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REGIONALIZATION STRATEGIES OF EU ELECTRIC UTILITIES

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ABSTRACT

As part of the debate about globalization and regionalization, this paper adds a perspective that has so far remained underexposed, that of (formerly state-owned) firms in (previously) regulated industries, in order to better understand the (changing) role of the home country/region in internationalization processes in the context of regional market liberalization. This paper explores the global/regional orientations of the seven major EU electric utilities from five different home countries, which are active in both fossil-fuel and renewable energy generation. Using a multiple case study design, we collected internationalization/regionalization data from firms' annual reports for the years 2000, 2005 and 2010, supplemented with an analysis of secondary sources. Firms show a clear pattern of increasing internationalization away from the home-country market, coupled with a home-region orientation for traditional generation activities, which differs from the more international, wider and often multiple regional presences in the newer renewables business for some firms. Institutional factors are argued to play an important role in both processes. Findings suggest distinct regionalization patterns for business units and different FSAs, with strategic opportunities related to asset positions. Home-country effects may be linked to a heterogeneous firm-specific home-region liability of foreignness, resulting in incomplete home-region internationalization in most cases.

KEYWORDS

Regionalization; Internationalization; European Union; Energy; Electric Utilities; Sustainability

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INTRODUCTION

In the past decade, a debate has started about regionalization, initiated by Alan Rugman who announced the ‘end’ of global strategy, calling it a ‘myth’ (Rugman, 2001; Rugman and Hodgetts, 2001). Presented as a specification of the integration-responsiveness framework (Bartlett and Ghoshal, 1989), particularly to further explore the ‘high national responsiveness’ dimension (Rugman and Hodgetts, 2001), it has evolved as a firm-level manifestation of semi-globalization, which alludes to the fact that markets show neither complete fragmentation nor perfect integration (Ghemawat, 2003). The region as a relevant unit of expansion for multinational enterprises (MNE) has been developed around an extended notion of Triad power and especially the ‘global impasse’ phenomenon as noted by Ohmae (1985), pointing at the inability of many firms to be present in all three legs simultaneously to the same extent. As such political and economic regional integration projects such as the North American Free Trade Agreement (NAFTA) and the European Union (EU) are important influences on the regional nature of MNEs, as these both provide more regional institutional coherence. For MNEs in a region, this offers the potential for substantially lower investment costs and/or greater efficiency in the exploitation and development of non-location-bound firm-specific advantages (FSAs) within the region relative to other alternatives (Rugman and Verbeke, 2004, 2005, 2008c).

The EU is the broadest and deepest regional integration project between independent nation states in modern time, including economic, political and social dimensions. Energy is a key EU policy issue area that features the longstanding economic ideal of a single European market, with the internal energy market, and a social dimension in the response to pressing societal challenges, pursued through the ‘EU sustainable energy policy’ process (EC, 2010). Initially put on the agenda in 1987, the EU internal energy market has seen three policy packages (in 1996, 2003 and 2007) aimed at liberalization of what used to be a “heavily regulated industry in almost all EU countries, dominated by national or regional, vertically integrated monopolies” (Domanico, 2007, p. 5064). In conjunction with energy market liberalization, which has been characterized as incomplete in some EU countries (Joscov,

2008), thus creating major differences between countries within the EU, renewable energy targets have also been set through various EU directives (Jones, 2010). In 2009, a Renewable Energy Directive was adopted by the EU in order to establish concrete policy, to be implemented by all member states, towards achieving the 20/20/20 targets (a 20% cut in carbon dioxide emissions, a 20% share of renewable energy and 20% energy-efficiency improvement by 2020). The steps taken in the EU sustainable energy policy process represent a drive for significant regional harmonization that has shaped the regional institutional environment of energy firms.

A particularly important subset of these energy firms is formed by those that are involved in electricity generation and supply (hereafter labelled electric utilities), in view of their role at the heart of the business-society debate about how to sustainably provide “the life blood of our society” (EC, 2010, p. 2). These firms generate a major energy source for both industrial and domestic consumers, while using a range of natural resources as their primary inputs, with various environmental impacts depending on the types involved. As such these firms are not only key players in the EU sustainable energy policy process but also in the broader transition from state-owned, protected positions to liberalized electricity markets with competition, private ownership and more independent regulatory bodies. This changing context clearly affects the profitability, growth and survival of electric utilities, and speed and degree of internationalization in relation to their home countries/regions is a crucial firm-specific factor in this regard. Incumbent utilities may, for example, benefit from a protected home market, while enjoying the opportunity to enter markets where liberalization has seen more progress. This raises questions about the importance of these utilities’ home countries and region in their internationalization processes, in relation to both their ‘traditional’ fossil-fuel and renewable energy generation.

