus, the introduction of these multilateral free trade agreements resulted in the need for new IGOs.

The flowering of free trade around the world was not isolated in its effect on the formation of energy IGOs. The dissolution of Yugoslavia and the Soviet Union had brought many energy-rich new countries to stage, creating a double effect. The fall of the Soviet Union in 1991 led to the devolvement of statehood to its 15 component states (Sakwa,

1999). These states included Georgia and Russia, as well as the Caspian states many of which now are major oil producing countries. This does *not* suggest that the development of these new states actually increased the amount of oil or the associated international cooperation associated with them. The Soviet Union was already a major world oil producer and supplier by the 1960s, supplying European and Middle Eastern markets from its extensive reserves (Stent, 2003). Stent (2003) estimates that by 1965, the Soviet Union was producing 1,020,000 barrels/day of crude oil, or around 4% of the world supply. At the peak of Soviet oil production in 1987, the Soviet Union was producing 624 million tons of oil (including crude and refined products), most of it from the Russian Federation (Vatansever 2010). With consumption of just under 250 million tons, this made the Soviet Union the world leader in oil production. While energy production in the Soviet Union had dropped by 1990-1991, it still represented about 40% of the state's convertible currency trade, with most exports going to OECD countries, the Eastern European bloc, and non-aligned countries including India and Cuba (IMF/OECD 1991). There was also significant energy production and cooperation in the former Yugoslavia. For example, the JANAF pipeline, which moved oil from refineries at Omišalj north into Yugoslavia, had come online by 1979 (Marušić 2012). Rather, the main change that prompted the change in energy IGO formation was the scramble for new political alliances with these states.

Existing countries tried on one side to reinforce their position face this period of uncertainty through a renewed set of economic alliances that could guarantee their energy commerce. One example of such a new-formed alliance is the 1997 strategic alliance between Turkey and the United States, which was focused on energy strategy (Hill 2004). Hill (2004) notes that this trading relationship was not based on physical connections, e.g. pipelines. Instead, it was based on an assessment by the US that Turkey served as a strategic foothold in the increasingly important Caspian region, offering it access to the newly opened Caspian states and their energy resources. The main outcome of this alliance was the construction of more efficient methods of transporting Caspian oil resources through Turkey to the world market (Hill 2004). Previous trading relationships also fell apart, based on the former Soviet Union's sudden demand for market prices for its oil from previously favoured trading partners. For example, Kyrgyzstan was forced to exploit its own dwindling oil resources after several years of

dependence on Soviet oil, after the former Soviet Union failed to honour its previous pricing schedule, making it unaffordable for Kyrgyzstan to supply its energy needs (Abazov 2002). The rapid change in the economic and trade relationships, particularly between former Soviet republics and the rest of the world, necessitated the expansion of energy NGOs because of the number of new countries involved in the world energy market directly as well as the change in political connections and increasing importance of markets to major producer like the former Soviet republics.

During this period, there was also a drive to create a normative linkage with these new countries. The use of normative pressures as a means of promoting international relationships and compliance with an accepted standard of state behaviour is relatively well accepted within the theoretical basis of international relations (Koivosto 2012). Normative state power can also be enacted at the international level. One clear example of this was the post-Cold War expansion of the EU to include states that formerly were part of the Soviet Union or Yugoslavia or independent states within the Soviet bloc (Sajdik and Schwarzinger 2008). The accession of these states actually happened between 2004 and 2007 (including Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia in the first round and Bulgaria and Romania in the second round) (Sajdik and Schwarzinger 2008). However, the groundwork for normative relationships with the states in question actually began during the 1980s, with opening of trade with independent states as well as expansion of trade with the Soviet Union and Yugoslavia.

Energy trade had already been established between the Soviet Union and the states of the nascent European Union, with pipelines carrying significant amounts of oil between these regions (IMF/OECD 1991). The process of EU accession added further components of normative pressure to the reformation of energy relationships with the new states. For example, EU accession rules under the Copenhagen criteria require 'the existence of a functioning market economy as well as the capacity to cope with competitive pressures and market forces within the union' (Copenhagen European Council 1993). These rules, which were put into place specifically to handle the possibility of accession by Eastern European economies previously falling under the aegis of the Soviet Union, were operationalized in a series of specific guidelines and requirements about economic performance and trade

(Sajdik and Schwarzinger 2008). In many cases, the main area where these former Soviet states *could* fall back was on their energy production capabilities, leading to the potential for formation of new energy NGOs due to the expansion of market capacity. Thus, even though formal EU accession by this group of countries did not occur until the first half of the 2000s, the processes and pressures that would lead to this accession, which included energy concerns, were already well underway by the early 1990s.

Finally, in the first years of the 2000s, the global political system experienced a flourishing of global energy initiatives that concentrated on two main items, including connecting national regulatory agencies within a regional framework and increasing the global transparency on energy data and processes. One example of such an initiative is the twin energy regulation organizations of the EU, the Agency for the Cooperation of Energy Regulators (ACER) and the Council of European Energy Regulators (CEER) (CEER 2012). CEER was founded in 2000 as a voluntary cooperative organization for European energy regulation groups, while ACER is the successor to the European Regulators Group for Electricity and Gas (ERGEG), formed as a formal European Commission advisory group in 2003 (CEER 2012). ACER became operational in 2011, taking on some of the responsibilities of ERGEG while others passed to CEER. Although their structure is slightly different, both organizations work to improve energy market efficiency and transparency across the EU, as well as supporting consumer initiatives and requirements in this area (CEER 2012). It is easy to see how initiatives of this type would support the development of new energy NGOs, as this type of regional cooperation is specifically the type of interaction that an NGO is designed for.

6. Weighted Nation Memberships

At this stage of the analysis, we felt it was necessary to move from counting the absolute number of IGOs and their members to a weighted measure of the different stages of centrality of energy IGOs in the different five-year periods considered in this analysis. For this purpose, we evaluated which energy-related measure could better represent a measure of the relevance of energy IGOs. First, we established that this measurement should be effectuated at a state level. Then, we considered that, for the scope of our work, it would have been useful to rely on a trade measure of the centrality of states in the

world energy market. In order to define this centrality, we posited that the amount of energy traded by each state (both bought and sold) could represent an adequate gauge of its centrality in the global energy market. This assumption is based on an understanding of the global energy market and the importance of international trade within this market, as well as the basic aspects of supply and demand (Bhattacharyya 2011). Although there are alternative measures that could be used, these do not necessarily reflect the same importance on the *international* stage. For example, one common measure is the ratio of production to exports (Bhattacharyya 2011). However, this figure reflects the importance of the energy trade to the internal economy, not the importance of the state to the global energy trade. In essence, by selecting total demand and supply of energy as a measure, it is possible to determine how important the state is in aggregate as a supplier, buyer, or both on the world market. From that state-level measure, we could then move to calculate the centrality of energy IGOs, on the basis of their member states' composition.

In order to determine this scope, we relied on the COMTRADE dataset. This dataset has been created by the United Nations, and provides free information and data on International Merchandise Trade Statistics (IMTS) and the work of the International Merchandise Trade Statistics Section (IMTSS) of the United Nations Statistics Division (UNSD). Specifically, we were interested in the two sectors related to oil and gas trade: sector 33, which comprises petroleum, petroleum products and related material; sector 34, which concerns gas, natural and manufactured. Both sectors were considered under Standard International Trade Classification revision 3. The value of data is expressed in dollars, thus measuring the value of trade rather than its volume. This is useful because it serves to reflect the changing value of energy commodities over time.

COMTRADE is one of the most comprehensive databases available for this commercial data, as well as one of the most regularly updated. However, it has limitations that affected our analysis.[1] Particularly, many countries do not provide data for each year. All COMTRADE data on oil and gas starts in 1969, and are not available for oil and gas commerce antecedent to that year. No data were available at any

[1] A comprehensive disclaimer on COMTRADE can be found on the following webpage: http://comtrade.un.org/db/help/uReadMeFirst.aspx.

period of time for Equatorial Guinea, Taiwan, South Sudan, Uzbekistan and the Soviet Union. This does not necessarily mean that these countries were not producing or consuming oil, of course. For example, the Soviet Union was one of the leading oil producers in the world prior to its 1991 dissolution, with a contribution of Uzbekistan (IMF/OECD 1991). South Sudan has only been recognized as an independent state following its January 2011 referendum on independence from Sudan and subsequent admission to the United Nations (UN News 2011). Reasons for unavailability of Taiwan and Equatorial Guinea data are unknown. Data became available after 1989 during most years for Russia and the other former Soviet Union states. Although this gap meant that our analysis suffered of constraints in time and space, we considered available data to be sufficient in number and quality to allow us to pursue our analysis. These types of gaps are commonplace in time series and panel data analysis, and as long as they are not extensive do not significantly bias the outcomes of the analysis (Tinbergen 2007).

Once we acquired data, we moved to the calculation of states' scores. For each state, we summed the money value of bought and sold energy in every of the five-year periods considered in our analysis. When data was missing, we used the value of zero for that specific year and state. The procedure we followed to assign a score was the following. We divided the total energy trade of the five-year period by the total energy trade of the five-year period of the single state. We then obtained the state's percentage of energy traded out of the overall world total. Subsequently, we compiled a state-based classification for each five-year period of our analysis. States at the top of the classification changed through the different periods. However, there was some variability through time in the top five states. This variability is consistent with the changing industrial and lifestyle needs and energy production of countries around the world. One example of the type of changes that have occurred over this period is the rapid industrialization and increase in consumption in the People's Republic of China since the early 1980s, which positioned China as the second-highest energy consumer in the world by 2003 (Crompton and Wu 2005). There have been movements in the other direction as well, as countries increased their energy independence through development of renewable and internal resources. For example, Denmark, already a net energy exporter due to North Sea oil and gas deposits, has recently

committed to supplying 50% of its internal energy consumption through wind energy by 2020 (Danish Ministry of Climate, Energy and Building 2012). However, these are relatively new initiatives on the scale of the research and it is unlikely that they have moved countries out of the top spots as of yet.

[Graph 3 about here]

Graph 3 shows the difference between simple and weighted memberships through time. We observe that at the beginning the two tend to correspond, while in the 1990s differentiation starts to constantly increase, leading simple membership to grow much faster than weighted membership. This outcome can be explained by the fact that, at the beginning of our investigation period, top-level consumer and producer states were the first states to enter one or more energy IGOs. This move makes sense, as strategic interests related to energy were stronger for them than for other states. Thus, in the first five-year periods, the simple membership, i.e., the number of states in the energy IGO system roughly corresponded to the weighted membership, i.e., the economic weight of states (their oil and gas purchases and sells) in the energy IGO system. However, during time a number of energy IGOs emerged. The strongest energy buyers or sellers did not compose these IGOs, but rather they had a universalistic aim, or were based on regional involvement. Thus, they also involved many states that represented small percentages of the global energy commerce. As a consequence, the absolute number of states in the energy IGOs system increased much faster than their weighted membership.

This tendency can also be explained by the necessity for energy IGOs to obtain as much political backup as possible for their initiatives, which require enlarging their membership to additional (though less energy-powerful) states. Although this is not an explicitly stated goal of any energy IGOs that we could find, it is consistent with a normative theory of state relations, in which a larger number of states supporting a given choice of policies is more likely to be seen as accepted (Koivosto 2012). It is also consistent with the formation of other types of IGOs such as the WTO, which has driven regulation of energy through the larger trade organizations (Selinova 2011).

7. Weighting Energy IGOs

After weighting states for all the periods considered in our analysis, we moved to sum states' memberships in order to evaluate the weight of energy IGOs. In table 2, column 5, we summarized the data at our disposal for energy IGOs.

[Table 2 about here]

As we had already noticed, the number of IGOs has been steadily increasing through time, with considerable advancements in the 1970s, the 1990s, and the 2000s. Simple and weighted memberships have been also increasing, as states developed multiple memberships in different organizations. However, graph 2 shows that the top five organizations displayed a reduced variability through time, especially for the first two positions.

[Graph 2 about here]

As a trend, it can nonetheless be noticed that consumer IGOs have increased while producer IGOs have reduced their presence. This is consistent with the growth of liberalized trade and free market regulations, which are behind many of the challenges to energy security, like rising energy prices and supply constraints (Barton 2004). As Kyrgyzstan's experience with the Russian Federation following the dissolution of the European Union shows, consumer countries are considerably at risk form the imposition of market rules, while producer countries are actually likely to benefit. This increases the likelihood of consumers forming protective agreements. Energy IGOs may also evolve in terms of their influence. For example, the International Energy Agency (IEA) was originally very powerful, but in recent years has dropped in its position. The simple reason for this is because of the emergence of new and highly powerful consumer states, such as China, which is currently the second-highest energy consumer in the world (Crompton and Wu 2005), and which have not elected to become IEA members. This shows that NGOs may not remain constant because of changes in their membership, or even changes that do not occur within their membership.

From graphs 4, we can analyse the progress of simple and weighted membership for all the energy IGOs.

[Graphs 4 about here]

Some energy IGOs are particularly worth noticing because of their unusual patterns of interaction within this analysis. GECF, for instance, suffered a collapse in its weighted membership, which can be explained with a reduction of member countries' production of exported natural gas. The GECF does not use quotas or other controls to manage production by its member countries, although its goal is ultimately to encourage increases in exports and natural gas use (GECF 2012). Thus, it cannot directly control its position within the rankings, as could an IGO with another structure, like OPEC. SCO weighted membership, on the contrary has been steadily increasing through time, a progress that is coherent with the growth in imports and exports of its main members, China and Russia. Russia, although a world leader in oil exports since the 1980s, was only counted within the data set since the collapse of the Soviet Union. However, it has been steadily increasing in oil production over this period of time, and today is one of the world's top oil producers (Vatansever 2010).

Similarly, China's energy use has been increasing since the 1980s, and today it is the second-largest consumer in the world (Crompton and Wu 2005). Under the rankings used within this study, both increases in exports and increases in imports within Russia and China would drive SCO toward a top position in the rankings, despite its relatively new establishment. On the contrary, OPEC and OAPEC's development through time testifies an evolution in their members' centrality in the global energy market. While at the beginning OPEC and OAPEC displayed a weighted membership higher than the simple one, in the 1985 period, both suffered from a steady decline in their weight, which rapidly stabilized itself in the next five-year period. This change was likely due to the global oil glut and attendant drop in prices during the 1980s, which was fuelled by overproduction, minor recessions that depressed demand, and increased efforts toward energy efficiency (Amuzegar 2001). This oil glut had mixed effects, driving many countries including Saudi Arabia to seek out price stability rather than higher prices (Amuzegar, 2001). However, this is reflected in our criteria as a drop in importance due to a drop in the price of oil during this period.

Finally, there are organizations, even quite different one from the other in their scopes, such as OOCUR and Petrocaribe, where both weighted and simple memberships remained constant through time. OOCUR and Petrocaribe, both Caribbean-based energy IGOs, have

benefited from offshore production, but with small populations, low levels of industrial and economic development, and significant use of oil resources by countries including Venezuela, the actual oil exports and imports of the region have stayed relatively consistent over time (Weintraub et al. 2007). Based on these four groups, it is clear that there are a variety of ways in which energy IGO importance may vary. However, it is clear that these variations can be traced to real-world events and the structure of the IGO itself, rather than any substantive issue within the model.

8. Conclusion

The changing structures of global production, with transitions most evident since the end of World War II, have posed problems to traditional systems of regulation (Abbot and Snidal 2009). Energy-focused IGOs, in essence, control the activities of economic actors through various systems of monitoring and enforcing. Institutions dependent upon IGOs as well as member-states of IGOs are core stakeholders in the system, with IGOs serving as the overarching actor that controls global production and consumption of energy. The most salient criteria for inclusion in this study were the energy-focused agenda of the IGO, with the unique role of energy in the global marketplace rationalizing the need for this model.

Dimensions of membership, coordinated oligopolistic systems, aid in energy shortage events, control power, scope, structure, centralization, and flexibility all informed the coding scheme for classifying the identified IGOs. The five-year clusters used for the temporal context of examination between the years of 1945 and 2011 highlighted visible changes in the number and nature of IGOs over time. Substantial and unprecedented advancements during the 1970s, 1990s, and 2000s, in particular, were noted, with memberships increasing and multiple memberships developed over time. A salient conclusion of the study is that while the overall number of IGOs has increased over time, the number of consumer IGOs has increased while producer IGOs have decreased in prevalence; this is at least partially attributable to the environmental realities of energy security, including supply restrictions and escalating prices.

Visible trends reflected in the model also include underlying goals of regional integration and involvement, rather than strong tendencies

toward consumption or production, alone. In essence, these IGOs embodied an overarching aim of interconnectivity, involving many nation-states that had conversely small percentages of global energy trade; this was not indicative of weighted membership but a higher quantity in member-state participation. At the crux of this trend is the overlap between the political and economic spheres of the global community, as IGOs acted out of a political necessity to achieve economic outcomes; they needed to garner political clout in order to achieve their goals. Such trends are indicative of the need filled by IGOs for individual member-states that have little global influence on the energy sector when acting as isolated entities. When bound to an IGO, however, these states wield far more power through collective action. The external force of diminishing nation-state power partially informs these trends, with alliances between energy-poor states with limited global power emerging from environmental factors.

Divergence between consistent membership and escalating influence can be attributed to these same external factors, including large-scale events and other transitions in the social, economic, and political spheres. Consequently, it is concluded that the validity of the model stands as discrepancies can be linked to alternative forces not bound to the IGO itself. The classification system articulated herein represents a much-needed model for highlighting IGOs' evolution over the time period in which the global marketplace became most interconnected, with energy trade concurrently and exponentially increasing. The role of energy in shaping multiple dimensions in the global community is a prominent one, and IGOs have become a key actor in regulating energy movements. This work has articulated a quantitative model for classifying IGOs between the years of 1945 and 2011, drawing key conclusions regarding the ebbs and flows in IGO quantity and influence. The diversity in IGOs as well as visible trends are indicative of unprecedented transitions in the global marketplace during this timeframe, with the increased focus on energy concurrently reflecting the increasing fluidity in movement of one of the most valuable, globally traded commodities.

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Appendix to Chapter 1

TABLE 1.a: List of Energy IGOs

Name	Acronym	Year of Creation	Documents Coded	Founding Energy Provisions
Africa--EU Energy Partnership	AEEP	2007	Communication from the Commission to the European Parliament and the Council, From Cairo to Lisbon, The EU--Africa Strategic Partnership, COM(2007) 357 Final	Provision 3.2.a
African Forum for Utility Regulators	AFUR	2002	Constitution of the African Forum for Utility Regulators; About Afur: The African Forum for Utility Regulators	Article 4 of the Constitution; p. 6 of About Afur
African Petroleum Producers Association	APPA	1987	Agreement Establishing the African Petroleum Producers' Association	Article 3

Asia-Pacific Economic Cooperation (Energy Working Group)	APEC	1989	There is no APEC statute or treaty or agreement so to speak. APEC is not a rules-based organization. Instead it works on the basis of consultation and consensus building. New policies decided within APEC meetings are agreed to voluntarily. Key documents include Leaders' Declarations, Ministerial Statements, and Meeting Reports. The coding was done on the First Ministerial Meeting (Canberra, Australia, November 6--7, 1989), the Second Ministerial Meeting (Singapore, July 29--31, 1990) and on the website section ``How APEC Operates'' of www.apec.org	Specific Element of a Work Program D of the First Ministerial Meeting; Work Project E of the Second Ministerial Meeting
Asociacion Iberoamericana de Entidades Reguladoras de la Energia	ARIAE	2000	Estatutos	Articulo 2
Association of Southeast Asian Nations	ASEAN	1976	While ASEAN was established in 1967, the ASEAN Secretariat was created in 1976. According to our rules, the design coding was done once the secretariat was in place. The coding was done on the Agreement on the Establishment of the ASEAN Secretariat and the Declaration of ASEAN Concord (Bali, February 24, 1976)	Section B of the Declaration of ASEAN Concord

Baltic Sea Region Energy Cooperation	BASREC	1995	First Meeting of the CBSS Energy Ministers (Stavanger, November 30--December 1, 1998)	Challenge section
Black Sea Regional Energy Centre	BSREC	1999	Communication from the Commission to the European Parliament and the Council, Black Sea Synergy: A New Regional Cooperation Initiative	Part 3: The Main Cooperation Areas
Central European Initiative	CEI	1996	While CEI was established in 1989, the CEI Secretariat was created in 1996. According to our rules, the design coding was done once the secretariat was in place. The coding was done on the Central European Initiative Guidelines and Rules of Procedures	Section I.6
East Asia and Pacific Infrastructure Regulatory Forum	EAPIRF	2003	EAPIRF Constitution	Article 4
Energy Community	EnC	2006	Treaty establishing the Energy Community	Articles 2 and 3
Energy Regulators Regional Association	ERRA	2000	Constitution	Article II
European Energy Charter/Energy Charter	EC	1991	The Energy Charter Treaty and Related Documents	Article 2

European Regulators' Group for Electricity and Gas/Agency for the Cooperation of Energy Regulators	ERGEG	2003	Regulation (EC) No 713/2009 of the European Parliament and of the Council of 13 July 2009 establishing an Agency for the Cooperation of Energy Regulators	Article 1
Extractive Industries Transparency Initiative	EITI	2003	EITI Constituency Guidelines and EITI Rules (2007 Version)	EITI Principles and Criteria of the EITI Rules
Gas Exporting Countries Forum	GECF	2001	GECF Charter and GECF Agreement	Objectives of the GECF Charter
Gulf Cooperation Council	GCC	1981	Charter	Article Four
International Atomic Energy Agency	IAEA	1957	Statute	Articles II and III
International Energy Agency	IEA	1974	Agreement and Decision on an International Energy Program (November 18, 1974)	Article 2
International Energy Forum	IEF	2001	Statute of the International Energy Forum	Chapter 1: Organization and Objectives
International Partnership for Energy Efficiency Cooperation	IPEEC	2008	Terms of Reference for the International Partnership for Energy Efficiency Cooperation	Points 1 and 2

Latin American Energy Organization	OLADE	1973	Convenio de Lima	Articulo 3
Mediterranean Gas and Energy Regulators Assembly	MEDREG	2007	Statutes	Articles 3 and 4
MERCOSUR	MERCOSUR	1991	Tratado para la Constitucion de un Mercado Comun and Decisiones del Consejo del Mercado Comun	Subgrupo de Trabajo n. 9 of Decisiones del Consejo del Mercado Comun
North American Free Trade Agreement	NAFTA	1994	North America Free Trade Agreement	Chapter Six
Organization for African Unity/African Union	AU	1963	Constitutive Act	Articles 13 and 14
Organization of Arab Petroleum Exporting Countries	OAPEC	1968	Agreement of the Organization of Arab Petroleum Exporting Countries	Article Two
Organization of Caribbean Utility Regulators	OOCUR	2002	Agreement	Sections 1 and 2
Organization of the Black Sea Economic Cooperation	BSEC	1999	Charter of the Organization of the Black Sea Economic Cooperation	Article 4

Organization of the Petroleum Exporting Countries	OPEC	1961	OPEC Statute	Chapter 1
Petrocaribe	PC	2005	Estatutos Petrocaribe	Articulo 2
Regional Electricity Regulators Association	RERA	2002	Constitution of the Regional Electricity Regulators Association of the Southern Africa Development Community	Article 4
Shanghai Cooperation Organisation	SCO	2001	Declaration on the Establishment of the Shanghai Cooperation Organisation and Charter of the Shanghai Cooperation Organisation	Point 2 of the Establishment of the Shanghai Cooperation Organisation and articles 1 and 3 of the Charter of the Shanghai Cooperation Organisation
South-Asian Forum for Infrastructure Regulation	SAFIR	1999	SAFIR Statute	Objectives