This paper seeks to answer these questions by exploring the global/regional orientations of the seven major EU electric utilities (EDF, Enel, E.ON, GDF Suez, Iberdrola, RWE, Vattenfall) from five different home countries (Germany, France, Italy, Spain, Sweden), which are active in both fossil-fuel and renewable energy generation. They have leading positions in multiple national markets and existing power generation portfolios largely established in fossil and/or nuclear technologies, with vertically integrated supply chains covering the production to end-consumer value chain including

generation, transmission, distribution and retail supply activities (Schülke, 2010). The seven firms are featured by (former) state ownership, are most often based in the largest national energy markets of key EU member states, and have shown serious internationalization since the late 1990s, in the context of regional market liberalization. The unique characteristics of the electric utilities gives the opportunity to further examine the representativeness critique of the original Rugman and Verbeke (2004) MNE sample (Seno-Alday, 2009). The predominance of (former) state ownership of these utilities, and their frequent historic dominance as domestic monopolies, suggests home-country effects are likely to be important features of their regionalization. The EU sustainable energy policy process furthermore offers the opportunity to explore the regionalization of firms in terms of legacy fossil-fuel energy generation and emerging renewable energy operations, thus considering different scope of business units and FSAs.

The paper proceeds by reviewing the regionalization literature and the role of the home country/region in this debate. This is followed by an explanation of the method and sample, a presentation and discussion of findings, and subsequently conclusions, implications and limitations in light of the broader regionalization debate, to which this study aims to contribute.

THE (SEMI)GLOBALIZATION AND REGIONALIZATION DEBATE

Following Rugman and Verbeke (2004), regionalization issues, covering various locations and industries, have subsequently been addressed by an increasing number of scholars and also received attention in special issues of *Management International Review* (2005), *European Management Journal* (2009) and *International Marketing Review* (2009), and in an edited volume (Rugman, 2007). The emergence of regional MNEs and regionalization can be placed in the context of earlier attention to local-global distinctions, which pointed at the need for MNEs to combine local responsiveness and global integration (Bartlett and Ghoshal, 1989, Prahalad and Doz, 1987), as well as the more recent evidence on the existence of incomplete cross-border integration, labelled as semi-globalization, thus requiring regional strategies (Ghemawat, 2003, 2005). A central argument being that the liability of foreignness that an MNE experiences is less within the home region than outside it, resulting in lower adaptation costs with intra-regional internationalization (regionalization) than those borne in case of

inter-regional expansion (Rugman and Verbeke, 2007). Home-region location-specific (linking) investments needed to exploit and develop non-location-bound FSAs can be expected to be less substantial and/or can be deployed more efficiently than outside this region (Rugman and Verbeke, 2004, 2005, 2008c); this can be reinforced by policies that add further coherence at the regional level, such as those taken in the framework of the EU or NAFTA. The result is the phenomenon as recognized by Rugman and Verbeke (2004) that firms are not global, i.e. that there are only a few MNEs amongst the Fortune Global 500 that have a substantial presence in all three regions of the Triad. Instead, if firms internationalize, they do this most often within their home region.

Rugman and Verbeke (2004) developed a four part typology of the regional presence/orientation of MNEs, including (1) global, (2) bi-regional, (3) home-region oriented and (4) host-region oriented MNEs. Classifying MNEs within these categories relies on the specification of the regions themselves and criteria for the value of sales, assets or other relevant measures of MNE presence for measuring regional presence. Each MNE has a home region where their home country is located and two other regions in which they can additionally be present. MNEs that are global have their activities distributed most evenly across the three regions. Bi-regional MNEs have the majority of their business in just two of the regions. MNEs with a host-region orientation have more than half their activities in a region other than their home region. MNEs with a home-region orientation have the majority of their business activities in the region around their home country; they accounted for 84% of the 380 MNEs in the Fortune 500 list included in Rugman and Verbeke (2004). This significance of the home region has emerged as a major theme in the regionalization literature (Rugman and Oh, 2012).

While the regionalization literature has been subject to significant debate, it is less the phenomenon itself and the argumentation that has been contested and discussed, but rather the underlying evidence, especially the conceptualization, measurement and the conclusions drawn from that. Debate has been sparked, inter alia, about limitations of the sample (since the Fortune Global 500 is not equivalent to the largest 500 MNEs, as it was presented initially); the arbitrary nature of the cut-off points between (bi-)regional and global; the coherence of particularly Asia-Pacific as a region; insufficient attention for the size of the (home) market; and the fact that the regionalization 'evidence'

may in fact stem from a home-country effect (i.e. the predominance of the domestic market rather than the other countries in the home region) (Aharoni, 2006; Dunning, Fujita and Yakova, 2007; Osegowitsch and Sammartino, 2008; Stevens and Bird, 2004; Westney, 2006). Subsequent studies have addressed such issues further, and some main findings will be indicated next – not with the objective to be comprehensive and ‘settle’ the debate, but instead to assess implications that are relevant for the subject of this paper: particularly the importance of the home country (Rugman and Verbeke, 2007, 2008c), of industry (e.g. Li, 2005; Rugman and Verbeke, 2008b) and issue specificity (Kolk, 2005, 2010), and differences between business units (Proff, 2002; Rugman and Verbeke, 2008a).

The importance of the home country has received considerable attention, also in responses by Rugman and Verbeke (2007, 2008c) to two commentaries on their work (Dunning, Fujita and Yakova, 2007; Osegowitsch and Sammartino, 2008). Interestingly, the data they provide (of sales of UK firms in the Global 500, and sales and assets of the top 500 in the 2001-2005 period) in both articles show that domestic sales (and assets) predominate, although this is not explicitly noted. In the Global 500 panel, percentages for sales/assets in rest of the world (ROW) are a little less than 25%, and those in rest of the region (ROR) around 10% (Rugman and Verbeke, 2008c), which means that the home country accounted for approximately 65% over the years. The largest European MNEs (in the 2000-2006 period) turn out to have close to half of their sales and assets in their home countries (Oh, 2009). The home market is on average even more important for Japanese MNEs (Collinson and Rugman, 2008). So regionalization for these sets of firms, on average, also means a strong domestic presence. A clear home-country effect has been found in further research with additional data and/or other approaches, and other sets of MNEs, both from the Triad and emerging economies (e.g. Asmussen, 2008; Banalieva and Santoro, 2009; Hejazi, 2007; Seno-Alday, 2009; Sethi, 2009). Home-country effects on MNE strategies have also recently (re-)emerged as an important theme in the broader International Business literature. Given the central role of the state in the historical emergence of most of the major EU electric utilities, this study makes a contribution to the regionalization literature by highlighting the importance of political and public policy influences on the regionalization of these MNEs. This complements the regionalization literature that has studied the importance of home

market size, regional concentration (Seno-Alday, 2009; Oh, 2009) and conformity to economic predictions of optimal internationalization (Asmussen, 2008; Hejazi, 2007).

While data problems, particularly availability of firm-level regional data, seem to hinder more in-depth study, this phenomenon deserves further attention, especially in the case of (formerly) regulated industries such as electric utilities. At least for analytical purposes, a further distinction of the 'regional' dimension appears necessary to separate that category from those firms that are predominantly local with their international presence furthermore mostly in either rest of region (ROR) or rest of world (ROW). This also means that domestic institutions matter as much, and in some cases more, than regional ones, depending on the type of MNE we talk about. To be fair, the original intention of Rugman and Verbeke (2004) was to emphasize the locus of destination, while not denying the importance of the locus of origin. However, since the data show that regionalization in many cases also implies a strong presence in the home country, a more explicit consideration of the different patterns of regional involvement seems an appropriate addition to allow for a more specific analysis and an improved understanding of the phenomenon, and its implications for MNE strategy. This includes a specification of intra-regional groupings (sub-regions) as proximate (large) markets often appear more interesting in terms of liabilities, adaptation costs and potential benefits of regionalization (cf. Seno-Alday, 2009). This seems particularly relevant in the case of electricity in view of transmission and distribution considerations.

What has also come to the fore in the regionalization debate is the importance of industry-specificity, considering broader categories such as manufacturing versus services, but also more specific, detailed (sub)sectors (e.g. automotive, retail, cosmetics, accounting, financial services, professional services, food and beverages, and soft drinks) (Filippaios and Rama, 2008; Gardner and McGowan, 2010; Grosse, 2005; Kolk and Margineantu, 2009; Oh and Rugman, 2006; Rugman and Collinson, 2004; Rugman and Girod, 2003; Rugman and Verbeke, 2008b). Li and Li (2007) showed that patterns of globalization/regionalization differ depending on whether an industry is more globally integrated or rather multi-domestic. The current study reckons with these concerns by its focus on one specific sector, electric utilities. By concentrating on generation, covering both fossil fuels and renewables, it also takes issue-specificity into account (Kolk, 2010). Finally, Rugman and Verbeke

(2008a) noted that regionalization dimensions may not only be relevant at the corporate level, but also for strategic business units, with the possibility of distinct roles in terms of FSA types and also geographic scope, even within one and the same MNE. Given that large electric utilities have generally created separate units for renewable energy, this is something that can be explored in this study. Before moving to the findings, the next section first discusses the method and sample.

METHOD AND SAMPLE

We used a multiple case study design in the same vein as that adopted by Rugman and Collinson (2004). This allows the in-depth study of a set of firms representing the major electricity generators in the European energy market and conclusions to be drawn about the nature of their globalization/regionalization strategies and the role of the home country in their internationalization processes. Regarding the sample, the following leading firms have been identified: EDF (France), Enel (Italy), E.ON (Germany), GDF Suez (France), Iberdrola (Spain), RWE (Germany) and Vattenfall (Sweden) (Schülke, 2010). Four out of the five home countries (Germany, France, Italy, Spain; only Sweden is different) are amongst the largest EU economies by GDP and energy consumption, and the largest markets by final energy consumption, with considerable renewable energy generation activity.