TABLE 1.b: List of Questions Concerning IGO Design

Variable	Abbreviation	Question and Possible Answers
Membership	memb	*What are the requirements to join the organization?*
		Open
		Open with requirements
		Closed
Coordinated oligopolistic system	cartlev	*What is the level of coordination of the oligopoly?*
		No oligopoly
		Potential oligopoly (i.e., expressed interest in influencing the market)
		Matter of fact oligopoly
	carttyp	*What is the type of oligopoly: is there a use of the coordinated oligopoly for political reasons?*
		No oligopoly
		Pure economic oligopoly
		Economic and security oligopoly (i.e., use of the oligopoly for political reasons)
Aid in case of energy shortages	aid	*Does the organization provide aid in case of energy shocks?*
		No
		Yes, requires the approval of states
		Yes, directly applicable by the IGOs
Control power	cont	*What kind of vote,*
		if any, is necessary to pass decisions?
		No control power applicable
		Majority vote required
		Qualified majority vote required
		Unanimous vote required/Possibility of veto

		IGOs can directly sanction states
Scope	scope	*Which energy sources are included in the IGO's domain?*
		Some energy matters are included (i.e., only some energy sources, only a segment of the market, etc.)
		All energy matters can be potentially covered
Structure	meet	*How structured are the working bodies of the organization?*
		Meetings for discussion (no working groups)
		Ad hoc/task force groups (which end after performing their duties)
		Permanent groups
	staff	*What kind of staff does the organization employ?*
		Staff borrowed from member states
		Shared staff among groups
		Dedicated staff for each group
Centralization of design	design	*What is the level of constraint that the organization can impose on member states?*
		Collect and diffuse information
		Release evaluations
		Release recommendations
		Directly impose decisions on states
Flexibility	flexadap	*Is it possible to derogate to rules?*
		Derogation to rules impossibile
		Derogation to rules possible
	flextrans	*Is it possible to renegotiate the IGO's treaty?*
		Renegotiation impossible

	Renegotiation possible, every five--ten years or more frequently
	Renegotiation possible, every ten--twenty years
	Renegotiation possible, every twenty years or less frequently

GRAPH 1: Number of Energy IGOs Membership by Nation for Each Period

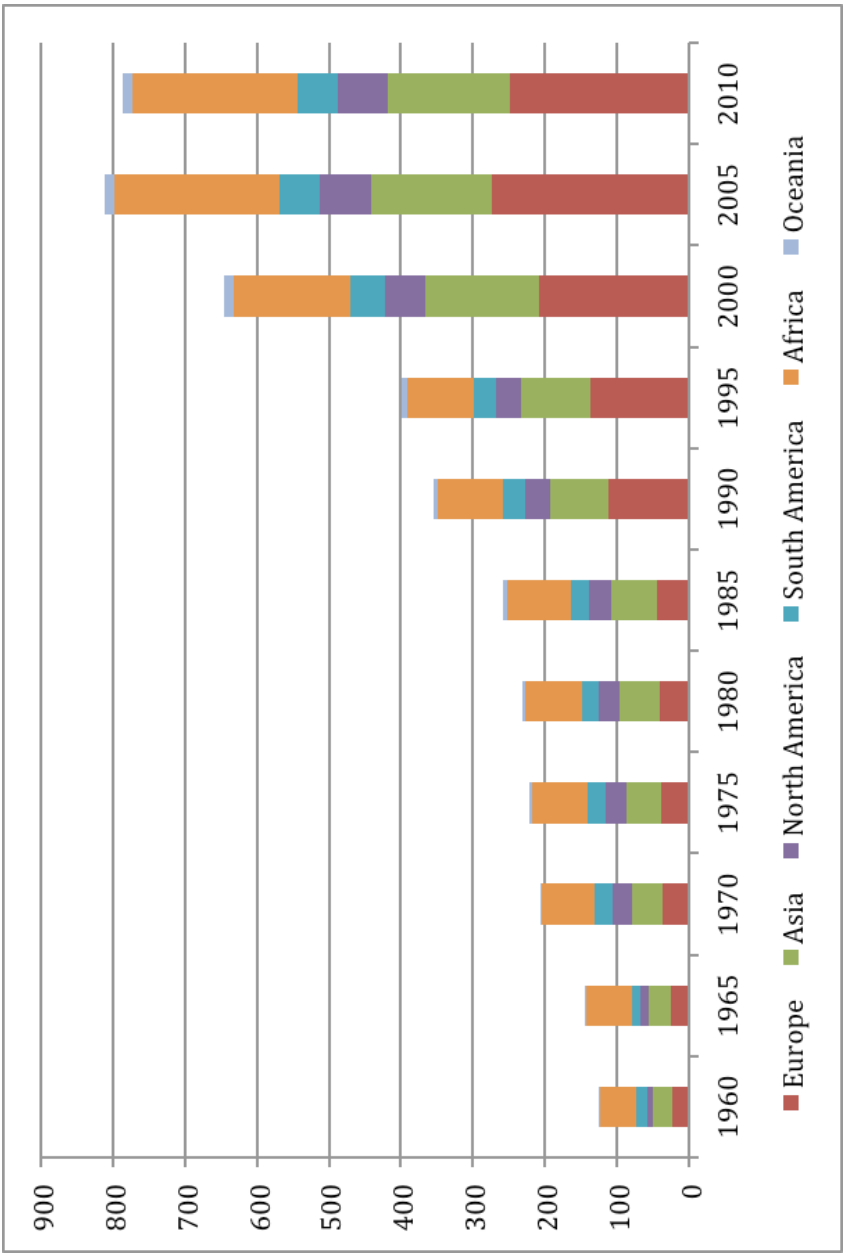
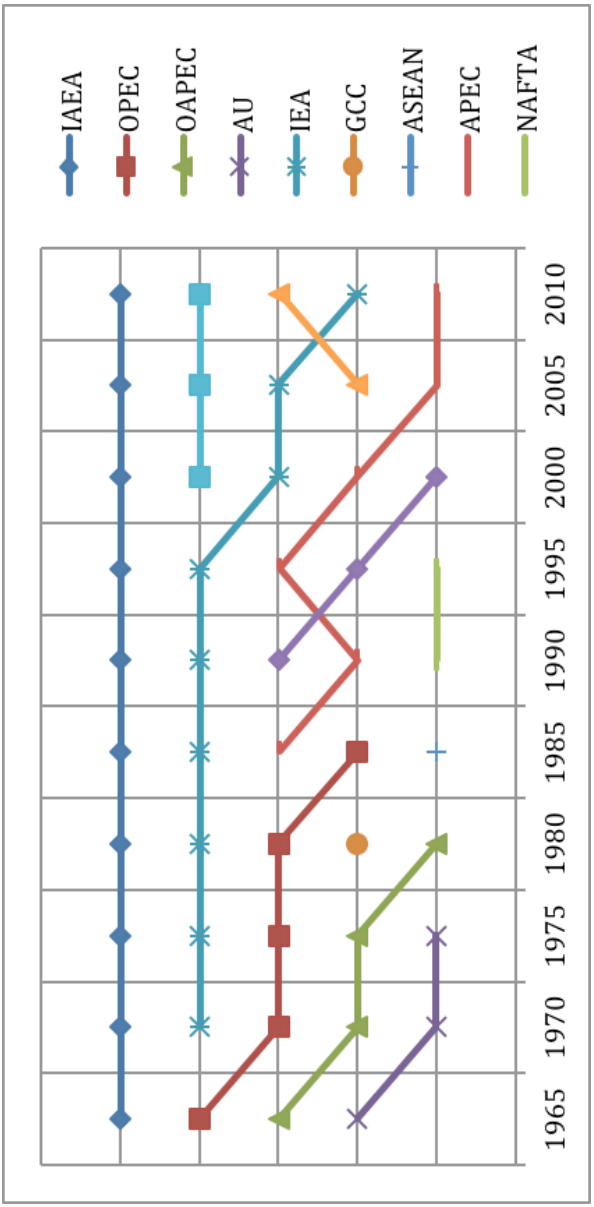


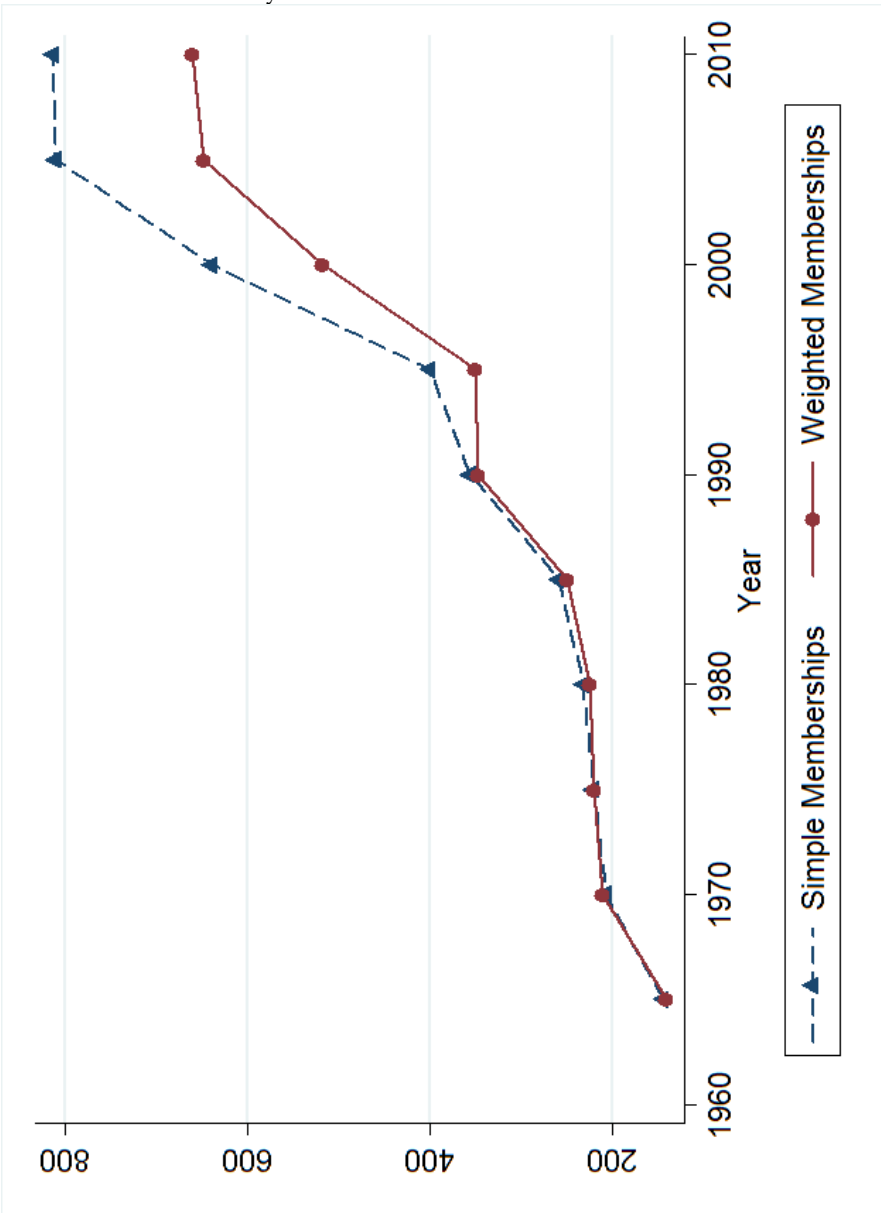
TABLE 2: IGOs Changes For Each Period

1. Year	2. Number of IGOs	3. Number of IGOs - Percentange Changes	4. Simple Memberships	5. Weighted Memberships
1965	4		144	1.42
1970	6	33%	207	2.11
1975	7	14%	221	2.20
1980	8	13%	232	2.25
1985	11	27%	259	2.50
1990	16	31%	356	3.48
1995	18	11%	400	3.50
2000	28	36%	639	5.17
2005	34	18%	810	6.48
2010	34	0%	813	6.60

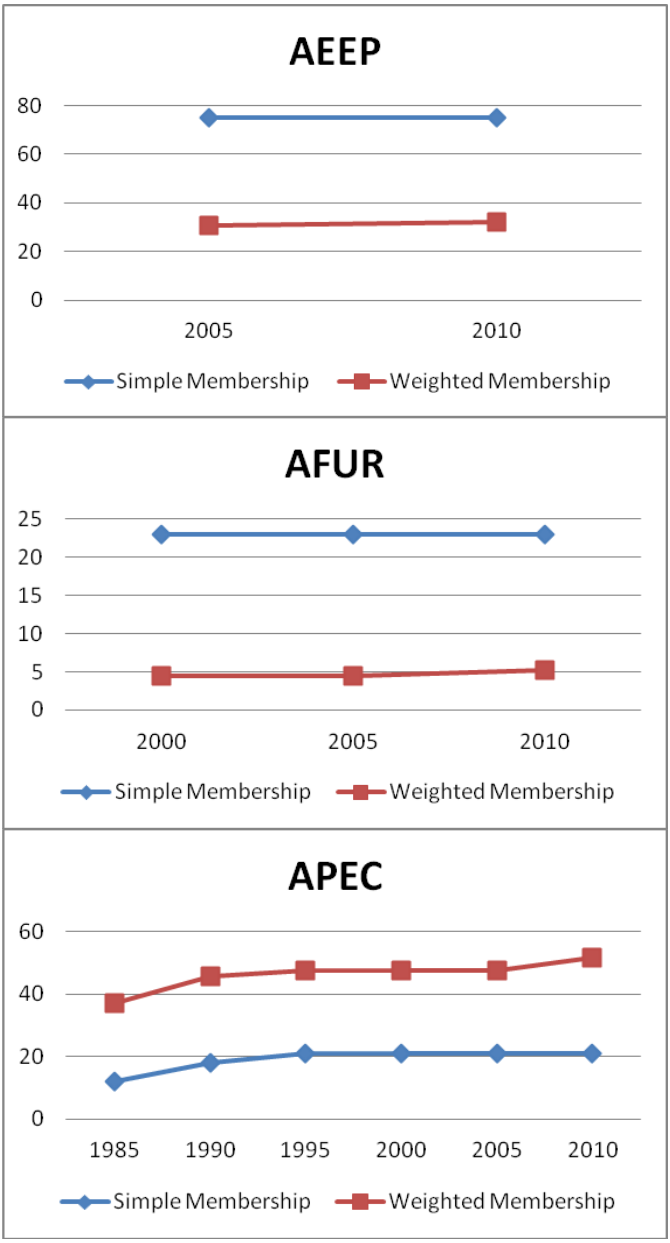
GRAPH 2: Top-5 Energy IGOs for Each Period

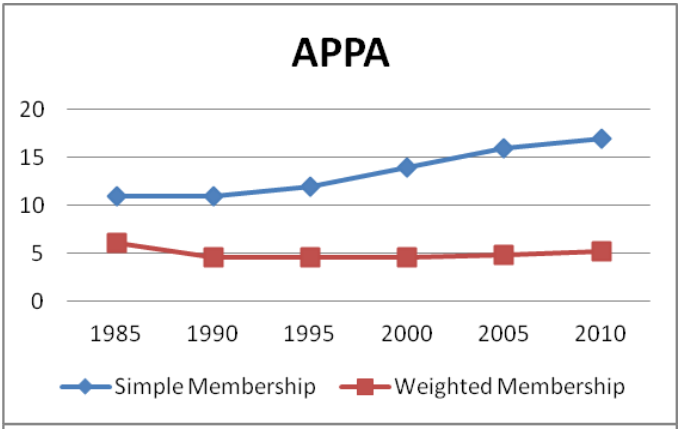


GRAPH 3: Energy IGOs Simple and Weighted Memberships - Collective Evolutionary Data



GRAPHS 4: Energy IGOs Simple and Weighted Memberships - Evolutionary Data for Each Organization




APPA
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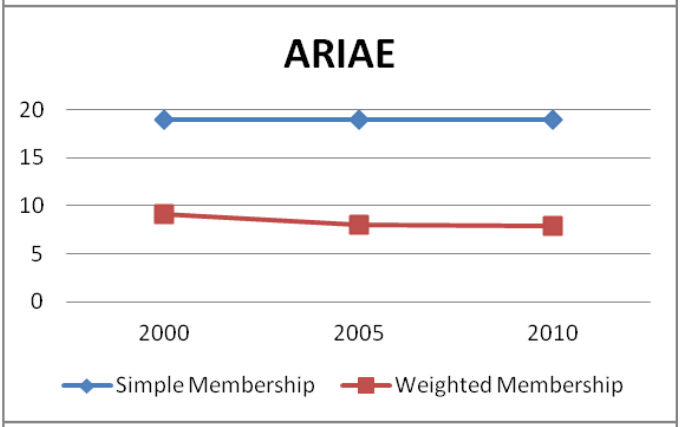
2010
Simple Membership
Weighted Membership


ARIAE
20
15
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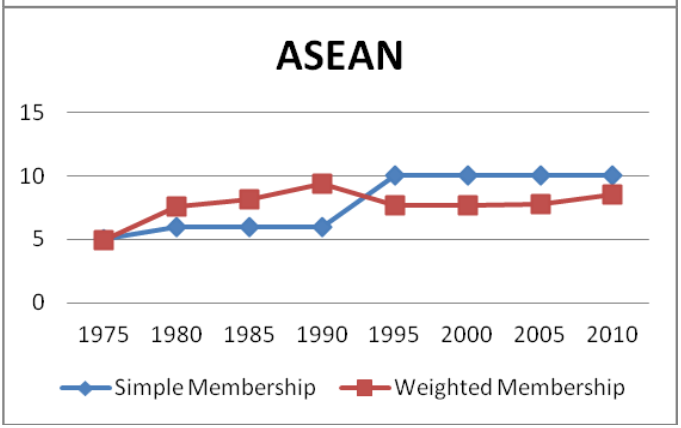
2000
2005
2010
Simple Membership
Weighted Membership


ASEAN
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1975
1980
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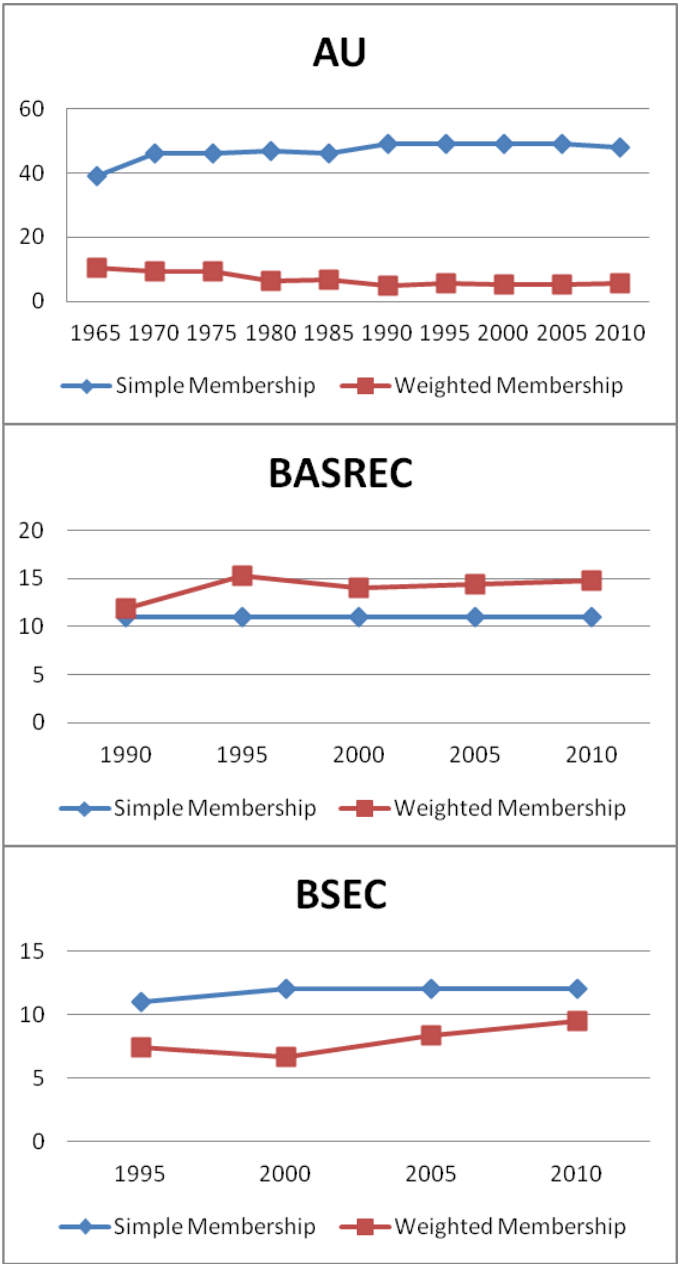
2010
Simple Membership
Weighted Membership


AU
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1965 1970 1975 1980 1985 1990 1995 2000 2005 2010
Simple Membership
Weighted Membership
BASREC
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1990 1995 2000 2005 2010
Simple Membership
Weighted Membership
BSEC
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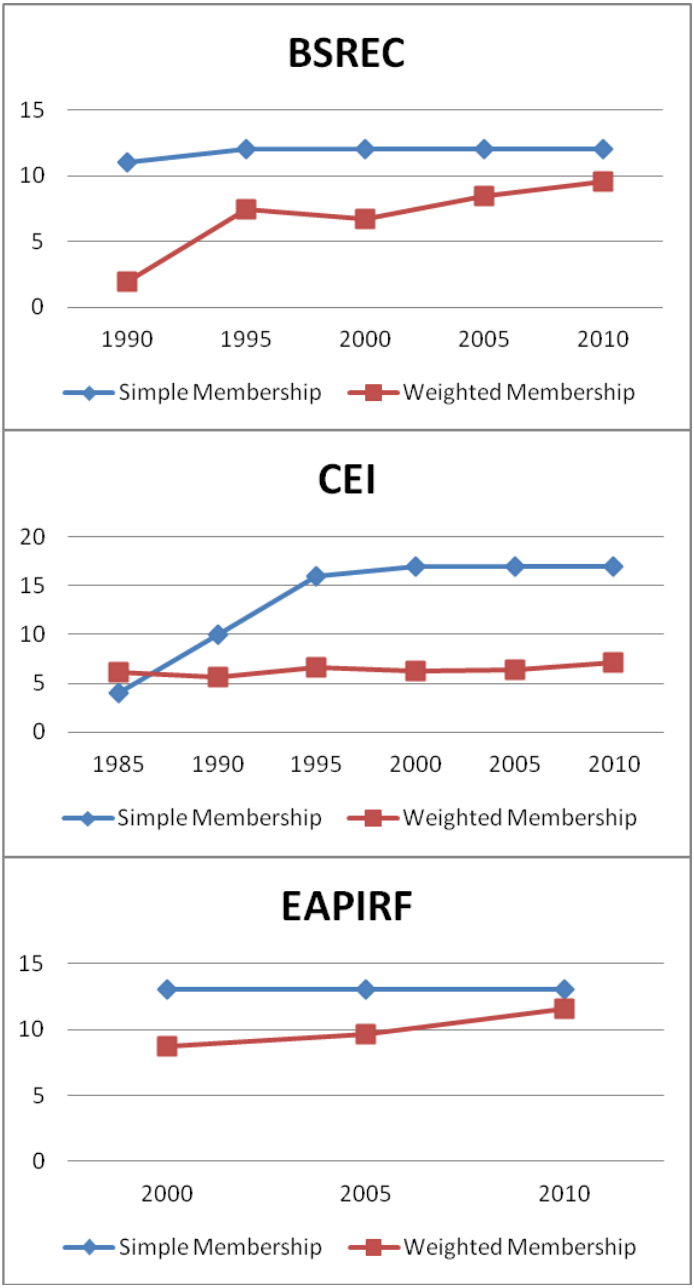
1995 2000 2005 2010
Simple Membership
Weighted Membership


BSREC
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Simple Membership
Weighted Membership
CEI
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2010
Simple Membership
Weighted Membership
EAPIRF
15
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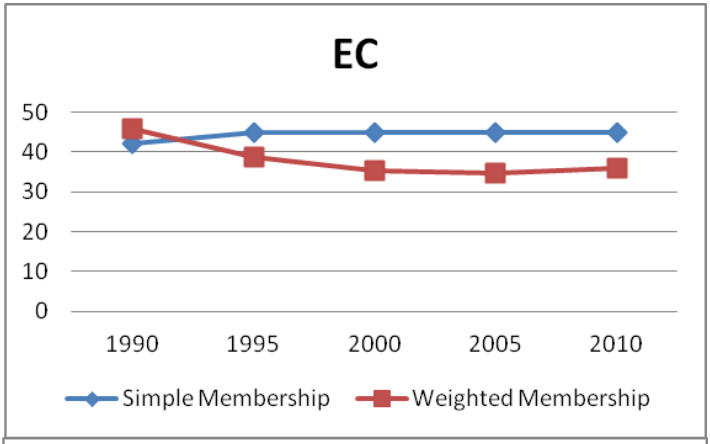
0
2000
2005
2010
Simple Membership
Weighted Membership


EC
50
40
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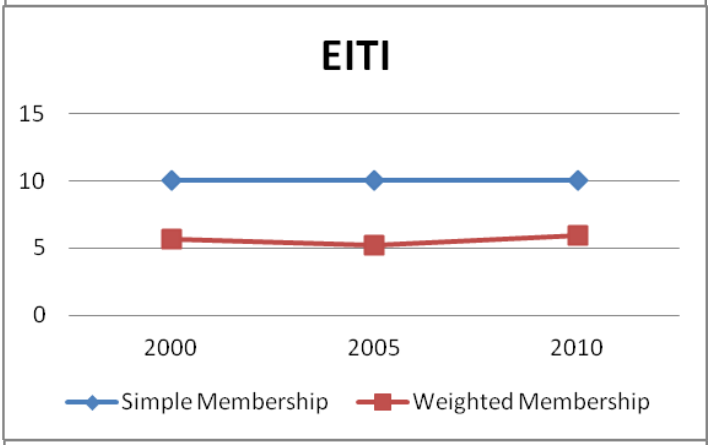
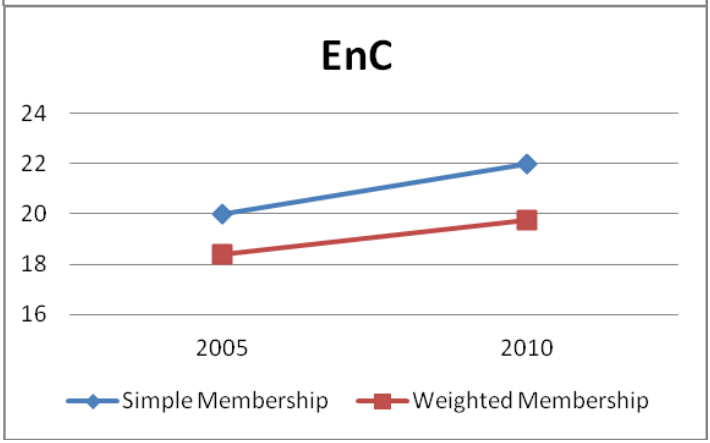
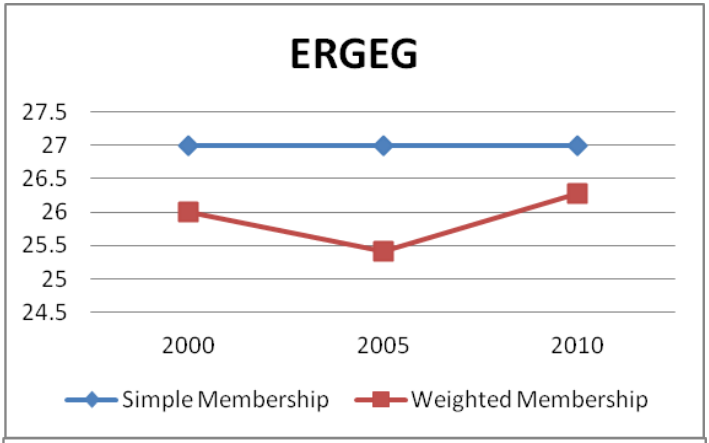
2010
Simple Membership
Weighted Membership


EITI
15
10
5
0
2000
2005
2010
Simple Membership
Weighted Membership


EnC
24
22
20
18
16
2005
2010
Simple Membership
Weighted Membership


ERGEG
27.5
27
26.5
26
25.5
25
24.5
2000
2005
2010
Simple Membership
Weighted Membership


ERRA
25
20
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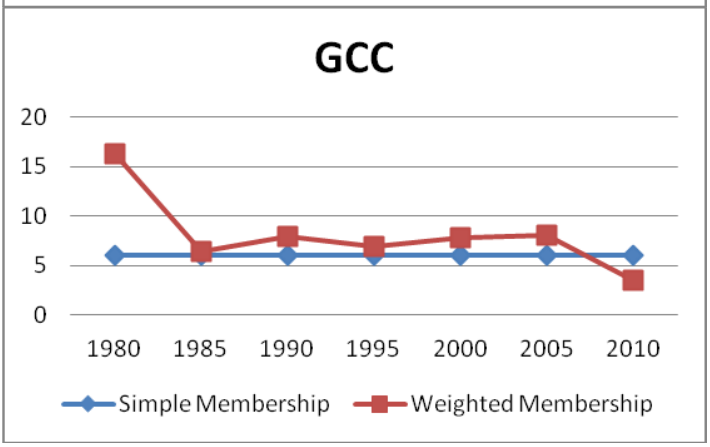
0
2000
2005
2010
Simple Membership
Weighted Membership


GCC
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15
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1980
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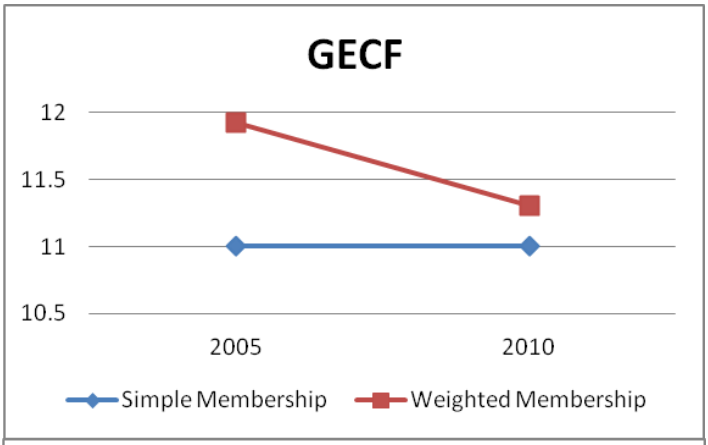
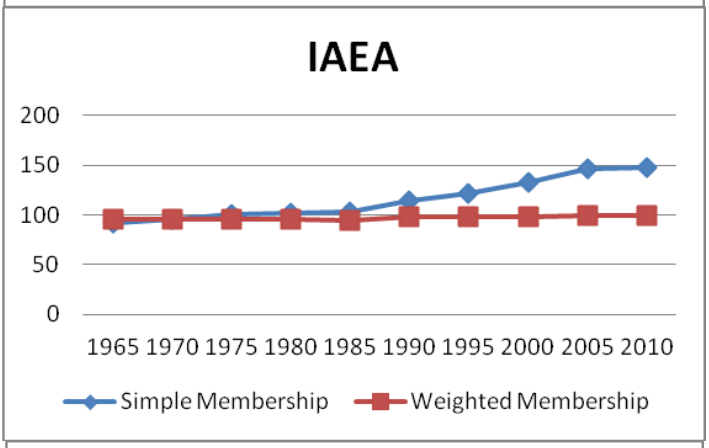
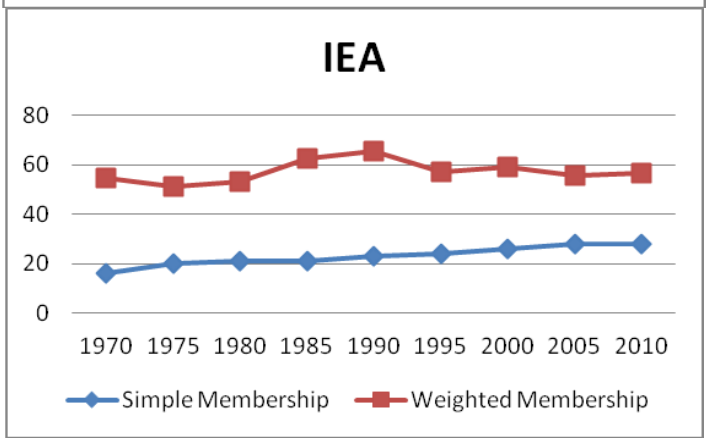
2005
2010
Simple Membership
Weighted Membership


GECF
12
11.5
11
10.5
2005
2010
Simple Membership
Weighted Membership


IAEA
200
150
100
50
0
1965 1970 1975 1980 1985 1990 1995 2000 2005 2010
Simple Membership
Weighted Membership


IEA
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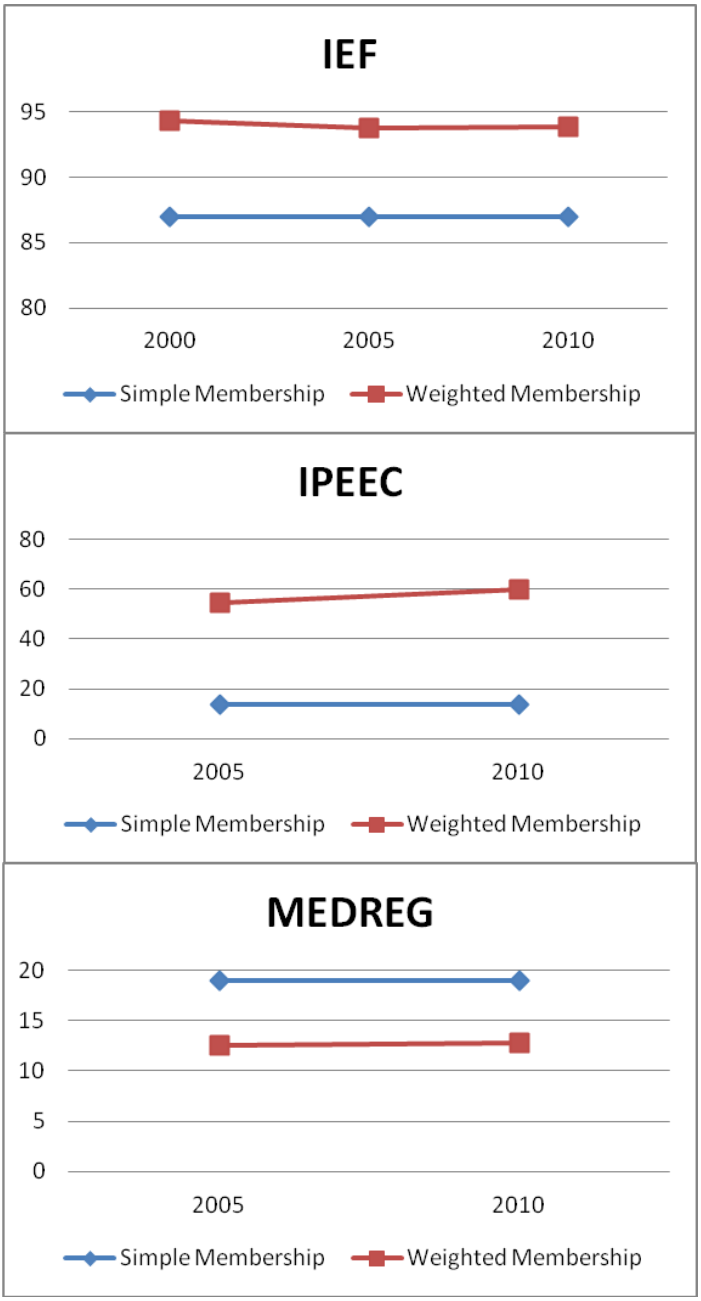
1970 1975 1980 1985 1990 1995 2000 2005 2010
Simple Membership
Weighted Membership


IEF
95
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Simple Membership
Weighted Membership
IPEEC
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Simple Membership
Weighted Membership
MEDREG
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2005
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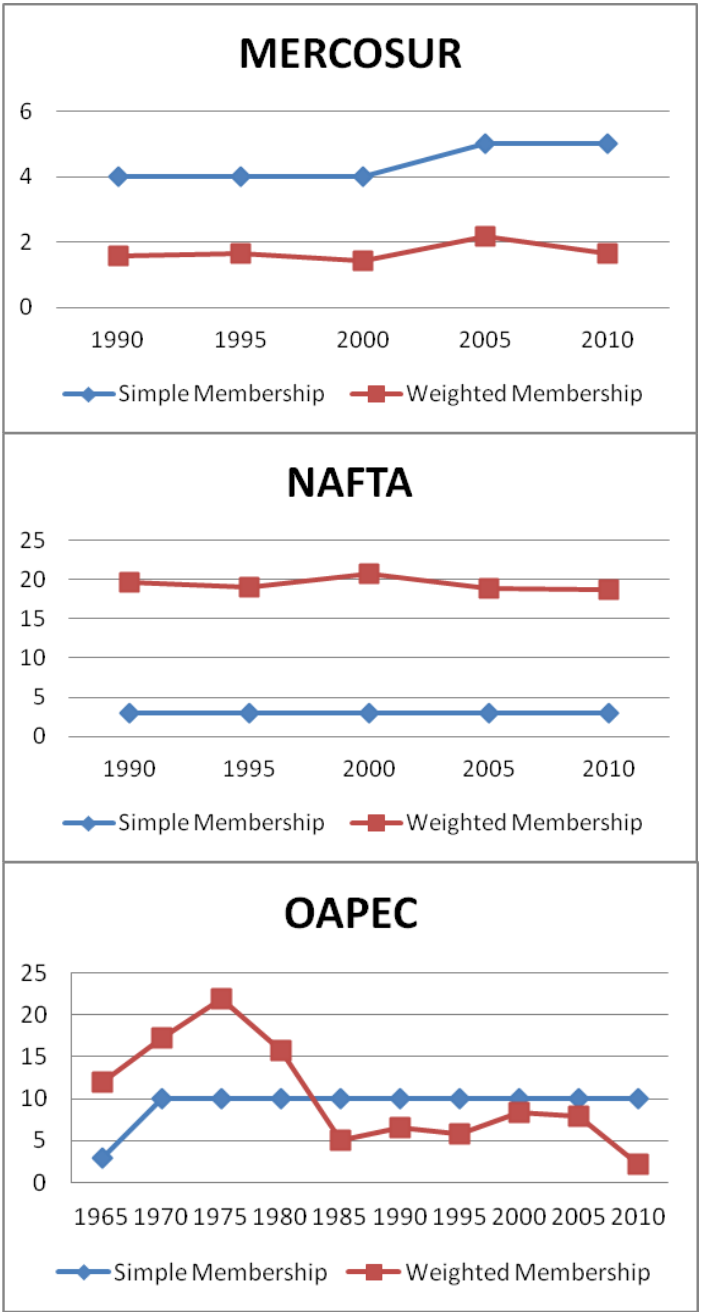
Simple Membership
Weighted Membership


MERCOSUR
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Simple Membership
Weighted Membership
NAFTA
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Weighted Membership
OAPEC
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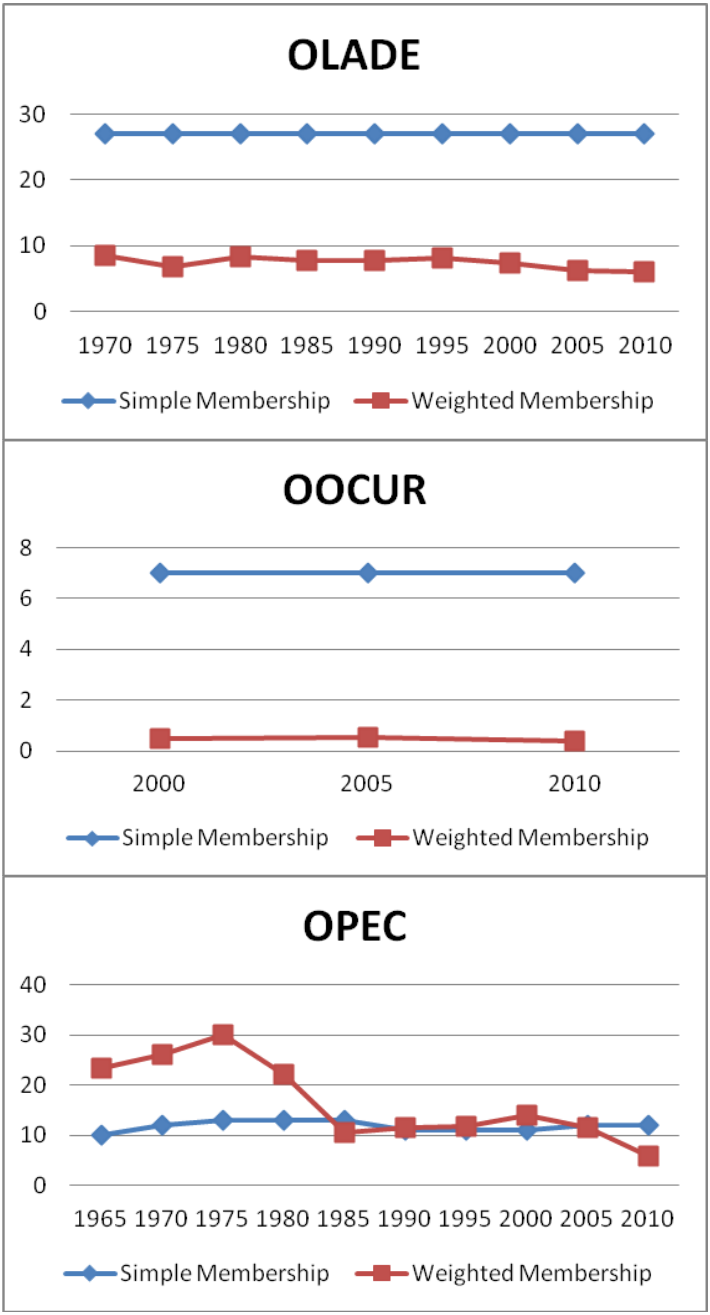
1965 1970 1975 1980 1985 1990 1995 2000 2005 2010
Simple Membership
Weighted Membership


OLADE
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1970 1975 1980 1985 1990 1995 2000 2005 2010
Simple Membership
Weighted Membership
OOCUR
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Weighted Membership
OPEC
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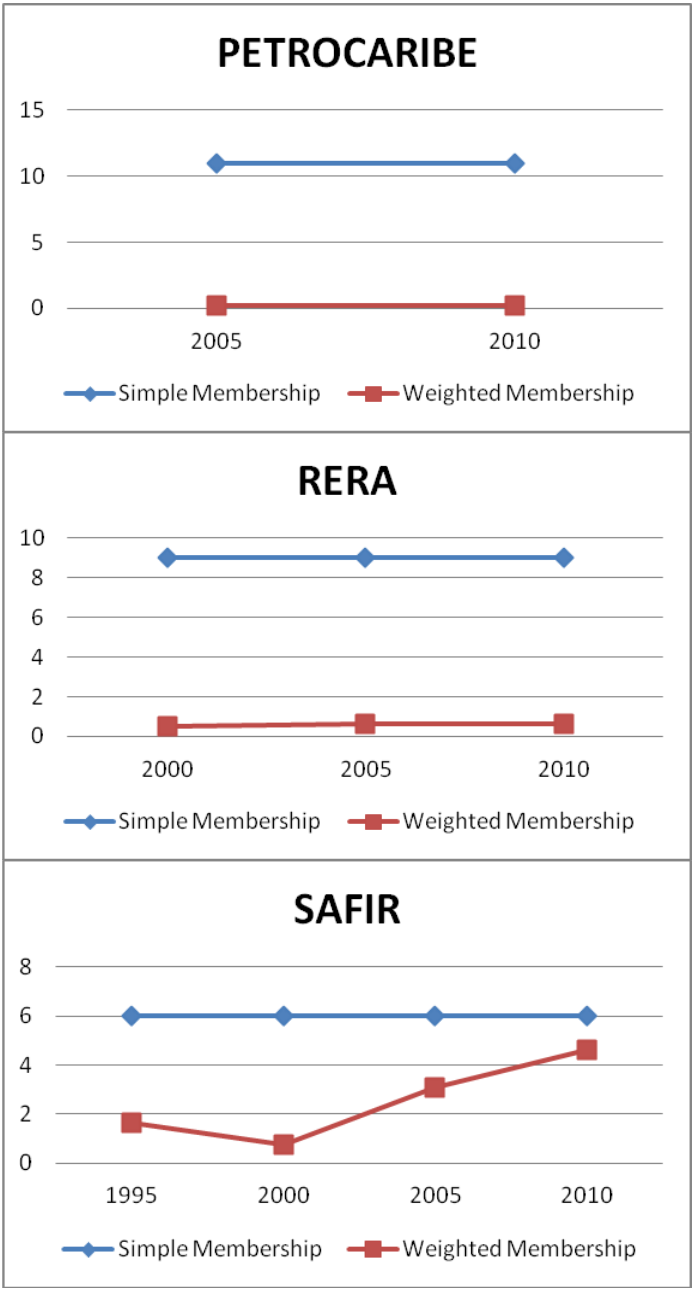
Simple Membership
Weighted Membership


PETROCARIBE
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Weighted Membership
RERA
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Simple Membership
Weighted Membership
SAFIR
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Simple Membership
Weighted Membership


SCO
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Simple Membership
Weighted Membership

- 3 -

Energy IGOs: Alliance, Membership and Infrastructure

1. Introduction

Energy security is increasingly one of the major concerns of international relations and international alliance formation. Yergin (2006) points to the emergence of energy security as a concern to the beginning of World War I and Winston Churchill's decision to move from coal-fired ships to oil-fired ships. Although this gained some tactical advantages, it left the United Kingdom open to shortages of oil, making oil an issue of national security for the first time. However, it was not until the 1973 oil embargo that energy security became a major byword of international relations as well as internal strategic positioning (Yergin, 2006). Energy security during this period led to the establishment of the International Energy Agency (IEA) as well as other transnational energy concerns, representing one of the first true transnational political structures (Keohane, 1978). During the 1970s and 1980s, energy security was considered solely in terms of availability and supply of oil, and the main issues were international conflict and uncertain international alliances (Yergin, 2006). Based on the need to control sufficient energy supplies, international alliances were created that specifically addressed oil access.

Although energy security is as important as ever was in the arena of international politics, this does not mean that concerns have not changed. One of the biggest changes is the gradual awareness of peak oil, or the point at which the world's oil production will begin to fall due to reduced availability and increased difficulty in extraction (Bardi, 2009). Bardi (2009) notes that it is difficult to predict when peak oil will occurs, although it is expected to be within the first few decades of the 21st century. He also notes that some analyses suggest that peak oil occurred in 2005 or 2006, and thus oil production is already on the downturn (Bardi, 2009). The idea of peak oil is particularly important for energy security because of the embedding of oil in the energy and transport infrastructure of almost all countries. Yergin (2006) argues that the occurrence of peak oil has resulted in a need to find other sources of energy to overcome future energy scarcity. This has had a significant influence on national energy security strategies. Another

concern is that of anthropogenic climate change, which has also induced changes in energy provision.