We adopt the approach of Rugman and Verbeke (2004), making use of firm-level data and their criteria for identifying the four regional orientation types MNEs might adopt. In view of limitations in the availability of data, additional criteria were developed for ROR and ROW (see below). The distinction between extended triad regions is followed for the purpose of this study: i.e. NAFTA, Asia and the EU (and rest of world). Additionally, the EU is divided into four major geographic sub-regions to allow intra-region regionalization to be identified if present. While the recognition of intra-EU regions is not novel in itself, we are not aware of its operationalization or use in previous publications on regionalization. We therefore developed a classification inspired by the academic literature including those on the varieties of capitalism (Amable, 2003; Schmidt, 2000, 2002; Rhodes and Van Apeldoorn, 1997) and informed by issues of proximity and integration of EU economies, resulting in four sub-regions that have common coherence in terms of Ghemawat's (2001) geographic, economic, administrative and cultural distance dimensions: Nordic, Northern, Southern,

and Central & Eastern Europe.

The Nordic group is defined primarily by the original categorization of Amable (2003), and low geographic distance. The Northern Europe group again takes Amable (2003) as point of departure, with the reduced geographic distance (at least time-wise), as a result of the interconnector between the UK and The Netherlands, as well as common approaches in these countries, justifying the inclusion of the UK in this sub-region. The work of Schmidt (2000, 2002) and Rhodes and Van Apeldoorn (1997) is believed to provide a justification for the exclusion of France from this group, which is instead placed in the Southern European sub-region (cf. Amable's (2003) mediterranean capitalism country grouping), especially in light of the geographic proximity of the countries. Finally, the Central & Eastern European sub-region includes all EU members that have achieved accession since 2004. Austria is also included in this sub-region based on its inclusion in the Central/Eastern regional classification of European energy markets (ENTSOE, 2010), the low geographic distance and the significant integration of economic activity between Austria and the transition economies around it since their accession to the EU (Huber, 2003). The remaining smaller EU members are finally 'assigned' based on their proximity to the large countries in each of the sub-regions.

We first collected data on the seven electric utilities from their annual reports for the years 2000, 2005, 2010 (and also scrutinized the latest reports published). This was done through a systematic reading of the annual reports and manual recording of quantitative and qualitative data on their internationalization strategies and core geographical markets. In a small number of instances (three firms for the year 2000), we took the most nearby year for which data was available (see Table 2 as presented and discussed in the findings section). It should be noted that the level of detail in which these firms report on non-home markets is limited; this may be related to the nature of the industry and the state ownership heritage (compared to listed companies). Extracting exact figures on their presence in specific geographical markets has been rather challenging due to the paucity of information in firms' annual reports. Figures for company and business unit performance are usually included in all reports. However, given that business units can be geographical, functional, or geographical-functional in nature, obtaining exact numbers for presence in specific geographical markets (and thereby detailed non-home country figures) proved rather difficult. In addition, business

units sometimes changed over time due to restructuring, which makes comparability between periods challenging. Moreover, information on the recent renewable activities is also limited in availability, and characterized by great diversity (e.g. in terms of energy sources). We therefore also analyzed qualitative statements from annual reports (included in Appendices A and B as further details and illustration) to better understand how companies portray themselves in terms of geographical presence and international ambitions.

For what is thus by nature an exploratory analysis, we collected data for revenues, employees, generation capacity, and reported presence in countries. While assets are an accepted measure of regional presence in the literature (Hejazi, 2007; Rugman and Verbeke, 2008b), the available data was not sufficient for inclusion. Revenue is an accepted measure for assessing the downstream regional profile of MNEs (Hejazi, 2007; Rugman and Verbeke, 2008b); this also applies to employees for the regional profile of MNEs (Hejazi, 2007; Rugman and Oh, 2008; Rugman and Verbeke, 2004, 2008). Generation capacity, measured in mega-watts (MW), is a sector-specific measure of MNE presence related to the firm's core electricity generation activities and provides a substitute for the asset measure that could not be used. This is in a similar vein to the use of production capacity by Rugman and Collinson (2004) for the study of the automotive sector, Sethi's (2009) counting of the number of M&A deals by country of acquiring and region of acquired firms, and the counting of stores in countries by Rugman and Girod (2003). Finally, we also counted reported presence in a country. While this is a relatively crude measure of the regional presence of a MNE, it does provide some indication of scope and was particularly important for this study as a mechanism for capturing the within-region distribution of the electric utilities in the EU home region. It provided a reliable discriminator between the within-region profiles of the firms; similar approaches have been used in the literature on regionalization. For renewables, we worked with the data that could be found (see Appendix B).