Although some progress has been made in developing new forms of energy and new energy production technologies, this process has been uncertain. A recent report from the International Energy Agency indicated that although significant progress had been made on developing alternative energy technologies, there was still a great deal of effort required to meet the requirements of a growing world (IEA, 2012b). This report pointed to the development of alternative energy strategies as important for both cost-saving measures and climate change mitigation measures. It indicated that each dollar spent on alternative energy investments would save three dollars by 2050 through avoidance of increasingly expensive fossil fuels (IEA, 2012b). Regardless, the development of alternative energy technologies has stagnated, with research and development funding actually falling since the 1980s and lack of deployment of highly promising technologies like offshore wind and concentrated solar power (IEA, 2012b). This trend in development and utilization of energy technologies runs counter to the availability trend for fossil fuels. Thus, the failure to develop alternative fuels is likely to exert an increasing strain on energy security.

Nations use a number of approaches to energy security during the current period. One of the approaches commonly used by these nations is the formation of alliances around common energy interests. The formation of energy alliances is a strategic approach, with relationships formed between alliance partners based on their perceived importance to internal energy considerations (Dorussen, 2006). This is similar to many other forms of international trade and structural alliance, where priority is commonly given to strategically important alliance partners (Dorussen, 2006). Energy alliances are often formed along the same lines as existing trade alliances, and may share priority in terms of trading partners. However, energy alliances may also be formed based on shared energy security concerns, rather than strictly trade concerns, setting them apart from simple economic motivations. However, these agreements may conflict with issues of state sovereignty or independence, which can serve as a negative factor in international cooperation agreements generally (Kroll, 1993). For example, IGOs are known to have significant coercive power over member operations, and to lead to the formation of norms and rules that may limit the

actions that can be taken by the IGO (Archer, 2012; Cao, 2009). This could be particularly true for state dyads with existing military or political conflict (Boehmer & Nordstrom, 2008). Thus, there is no guarantee that even in cases where there are shared energy interests, the formation of an IGO will be successful.

In this paper, we will discuss the formation of energy alliances as motivated by shared energy security concerns. It proposes that shared energy security concerns are the prompting factor in international energy alliances, including state membership in energy IGOs and the construction of common energy infrastructure. To explore these propositions, the paper uses two qualitative, analytical case studies. These case studies include the International Energy Agency (IEA) and the Shanghai Cooperation Organisation (SCO). These two cases show that the formation of energy alliances is not dependent on existing trade ties (although it may often follow these existing trade ties). Instead, it is based on shared energy security issues within a region or a group of nations, along with shared infrastructure development needs.

2. Literature Review

Energy security is not a fixed quantity, and often cannot be measured directly. As Valentine (2011) points out, issues such as the scope of energy security, the time horizon it is analysed at, and the assumptions made in the analysis change the assessment of how much energy, or of what type, is required to achieve energy security. Although there are a variety of measurements and scales available, many of these measurements have biases in one direction or the other (Valentine, 2011). Valentine (2011) provides the example of the Shannon Index as an indicator of energy security that is excessively biased to international political concerns. However, he also notes that almost every other aggregate index of energy security suffers from a similar problem, with one or more political or ideological assumptions complicating the calculation of energy security (Valentine, 2011). Because of this problem, this research does not attempt to analyse in detail objective energy security concerns or energy reserves. Instead, it focuses on perceptions by governments of shared security concerns. Core aspects of this literature review include energy security, energy alliances, and IGOs. Energy security is the core vulnerability studied, while energy alliances (especially through IGOs) is the mechanism by which energy security is protected.

2.1 Energy Security

Security commonly refers to economic or military security, and is often developed through regions of international influence (Buzan & Waever, 2003). The first emergence of energy security, or concerns regarding the safety and supply of energy sources, became tangible during the First World War (Yergin, 2006). However, the first international governmental organisations (IGOs) devoted to energy security did not emerge until after the 1973-1974 oil crisis, which was prompted by political fracturing in the Middle East, particularly in Iran (Keohane, 1978). The development of energy security is thus a relatively recent concern in international relations. The first IGO dedicated to energy security assurance, the IEA, was established in 1974 in the wake of this incident and resulting worldwide oil shortages (Keohane, 1978). The IEA is one of the case studies profiled in this research, because of its long standing nature as well as the non-trade based impetus for its foundation.

Empirical evidence supports the importance of security. One analysis of international conflict mediation between 1918 and 1988 found that alliance partners routinely use their economic, political, or military ties as a mediation tool, offering intra-alliance control over the actions of these partners (Gelpi, 1999). This security role is relevant given the long-standing position of energy security as a key security concern that drives international relationships and trade (Deese, 1979). Security and defence alliances between states appear to expand international trade as well (Gowa & Mansfield, 1993). Gowa and Mansfield's (1993) analysis of international trade from 1905-1985 found that defence alliances led to trade alliances and open trade, and that these effects were strongest in bilateral trade flows. Thus, the empirical evidence suggests that energy alliances improve trade between alliance partners, even though they may not be explicitly undertaken with this goal in mind.

2.1.1 Energy Alliances

Energy alliances can be understood as part of the visible framework of connections between states. Keohane and Nye (2011, orig. 1977), in their classical framework of state alliances and interactions, presented a framework for understanding this type of interaction between states. This framework indicates that state power is insufficient, in and of itself, to ensure security or international cooperation (Keohane & Nye,

2011). This assumption is directly opposed to that of realism, which holds that state power is the primary issue and international cooperation or activities are secondary and only enabled by the internal power of the state. Rather than focusing on the singular state as the instrument of power, Keohane and Nye (2011) build a web of *complex interdependence*, where sensitivity, or exposure of the state to other state actors, and vulnerability, or the ability to react to changes made by states to which it is exposed, determine a state's actions on the international stage. Under this framework, it is not strictly power that is important, but is instead the interconnections with other states. This framework explicitly allows for the formation of alliances that are not explicitly based on trade demands, as it allows for alliances to be formed based on shared exposure and vulnerability.

Alliances are known to be strategic in nature, although they may not, strictly speaking, be trade-based. One understanding of alliances is that posed by cooperation theory. Cooperation theory commonly uses game theory (particularly the prisoner's dilemma or coordination games) to explain international cooperation (Fearon, 1998). Fearon (1998) argues that both bargaining and enforcement are parts of the cooperation process (integrating both of these models), and that common strategic interests drive the cooperation effort. Cooperation theory also suggests that pure economic optimization is not the only goal of international alliances (Pollins, 1989). Instead, concerns including security, defence, and the economic security of partners needs to play a role in the decision process (Pollins, 1989). This strongly supports an understanding of alliances as strategic cooperation efforts that do not necessarily integrate trade concerns. However, the internal strategic goals of a given state may not be entirely free from influences of external economic ties (Papayoanou, 1997). This means that energy alliances are likely to have economic implications and entanglements, even if they do not simply follow existing trade arrangements.

A case study of energy alliances undertaken by France following the 1973 oil crisis illustrates the importance of the alliance to energy security (Lieber, 1980). This case study notes that France's rapid economic development during the 1950s and 1960s significantly increased its energy demands. Between 1960 and 1970, imported oil shifted from meeting 28% of France's energy requirements to 67.6% of those requirements, despite a dramatic increase in energy requirements during this period. Imported energy met 76% of France's energy needs

by 1973, leading to significant economic stress following the oil embargo and subsequent oil crisis in the same year. France reacted to this sudden incursion into its energy security using two paths, including foreign policy changes and energy technology development, especially development of nuclear energy. The extent to which it accomplished reduction in energy dependency through this approach is debateable, given that the first six years of the energy development program resulted in only a 2% drop in the extent of its foreign energy dependency. France's second strategy was to seek out bilateral agreements with Arab states for oil supplies, but this proved to be not much more successful. Despite even rejecting European Economic Community (EEC) agreements in favour of these bilateral movements, France realized little in the way of improved oil availability or price. Based on this initial lack of success, France moved to an alliance-based approach, after "the realization that France, as in so many other areas, could not resolve a major problem of international politics or economics by her own external actions…nor by external choices (Lieber, 1980, p.153)." This realization is consistent with the framework of Keohane and Nye (2011), who pose that complex interdependencies reduce the chance of success, or in some cases preclude it, for unilateral actions. This was further shown by the failure of US-European relations, as the US attempted unilateral action by subsidizing oil imports (Lieber, 1980). These challenges represent a failure of initial bilateral alliances, but Lieber (1980) also posit that by forcing the recognition of shared vulnerabilities and interests, France's actions and subsequent EEC and American conflicts led to increased cooperation in EEC states. Thus, the formation of a closer alliance was brought about by recognition of shared vulnerability and complexity, rather than simple alignment of economic interests.

Based on the literature review, the following statements can be made about energy alliances. First, they are formed based on shared interests, or under Keohane and Nye's (2011) framework, shared vulnerabilities and sensitivity to the movements of other states. Second, they may or may not be aligned with current trade interests. Third, based on the experience of France during the 1970s, they may be much more effective at meeting the needs of the state than direct bilateral agreements, which may gain the states nothing. These stylized facts about energy alliances will be explored in more detail within the case studies.

2.2 Inter-Governmental Organizations (IGOs)

One way that energy security alliances may be implemented is through the international governmental alliances, i.e., inter-governmental organizations (IGOs). One reason for joining an IGO (or founding it) is to meet strategic goals. IGOs and other international organisations are founded based on the strategic interests and goals of member states, and are specifically designed to serve those interests (Koremenos et al., 2001). Krasner (1976, p. 319) identifies four key strategic goals, including "political power, aggregate national income, economic growth, and social stability," though the importance of each of these may vary. IGOs may be formed along existing lines of alliance, such as trade agreements (Snyder, 2007). For example, economic alliances could be formed in order to help the state maximize Pareto efficiency through trade of goods (Krasner, 1976). This framework is contrary to much current analysis of energy security, which focuses on energy security as a zero-sum fight for limited and defended resources (Goldthau & Witte, 2009). However, this ignores issues like energy market reform and market forces, which mean that the state is no longer a significant direct actor in securing energy (Goldthau & Witte, 2009). Thus, within the framework of complex interrelationships, the IGO can be seen as the formalization of an existing set of shared interests and vulnerabilities around which state relationships may be based (Keohane & Nye, 2011).

There is contradictory evidence for whether or not energy IGO participation reduces conflict in other spheres or not. One examination of the conflict between China and the United States in Africa finds little opportunity for cooperation between these states generally, despite the relatively high level of existing economic and political cooperation in this arena (Austin et al., 2008). There is also a convergence effect, with interests and connections between IGO participants becoming more similar over time (Bearce & Bondanella, 2007). This suggests that IGOs may reduce conflict over time. Another study of IGOs using social network analysis found that mutual IGO involvement had a negative effect on conflict, as did strategic affinity (or alignment of strategic goals between states) (Maoz et al., 2006). This suggests that thickened interrelationships between states through IGOs could reduce conflict. However, this reduction is far from certain. The most important point about IGOs is that they are not necessarily formed along existing trade lines (Krasner, 1976; Snyder, 2007). This suggests that there are shared

interests and interdependencies that are not already spelled out in trade agreements, which serve as a means to promote the alliance. This is an area the current research will explore, especially looking at energy security concerns and shared infrastructure development as a cause for energy alliance development through the IGO.

3. Theory and Hypotheses

The formation of energy IGOs and subsequent actions is theorized as a two-stage action model. During the first stage (the bargaining stage), states with existing political connections or agreements and shared energy interests negotiate between themselves, leading to the formation of an energy IGO with shared interests and intended to meet specific requirements. The second stage (the enforcement phase) involves the actions of states within the existing IGO, which serve to meet the needs of the member states to one degree or another. In this section, each of these phases is encapsulated in a hypothesis about how states interact. Each of the stages involves a policy mechanism or model through which the state can achieve its energy security goals within the framework of the IGO.

For Hypothesis 1, a simple policy-making model is built that describes the relationship between the common security concerns of the state with other states and the joining or foundation of the energy IGO. For Hypothesis 2, a framework involving trust and common security concerns is developed to explain the co-development of shared energy infrastructure.

3.1 Bargaining Phase: Common Security Concerns and the Formation of IGOs

The first hypothesis of this research focuses on the bargaining phrase and the formation of IGOs. Bargaining can be understood as the process of negotiating agreements based on optimal and acceptable levels of agreement between states (Jönsson, 2002). As Jönsson (2002) notes, the bargaining process does not necessarily limit itself to the pre-agreement phase, but may continue following the agreement as specific issues are ironed out. However, the majority of basic agreements, including the agreement to take part in the IGO or other agreement in the first place, occur at the stage prior to the implementation (Jönsson, 2002). The bargaining phase is predicated not just on external connections between the states in the agreement, but also on the

internal conditions of the state and its approach to diplomatic agreements (Wiegand, 2011). In some cases, the bargaining phase will fail because of the lack of internal agreement with the goals of the IGO, or because of existing conflicts between states that is as yet unresolved (Wiegand, 2011). The bargaining stage of international agreements is well established as a diplomatic agreement-making process.

The bargaining phase is the phase in which national-level interests become coincident and nations begin to negotiate or bargain to formulate IGOs. However, in order for these interests to coincide, there needs to be common energy concerns in place between states. To test the hypothesis that is stated at the end of this discussion section, a policy-making model of factors in IGO formation has been developed (shown in Figure 1). This framework posits that existing political and trade alliances, along with shared energy concerns, lead to the formation of the energy IGO. However, these forces are opposed by factors exerting pressure away from the formation of the IGO. These negative forces include the risk that the state will not be able to sufficiently control the direction of the IGO, and that the strategic role of energy and energy resources may bring it into conflict with the IGO and IGO partners. This framework is developed through the literature in the discussion below.

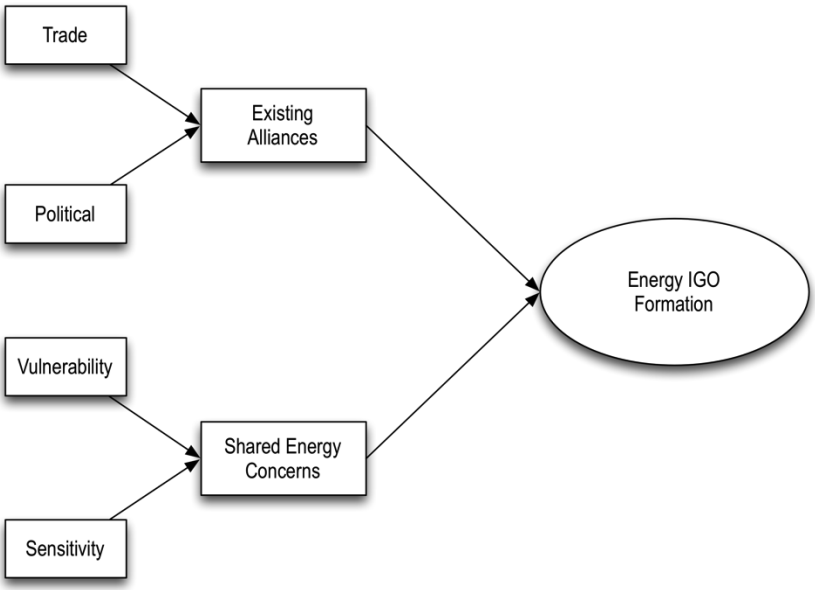


Figure 1: Policy-making framework for Energy IGO formation, including influences on the IGO formation decision (Shared energy concerns and existing alliances)

3.1.1 Influences on state IGO bargaining

The two key influences that are identified that influence the decision to form or join the energy IGO include existing alliances (such as trade and political alliances) and shared energy concerns (including shared sensitivities and vulnerabilities, using Keohane and Nye's (2011) framework of complex interdependencies).

The formation of energy IGOs along the lines of existing trade and political alliances is well understood from the literature (Snyder, 2007). The formation of alliances between states is generally understood to reduce conflict and aggression between states and to thicken ties between them (Mansfield & Pevehouse, 2000). This result in an increased number of trade interactions through IGOs and other agreements based on the formation of shared IGOs, while at the same time, shared IGO participation also increases the amount of economic interaction between states (Ingram et al., 2005). There is also empirical

evidence that shows that economic dependence and existing alliances serve to increase the entrance into the IGO, while military or political aggression reduces the chance of entrance into a shared IGO (Boehmer & Nordstrom, 2008).

There are a number of examples that can be found that support the role of existing trade or diplomatic relationships between states. One such example is the Asia Pacific Economic Cooperation (APEC) Energy Working Group, especially its Energy Security Initiative, which addresses short-term and long-term energy security concerns through approaches like development of energy infrastructure and renewables (APEC EWG, 2012). This group is based around the common informal agreements of APEC, following existing political and trade agreements. Furthermore, the APEC EWG reaches outside the Asia Pacific region, incorporating states such as Mexico and Chile, that have strong trade connections with the region, and which participate actively in the energy practices (Xinhua, 2008). The Energy Community (EnC), which extends the EU single energy market into the Baltic states, is also connected to existing state and regional political and trade ties between neighbouring regions (Energy Community, 2012). In the case of the EnC, the extension of an existing energy IGO served to expand diplomatic ties and strengthen connections within the recently fragmented Baltic region. The EnC would also serve to reduce aggression and enforce norms in a region recently in conflict, as suggested by Boehmer and Nordstrom (2008). These brief examples show that it is uncontroversial to state that existing political and trade ties between states will increase the likelihood of joining or forming an IGO together.

The second key influence in the formation of the IGO is shared energy concerns, particularly shared sensitivity and vulnerability to international conditions. Kroll (1993) argues that vulnerability represents a condition of dependence, and sensitivity a condition of interdependence. Kroll defines interdependence as "a case of mutual vulnerability, where two actors find themselves in a relationship that would create large costs for both of them should it break down (Kroll, 1993, p.322)." This definition makes it clear that the vulnerability expressed within the complex interdependence model is not just vulnerability to external conditions, but to interactive conditions. To illustrate using the previous example of France in the 1970s, France and the rest of the EEC were both vulnerable to external oil shortages

caused by Middle Eastern conflict and vulnerable to internal conditions and shortages (Lieber, 1980). This is particularly important to understand, especially given the second aspect of the definition – sensitivity. According to Kroll, sensitivity is "the degree to which states must coordinate changes in their policies (i.e., not "deviate widely") to achieve the sought-after benefits of those new policies (Kroll, 1993, p.330)." As Kroll (1993) notes, following Keohane and Nye (2011), states have varying levels of vulnerability and sensitivity, even in cases where their interests may be aligned qualitatively. Kroll (1993) quantifies this level of vulnerability and sensitivity expression as Fate Control and Behaviour Control. Fate Control, associated with vulnerability, refers to the extent to which the state actor can control the outcomes, while Behaviour Control, associated with sensitivity, refers to the extent to which the state actor can control the actions taken (Kroll, 1993).

Under this framework, the twin characteristics of vulnerability and sensitivity, their relative strengths, and alignment, influence the formation or joining of the IGO. As with the case of shared trade and political ties, there are numerous examples of the formation of energy IGOs based on vulnerability and sensitivity to energy risk. From the perspective of consumer countries, the Organization of the Oil Producing Countries (OPEC) provides an obvious example of shared vulnerability and sensitivity to world markets. The OPEC Statute, OPEC's governing document, explicitly recognises the shared vulnerability and sensitivity to world oil markets in its opening articles, noting that its goal is to "devise ways and means of ensuring the stabilization of prices in international oil markets with a view to eliminating harmful and unnecessary fluctuations (OPEC, 2008, Art. 2)." OPEC is one of the most active energy IGOs that acts in market operations, for example by controlling output of oil products from energy markets in response to market conditions (Kwiatkowski, 2012). From the consumer standpoint, the International Partnership for Energy Efficiency Cooperation (IPEEC) has a similar basis in shared vulnerability and sensitivity to energy markets. Points 1 and 2 of the IPEEC Terms of Reference (2008), which address shared concern with energy efficiency and devotion to improving energy efficiency and exchange of these energy efficiency measures, clearly suggests a shared vulnerability and sensitivity to energy market concerns and focus on measures to reduce the importance of these market concerns.

3.1.2 The formation of the IGO

The formation of the IGO, as suggested in the model shown in Figure 1, occurs when the cooperation forces (previous alliances and shared energy interests) are stronger than national sovereignty concerns (control over the IGO and the primacy of energy security concerns). What is also implied in this model is that the relative strength and dimensions of these concerns influence the design of the IGO. In particular, the strength of national sovereignty concerns could result in a less-binding IGO, while dominance of shared energy concerns and existing trade alliances could result in a more-binding IGO. Empirical evidence does suggest that IGOs in general are influenced by the factors above, although the extent of importance of these factors may vary. It should be noted that the ideological principles by which energy security is measured could influence the formation of the IGO as well. For example, energy security vulnerability is measured using different criteria in the EU and US, and although there is some overlap these measures do reflect different security priorities (Gnansounou, 2011). This implies that it is not just aligned interests, but *perception* of aligned interests, which will lead to the formation or joining of a shared IGO.

The final supposition of this research is that the relative strength of shared interests and national sovereignty concerns will influence the willingness to join the energy IGO or, in the case of a new IGO, its initial design and formation. This supposition is supported by evidence regarding state decisions to join IGOs in cases where there is some existing political or military conflict (Boehmer & Nordstrom, 2008). This evidence showed that states would actually join IGOs that included states with which they were in conflict, but that they were more likely to join weak or loosely structured IGOs under these conditions than highly structured IGOs or IGOs devoted to security intervention. This is also supported by the model of complex interdependence, which suggests that the interactions between states are driven by a complex web of dependence, interdependence, and independence (Kroll, 1993). Based on this framework, it is not presumed, as it has been in earlier work (Krasner, 1976), that interactions are entirely driven by state power, but that this has an oppositional role to shared interests and existing trade ties.

In sum, our hypothesis can be put as follows:

Hypothesis 1: Common security concerns in energy matters between allied states lead to joint membership and foundation of energy IGOs.

It should be noted that common security concerns are necessary, but are not sufficient, to drive the foundation or joint membership in the energy IGO. This can be seen in the membership of energy IGOs that have not been included. For example, producer energy IGO OPEC excludes a number of major oil producing and exporting nations including the United States and Norway, despite superficially similar energy security concerns. Instead, members are geographically centred on the Middle East and Africa (OPEC, 2013). There is also the issue of differing perceptions and measurement of energy security and measurement of security concerns (Gnansounou, 2011). It is clear that energy security can sometimes prompt member states and applicant states to join the same energy IGO even in cases of economic or political competition in some areas (Boehmer & Nordstrom, 2008). This raises the question of why states should do so. One potential answer is that energy security concerns become overriding compared to other concerns, possibly through an unexpected shift in the geopolitical or economic status quo, which force cooperation within a group of countries. The organizations that are included in this research, including the International Energy Agency (IEA) and Shanghai Cooperation Organization (SCO), have different levels of potential competition within their member states. However, both were founded during periods of economic uncertainty, particularly in the energy market. The rapid increase in cost of energy following the 1973 oil crisis, which spurred the foundation of the IEA, is an exceptional example of this type of precipitating alignment of interests (Bünsdorf, 2004). The two organizations selected for profiling are interesting in that they do align interests across countries based on these foundational conditions.

3.2 Enforcement Phase: Energy infrastructure

Involvement of states with each other does not end with the IGO formation. Instead, states continue to act with and on each other during the lifetime of the IGO, a period we have chosen to call the enforcement stage of the IGO agreement. The enforcement stage of international agreements is the period in which agreements are enacted and developed, creating more specification of norms associated with the

agreements (which are usually skeletal when enacted) (Mistelis, 2010). This enforcement can take the form of legal requirements or agreements or court actions (Mistelis, 2010), but in this case a broader understanding of enforcement that includes voluntary action within the NGO's framework is used. Enforcement can include the formation of norms such as transparency and accountability, as well as the development of specific projects and requirements through the IGO (Young, 2012). As Young (2012) notes, the power of enforcement varies widely with the power of the IGO, as determined by both the strength of its individual members and the number of members involved. However, during all agreements that are effective there will be some stage of interaction (Young, 2012).

While the first theoretical analysis examined the impetus for joining the IGO (or in the case of a new IGO, participating in its formation), the second theoretical analysis focuses on the activities of the state once within the IGO. This hypothesis is based on the role of trust in development of international states, and the idea that states that are more connected to each other through IGOs are likely to have increasingly thickened trade and interaction ties, which could include building common energy infrastructure, following the creation of a multilateral energy security framework through the IGO. This would be particularly likely given Hypothesis 1, which posited that common security concerns are major determinants in joining the IGO in the first place. Obviously, the decision to build some types of common energy infrastructure, although not all, would also be dependent on geographic contiguity between states. Figure 2 shows the basic formulation of this hypothesis. The first half of the causal chain, joining the IGO in the first place, is discussed in the section above. The work of this section is to trace a causal relationship between formation of a multilateral energy security framework and the development of shared infrastructure.

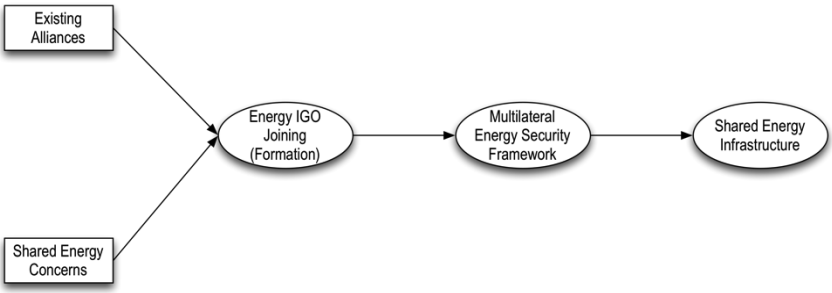


Figure 2: Chain of causal effects encompassed in Hypothesis 2

3.2.1 The formation of a multilateral energy security framework

The purpose of the energy IGO is typically the formulation of a multilateral energy security framework. This purpose is demonstrated by a number of examples, of which the most comprehensive is the IEA. The IEA was formed in order to provide shared energy technology development and promote energy security among its member states (IEA, 2012a). Whether or not this has been successful in its implementation is of course always open to critique. For example, the IEA's most recent report on alternative energy technology development shows that this area of the shared technology infrastructure is significantly behind (IEA, 2012b). However, this does not change the nature of the shared energy security framework that mandates the development of this technology. The development of shared security frameworks is also consistent with the purpose of other types of security IGOs, including interventionist and structural IGOs intended to address issues of militarized interstate and intrastate conflict (Boehmer & Nordstrom, 2008). One example of this type of multi-basis shared security IGO including energy security is the Organization for African Unity (African Union), which integrates shared energy security concerns into general security concerns, like foreign trade, food and water security, and humanitarian actions (African Union, 1963). In fact, energy concerns within the African Union are often addressed at the same time and in the same context as external concerns, and are often interventionist in nature (UNIDO, 2009). This suggests that the enforcement of multilateral energy frameworks may be in the context of other multilateral security concerns.

3.2.2 Shared energy infrastructure projects

The final question for this hypothesis is why multilateral energy security frameworks should allow for the construction of shared energy infrastructure projects like oil and natural gas pipelines. The most superficial answer is that pipelines represent a strategic resource for ensuring energy supply, as well as tying states together more firmly in dyadic and multilateral strategic relationships (Demir, 2012). However, Demir (2012) argues that it is not only a power or independence movement on the part of states; that is, it is not just about ensuring supply for the destination state. Instead, it is a relationship of *interdependence* between states; while the destination state does have an improved supply of energy resources, the source state also has an ensured demand (Demir, 2012). Thus, shared energy infrastructure like pipelines supports the interests of both states involved in the relationship. It also offers one potential means of achieving energy security goals, although according to at least one report most OECD countries have not made substantial progress in this area (Sovacool & Brown, 2009). Thus, this kind of attainment of structured interdependence between countries remains an aspirational goal. However, there are many energy IGOs that have actively undertaken the development of shared energy infrastructure regardless. For example, the Latin American Energy Organization (OLADE), which was established in 1973, undertakes a number of shared energy infrastructure projects intended to extend electricity and hydropower generation networks across international boundaries (OLADE, 2012). OLADE's Energy Coordination activities help smooth production and transmission across member countries using shared energy grid infrastructure. This type of shared infrastructure helps to cement the shared energy security frameworks in a physical form.

Transit countries, or countries through which a pipeline passes but does not terminate, represent a slightly different problem. One example of this is the Caspian Sea region (or Caspian basin), where oil production resources cannot be fully exploited without allowances for passage of pipelines through several transit countries (Bahgat, 2002). These transit countries sometimes have significant oil resources of their own, putting the interests of source and transit countries in conflict (Bahgat, 2002; Cohen, 2009). However, transit countries too may be involved in the energy IGO, particularly in cases where the IGO is a regional IGO. The conflict between transit states and terminal states for pipelines can be solved by a number of different approaches, including

military intervention, increasing dependency of the transit country on the pipeline, or most appealingly according to this framework, bringing the transit country into the multilateral agreement and developing dependence and interdependence between terminal and transit countries (Stevens, 2009).

The relationship between IGO participation and shared energy infrastructure is complex. The only way that shared energy IGO participation can lead to shared infrastructure projects like pipelines is if shared interests, rather than national sovereignty and power, dominate. However, there is evidence that this is not the case. In fact, geopolitical struggles over shared projects like pipelines are common, driven both by sovereignty and security concerns and the interaction of multinational corporations (Klare, 2004). Another issue is the failure of market structures to help ensure supply and demand, which has significantly reduced the efficiency of deregulated energy markets (Helm, 2002). Although Helm (2002) suggested that a shift toward alternative energy was required, this development continues to lag in IEA countries (IEA, 2012b). Another concern is that energy infrastructure is increasingly the target of terrorist and military attacks, increasing their physical security vulnerability (Farrell et al., 2004). Given these conditions, it is unlikely that the relationship between energy IGO membership and pipeline construction would be straightforward. However, the theoretical and empirical evidence does suggest that alignment of energy strategy through the energy IGO would reduce the distance between states and enable the possibility of shared energy infrastructure.

Our second hypothesis can be put as follows:

Hypothesis 2: When members of the same IGO, allied states will build more common energy infrastructure, such as pipelines.

4. Control Variables

There are two control variables that have been accounted for in the formulation of case studies. These control variables may serve as negative influences on the initial formation of energy IGOs, and may also influence the development of common security policies and eventualy-shared infrastructure.

The first of these control variables is state sovereignty. As previously stated, state sovereignty can be understood as an expression of state independence in Kroll's (1993) complex interdependence model, and it may be observed at varying levels of importance by states making different types of decisions. Independence is associated with state power, or ultimate control over fate and behaviour (Kroll, 1993). The two key aspects of state sovereignty that are identified as important in this relationship include the risk of not being able to control the direction of the IGO and the role of energy as a military or political strategic factor. These two aspects of the IGO could act as a negative factor for joining the IGO, particularly for a state that has heavily invested in its own energy security policy.

The second control variable accounted for in this research is that of geographic contiguity, which serves as an obvious constraint on some forms of energy agreement. A canonical case of shared energy infrastructure (though not the only such case) is that of the oil transport pipeline, which may transit between oil generating areas and refinery areas, consumption areas, or distribution areas (ports). There are a number of such international pipelines either already in place or in the planning stages, although these pipelines are often contentious in internal politics as well as international relations (Cohen, 2009). The aspect of geographic contiguity can be seen in Cohen's (2009) discussion of pipelines in the Caspian basin, which show that dyads of adjacent states need to be in agreement in order to allow construction of shared energy infrastructure. For example, the pipeline agreement of China and Turkmenistan requires that the intermediate states (Kazakhstan and Uzbekistan) must agree to the pipeline, since it must be built across their territory (Cohen, 2009). Thus, at least for a pipeline or other infrastructure that requires continuous connections, agreement between geographically adjacent dyads is required to implement the shared infrastructure. This is, as Cohen's (2009) discussion of rejection of various routes for Caspian pipelines by intervening countries shows, not a trivial concern. However, the formation of a multilateral energy security policy is more important, not least because a regional multilateral energy security policy is likely to improve conditions of acquiescence for infrastructure that requires geographic contiguity, like pipelines or shared energy distribution grids

5. Case Studies

Two case studies of energy IGOs have been selected to explore the hypotheses posed in the sections above. These case studies are focused on energy IGOs that do not directly follow trade cooperation lines, although a number of trade agreements also include aspects of energy security procurement and cooperation. These two case studies, the IEA and SCO, show how international energy alliances result from threats to shared security concerns, as well as how membership leads to the development of shared infrastructure. As consumer or mixed consumer/producer IGOs, the IEA and SCO are also not explained adequately using the empirical analysis in the first chapter. Thus, the proposed model provides a different view, offering the opportunity to explain different types of energy IGOs. These case studies are analysed using the frameworks set out above, specifically identifying supporting factors for hypothesis 1 and 2.

5.1 The International Energy Agency (IEA)

The IEA is among the oldest international alliances profiled, as it was founded in the wake of the 1973-1974 oil crisis (IEA, 2012a). The original objectives of the organisation were centred on energy security, including reducing supply disruption, developing cooperative rational energy policies, and improving efficiency and infrastructure of the world energy supply. The main founding members (with the exception of Canada, Norway, the United Kingdom, and the United States) were energy consumer nations (Scott, 1994). Evidence shows that the IEA was founded by states with strong existing alliances, trade flows, and economic and political strategy alignment. This case shows that both the foundational model for IGOs posed in Hypothesis 1 and the sharing of energy infrastructure (dependent on geography) posed in Hypothesis 2 applies to members of the IEA.

5.1.1 The formation of the energy IGO

The first and simplest foundation of the policy model comprises existing trade and political ties between the foundational and joining countries. The IEA clearly meets the requirement that members of a new alliance have strong existing alliances prior to the alliance formation. Initially, the IEA included member states of the Organisation for Economic Cooperation and Development (OECD), but did not include any non-OECD countries (Scott, 1994). This immediately suggests that these nations had strong trade ties at the time of foundation, since the OECD was explicitly founded to facilitate

and develop free trade between member states as well as between member states and non-member states (OECD, 2012). The OECD itself was established in 1948, and as such had been in place for 26 years by the founding of the IEA. This relationship has continued over time. An analysis of 21 of 24 OECD countries from 1970 to 2003 shows synchronization of business cycles during this period (Inklaar et al., 2008). This study also showed that while trade flows were important, far stronger effects were seen from political and economic strategic policy alignment, especially short-term interest rates and deficits. Thus, there was a clear, long-standing strategic economic alliance between the countries that made up the IEA at the time of its founding, fulfilling the first criterion of the model in Hypothesis 1.

The second criterion for the formation of an IGO is the alignment of energy interests among states in the formation of the IGO, especially in terms of shared vulnerabilities and sensitivity. Previous research regarding strategy-based reasons for entering into alliances has shown that formation of the IEA was based on alignment of (Krasner, 1976; Snyder, 2007). The IEA's initial formation strategy of coalition-building and trans governmental accountability allowed for the alignment of strategic needs (Keohane, 1978). However, as Keohane (1978) points out, the 1973 oil crisis, the precipitating factor in the formation of the IEA, was significant because it brought a new awareness of shared vulnerability to oil-producing states and sensitivity to their actions. In fact, this was the first point where OECD (and EEC) countries became aware of these shared energy priorities, as they had previously pursued very different energy security strategies (Lantzke, 1975). Thus, the foundational IEA states were prompted to join the IEA not just by existing trade ties, but also by the sudden alignment of energy security concerns from a previously unaligned and complex set of concerns.

There does need to be consideration of sovereignty issues in the formation of the IEA. One case study has already demonstrated that some states, including France, opposed the formation of the IEA due to national sovereignty concerns (Lieber, 1980). The case of France and its opposition to the IEA's formation, which eventually ended in joining, shows that national sovereignty concerns are not always sufficient to prevent joining an IGO. The example of France, which was ultimately unsuccessful in using its own sovereign power to meet its energy goals, shows the importance of complex interdependence as a means for understanding the decision to join the IGO. However, it should be

noted that even states with a much higher degree of sovereign energy independence than France, such as the United States, joined the IEA (Katz, 1981). This suggests that interdependence may actually be a much more significant factor in the decision to join the energy IGO than sovereign power. However, it should be noted that the IEA was initially constructed as a policy forum, rather than an international body with any significant power (Katz, 1981). Katz (1981) argues that the IEA was significantly steered by the US in its early development, which perhaps reduced the resistance to joining. Although France did not have this extent of power over the IEA, it was instrumental in setting priorities for the EEC (Lieber, 1980), which could reduce some sovereignty concerns in this area. Over time, the IEA's role in energy policy has shifted and become more proactive in energy policy development (Van de Graaf & Lesage, 2009). This has not resulted in the loss of members, but this does not necessarily reflect on the position of state sovereignty vis-à-vis shared energy policy. Instead, it could reflect the political difficulty of withdrawing from an existing energy IGO.

5.1.2 Shared infrastructure development

The focus of the IEA is on developing energy efficiency and expanding infrastructure for member and non-member nations (IEA, 2012a). In other words, the goal of the IEA is to formulate energy security frameworks, meeting the first criterion of the second hypothesis. This suggests that, as Goldthau and Witte (2009) indicated, founding members did not support the idea that energy security was a zero-sum game, and instead viewed it as a cooperative game to expand and distribute resources. However, it does not show whether or not IEA nations engage in shared infrastructure development.

There is significant empirical evidence for the development of shared energy infrastructure between IEA member states based on the shared energy security framework promoted by the organisation. One area of shared development is alternative energy technologies, such as offshore wind, hydro (wave) power, and concentrated solar power (CSP), as well as carbon capture and storage (CCS) (IEA, 2012b). The IEA (2012b) reports that these shared initiatives are not as advanced as they should be, due to lack of investment by IEA countries, but they do still represent shared infrastructure efforts. These efforts do not involve geographic contingency, but other efforts do. One such project is a

recent pipeline project intended to transport LNG between the Slovak Republic and the Czech Republic, with further development intended to integrate LNG markets in Poland and Croatia (IEA, 2012c). Multiple other examples also demonstrate the shared infrastructure development of IEA countries. One high-profile example is the Keystone pipeline and the proposed Keystone XL extension, which connect Canada's tar sands oil production regions to markets in the United States (Hoberg et al., 2012). This project is not without controversy, particularly the planned extension to the Gulf Coast, but it does represent significant cooperative infrastructure building. There are also multiple oil and natural gas pipelines that cross Europe, including inter-European pipelines and import pipelines from outside the EU (Bjørnmose et al., 2009). While the longest of these, the Druzhba pipeline, originates in a non-IEA member country (the Russian Federation), there are many other connecting and transit lines associated with IEA countries in the region (see the comparative graph 1 after the SCO section), that demonstrate active cooperation in this area (Bjørnmose et al., 2009).

5.1.3 Summary

This discussion has shown that the case of the IEA fulfils the policy statements in Hypothesis 1, as it originated from sudden alignment of energy security concerns following the 1973 oil crisis as well as existing, long-standing trade relationships. These factors were sufficient to offset sovereignty concerns even for states with high levels of energy power, although this could be due to the initially low level of policy setting power of the organisation. Additionally, the causal mechanism posed in Hypothesis 2 can also be seen to be appropriate, with member states first engaging in alignment of energy security frameworks and then becoming involved in shared energy projects. Thus, the IEA serves as an example of the two models shown above.

5.2 The Shanghai Cooperation Organisation

The second energy IGO that is studied is the Shanghai Cooperation Organisation (SCO). This organisation is substantially smaller and newer than the IEA, as it was founded only in 2001, with the extension of a previously existing military defence organisation (Sutter, 2012). However, the SCO shows many of the same characteristics in its formation and involvement in shared energy projects as the IEA.

5.2.1 The formation of the energy IGO

Like the IEA, the SCO was preceded by existing alliances between member states. However, rather than being primarily economic as with the OECD, the SCO's member states were previously engaged in defence alliances. The SCO is a descendant of the Shanghai Five. The Shanghai Five were a group of five member states (the People's Republic of China, Kazakhstan, Kyrgyzstan, Russia, and Tajikistan), which signed a sequence of mutual defence treaties in 1996 and 1997 (Sutter, 2012). This series of mutual defence treaties gradually expanded from military defence to include anti-terrorism, smuggling, and other illegal, cross-border regional activities (Sutter, 2012). The SCO was formed in 2001 with the addition of Uzbekistan, which had previously had bilateral defence relationships with the five existing member states (Sutter, 2012). This means that the main strategic goals of the SCO were military defence, rather than economic trade. This is a classical strategic reason for the formation of external alliances (Buzan & Waever, 2003; Deese, 1979; Gelpi, 1999; Keohane, 1978; Long, 2003; Long & Leeds, 2006). The main purpose of the SCO remains military defence, as well as reduction of tensions, particularly between China and Russia, which have historically had conflict along the shared border (Bailes & Dunay, 2007). However, there are also energy components to the IGO's formation, which are part of the IGO's structure as a general defence organisation (De Haas, 2008). These include the 2006 formation of an Energy Club and the 2007 proposal of a unified energy market (Matveeva & Giustozzi, 2008).

The domination of the SCO by China would seem to reject the alignment of energy security interests in the region. However, this is not necessarily the case. China argues that it is not seeking a hegemonic leadership position, but is instead protecting the region economically as well as politically from the encroachment of US hegemony (Carroll, 2011). It cannot be denied that China's interests have significantly shaped the SCO, as it is by far the largest member (Carroll, 2011). At the same time, however, there are significant interdependencies between the SCO states that promote the shared interests. Members of the SCO, including Kazakhstan and Kyrgyzstan, have significant oil and LNG resources, but no clear path to market, especially given the opposition by neighbouring countries with their own reserves (Bahgat, 2002; Cohen, 2009). These countries are also in a difficult political position, often isolated between Asian and European political interests

(Marketos, 2009). Thus, the strategically interdependent nature of the alliance becomes clear. While China's dominant interest is that of ensuring oil supply, many of the other member states have interest in ensuring and accessing demand for their oil resources, as well as a clear political affiliation (Demir, 2012; Marketos, 2009).

The SCO takes a particular approach to reducing the influence of sovereignty concerns on entry into the energy IGO – it eliminates concern with domestic activities. The defence interests of the SCO states also varies widely, particularly given that three of its member states produce significant amounts of oil (Russia, Kazakhstan, and Uzbekistan), while the other three produce little or none (Bailes & Dunay, 2007). It is likely that the SCO will remain primarily a defence and energy security IGO, given its position of ignoring domestic issues such as authoritarianism and political determination struggles (Hessbruegge, 2004). However, this does lower barriers to entry such as those faced by the IEA.

5.2.2 Shared infrastructure development

As with the IEA, the shared energy interests of the SCO members have promoted the development of shared energy infrastructure. One project is the China-Kazakhstan oil pipeline, which came online in 2006 (Guoqing, 2012). The Central Asia-China pipeline, which transports natural gas from Turkmenistan to China through Uzbekistan and Kazakhstan, came online in late 2012 (Jarosiewicz, 2012). A third such project is a pipeline linking Russia and China, which ensures China 300,000 barrels/day and opening Asian export markets for Russian oil (Gorst, 2010). This project opened in 2010. In some cases, such as the Central Asia-China pipeline, this has involved some of the SCO state acting as transit states (Cohen, 2009). The existence of SCO states in the alliance is one possible way to reduce resistance to this type of international transit pipeline (Stevens, 2009).

There is no specific incident that can be identified that suddenly realigned interests between IGO members like the IEA's experience of the 1973 oil crisis. However, there is clear evidence for this type of interest alignment. One reason for such a multilateral energy security alignment is the conflict of interests between China, the European Union, and the United States, all of which compete for limited resources (Hasan, 2010). The precipitating factor in this case is the emerging oil and natural gas resources of the Central Asian region,

which are highly sought after by other regions (Hasan, 2010). However, this is not without conflict. Russia and China do have conflicting interests in energy supply and demand, although they continue to cooperate with each other within the SCO (Yun & Park, 2012).

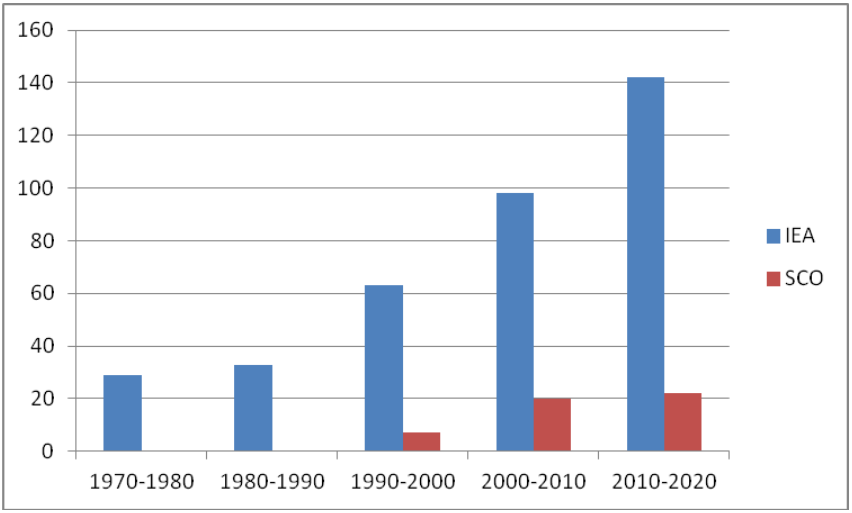
Shared infrastructure development within the SCO has been somewhat more contentious than in the IEA. Shared pipelines between the Caspian states and China are clearly advantageous to both groups, as it provides both supply and demand assurance and meets the interdependency requirements of both states (Cohen, 2009). This puts these states in conflict with Russia, which as a major oil producing state also has an interest in ensuring its market (Öksüz, 2009). However, there are clear advantages for Russia as well, since supplying China offers it a stable and high-demand market (Proedrou, 2012). The size of the Chinese energy market is likely to be the determinant of success in this area, as it drives many of the energy policy decisions within the SCO. This market is rapidly growing. For example, the 2011 market for natural gas was 18.2% higher than in 2009 (Lamoureux, 2011). Thus, for the time being the demand element of the market is likely to be stable.

The political relationship of Russia and China within the SCO is an evolving relationship that represents a significant step forward in terms of cooperation from previous periods (Bailes & Dunay, 2007). Ultimately, the SCO is still a young IGO, and its internal politics are still under evolution (Matveeva & Giustozzi, 2008). This development has already resulted in rapid cross-border development of shared energy infrastructure, which is likely to continue over time (see graph 1 below).

5.2.3 Summary

This case study has shown that the SCO is considerably younger and smaller than the IEA, and that the existing connections between states were primarily military rather than trade-based. However, many of the same conditions that were found at the base of the IEA can also be seen in the case of the SCO. For example, alignment of energy security interests can be seen in the relationships between China and the oil-producing states along the Caspian, which provide a much stronger case for mutual interdependence between these states. Regardless of the age and primarily military basis of the SCO compared to the IEA, the member countries have aligned their energy policy and begun to build shared energy infrastructure, especially international oil

pipelines intended to maximize the supply to China and ability of oil-producing countries to reach markets. This clearly shows the interdependence of energy IGO members and their aligned energy security frameworks and their realization in shared infrastructure. Although there are concerns around the Russia-China relationship and their conflicting interests, as well as the interests of transit states, the SCO has shown that these concerns do not overcome market (supply and demand) concerns.



GRAPH 1: Evolution in the number of cross-border pipelines in IEA and SCO, comparative data

5.3 Discussion of Results

The two case studies profiled offer slightly different viewpoints on the theoretical framework and its implications. The IEA and SCO differ in a number of ways that change the outcomes and means of analysis, even though the basic framework serves to explain the formation of energy alliances between member states and the construction of shared infrastructure.