To obtain some further insight into developments and strategies, we also did a search of the Financial Times reporting on the seven firms between 2000 and 2012, using the name of the firm as key search term as a first step. This resulted in a very broad range of articles being returned, which were then systematically reviewed to identify articles providing significant commentary on the

strategies of the focal firms. The results of this search were as follows for each firm (the first number is the earliest year for inclusion of an article, the second the total articles returned and the third the articles considered most relevant to firm strategy); RWE (2001; 643/34), E.ON (2001; 498/64), EDF (2001; 1964/143), GDF Suez (2005; 1142/61), Enel (2001; 493/63), Iberdrola (2001; 753/49) and Vattenfall (2001; 185/29). These articles were scrutinized through systematic reading on relevant strategic and policy developments.

The exploration of this firm-specific information proceeded similar to Maguire and Hardy (2009). We developed a narrative account of the key strategic decisions/events for each firm and constructed a history of key events drawing on the newspaper sources and annual accounts independently to provide a picture of its strategic evolution. This approach allows for data triangulation, which we complemented by investigator triangulation, as all three authors considered the data and provided an analysis. Limits on the scope of the work however did not allow a design of the study to accommodate theoretical and methodological triangulation (Denzin, 1978). The case analysis was completed through a within-case analysis for each firm independently and then cross-case analysis of these firm-specific accounts to compare and contrast findings to illuminate themes unique to specific cases and those that were common to a majority of the firms (Yin, 2003). The work of Miles and Huberman (1994) is reflected in the use of tables to present our data and findings.

INTERNATIONALIZATION OF EU ELECTRIC UTILITIES

Developments in regional orientations

Table 1 contains the available internationalization data for revenues, employees and generation capacity, with an indication of basic regional orientations on these dimensions for 2000, 2005 and 2010. We collected additional information on the firms and their renewable activities (summarized in the Appendices), which were used to assess the regionalization strategy and sub-regional orientations for 2010, differentiating utilities' core, 'traditional' generation activity from their renewable-energy business (Table 2). We first discuss broader patterns of regionalization, followed, in the next subsection, by an exploration of utility-specific dimensions/patterns, in the context of the (historic) role of

respective home governments, derived from the different sources specified above.

Insert Tables 1 and 2

The overall development is one of considerable internationalization since the late 1990s, considering revenues, employees and generation capacity, reflecting accompanying EU energy liberalization. Although Table 1 only distinguishes between home market (country) and non-home market, the vast majority of the available data covers European business activities, as qualitative analyses confirmed (see e.g. Appendix A). The majority of this internationalization is therefore argued to be home-region oriented, reflecting regionalization patterns identified by Rugman and Verbeke (2004). The relative importance of non-home markets has clearly increased, except for GDF Suez (see firm-specific analyses below).

Interestingly, firms' reports show that none present themselves as home-country oriented, instead emphasizing their geographical spread and international ambitions. They often link internationalization and growth ambitions: i.e. seeking opportunities outside the home country and diminishing risks through diversification of geographical portfolios to depend less on one specific market. Concurrently, most utilities still concentrate on a small number of core markets in Europe, which seems to reflect the phenomenon that Europe has one grid (physically), whereas commercial strategies start from sub-regions that are interconnected through transmission agreements and national system operators (ENTSOE, 2010).

For renewables the international spread is much greater than for core generation, often beyond Europe (see Table 2 and Appendix B). Utilities' renewable business is relatively new, influenced by recent EU policy developments, so indicating specific patterns over time is hard; also due to limited data availability (this is most notable for GDF Suez, which only mentions activities in Europe and the Americas). Current renewables regional orientations show home-region foci for Enel, RWE and Vattenfall; EDF and Iberdrola are close to bi-regionalization and E.ON is host-region oriented, all three with a clear presence in North America.

Early government support for renewables, particularly in Germany, Spain and Denmark, has

been said to have played a role in this development (Gan, Eskeland and Kolshus, 2007; Saidur et al., 2010). When US stimulus programmes emerged later, European firms could leverage their (non-location bound) FSAs built up before at home (Pinkse and Kolk, 2012). For example, of the \$1 billion 2009 clean-energy grants of the Obama government, Iberdrola obtained 57% and E.ON almost 13% (Choma, 2009). Almost 90% of these grants went to wind, which reflects its overall dominance in utilities' renewables portfolios. Wind has grown fastest in installed capacity (Saidur et al., 2010), is most developed economically and technologically (Jacobsson and Johnson, 2000), and seems to suit utilities' FSAs in larger-scale investments best.

Utility-specific regionalization dimensions

The seven electric utilities are featured by diverse historical trajectories in specific domestic contexts, which has coloured current peculiarities (see Table 3 and the Appendices). Government influence/protection has varied, and so has ownership; Vattenfall being the only fully state-owned utility. Both EDF and Enel were established as dominant domestic utilities through government-driven industry consolidation (in respectively the 1940s in France and the 1960s in Italy), with nuclear-energy giant EDF receiving consistent state protection in its home market, much more than Enel (see below). Also in France, GDF Suez emerged only towards the end of the EU energy liberalization process as government-promoted defensive merger to protect Suez as diversified utility from foreign takeover, which required the hasty privatisation of the previously state-owned gas monopoly GDF. In Germany, RWE is a century-old private diversified utility with strong local government ties, while E.ON results from the merger of two privatised conglomerates, influenced by the national government in anticipation of EU energy policy. Iberdrola was created through a merger of two existing private electric utilities in the early 1990s. It is worth noting that EDF and RWE, each as the dominant national utility benefiting from consistent government support, have also been the only home-country oriented firms (for core generation) in our sample (see below). In addition to background information on formation, privatization and the relation to government, Table 3 also includes detailed information on key mergers, acquisitions, joint ventures and disposals, which reflect each utility's unique strategic path. Below we will provide brief utility-specific case analyses in the context of EU energy liberalization processes and a consolidation wave in the industry. This is followed by a discussion of

the implications of the case analyses for the broader regionalization debate to which this study aims to contribute.

Insert Table 3

Vattenfall

Vattenfall is peculiar for being the only state-owned utility, and for its specific regionalization trajectory. The early integration of energy markets in the Nordic region allowed Vattenfall to establish a strong ‘home’ base. Concurrently, limits to growth in this relatively small market drove expansion abroad to the largest CEE market (Poland) and the main Northern markets through various acquisitions and joint ventures. This internationalization, however, changed Vattenfall from having low-fossil fuel-based FSAs into one with an energy mix containing significant coal generation, particularly in Germany. This change became an issue for home-market stakeholders, which in conjunction with broader questions over the purpose of the firm brought its internationalization strategy into question. As the only state-owned firm in the sample, Vattenfall has been most susceptible to home-country pressure, which by 2010 drove a consolidation in its key European markets and withdrawal from many other markets. Vattenfall now explicitly emphasizes a stronger focus on its three core Northern European markets (Sweden, the Netherlands, Germany), which accounted for 85% of the firm’s cash flow in 2010, as central to corporate strategy. Vattenfall’s renewables generation capacity is equally concentrated in the core Nordic and Northern European markets, particularly Denmark (27%), Sweden (23%), the UK (23%) and the Netherlands (17%), with offshore wind power in countries in the North Sea region standing out as key for further expansion. The search for renewables can be placed in the context of its changed energy mix, as opportunities to offset fossil-fuel emissions are sought. Vattenfall intends to expand its power-plant investments in low-emitting technologies from 33% of plant investments in 2012 to 66% in 2016, with proportionally the fastest growth in wind energy, which underlines the importance of renewables, but clearly restricted to the nearby home region.

Iberdrola

Iberdrola’s ties to the government seem relatively weak as it prevented the firm’s attempt to achieve

European scale via the domestic acquisition of Endesa. The failure to gain scale leaves Iberdrola subject to repeated threats of being acquired (e.g. by EDF), and it invests significant effort in avoiding this outcome, resulting in a more regional profile. Deals include a strategic alliance with domestic wind turbine manufacturer Gamesa and a 2006 acquisition of Scottish Power, which provides the scale needed to stay independent and helps to build Iberdrola's unique FSAs in renewables. These FSAs play an important part in the internationalization of the firm, and allows the most to be made of renewable-energy incentives that governments put in place. Iberdrola is the largest wind power company in the world, and it claims 'global leadership in clean energy'. Spain (43%) and the UK (8%) are the largest European renewables markets in terms of installed capacity, while the US (39%) is a core market as well, indicating that Iberdrola almost classifies for a bi-regional focus in renewables. Deeper geographical diversification in renewables outside the home market, thereby building on the strong FSAs in renewables, is a clear focus for Iberdrola given that 84% of newly installed renewable capacity in 2010 occurred outside Spain, with 56% in the US. Overall, for its core business, Iberdrola remains home-region oriented, with 2010 figures for the geographical spread of electricity production showing Spain as main market with 47%, followed by Latin America (25%), the UK (18%), and the US (9%).