The IEA can be characterized as a mature consumer energy organization, concerned primarily with energy security for members from heterogeneous sources. The IEA does not have a single dominant partner driving its interest formation, although it does have various interest blocs. It also is not geographically concentrated, including

member states in North America, Europe, and Asia. In contrast, the SCO is an organization of both consumers and producers, some of whom maintain international energy supply connections as well. It is geographically concentrated, and is focused on oil and natural gas supplies. The SCO, unlike the IEA, *does* have dominant member states, with China's energy demand and Russia's role as major oil producer dominating its energy policy making and structure. These differences in configuration of the respective alliances are likely to make a significant difference in how states form energy policies and build infrastructure.

One of the most obvious issues that emerge from this analysis is the dominance of supply and demand in the construction of intra-IGO infrastructure. This factor is integral to the formation of a multilateral energy security framework, which would take into account different needs of countries in terms of demand. Kroll's (1993) model of dependence, interdependence, and independence can serve to explain these relationships in part, as illustrated by the case of the Russia-China gas pipeline. This web of dependence, interdependence, and independence can be illustrated with the Turkmenistan-China pipeline. This pipeline is intended to supply natural gas to China, which has one of the most rapidly growing demands in the world for energy supplies (Lamoureux, 2011). The growth in demand for natural gas as well as crude oil and other energy resources might be seen as the dominant factor in the development of energy security frameworks in the SCO. However, this is not necessarily the case. For example, while China gains guaranteed access to 300,000 barrels/day of Russian oil through the Russia-China pipeline, the pipeline itself will eventually allow the flow of 1.6 million barrels/day (approximately a third of Russia's total production) into the Pacific region (Gorst, 2010). Thus, this energy infrastructure improvement supports the needs of both the supplier (for guaranteed markets and access to new markets) and the buyer (for guaranteed access to energy resources). Importantly, this issue of supply and demand was sufficient to overcome considerable political conflict between Russia and China, which have had a history of military and political conflict and which continue to compete for regional dominance (Marketos, 2009).

Another issue is the issue of substitution. In many cases, shared energy transport infrastructure is a replacement for a similar, less effective method of transporting energy. For example, the Russia-China

pipeline, which transports oil from Eastern Siberia to north-eastern China, is not a new trade link. Instead, it is a connection that is intended to replace transport of crude oil via tanker cars on an existing railroad (Gorst, 2010). Gorst (2010) noted that transport via pipeline would be more economically efficient than tanker transport, but this does not necessarily mean that this represents a deepening commitment to the existing relationship by either Russia or China. The issue of substitution shows that the decision to build shared energy infrastructure is not just based on economic factors, but really does represent the extension of an existing relationship. The origins for this relationship can be found within the theoretical model, including the existing trade relationships (which in many cases may include energy trade) and the formation of a multilateral energy security policy.

A final issue is the political controversy that often surrounds shared infrastructure projects outside the main considerations of aligned economic and energy interests. The Keystone XL extension, one of the IEA projects identified, is an example of this. In both the United States and Canada, there are substantial political debates and arguments over this pipeline, although the specifics of the debate differ (Hoberg et al., 2012). In both states, there is considerable concern about the economic, environmental, and other implications of the project, although these are expressed somewhat differently and are subject to different procedural rules. Furthermore, sub-national governments and courts also play a major role in determining the outcomes of the planned extension (Hoberg et al., 2012). These sub-national governments and courts are not accounted for in the IGO framework, which solely focuses on the interests of the state at the national and international level. However, this does not mean that these sub-national political concerns are not important when it comes to determining participation in shared energy infrastructure projects.

Ultimately, what can be said about the cases of the IEA and SCO, which show such similarities even though they are very different organizations? Although the organizations have different focuses, they do have similarities in terms of how energy policy is handled and the implications of the model for policymaking. The cases also show that although a shared energy infrastructure at the international level is precipitated by factors like participation in the IGOs, shared energy security frameworks, and supply and demand factors, this does not explain much about the internal politics of states. These internal politics

are likely to influence the process of IGOs' formation and shared energy infrastructure projects at all stages, and because of this they may be over determining on the theoretical model discussed in this research. However, as the Russia-China pipeline shows, it is clear that internal politics and existing relationships between states do not entirely constrain or eliminate the possibility of energy cooperation and shared infrastructure even between rivalrous states. Thus, the model of this research does not take everything into account, but it does still provide a reliable explanation for shared energy infrastructure construction.

5.3.1 Implications

The main policy implication of this research has to do with the frequent failure of energy IGOs to promote the construction of shared energy infrastructure, despite seemingly aligned interests. Both IEA and SCO cases show that shared energy infrastructure results when there are mutual supply and demand advantages, even where there are political conflicts (such as those between Russia and China). However, the problem of transit countries, as well as the complexity of decisions, can often delay or limit these projects. For example, the case of the SCO shows that direct conflict between Russia and China, as well as the dominance of China's interests compared to periphery states like Turkmenistan, have seriously influenced the form and structure of infrastructure projects. It is at this point that flows of dependence, interdependence, and independence need to be considered, as they inform the analysis and enable understanding of why such an effort might be limited. Overall, these cases show that shared IGO membership and geographic contiguity (or allied transit countries) are necessary, but not sufficient, conditions for energy infrastructure. Instead, countries need to have aligned economic interests, such as the relationship between supplier and buyer, in order to generate this type of infrastructure. Thus, alignment of economic interests should be a major point of analysis in understanding shared infrastructure projects.

5.3.2 Limitations and Opportunities for Future Research

There are some key limitations that should be considered in this research. One such limitation is lack of transparency in decision-making within the case study of SCO, which is known to be an issue and which limits much policy analysis in this area (Bailes & Dunay, 2007). The problem of inadequate transparency means that much of the

policy analysis is based on post hoc or outcome analysis, rather than specific policy statements or monitoring by the IGO itself. However, this limitation leads to an opportunity for future research, including rigorous analysis of the SCO itself and its policy direction. Marketos (2009) has been among the first authors to start this work, but much of this analysis is specifically from the consumer perspective (i.e. China's energy policy as a major consumer). Focusing on producer and transit countries within the SCO and international relationships outside the SCO would deepen the available information and increase the reliability of analysis in this area. The qualitative case studies could be supported using a large-n quantitative analysis, potentially including a time series or panel component in order to understand changes over time.

6. Conclusion

An energy intergovernmental organisation (IGO) can be briefly defined as an intergovernmental organisation that deals with concerns of energy security. With the establishment of energy IGOs during the 1970s and 1980s, these concerns were primarily securing an appropriate supply of oil and natural gas resources in the face of constrained supply and oil cartels. Over time, however, issues like peak oil and anthropogenic climate change, as well as the opening of new oil sources like the Caspian states, have gradually shifted the role of energy IGOs to development of alternative energy technologies. The influence and power of energy IGOs has also shifted, with the IEA moving from a purely advisory position to being significantly involved in setting energy policy for its member states.

The goal of this analysis was to explain the formation or joining of the energy IGO and acting within it for goals such as shared energy infrastructure. The theoretical discussion first posited that a combination of factors led to the formation or joining of an IGO, as described under Hypothesis 1. The first such factor was existing political or trade ties, like trade agreements or military defence pacts. The second such factor was an alignment of energy security concerns including dependence or sensitivity and interdependence or vulnerability concerns. However, these concerns needed to be balanced against concerns of state sovereignty, such as control over the direction of the IGO's operations and the violation of state sovereignty norms. Together, these factors would determine in the first instance whether a

state would join a given IGO or not, and in the second instance how the IGO would be designed and structured. The second mechanism of this research, described as Hypothesis 2, focused on shared infrastructure projects as the realization of aligned interests as expressed through the energy IGO. This hypothesis posited that following the formation of the energy IGO, the states involved would align their energy security strategic frameworks, which would allow for the development of shared energy infrastructure. Geographic contiguity was also a factor in the successful development of land-based energy infrastructure like pipelines.

Two case studies were used to demonstrate the policy-making and investment models posed in Hypothesis 1 and 2. The first case study was the IEA, which is the first energy consumer IGO established. The IEA was established in the aftermath of the 1973 oil crisis from OECD member states, which already had extensive and long-running trade ties. The IEA's energy security interests had been abruptly aligned by the oil crisis and the sudden threatening of supply, and this formed the basis for both its role in ensuring supply and its role in developing alternative energy technologies. The IEA's formation was not uncontested, as the case of France shows. However, it did gradually gain strength over time as perceptions of its role as threatening national sovereignty was reduced. The IEA has engaged in a number of common infrastructure development projects, including the development of alternative technologies as well as pipeline projects. The current development of pipelines in the Balkan region, including the Slovakian Republic and the Czech Republic, show that the IEA has been successful in promoting shared infrastructure projects.

The second case study, of the SCO, provides support for both the first and second hypotheses. The SCO was established first as the Shanghai Five in 1997, as a military organisation intending to protect the region from incursions by US interests and others. However, it also has taken on more general security concerns in the region, including energy concerns. Given that the SCO states include a number of oil producing states along the Caspian Sea as well as Russia, and a major oil demanding state (China), there is some opportunity for alignment of interests among these states. The SCO has solved the problem of sovereignty by ceding all control over domestic affairs, which could have reduced the resistance to formation of the energy IGO. Thus, in terms of its formation the SCO is very similar to the IEA, although it is

newer and there was no single event that can be pinpointed as the cause of a sudden alignment. The SCO is in many ways not as straightforward as the IEA, with multiple oil producing countries as well as one major consumer (China), and with competing and conflicted political interests. It is also a much younger and more dynamic alliance than the IEA. Within the SCO, China's interests as an energy consumer drive much of the shared infrastructure building that takes place. However, this is not an absolute. For example, the Russia-China oil pipeline is intended to supply China, but will also allow Russia access to Pacific markets for its Siberian crude oil (Marketos, 2009). Once again, within the SCO shared infrastructure decisions are driven by supply and demand considerations, rather than simply existing relationships within the IGO. This both supports the hypotheses of the research and shows that the SCO, though nominally an energy security and military security organization, also has substantial economic implications.

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- 4 -

Regulate to Compete
How European Networks of Energy Regulators Reinforce the Competitiveness Agenda of National Regulatory Authorities

1. Introduction

Energy represents one of the most affected commodities by the forces of globalization. A primary role of the European Commission (EC) is the regulation of various industries in Europe (Jones 2011), with energy competition emerging a key concern with respect to multiple-member states. The European Union (EU) is grounded in the assumption that increasing trade fluidity, facilitated by a common currency area, is preferable to more isolated market-systems. Limitations placed on energy competition, consequently, counter the economic interests of not only member-states but also those of the entire European collective. The transition of regulatory control over energy production and consumption from states to the EC has been an arduous one, and, as the autonomy of member-states becomes increasingly reduced, significant implications for energy competition in Europe emerge. In essence, the opening of energy markets throughout Europe is essential to the sustainability of the EC, as energy represents a unique commodity informative of multiple aspects of trade, including supply and demand. Key advantages for the nation-state, despite a diminished level of regulatory control, then emerge from improved energy competition, and this study is rationalized by the assumed benefit to member-states from energy competition generated at the EC level (Black 2002; Heritier 2002; Lodge 2008; Moran 2002). In this research, we use a policy model framework to examine two specific cases of energy regulation through the European Networks of Energy Regulators (ENERs), looking at the interactions between the national regulatory agency (NRA), energy industry, national government, and the EC as a means of explaining the role of the ENER in improving competition, transparency, accountability, and independence within the national energy sector. We use a qualitative policy model based on the previous work of Putnam (1988) and others to help explain the causal relationship between the ENER and energy sector competition at the national level.

The case studies we have selected include the Czech Republic and Spain, with these cases selected for their diverse characteristics and variability according to the selected model. In the Czech Republic, we focus on the 2004 ascension to the EU and joining of the Council of European Energy Regulators (CEER), and the subsequent movement of the Energy Regulatory Office (ERO) to harmonise Czech energy legislation to the European acquis communautaire concerning the liberalization of the electricity and gas sectors. In Spain, we focus on Spain's involvement in ACER and the effects of this involvement on the electricity and gas sectors. In both cases, we focus on accountability, transparency, and independence of the ENERs involved and the resulting improvement in energy market competition at the national level. Our contribution to the body of literature concerns the analysis of ENERs impact over national competitiveness levels. Our aim is to unveil the causal relations that link European-led supranational networks to modifications in domestic markets.

The global marketplace is increasingly shaped by the movement of energy, with emerging regulatory frameworks such as that provided by the EC serving to a fill an urgent need; existing regulations were insufficient in addressing the nature of global competition with respect to both the energy sector, specifically, and across industry lines, more broadly. Energy competition is a core and critical element of the single-market system which the EC and EU seek to cultivate, with multiple actions taken at the EC level to promote energy competition through enhanced, higher-level regulation. Nation-states have responded to the enhanced, supranational control in various ways, with many failing to adhere to mandated competition regulations. Gaps in proposed competition goals and the realities of the energy sector in nation-states failing to meet EC-guided outcomes emerge largely from the transition process from state to EC control.

Mechanisms of control, additionally, are markedly diverse, and the malfunctioning of energy markets in nations without sufficient competition is indicative of a need for change. While the energy market has become generally and fortunately liberalized during recent years, single-market status marked by integration and competition within the EU has not yet been accomplished; this is largely attributable to various forces, including the unique nature of energy, diminished national role in regulation, and a general and unaddressed discrepancy between domestic market regulation and European, supranational networks. As

energy regulators become increasingly more effective and influential on the emerging single-market system, their emphasis on streamlining competition in the energy sector will increase and concurrently become more effective. Undergirding this study is the assumption that energy competition will be directly boosted by three, key characteristics of energy regulators; these are accountability, independence, and transparency. Additionally integral to the study is the notion that these regulating bodies will play a key role in shaping not only the structure of the energy market but also the key policies involved. According to Thurner and Hatzold (2010), energy represents the most influential commodity in the global marketplace: 'energy is not a commodity as any other commodity – it is the most important input factor for economic production and consumption – and finally for the survival of political leaders and whole political entities. The production and consumption of fossil fuels is highly asymmetrically distributed around the globe with some countries being net producers and others being highly dependent on the import from net producers. Trade is accomplished often over long distances and transit countries.'

By extension, the mechanisms guiding energy's movement, competition, production, and consumption are tantamount to those which guide the entire, global trade system. This study then provides a salient direction for future research in that it forges connections between energy competition, enhanced regulation, and plausible instruments for mediating gaps between domestic and supranational control.

2. European Energy Regulation

2.1 Regulatory Agencies in Europe – Beginning and Development

Majone (1994, 1997) introduced the concept of regulation in European political science academia. Majone argued that the state was moving away from its previous functions of stabilization and redistribution, instead focusing on regulation and the development of the regulatory state. At the same time, the European Commission adopted regulation as one of its central tasks (Jones 2011).

The lack of accountability through direct elections was seen as a reason to avoid increasing reliance on regulation at the EU level, since this would endanger European democratic institutions (Majone 1994, 1997). European political writing focused on analysing this loss of

control for the government and the risks involved with this loss. Scholars worked on the mechanisms leading the growth of European regulation. The focus was on understanding how the top-down policy integration among states impacted countries, societies, and the industry. Researchers were also interested in the practical outcomes of the regulatory waves, both for states and the EU (Black 2002; Héritier 2002; Moran 2002; Lodge 2008).

2.2 National Regulatory Agencies – Domestic Constraints

Works focusing on the role of the European Union in the regulatory process accompanied these broader studies. The general outcome was not in favour of a preeminent role for the Commission. Changes in national frameworks resulted mostly from a domestic political process of acceptance of the need to open up to competition (Knill and Lehmkuhl 2003). Factors that accounted for constraint of EU action on member states were limited. An important finding was that the EU primarily played a coordinating role between European regulatory agencies, rather than playing a command and control role, and that states maintained strong control of these coordinating functions (Majone 2005; Zeitlin et al. 2005). Another important finding was that the EU faced significant difficulties in finding a tool to directly impact member states (Kelemen 2002; Chalmers and Lodge 2003; Lodge 2007). Furthermore, member states' different starting points in regulation made harmonization of the regulatory frameworks across the EU a significant challenge (Jordana and Levi-Faur 2004; Zeitlin and Pochet 2005; Lodge 2007).

These studies posited that unsystematic variance depends on two factors. The first factor is the compatibility of the existing national institutional architecture with EU norms. While there is an incorporation of the EU norms at the domestic level, national actors are still in charge of the implementation. States were then free to interpret European normative frameworks in different ways, as long as outcomes tended to harmonization (Héritier and Knill 2001; Cowles et al. 2001; Sabel and Zeitlin 2007; Börzel and Risse 2003). The second factor concerns the opportunity that European reforms offer to domestic interest groups to change the domestic power balance and bypass the constraint of national veto players. Institutions empowered by EU norms contribute to weakening the various veto points of a

country, according to several studies (Cowles et al. 2001; Zeitlin and Pochet 2005; Börzel and Risse 2003).

Proponents of the rational design approach share this view concerning the motivations behind the government's action. However, they also argue that there is a trend in the energy field and in the other network sectors toward an increased coordination between the different actors in the system (Börzel 2010). These scholars posit that we are now facing a hybrid system, where powers are unclearly divided between the European Union and the national level (von Danwitz 2008; Lavrijssen-Heijmans and Hancher 2008). The European networks of energy agencies are gradually acquiring formal powers that allow them to directly intervene on stakeholders (van Ooik 2005). Thus, the interaction between European and national-level energy regulators needs to be considered carefully.

2.3 European Energy Regulators - Influence on Member States

Generally, literature on European regulation and studies on the competitive conditions in the European energy sector have paid little systematic attention to the impact of European networks of energy regulators on the competition outcomes of member states. A few recent papers have addressed the issue of European networks' power of diffusing policies, but they failed to connect the legislative action of networks to its natural target, i.e. the competition performance of the market.

One notable example is Maggetti and Gilardi (2011). These authors worked on the role of network centrality in the domestic adoption of standards decided at the network level. In their case-study analysis on the Committee of European Securities Regulators, the authors noted that "(…) these standards, although on a voluntary basis, are adopted quite consistently as compulsory regulations by member states. Therefore, decision making within ERNs matters. More precisely, (…) we identified five patterns of adoption (…) that do not match with those expected following the (…) arguments developed in the literature on Europeanization. This result is intriguing because it shows that the effect of European networks on domestic regulations is mediated by different factors than those evoked for traditional European-level processes, policies and institutions" (Maggetti and Gilardi 2011: 17).

An advantage provided by the ENERs is that the ties between various members are unusually robust (Maggetti and Gilardi 2011). Most policy networks are loosely grouped and permeable agencies that do not have strong relationships with other agencies. In contrast, the ENERs have a well-defined structure, which is characterized by significant competencies and resources. The different entities in the ENER networks work well together and generally promote constructive interactions, which heighten the competencies of those involved. These tightly knit groups result in peer pressures for constant improvement and increased levels of competition (Maggetti and Gilardi 2011).

The literature presently has a shortcoming related to the relationship between European-led supranational networks and the effect of these networks on domestic markets. Specifically, there is a lack of information regarding the effect that ENERs can have on levels of competitiveness in the energy sector. The hypothesis of this study is that levels of competitiveness in the energy sector are the result of ENERs increasing accountability, independence and transparency. According to this hypothesis, the increased level of knowledge regarding the performance of regulated entities in the energy sector will result in more competitive market practices. The independence of National Regulatory Authorities (NRAs) from the government means the regulated entities have the opportunity to fairly compete with each other in order to increase their profitability and other performance measures.

ENERs, both the ones concerning only EU member states and those designed to include neighbouring countries, have a role in changing the structure of the energy market and the related legislation. The attempt to account for changes in the competition side of the energy markets without considering their role would lead to flawed results.

3. Theoretical Background: Regulatory Agencies and National Competition

By creating independent agencies such as ENERs, the government's organizational structure becomes more attractive (Vos 2005). The agencies that are free of the government tend to have higher levels of transparency and accountability. With regard to the European Union and ENERs, the tasks which are assigned to these agencies are more

precise and easier to quantify than traditional government agencies. National Regulatory Agencies are designed to be independent of the government, and under the ENERs framework they can be compared with each other to evaluate their levels of action on the market. Like its national members, the ENER becomes answerable for its actions and is structured to require accountability and transparency (Vos 2005).

Our argument advances the idea that the increase of competition levels in the national energy sectors is a function of the countries' membership in one or more European networks of energy regulators (ENERs). Membership of ENERs may be comprised of EU member countries only, or may integrate neighbouring countries. Examples of EU member ENERs include the European Regulators' Group for Electricity and Gas (ERGEG), the Agency for the Cooperation of Energy Regulators (ACER), and the Council of European Energy Regulators (CEER). Examples of ENERs that integrate EU member states and neighbouring countries include the Energy Community and the Association of the Mediterranean Regulators for Electricity and Gas (MEDREG).

3.1 The ENER's Role in Competition

Ultimately, the goal of the ENER is that it promotes fair competition within the market. The *acquis communautaire* (or body of European law) referring to energy regulation constitutes the reference for regulation. The inherent structure of the ENERs increases independence from governmental decision-making, thereby augmenting compliance to regulatory standards (such as transparency), which results in more competitive energy markets. The mechanisms the ENERs use for this function include mechanisms related to accountability, transparency, and independency.

3.1.1.Accountability

Regulations establish a benchmark by which the ENERs can be judged and held accountable. Energy regulation may involve either social or economic concerns, though it commonly involves both. The European energy *acquis communautaire* strongly intertwines the concept of liberalization of competition with the objectives of regulation. Regulation is characterized by the formalization of the private-public relationship in the political domain (CTRRCE 2007; von Danwitz 2008).

We can understand the objectives of energy regulation through two different, yet complementary, lenses: from the viewpoint of industries (guaranteeing competition) and the viewpoint of customers (protecting public welfare) (OECD 2005). From the industry's viewpoint, energy regulation can be depicted as a sector-specific set of laws that guarantee an appropriate degree of competition in the liberalized market (Hauteclocque 2008). One example of this type of focus is the call on the part of Eurelectric (the Union of the Electricity Industry, an electricity sector interests association) to enforce more cogent standards on congestion management and the harmonization of transmission tariffs (EurActiv 2009). From the consumer viewpoint, energy regulation sets standards that protect the public welfare (e.g. concerning tariffs and supply) (de Suzzoni 2012). Regulation in relation to consumer interests is strongly intertwined with the concepts of accountability of the supervising authority. The Report on Energy Regulation and Consumers' Interests states that consumer interests in European energy regulations include the reduction of search and switching costs (or costs associated with initial selection or change of energy provider) and the release of updated data on the continuity of energy supply (CTRRCE 2007).

As regards both the industry and the consumers, clear and dependable information is a rare good in the energy market, because there is a lack of reliable sources of reference (Solana and Carranza 2011). As a consequence, the accountability of the regional regulators is a necessary requirement for having a fair competition in the energy sector. Consumers are often unaware of the various offers provided by utilities, while firms struggle to understand the exact shape of the market and plan their industrial actions. A history of credible information increases the confidence of the industry and invite for industry investments (CTRRCE 2007). At the same time, accountability is directly linked to transparency, as transparency also reduces the opportunities that firms have to undertake collusive activities (which increase consumer costs) (Diathesopoulos 2010).

3.1.2 Transparency

Higher transparency means revising the market to make it more understandable and predictable for the actors involved. The Council of European Energy Regulators (CEER) is an ENER that represents national energy regulators of EU member states. Since CEER is a self-

managed organization of regulators, it works independently of the governments of the national-level regulators that make up its membership. CEER requires annual reports detailing the activities of energy regulators and CEER itself, which serve the purpose of holding the Council accountable for its decisions and level of competitiveness. The reports provide increased levels of transparency on the work of the agency, and establish a reference set of norms to which NRAs can be held accountable.

The Commission has noted the importance of the transparency aspect in its regulatory action on the internal energy market as well as in the energy initiatives toward neighbouring countries (Commission of the European Communities 2001; Eikeland 2008). One of the goals of the establishment of CEER was to increase market accessibility, especially by removing distortions that prevent market players from knowing the full range of options available. As the European Commissioner for Energy, Günther Oettinger (2011:5), argues, European legislative proposals should guarantee "transparency at a programme level (…) where all stakeholders can participate and where results are made publicly available".

3.1.3 Independence

European regulatory authorities have a high degree of decisional autonomy when compared to the classic forms of intergovernmental organizations, such as the United Nations. In other words, there is a high level of independence built into the top-down regulatory structure. This attribute comes from the characteristics of the institutional designs of energy agencies. Classic IGOs submit their proposals to the ratification of their member states, and their direct intervention on countries is quite limited. They do not substitute the state in the accomplishment of some of its administrative duties; they rather support it with recommendations and other mild forms of intervention (Abbott and Snidal 2009). ENERs are peculiar entities when considered under this classical structure. ENERs are formally independent in their decision-making processes from both governments and the regulated industry (Larsen et al. 2005). They accomplish administrative actions more independently than other IGOs and are not required to report to governmental structures. European networks of regulators can be defined as independent inter-

governmental organizations (IGOs), since they do not have to directly respond to governments, even if they are part of the executive sphere.

The EU Commission has been mostly supportive of independent regulatory bodies. The EU's policymaking bodies have often seen regulation as a way to bypass the financial and political constraints posed by member states to EU actions (Majone 1996; Moran 2002). The objective was to establish a network of national bodies that were in direct contact with the Commission and could be used to implement its policy directives. The creation of state authorities moved the costs to the country level. Subsequent directives aimed at increasing the independence of these authorities from national executives served to link them further to the EU through the establishment of ENERs (EU Commission 2010). Because security of supply is among their main mandates, ENERs have engaged neighbouring countries (i.e., the Mediterranean and Balkan countries) in European-led regional networks of regulators (Youngs 2007). These ENERs promote the EU concept of energy regulation to states where governments hold the predominant influence on the social and economic aspects of the energy market (OME 2004). ENERs become more competitive when they are independent because they do not have to directly consider political instances and priorities in their decisions. Instead, they can follow their mandate autonomously and monitor the energy market and consumers' response to it without political interference.

The notion of political independence is strong in theory, but may not be as strong in practice. The executive power is responsible, in some cases together with the legislative bodies, for the nomination of representatives to regulatory authorities (OECD 2005). Governments have been accused of using regulation to reduce political accountability, as regulatory entities are not subjected to the direct vote of citizens (van Ooik 2005). Governments remain partially in control of some of these non-majoritarian instruments, to which they may assign responsibility for unpopular choices while still exerting control over their decisions (Lodge 2001). Significant doubt regarding the legitimacy of regulatory bodies is found where there is both a lack of knowledge about their activities and results and about their linkages with governments and the industry (OECD 2005; Gasmi et al. 2006).

While the argument that political power can hamper the accountability and transparency of regulatory bodies has its merits, it is

also true that countries that are members of an ENER will tend to operate in a more transparent manner. Additionally, it is easier to hold them accountable according to the established regulations, as all European networks develop regular reports on the current status of energy regulation in member countries. These reports, together with the publications ENERs periodically release on different matters concerning energy regulation, allow all energy stakeholders to know the status and changes of different aspects in the energy market. Thus, the ENER structure itself provides mechanisms for accountability and transparency.

4. The Policy-Making Model

For the qualitative analysis that forms the bulk of this research, we have constructed a policy-making model based on previous work by Putnam (1988) and others that explains the causal relationship between ENER membership and increased competition at the national level. The goal of this policy-making model is to show how ENER membership imposes conditions for the national regulatory agency to work under that change the competitive conditions at the national level, especially its influence on customer conditions and the incumbent.

4.1 The Actors and Instrument

There are four actors and one instrument that are considered in this policy-making model. The actors include:

1) The national regulatory agency (NRA);

2) The energy industry (consisting of existing incumbents);

3) The government; and

4) The European Commission (EC).

The instrument through which the game is played is the ENER, which is defined in some detail above. The actors in this game are defined based on liberal intergovernmentalist assumptions, which presume that political structures within the EU come about through interaction between the EC (or other EU-level body), national government, and other interest groups (Schimmelfennig & Rittberger, 2006). The interest groups in this case include the existing market incumbents (who represent an industry perspective) and the NRA

(who represent a consumer perspective). These perspectives are the most common in national-level interest groups that move to the level of EU engagement, because of the dominance of economic interests in EU involvement (Schimmelfennig & Rittberger, 2006). While government interests are commonly understood to have dominance within a given national setting, there is some evidence that this could be fading due to erosion of national sovereignty concerns and the growth of regionalism (Keating & Hooghe, 2006). Thus, this traditional dominance of the national government's interest is not assumed in this model.

4.2 The Two-Level Game

The model used in this policy model is that of the two-level game, as described by Putnam (1988). Putnam's model of domestic and international politics was based on the observation that although it was clear that domestic and international politics influence each other, the mechanisms and direction of this influence is not always clear. Putnam (1988) used the metaphor of the two-level game to describe the interaction between the domestic and international level of political action, even between seemingly unrelated actors. He described this game as follows:

"At the national level, domestic groups pursue their interests by pressuring the government to adopt favourable policies, and politicians seek power by constructing coalitions among those groups. At the international level, national governments seek to maximize their own ability to satisfy domestic pressures, while minimizing the adverse consequences of foreign development. Neither of the two games can be ignored by central decision-makers, so long as their countries remain interdependent, yet sovereign (Putnam, 1988, p.434)."

There are a number of implications of this basic model. One of these implications is that the national leader must carefully choose actions both at the domestic and international level, since these two games may have interests in conflict (Putnam, 1988). Furthermore, the political leader who makes the decisions (positioned by Putnam (1988) as the player positioned between the two boards) faces potential ejection if he does not balance the interests in play on both sides. As Putnam (1988) notes, it is sometimes possible for the player to cause a realignment that can result in realigned interests, but this is not always the case. This might be accomplished through the use of an information asymmetry, or a situation where one player knows something that another does not

(Milner, 1997). Milner (1997) offers a particular insight into how this might apply in the present research, noting that players may use endorsers to fill in the gaps in the case of incomplete information; thus, in order to generate agreement with incomplete information, an endorser is required (Milner, 1997).

Putnam (1988) uses the theoretical and simplified case of ratification of a bargained agreement to demonstrate the possible outcomes of a two-level game. At Level I, an agreement on some topic is negotiated by actors at the international level (such as heads of state or designated delegates), on the basis that the agreement will only be adopted if it is accepted by the domestic power structure within a given country. At Level II, the agreement must be accepted through some mechanism at the domestic level, such as ratification in a national legislature. Based on this observation, Putnam (1988) observes that the agreement that is most likely to result is the one with the largest win-set, or the largest set of conditions that will prove acceptable at Level II. However, there is also a dependence on the Level II "deliverability" at Level I, as states will be less likely to accept a given agreement if there is an expectation that it would not be ratified (particularly by a major partner in the agreement). This is the case whether defection is voluntary or involuntary. Thus, the two-level game is not just a game of influence of international politics at the national level, but is a game of interdependence and expectations between players at both levels. The effectiveness of game outcomes depends on level II institutions, preferences, and coalitions, as well as Level I negotiation strategies in use (Putnam, 1988).

4.3 The Policy Model

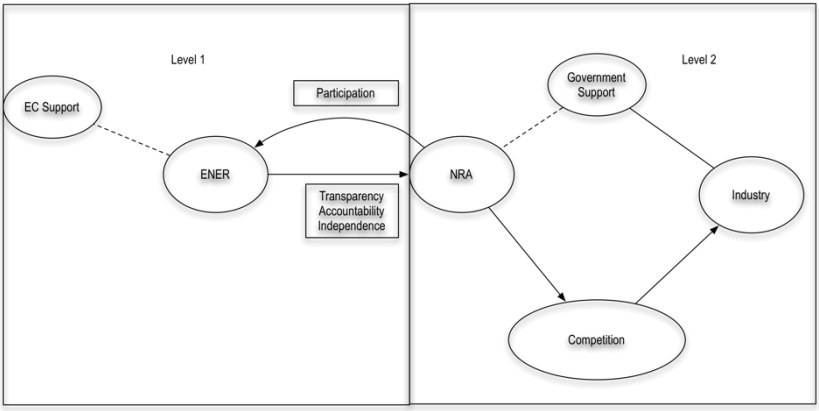
Based on the information above, the policy-making model that promotes ENER membership and, through this membership, the emergence of improved competitive conditions, can be specified as follows:

1) The NRA's entry into the ENER serves as a means of transforming the competitive game into a two-level game as described by Putnam (1988), with the NRA playing the super-national level, supported by the EC, without direct political interference from the government at the national level; and,

2) Entry also serves way to obtain a 'certification' from the super-national level and expand resources at the national level, increasing its resources in the national game and using the ENER as both a resource and an arena for expansion of play, characterized by the passage of increased transparency, accountability, and independence from the super-national to the national level.

3) The result of this increased resources and power of the NRA (representing a consumer perspective) is increased competition (reduction in incumbent power).

The figure below shows the two-level game and its effects on the outcomes of the situation as anticipated by the model. Within this model, the NRA acts in the central position as described by Putnam (1988), balancing the international and national interests and seeking out more resources at the national government level. This results in a reduction in the power of the existing industry incumbents, or in other words an increase in competition within the industry in question.



4.3.1 Transformation to a Two-level Game

There is a long history of domestic interests playing a role in the decision to enter (or to not enter) European regional political structures. Bulmer (1983) specifically located EC policy-making in the decisions made within the domestic political sphere, noting that the interdependencies created by the EC are driven by domestic political influences and priorities. Although the national polity may be the

primary level at which interests may be defended, it is also possible that interest groups may choose to seek out influence at higher levels (such as the EC) in order to achieve their objectives (Bulmer, 1983). Thus, Putnam's (1988) model must be expanded, since it is not just the head of state that is playing at the international level and managing interests at two levels. However, it cannot be assumed that this would be the same in all cases, since national polities vary widely (Bulmer, 1983).

4.3.2 Expanding Resources and Power

There are a number of examples of EU regional networks that have used their participation in agencies similar to the ENERs at the international level to legitimate or certificate their authority at the national level, expanding their resources and power. One recent example is EU regional data privacy networks, which have used their regional cooperation structures and regulatory and management functions (a Level I interaction) to increase their level of power in the domestic political sphere (a Level II interaction) (Newman, 2011). In fact, it is the regional interaction itself that serves as a means of increasing the importance of the interaction on the domestic level. This is consistent with a liberal intergovernmentalist theory, which suggests that engagement in international governmental structures (such as the EU generally in the original authors' work, or the ENER in this research) actually strengthens the influence of the government in the domestic arena (Moravcsik, 1993). This research strongly suggests that the role of international engagement in the ENER would be to achieve domestic ends such as increasing resource availability rather than simply international interaction. Given the importance of the NRA in enforcing the consumer viewpoint, it can be presumed that the domestic ends that would eventually be achieved through the ENER involvement would be an expansion of resources for consumer interests at the national level.

4.4 The Analysis Method

The analysis method that will be used in this research is an analytical case study examining known examples of interaction between the EC and NRAs at the level of the ENER. This represents, fundamentally, a comparative policy analysis, in which policies across two different institutional regimes are compared in order to generate a theoretical understanding of a particular situation (Radaelli et al., 2012).

The goal of the research is to define a causal mechanism (ENER engagement) for a specific outcome (increased competition), while still taking into account the contextual influences of two distinct levels of interaction. This model is defined in the section above.

We have chosen to perform a qualitative, analytical comparative case study between two states because of the potential limitations on quantitative analysis to lend insight into the relationships and operations of institutions (Scharpf, 2000). The role of context in causal analysis is particularly important in political analysis because it has an interaction effect that needs to be considered, and that should be integrated into the analysis process (Faletti & Lynch, 2009). The comparative case study cannot perform all the work of hypothesis proving, outside conditions where external conditions can be strictly controlled (Scharpf, 2000). This level of control is not possible in this instance, but the comparative case study can still provide valuable information about deviations as well as shared conditions within the framework. The case study can serve a number of purposes, including the development of a theoretical or working model for decision-making as well as potential extrapolation to other environments (Barzelay, 2007). In this case, we have focused only on the causal mechanisms in play, drawing on government, institution, and journalistic sources as well as previous research and evidence to show the causal mechanisms of the policy-making model described above in play.

There are, as Radaelli et al. (2012) pointed out, some particular challenges in comparative policy analysis that can emerge, such as institutional determinism and unfounded conjecture. By focusing on a non-deterministic policy-making model and using case studies of real energy industry regulatory situations, we avoid these problems, but we do recognize that they are a fundamental element of our research process. While quantitative approaches, as in econometric comparison of product-market regulation and competition within the EU, have been performed previously (Conway & Nicoletti, 2006), and have added useful information, we do not consider this to be an appropriate approach because it cannot take into account the context of the research. Thus, the comparative policy case study has been selected, and the research design and analysis has been approached carefully to avoid the potential pitfalls of conjecture or determinism.

5. Case Studies

Case studies serve as microcosms for broader, global phenomena, with the methodology viable in making critical connections between single cases and the larger, environmental context in which these cases exist. The fortitude of case study research lies in the applicability of the cases to the phenomena being examined as well as the methodological design. The case studies selected for the qualitative analysis were chosen for their applicability to the two variables, namely ENER intervention as well as enhanced competition. However, the greatest relevance of these cases to this present inquiry is the diversity of the independent variables between the two cases. The nature of the energy sector, with its dynamic trade relationships and increasingly weighted influence on multiple dimensions of the global marketplace, warrants that diverse case studies be explored in order to draw conclusions regarding the impact of ENER intervention on energy competition.

Grounding the case study selection, by extension, is the assumption that universal solutions to energy regulation and competition are neither viable nor sustainable in the global economy, as the gaps between supranational and domestic regulation vary between nation-states. The case studies addressed using the policy-making model outlined above include the Czech Republic and Spain. The Czech Republic discussion focuses on the harmonization of national requirements with CEER in the electricity and gas sectors. In Spain, the gas and electricity sectors and their relationship to ACER is the focus of discussion. The focus of these case studies is on the accountability, transparency, and independence of the ENERs and the resulting competition. In both cases, the ENER's focus on these three norms increased the available resources of the NRA and allowed them to reduce incumbent power and government support, expanding the focus on the consumer interests the NRA represents at the domestic level.

The divergence between the Czech Republic's emphasis on national requirements and Spain's focus on its relationship to the ENER represents a critical distinction that is essential to this analysis, with the conversely similar focus on the gas and electricity sectors in both nations providing a strong mechanism for comparison. The variability between the case studies is sufficient enough to derive flexible and globally applicable conclusions from the analysis, with the similarities

between the cases concurrently necessary in order to forge meaningful connections between the case itself, energy competition, and ENER intervention. In short, the generalizability of the study is inextricably bound to the relevance of the Czech and Spanish case to the need for boosted energy competition throughout the EU.

5.1 Czech Republic and the Adaptation to CEER Standards

The Council of European Energy Regulators was established in 2000 by ten national regulatory authorities[1] to ease the creation of an integrated, competitive and sustainable European market for gas and electricity, and has become a non-profit association in 2003.

The Czech Republic joined the European Union and CEER in 2004. It was therefore not a founding member of the Council. In the mid-2000s, when a considerable number of new countries joined the EU, the CEER work programme was particularly concerned with the harmonization of different regional energy markets and the assessment of the real level of competition and barriers to energy trade (CEER 2004).

The first actions of the Czech government and the Czech Republic's Energy Regulatory Office (ERO), established in 2001, were focused on the assimilation of Czech energy legislation to the European *acquis communautaire* concerning the liberalization of the electricity and gas sectors (Czech Republic 2005: Chapters 1 and 2). This was not just based on the Czech Republic's internal priority. While EU principles of harmonisation do not require complete uniformity of law, they are intended to promote interoperability and especially the ability of the internal market to operate (Menski, 2005). Thus, the development of an electricity and gas market that was liberalised and highly competitive was consistent with EU internal market principles and would eventually be required.

5.1.1 Independence

Acting according to CEER advice, in 2004 and 2005 ERO supported the opening of the electricity market, which had already started some years earlier, and started a similar procedure for the gas market (Czech Republic 2007: Chapter 2). These procedures demanded some time, as

[1] These ten NRAs were from Belgium, Finland, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden and United Kingdom.

it required organizing the electricity market and establishing a new methodology for price distribution in the gas market. A full liberalization of the electricity market came in 2006, while the gas market still remained partially closed until the following year (Czech Republic 2007: Chapters 3 and 5). The slow liberalization of the natural gas market can be attributed to a number of different factors, including control of gas storage units by incumbents and lack of production of natural gas in the Czech Republic, which served to initially increase the cost of natural gas compared to the pre-liberalization period (Mravec, 2006). This suggests that at least initially the ERO could not take advantage of CEER and its independent position to improve its independent position, though eventually it would succeed (Czech Republic 2007).

5.1.2 Transparency and Accountability

In 2006, CEER concentrated, among other themes, on the transparency of information for national regulatory authorities (CEER 2006). According to CEER (and ERGEG) vision, more timely information was necessary for market players to deal with the forces of the market and cope with price changes to develop informed decisions. The Council deemed public information particularly necessary when the companies managing the networks were connected to firms operating in the competitive part of the market (CEER 2006: 4). ERO implemented a more transparent web-site section on Frequently Asked Questions to inform customers on the main changes deriving from the establishment of the free market (ERO 2006: 16). This is consistent with the role of regulators as supporting the interests of customers, although it did not directly address cost controls for customers.

This improvement of the regulator-customer communication took advantage of more interactive tools. For instance, to help customers with the liberalized market ERO released a web application to calculate the different costs of the various operators of the supply market to find the one which best suited their needs. The establishment of this tool was possible because of the requirement for suppliers to provide ERO with constant updates on their prices for small consumers (ERO 2007: 16). In two-level game terms, this represents the elimination of information asymmetries between the industry incumbent and the consumer through the intermediation of the ERO; since this information asymmetry is a major source of game advantage, it would

serve to level the playing field (so to speak) between these consumers (Milner, 1997). ERO's communicative work in favour of competition continued with the diffusion of a series of comprehensive fliers on the changes that final customers should expect from the free market of energy (ERO 2007: 60).

5.1.3 Advancements in Competition

Concerning the increase of competition in the Czech energy market in the 2005-2007 period, the government and ERO took into consideration CEER indications for regulators and national institutions to contribute to the full implementation of the existing (First and Second Energy Packages) legislation, which was still partially unrealized (Czech Republic 2005: Chapter 2). Starting with electricity, the Czech regulator, in collaboration with the Office for the Protection of Competition, has enlarged and clarified the entities, which are covered by the competition legislation for the energy sector, which has come to encompass all public and private companies (Czech Republic 2005: Chapter 3). ERO has underlined that the surveillance on electricity installations should be particularly severe, since new infrastructures take time to be built, therefore leaving space to a *de facto* network monopoly for some time to come (Czech Republic 2006: Chapter 3).

Moving to the gas sector, the main measures taken by the energy and competition regulators came after an abuse of dominant position on the part of gas trader RWE Transgas (2006 Report on the Activities and Finances of the Energy Regulatory Office: Chapter 4). This misuse led to the creation of price caps on the gas trader to avoid a new market abuse while allowing customers to switch to a more favourable trader, when possible. These punitive measures where removed only when the company agreed with the two regulators to the establishment of an equal starting condition for all the interested suppliers in the market (Czech Republic 2006: Chapter 4). This episode had two main consequences. First, RWE Transgas decided to adopt a transparent selling procedure to avoid committing new abuses. Second, the full liberalization of the gas market was accomplished (Office for the Protection of Competition 2006; Zapletnyuk 2006).

Even following the liberalization of the market between 2006 and 2007, the Czech electricity and gas markets remained highly concentrated with existing incumbents maintaining most of the

distribution power (European Commission, 2007). However, Czech energy markets have continued to evolve, with the development of unbundling and requirements for independence in generation and transmission, as well as limited-period trading licences (Spodniak et al., 2012). Additionally, the Czech Republic has moved away from dominance of its traditional players, with German and Slovakian companies entering the energy market in preparation for a single energy market (Spodniak et al., 2012). Thus, while ERO may have originally faced challenges in implementing a liberalized market and improving competition, it is clear that this is no longer the case.

Consistent with our argument, this illustration clearly shows that even a voluntary association, such as CEER, in collaboration with another de-facto voluntary association, ERGEG, had a detectable effect on competition in the Czech Republic's energy sector, a representative of the younger and less regulated generation of EU countries. This influence was contextualized by the Czech Republic's need to harmonize its competitive regime with the EU as a late entrant, as well as the dominance of the incumbent within the market, which made the implementation of a fully competitive market difficult. However, these conditions are likely to ease over time as the industry becomes less dominated by existing inputs.

5.2 Spain and the creation of ACER

Spain, as a long-time member of the European Community, has seen the creation of all the European Networks of Energy Regulators and is part of CEER, MEDREG, and ERGEG/ACER at the present time. In this case study, we concentrate on the effects that the creation of ACER and its Third Energy Package provisions have exerted on this Mediterranean country.

In 2009, when ACER was established, the Spanish energy market offered a mixed picture (Spain 2010). On the one hand, energy usage had peaked and access tariffs had been continuously increasing for electricity for a long time, leading to a substantial increase in end-user prices. On the other hand, interconnection capacity has enlarged due to new infrastructural connections (Spain 2011: 7, 106). These connections increase the number of opportunities (therefore, the competition) for cross-border gas and electricity trade with Spain's neighbours (Spain 2011: 22). This was a substantial improvement from just a few years previously, where Spain had only a few interconnections with

neighbouring countries and traded less than 3.5% of its energy demand on the European market (Conejo, 2007).

5.2.1 Advancements in Competition

The creation of ACER through the EU Third Energy Package has represented a stimulus for the concrete increase of competition measures in the country. ACER's mission indeed touches upon market monitoring, with a focus on energy trading and infrastructure issues in EU states, which are also all members of the Agency. In the implementation phase of the Third Package in EU countries, ACER has acted as a watchdog (Regulation (EC) No 713/2009: Article 6-8; Directive 2009/72/EC: Article 40; Directive 2009/73/EC: Article 35). The unbundling provisions of the package were particularly delicate to supervise, since countries could choose among three different unbundling models by March 2012, but they could benefit from exemptions for new gas and electricity infrastructures (Regulation (EC) 714/2009: Article 17; Directive 2009/73/EC: Article 36).

A direct reference to the advancement of competition and the fight against abuses of market dominance is contained in the renewed collaboration between CNE and the Spanish National Competition Commission (CNC), as made explicit in the Law on Sustainable Economy.[2] For electricity, generation and supply are scrutinized and monitored by CNE to examine market results and bids. At the same time, CNC can investigate for anticompetitive behaviour in supply activities (such as the switching of operator) and energy generation. For gas, special attention is given to the provision of gas and the supply contracts, to avoid discrimination and cross-subsidies. When vertical undertakings are present, the entire subsidiary and group companies, as well as the parent company, should provide CNE with their annual accounts.