Enel

Enel's home market has presented considerable challenges because the Italian government started energy-market liberalization in 1999. Enel faced a regulator that actively sought to reduce its dominance via mandated sales of generation capacity throughout the first half of the period. Enel abandons its initial multi-utility strategy, with the disposal of non-core assets raising funds for potential expansion, but due to the reduced home-market dominance, it lacks sufficient scale, and without unique assets struggles to participate in the first wave of European consolidation. Although some acquisitions are made (including Eastern Europe and later Russia, as first mover), no major deals are completed. The early years of the second half of the period see Enel bid for Suez, to which the French government responds by sponsoring the GDF-Suez merger (see below). Shortly afterwards, however, Enel emerges as preferred alternative to E.ON in the eyes of the Spanish government for

acquiring Endesa. This results in the European scale sought, also in defence against unwelcome interest from other utilities, and provides Enel with a strong position in Southern Europe and Latin America, although Italy is still the main market with 43% of generation capacity in 2010. For renewables, primarily developed through Enel Green Power, its spread is consistent with the generic profile in terms of focus regions, but with a geographically more diverse portfolio, a presence in more different countries within each (sub-)region, and also in North America. Italy is most prominent for renewables as well, followed by Iberia (Spain and Portugal), and then North America, Latin America, and other European countries. Overall, for both core generation and renewables, the large presence in Southern Europe indicates expansion to proximate markets.

GDF Suez

When Enel makes a hostile bid for water and power group Suez in 2006, the French government actively promotes the merger with Gas de France (GDF) to create an integrated European energy utility. Even in the context of EU energy liberalization, the French government retains its distinctive ‘dirigiste’ tradition, in a state-led model of market coordination (cf. Bohne, 2011), sometimes leading to contradictions and only incremental changes to existing policies; this is most notable in the EDF case presented next. Throughout the later part of the period of investigation, the integration of GDF and Suez takes place and, seemingly as a result, no major acquisitions are made before 2010. Although the firm has a considerable gas market share, the French government effectively prevents GDF Suez from establishing major electricity generation in the home country by supporting EDF (see below), also for nuclear assets for which EDF is preferred in 2009. GDF Suez therefore continues to look internationally for growth. For 2010, electricity generation capacity per geographical region reflects this strong international focus, with 57% of installed capacity in Europe (of which 45% outside France), 20% in Asia, Pacific and Middle East, 14% in Latin America, and 9% in North America. This outward-looking strategy appears to draw on FSAs in managing global operations; the expansion to the UK via International Power in 2010, which pursued a comparable strategy is seen as a natural match. The European and North American markets dominate the firm’s core activities, but at the end of the decade, it indicates a clear intention to broaden further, with a third of investments between

2012 and 2017 aimed at pursuing growth in emerging markets. Europe remains by far the strongest contributor to revenues in 2011 (80%), with the Asia, Pacific and Middle East region; North America; and South America contributing with 8%, 6% and 5%, respectively. GDF Suez has an equally global renewable-energy strategy, with presence in Europe, North America, and South America, but specific data is not available as noted above already.

EDF

Benefiting from considerable home-government support, including (in)direct protection from domestic and foreign competition, EDF retains monopoly-like home market shares throughout the period studied, with a clear home-country orientation in core generation. As the EU energy market liberalizes and consolidation begins, EDF makes a number of acquisitions in key markets; but the strong domestic political support appears to affect the degree to which some markets are open to EDF. EDF faces little resistance when removing a competitor on the German border by taking a stake in EnBW, growing its business in the UK by acquiring Seeboard, acquiring a direct stake in SPE in Belgium or an indirect one in gas supplier GVS via EnBW. Acquisitions in Southern Europe are more challenging, however, with significant resistance from the Italian government resulting in new laws to restrict voting rights for state-owned enterprises, a move that attract attention of the European Commission. The indirect acquisition of Hidroelectrica del Cantabrico in Spain via EnBW (in cooperation with Electricidade de Portugal) again leads to temporary blocking of voting rights while state ownership is probed. State ownership clearly has an effect on the degree to which EDF experiences a liability of foreignness in Southern Europe. As further illustration of the influence of the home country on firm strategy, EDF faces strong criticism from the French government in 2003 for risking public money with its internationalization strategy, and the European Commission orders it to repay €1 billion of (in)direct state aid and guarantees.

In 2005, EDF is partially privatised and focuses attention on Europe; by 2008 it has leading positions in UK, Italy and Germany in core generation. Unique FSAs in nuclear energy provide EDF with significant strengths in the acquisition of British Energy and US Constellation Energy. It initially entered the US nuclear sector via a strategic alliance, but his proved challenging, and ultimately

requires EDF to buy out its partner. Furthermore, EDF sells the stake in EnBW towards the end of the period, when gaining control seems increasingly unlikely, and acquires Edison in Italy. The 2010 sales figures reflect the developments towards three core markets, which include France, the UK and Italy with 56%, 16% and 9%, respectively. EDF grows renewable energy in both Europe and North America during the period, emphasizing a clear strategic choice to “embark on diversified international expansion drive from the very outset”. Contrary to the home-country dominance for EDF as a whole, France is only of marginal importance with 15% of installed renewable capacity, while North America accounts for 34%, and nine other European countries jointly for 51%.