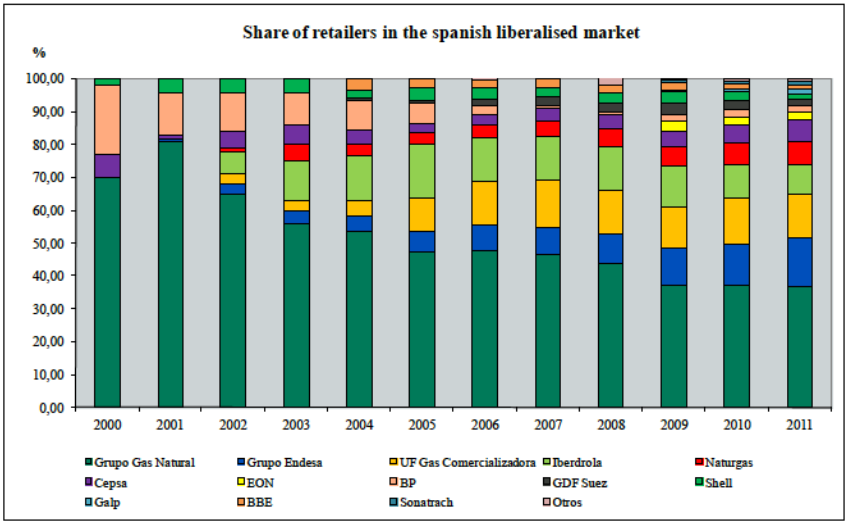
5.2.2 Accountability

So far, Spain has actively intervened on the majority of legal requirements coming from the new European energy arrangement, while some secondary issues still have to be fully implemented. In March 2011, the Sustainable Economy Law passed various acts

[2] Ministerio 2011, http://www.thespanisheconomy.com/ SiteCollectionDocuments/en-gb/Economic%20Policy%20Measures/110222%20StrategySustainableEconomy.pdf, accessed 15/07/2012.

concerning the energy sector. In particular, the law transposed a good part of the requirements concerning new powers to the Comìsion Nacional de Energìa (CNE), the Spanish Regulator for Electricity and Gas.[3] While in 2010 the country counted forty companies acting as retailers for gas in its market, the number has changed to sixty-nine at the end of 2011, once all the energy provisions contained in the law were passed (Spain 2012: 106, see figure below). However, not only the number of suppliers changed but also the market share the new entrants owned. At the end of 2011, new entrants in the market had taken up the majority of the energy market share (Spain 2011: 90). This change sustains the hypothesis that the creation of ACER and the consequent empowerment of CNE resulted in a stronger openness of the Spanish energy market. However, it should also be noted that the Spanish government has also taken a strong position on the energy market by manipulating tariffs to keep retail energy prices low (Bravo, 2012). This has resulted in a significant cost to manufacturers who are asked to cover the deficit, in a reversal of the usual practice of governments to support industry rather than consumers. There have also been a number of other indications that the Spanish energy regulator is focused on the reduction of incumbent power, such as the deregulation of tariffs in 2008-2009 for most categories of customers and the discontinuation of a Virtual Power Plant (VPP) auction program that had previously served to increase incumbent concentration (Federico, 2010). Thus, it is not a coincidence that the Spanish market is becoming increasingly liberalized, but is instead the immediate outcome of changes in government and regulator policies intended to promote liberalization and reduction of incumbent positions.

[3] Ministerio de Economìa y Hacienda 2011, http://www.thespanisheconomy.com/SiteCollectionDocuments/en-gb/Economic%20Policy%20Measures/110222%20StrategySustainableEconomy.pdf, accessed 15/07/2012.



Source: CNE Report to the EU Commission 2011 - Spanish Retail Gas Market Evolution, p. 90.

5.2.3 Independence

The unbundling issue has been documented to be another testing ground of the strong relationship between ACER and national regulatory authorities, as expressed in the ACER tasks.[4] Unbundling is a common response to excessive concentration in in network industries, and it has been implemented in the EU *acquis commaunitaire* through Directive 96/92/EC among others (Fichert et al., 2007). It is also a fundamental aspect of increasing energy production through renewable sources, which is often a task taken up by small energy producers rather than market-dominant incumbents (de Lovinfosse & Varone, 2004). Thus, there was considerable impetus for unbundling resulting from long-standing market pressures in this area. The unbundling regime of ACER members and others is determined by Directive 2009/72/EC (for the electricity market) and 2009/73/EC (for the natural gas market) (European Commission, 2009).

Based on the EC requirements for unbundling and the guidance offered for electricity, it was possible to choose between the ownership

[4] See ACER Website, Tasks Section, http://acernet.acer.europa.eu/portal/page/portal/ACER_HOME/Activities/Tasks_and_responsibilities/ACER_tasks, accessed 15/07/2012.

unbundling of the Transmission System Operator (TSO), a full separation between the transmission networks and the generation and supply activities; the Independent Transmission Operator (ITO) option, that requires the network to be managed by a subsidiary company; and the Independent System Operator (ISO) choice, which allows the company to retain the ownership while releasing all issues concerning operation, maintenance and investment to an independent company. In July 2010, CNE advised the competent Spanish Ministry on the necessity to transpose the EU Directive concerning unbundling for these companies (Spain 2011: 12). In 2011, a Spanish law officially divided the operation of the transmission system from the transport and ownership of assets into two different companies both referring to the ENAGAS group (Spain 2011: 13).

5.2.4 Transparency

ACER's provisions under the Third Energy Package on the sharing of good practices between NRAs have provided CNE with enhanced powers to improve the transparency of the supply market. First, CNE has worked toward the establishment of a fair energy environment for the actors involved (Regulation 1227/2011). For instance, CNE can suspend the payment of incentives for photovoltaic plants in case it finds irregularities and it is entitled to determine a maximum number of hours for photovoltaic plants to receive the subsidized price, so that no actor can over-profit from contributions. Second, CNE has invested on a more transparent communication strategy (Royal Decree Law 1/2012). To promote market transparency, the regulator has created a web price comparison tool for gas and electricity offers, to help consumers in their choice. Finally, CNE has increased its internal accountability, so to qualify itself as a balanced arbiter between the various actors of the energy market. Specifically, according to the European Directives, the Spanish legislator has established that CNE should be independent from political and economic interests through a strict appointing scheme for the Chairperson and six Commissioners of the CNE Board (Spain 2011: 19, 20).

In summary, the Spanish energy sector has benefited from a stronger environment for competition with the implementation of the ACER founding provisions, while the national energy regulator, CNE, has strengthened its role as the connection between ACER and the

Spanish energy actors. This illustration provides further support for the usefulness and logic of our theoretical argument.

6. Discussion of Results

Clearly, two case studies cannot serve to completely illustrate the potential range of regulatory regimes, national polities, and interactions between the domestic and international political environments that the EU encompasses. However, both the Czech Republic (a late entrant into both the EU and its attendant ENERs) and Spain (which was present at the founding of most of these groups and has continued to serve as a member of several ENERs) show that ENER membership on the part of the national regulating agency serves a number of purposes, especially increased competition and interaction. Thus, the NRAs within these countries are both joining the ENER initially as a means of harmonization, and are then using this harmonization to increase their own access to resources, as expressed within the model. In this section, we discuss these findings and compare the Czech Republic and Spain with the policy model to show how the case studies reflect the model.

The first step in the model was that the NRA joined the ENER as a means of *creating* a two-level game; that is by joining the ENER, the NRA placed itself in the position of the government decision-maker in Putnam's (1988) model, making decisions that simultaneously had to be accepted at the domestic and international level. This finding is not without precedent, as previous research had suggested precisely this mechanism in other EU agencies (Bulmer, 1983). The Czech Republic shows this most clearly, perhaps because it did not join the EU during the foundational period. Instead, its movement toward integration and harmonization of its gas and electricity markets can be seen as part of a general harmonization effort undertaken as part of its relatively late entry into the EU. Conversely, there is relatively little evidence about why Spain may have initially joined its member ENERs; however, since it was a foundational member that accepted the principles, it can be presumed that its membership was also driven by the explicit desire to move energy policy from Level II to Level I.

The second step in the model was that the NRA used its ENER membership as a means of increasing its power and effectiveness at home. This was shown in previous research in areas such as data protection agencies, where membership in regional bodies was used to

legitimate increases in power at home (Moravcsik, 1993; Newman, 2011). It is here that Milner's (2007) observation regarding information asymmetry can be seen in play. For example, the creation by the Czech regulator ERO to explicitly provide consumers with information about tariffs charged by various incumbents in the market is a clear approach to reducing or eliminating an information asymmetry that benefits the supplier more than it does the consumer. Ultimately, this reduces the switching costs associated with the choice of an electric supplier and reduces uncertainty for the consumer. This example solidifies the role of the electricity regulator as a body that is primarily interested in the consumer viewpoint or interest, rather than the industry viewpoint. There are also other actions the Spanish government has taken, including artificially holding down electricity costs, that emphasize the importance of the consumer as compared to the producer. Thus, the use of legitimated or licenced Level I powers associate with joining an ENER and operating at the international level to benefit the consumer (the main stakeholder group the regulating body represents) is held up by the findings as well.

The final stage in the policy-making model is the causal element; that is, does the joining of an ENER and the attendant increase in domestic power and influence on the part of the regulator independent of government control increase competition in the market through transparency, independence, and accountability? Both cases profiled in this research strongly suggest that it does. Although the Czech Republic's market liberalization did get off to a slow start because of control of vital infrastructure by incumbents, the market has become increasingly competitive over time, in large part due to increasing transparency in pricing and rates and other factors. Similar, the concentration of the energy market in Spain has fallen over time (thus indicating more competition), and explicit unbundling requirements have also increased independence of transmission, generation, and so on. These improvements have not been generated through an isolated system of improvements, but have instead been created through cooperation within CEER, ACER, ERGEG, and other ENERs that have negotiated high-level agreements to promote liberalization and unbundling.

Ultimately, the findings of this research do support the application of a model of a two-level game to the interactions of NRAs, the EC, ENERs, and national governments, as well as the interests of industry

and customers. The application of this model has shown that the issue of interests is complex, with harmonization between EC and national laws being a driving factor, but national political environments also informing the formation of EC laws. This suggests that the causal and contextual mechanisms of decision-making in this area are highly complex, justifying the use of a qualitative analytical approach.

7. Conclusion

We offer both a theoretical argument as well as empirical support in favour of an augmenting effect that a regulatory agency has on the competition level of a country. The theoretical argument is based on the two-level game, in which an agreement is first negotiated at the international level, and then at the domestic (national) level, in order to create an international organization. This was demonstrated through the European Network of Energy Regulators (ENER). ENERs establish a regulatory framework (representing the first level of the game), which increases accountability, transparency and independence of policy decision-making in the energy sector of a country (the outcomes of the second level of the game). In consequence, the competition level in the energy sector grows in the member states. These results cast light on the level of compliance that ENERs are able to obtain from member NRAs, which is relevant if compared to the overall influence that inter-governmental energy organizations exert on member states.

The empirical evidence offered focused on the Czech Republic and its membership in CEER and Spain and its membership in ACER. The Czech Republic's case is primarily focused on its alignment to the acquis communautaire as represented by CEER following its 2004 EU ascension. Spain's involvement in ACER is more focused on development of energy markets and supply, rather than alignment of regulations and the general body of EU law, owing to its more long-term position within the EU. However, both cases were successful in demonstrating that the international level of negotiations through CEER or ACER did influence the national-level agreements and operations within the country, whether this was legislative or market-based.

The cases of the Czech Republic shows qualitatively that involvement in an ENER such as CEER can have strong effects on competition within the domestic market for electricity and gas. Some of this effect can be attributed to general harmonization and alignment of market structures, as in the case of the Czech Republic, which undertook a deliberate liberalization effort alongside its CEER membership. This liberalization effort, which was a condition of involvement with the EU and alignment with the acquis communautaire, was directly undertaken to diversify the supplier market in the Czech Republic (which is primarily a consumer country). The liberalization did not move at the same rate in the electricity and gas markets; notably, liberalization in the gas market only proceeded following the exposure of the abuse of a dominant market position by RWE Transgas. Thus, the initial market liberalization and involvement with CEER did not produce immediate effects. However, it did eventually result in a liberalized natural gas market as well as an energy market, increasing the potential efficiency of the market and its operation.

With the case of Spain, this analysis has also shown that involvement in the ENER, with its construction of norms that encourage competition, increased accountability, independence, and transparency within the respective energy industries of these countries. The goal of Spain, which had benefited from a long-term membership in the EU and expanding cross-border connections, was not harmonization of regulations and market liberalization but instead leveraging its existing capacity in order to take advantage of the cross-border supply and demand it could access. Spain is also distinct from the Czech Republic in that it had an active role in the initial negotiation of ACER rules and general EU regulations in the energy sector, and thus can set its participation more on its own terms. However, this case also shows that independence, transparency, and efficiency were increased by Spain's involvement with ACER. Efficiency is of course implied by the expansion of transmission grids across borders, enabling more efficient distribution of energy within a common energy market. Involvement in ACER also resulted in the expansion of firms taking part in the energy market, for example increasing the number of

gas firms from 40 in 2010 to 69 in 2011. Finally, independence was addressed through unbundling, which served to reduce the dominance of large-scale market competitors. Thus, the causal mechanism proposed in the policy-making model that formed the core of this research was supported by the case studies, showing a strong improvement in competition in the target countries. This general causal mechanism held even across states with markedly different levels of market development and participation.

Future research should advance the theoretical debate as well as empirical testing by looking into the set-up of these regulatory agencies and what this implies for competition. Questions that could lead this debate might be: How independent are the regulatory agencies from political concerns? How much policy-making capacity do these regulatory agencies have? What differences can be seen in the structure of ENERs that influence the outcomes of competition within these industries? Looking closer into the set-up and functioning of the different ENERs could explain why some ENERs have significant effects while others do not. Another research area could be to extend this analysis from the European context to other areas, such as African or Asian energy markets. This could help show whether there are conditions specific to the EU that promote the increase in competition through the use of the ENER, or whether this is a generalizable state of affairs that could improve competition around the world. Given that even with the addition of the present research, information in this area is still very sparse, any of these areas of further research would represent a significant improvement in the existing literature on the role of ENERs in energy competition. It should also be noted that ENERs operate within a third layer of overarching international negotiation, the European Union itself, which to some extent directs the actions and scope of the ENERs and takes a direct interest in energy policy. Thus, a final extension of this research could consider the overarching influence of the EU on the operation of ENERs and ultimately, their reach into the member states, and examine where different levels of operation take priority.

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- 5 -

Conclusions and Implications

1. Summary and Conclusions

This volume has focused on the emergence of the energy IGO on the international organization stage and the implications of this emergence for international relations and energy policy. The analysis included the use of quantitative research covering a wide range of institutions and the qualitative research, comparing just a few case studies in far more detail. This mixture of methods throughout the book has provided breadth and depth to the analysis, allowing for a better understanding of the problems we are concerned with. Although many of these findings seem diverse, over the course of the chapters some general findings can be summarized and some lessons can be drawn.

In chapter 1, we set the stage for analysis and defined the theoretical foundations and terms of our work. By extending the use of the rational design model proposed by Koromenos et al. (2001) and including the functional variables of aid in case of energy shortage and coordinated oligopolistic systems, we offer a means of understanding the role of the IGO from a functional viewpoint and not just the structural or institutional viewpoint suggested by rationalist IR theory. This extension enables us to consider the broader issues involved in the foundation of energy IGOs and to examine them as places of negotiation, intervention, and enactment of both narrow and wide national and international principles. This chapter also offered description and explanation of how quantitative and qualitative data was selected and discussed the use of the rational design model and its variables within the qualitative and quantitative analyses. Finally, it presented descriptive data about the organizations discussed in the following chapters, offering an insight into the present-day landscape of energy IGOs.

Chapter 2 presents a quantitative analysis of energy IGOs. This analysis focused on the relationships between trade, infrastructure, and

international organization diffusions. In addition to rational design, it used theories of collective action to understand how energy IGOs have diversified and spread. In this chapter, we posited that countries are incentivised to join energy IGOs by shared energy security concerns and with a goal of coordinating energy policies across national boundaries. We also posited that the provisions included in the foundational agreements of the energy IGO play a significant role in their proliferation (or indeed, non-proliferation). The analysis in this chapter used panel data covering 34 different IGOs over 38 years (from 1970 to 2007), with network analysis providing the main insights in regard to the establishment of energy IGOs. We then used spatial econometrics to demonstrate the diffusion of these IGOs over time. In order to test the validity of the findings from these methods, we then used additional evidence regarding the foundation and diffusion of energy IGOs, with information on oil and gas pipelines, design and types of energy IGOs, and differences in oil and gas markets being considered as a means of understanding how these results can be interpreted. Ultimately, this analysis indicates that countries join energy IGOs in response to the actions of their competitors and trading partners, that countries that share pipelines are more likely to join the same IGOs, and that design features of the IGO influence the speed at which it spreads.

In Chapter 3, we switch gears for qualitative analysis of reasons for joining energy IGOs. In this chapter, we proposed that shared energy security concerns are a necessary (though not necessarily sufficient) condition for formation of a new energy IGO or joining an existing IGO. We further proposed that on joining the IGO, member states had an increased rate of construction of shared energy infrastructure, such as shared pipelines or energy transmission grids. This is a two-stage process, which we formulated as foundation and enforcement. We used two cases, including the International Energy Agency (IEA) and the Shanghai Cooperation Organisation (SCO), to demonstrate these points. The IEA is the oldest consumer energy IGO, having been founded in 1974, while the SCO is primarily a mutual defence organization and was only founded in 1996-1997 as the Shanghai Five. However, the two organizations shared commonalities in their foundation and in post-foundation infrastructure activities. IEA

members, primarily drawn from the OECD states, found common cause in the energy price spikes of the early 1970s, while the energy security concerns of the SCO emerged gradually as the participant countries began both producing and consuming more energy. However, both organizations were driven by the alignment of energy interests, primarily within a given region. After foundation, members of both energy IGOs began to undertake shared infrastructure projects, particularly between countries that are geographically contiguous or that are separated by cooperative transit countries. Thus, energy security priorities are a foundational impetus for the energy IGO, which is then used as an instrument for achieving these priorities.

Chapter 4 is our final analysis chapter, and we once again undertake a qualitative comparison, this time at the country level. In this chapter, we address the European Networks of Energy Regulators (ENERs), which are a class of energy IGOs that are made up of national-level energy regulatory agencies (NRAs). We posit that the main role of the ENER is to promote fair competition in line with the acquis communautaire, promoting governance practices of accountability, transparency, and independence. The goal of this increased competition is to promote efficiency within national energy markets. To explore this framework, we used a simplified policy-making model that described the actors and instruments through which this policy goal was achieved. The cases of the Czech Republic and Spain and their participation in CEER and ACER respectively demonstrated how the goals of accountability, transparency, and independence were achieved, as well as some of the problems that were encountered in the transition to an open market. Particularly relevant is the uneven progress of participation, such as the Czech Republic's relatively rapid liberalization of its electricity market compared to its gas market. This chapter showed that engagement with energy IGOs helped improve efficiency, not just infrastructure, as demonstrated in Chapter 3.

What is the ultimate lesson we can take away from this research? Perhaps the most important lesson is that energy IGOs are an expression of the interdependence of nations in the arena of energy security. Nations form or join IGOs in response to specific energy concerns, although generalized trade relationships and diplomatic

relationships obviously play a significant role in the decision to form or join as well. Furthermore, once they belong to these IGOs they use them to enact various energy priorities directed to reduction of the danger of energy shortages and coordination of oligopolistic activities, like building shared infrastructure. Finally, we can see from this research that there are positive effects on markets and energy availability for the nations that participate. These findings show that energy IGOs act as a means of enacting national-level policy through international-level interdependence and cooperation. It also shows that, given the tendency of nations to join energy IGOs based on the actions of economic competitors, energy IGOs represent a sphere of international cooperation *and* international competition.

2. Contribution to International Relations Literature

This research offers some interesting insights into the IR literature regarding international competition and cooperation. One of the most important findings from this perspective is that countries may join energy IGOs based on several factors, which include both the membership of cooperating countries and the membership of competing countries, and shared energy security concerns among both cooperating and competing countries. This suggests that the role of energy in the international arena has superseded a rationalist model of state autonomy, sovereignty, and individual interests in competition. Instead, the energy IGO and its effects implies that at least in some areas, independence and interdependence of states and the effects on actions and interests is a more appropriate model for considering international engagement at the IGO level. Rather than simply acting as the mouthpiece of a dominant state, the energy IGO acts as a semi-neutral ground for states to negotiate shared interests even among competitors. This does not extent to all energy IGOs, some of which are dominated by the interests of a single state, such as the China-dominated SCO, or a single region, such as the primarily Middle Eastern focus of the OECD. However, other IGOs do offer shared ground between competing nations, and even encourage development of increased liberalization of markets and shared infrastructure between them. Thus, the key contribution of this research to the IR literature is that energy IGOs do not act as a simple policy arm at the

national level, but instead represent the importance of interdependence at the international level.

3. Contribution to Energy Literature

The research in this volume has a number of important contributions to make to the energy literature. One of these contributions is showing why states found or join energy IGOs in the first place. The existence of energy IGOs like the IEA and others is often taken for granted in the energy literature, and are viewed as a given in models of understanding international energy cooperation. However, as this research demonstrates, the existence of energy IGOs is *not* a given. Instead, it is precipitated by shared energy concerns between not just cooperating states, but also competing states. This suggests that to some extent energy concerns may override or dominate international competition rules. This research also provides a structural and functional explanation for the development of shared energy infrastructure, showing that it constitutes and is constituted by the foundation of energy IGOs. Shared pipelines are shown to be a factor in joining IGOs whose pipeline partners also belong to them. At the same time, energy IGO membership is viewed as being a factor in the further development of shared energy infrastructure. Finally, energy IGOs are foundational to the development of effective market structures and governance at the national level. This suggests that energy IGOs are not just an overlay on infrastructure and market development and liberalization. Instead, the energy IGO is foundational to the participating state's ability to enact these state-level policies.

4. Originality of the Research

There are a number of original aspects of this research that should be considered as a means of understanding future research. The foundational model of the research offers some uniqueness because of our supplementation of the six original variables of the rational design model with two additional functional variables. These functional variables introduce specific mechanisms of action, rather than simply structure, through which energy IGOs can be seen to work. In Chapter 2, we examined the importance of oil and gas pipelines and their role in encouraging membership in the same energy IGOs for the countries

that share them. As far as we could determine, no other researchers have studied the role of shared oil and gas pipelines as a precipitating factor in energy IGO membership. This finding is particularly important given the increasing incidence of shared energy pipelines and the development of long-range natural gas pipelines. In this chapter, we additionally found that energy IGO membership was a function of both competition and cooperation, broadening the scope of understanding the joining mechanisms. In Chapter 3, the originality of the findings hinges on the two-level game and multiple mechanisms of action. This chapter shows that energy IGOs are reacting to both national and international imperatives in joining IGOs and the subsequent actions within them, and also that the energy IGO acts as a venue for enactment of national-level priorities in the international arena. Finally, Chapter 4 shows that energy IGOs act as a means of not just securing energy supplies, but also improving efficiency and market functionality. Thus, the overall originality of this research is that it demonstrates the functionality of the energy IGO not just as a means of direct action by the state, but as a means of cooperating and competing in order to improve outcomes.

5. Future Steps

There are a number of opportunities for future research that these chapters suggest in general, along with the additional opportunities for research outlined in the chapter conclusions. One of the most obvious applications of future research is considering whether the models used in this research, such as rational design theory and the two-level game, can be applied to other categories of IGOs. This application of the method of this research to other categories of data could further expand the theorization of IGOs. An area that this research touches on that is currently somewhat under-theorized is the impetus for expansion of international organizations. Most of the work done in theorization of this area is based on the EU, and most of it focuses on issues like economic expansion. Currently, the theoretical explanation for expansion is relatively robust for applicants, but there are only vague mechanisms proposed for the expansion from the existing members' perspective. Definition of further reasons to expand energy IGOs, or IGOs in general, could offer an expanded perspective

on the role of IGOs in the international arena. Engaging in historical research in this area could also help shed light on the changes in the role of IGOs that have come with increasing globalization and flows of goods, people, ideas, and capital across national boundaries. This theoretical expansion could help illuminate how states have maintained independence through interdependence.