RWE

The German setting is somewhat specific for its overall corporatist model of social market coordination and the federal structure with decentralized (partial) ownership by sub-national governments (Bohne, 2011). This is most notable in the case of RWE, with the German home market and its local political stakeholders providing a secure and supportive environment for its internationalization. Throughout the period studied RWE pursues a strategy of investment in core businesses and divestment of non-core assets reflecting its abandoned multi-utility strategy to focus on electricity and gas. Divestments also take place in Germany, where some of the retained assets are ‘rationalized’, including efficiency improvements in operations in former Eastern Germany, facilitated by domestic energy policy reforms in the late 1990s. UK Innogy and Essent in the Netherlands are the two major energy acquisitions which reflect a Northern European focus, although Germany is still the dominant market. In the later part of the period, the legacy of coal-powered generation in the context of emerging regulatory pressure for emission reductions is an important driver for RWE’s move into renewables. In 2008, renewable-energy activities in the RWE Group are bundled into RWE Innogy, for which the primary purpose is defined to expand generation capacity in mature renewable-energy technologies and focus R&D efforts and venture capital investments to develop emerging renewable-energy technologies. RWE has built on its existing core markets for installed renewable energy capacity in terms of geographical presence, with 81% of its installed capacity in its three main markets of Germany (32%), the UK (35%), and The Netherlands (14%), complemented with Spain (12%) as crucial for especially wind energy.

E.ON

The German home government plays an instrumental role in the establishment of E.ON through the merger of two formerly state-owned conglomerates in anticipation of EU energy market liberalization and facilitating the acquisition of domestic gas assets to establish the firm as an integrated energy utility. Pursuing a multi-utility strategy including electricity, gas and water, E.ON communicates a clear European and North American focus in the early years. The integration of the German gas assets in the home market, however, delay an intended North American expansion and initial internationalization is directed at the UK, Eastern and Nordic Europe. E.ON generates funds for internationalization through the sales of legacy non-core assets and then through regulator-mandated divestments in Germany, including water assets, and is perceived to have pursued a very successful strategy of acquisitions, although expansion into Southern European markets was initially difficult. E.ON is the only utility with a significant trans-European home-region orientation, with a presence in all four sub-regions. Its German home market is still dominant in terms of revenues with 54%, but this is much less the case for employees (41%) and generation capacity (34%). Towards the end of the period, E.ON sells US assets and pursues growth opportunities in Europe, Latin America and Asia.

Since 2007, when E.ON Climate & Renewables came into existence, renewable investments have been rather significant with approximately €7 billion between 2007 and 2011, and another €7 billion planned for 2011 to 2016. Wind energy accounts for 96% of its installed renewable capacity. E.ON meets the criteria for a host-region oriented strategy in renewables with 53% of activities in the US; its European presence includes two of the major Northern European markets (Germany, UK) and all three major Southern European markets, as well as the main market in both the Nordic (Sweden) and CEE (Poland) sub-regions. It explicitly states a focus on the most attractive Western markets as identified in the Country Attractiveness Index Renewables (E&Y, 2012), which in addition to the US includes six European countries. Installed renewable capacity outside its German home market amounts to 95%, indicating that the geographic diversification in renewables is much deeper than for core generation. E.ON identifies dependence on political support as a key risk for sustainable market growth in renewables, emphasizing that “support frameworks are diverse and highly volatile”. Most

recently E.ON has exited the UK nuclear sector in line with home-market institutional changes away from this energy source that will affect the utility's future internationalization strategy as well.

DISCUSSION AND CONCLUSIONS

As discussed in the theory section, core assumptions supporting the regionalization literature are that home-region internationalization is associated with lower liability of foreignness than expansion into other regions, which can be reinforced by regional policy coherence, with most MNEs thus likely to have a home-region profile. Two additional observations identify possible nuances: first, there may be distinct regionalization patterns for different FSAs and scope of business units; second, home-region orientations may in fact stem from a considerable home-country effect or predominance of the MNE presence in its home market. This study explored these aspects for the main EU electric utilities, and confirmed a home-region orientation for core generation, with two firms having a strong home-country focus. Policy harmonization and market integration at the regional level appears to have played a role in promoting regionalization of these formerly domestic utilities. Their renewables business units show a different pattern, however, for the six firms with sufficient data: three utilities are home-region oriented, two are close to bi-regionalization and one is host-region oriented.

Hence, while core generation confirms home-region orientations and home-market effects, suggesting much greater liability of foreignness is experienced when internationalizing outside the home region, this differs for renewables, supporting the argument of different FSAs and scope of this relatively new business. Here, utilities appeared able to leverage FSAs built up at home first, supported by renewable-policy incentives, also outside the region. The subsequent drive for renewables (as part of 'green-growth' plans) in the US was an important dimension in the host-region orientation of E.ON and the bi-regional tendency of EDF and Iberdrola. Whether such a 'regulation drives innovation' argument in a new shape, i.e. considering the peculiarities of MNEs (cf. Rugman and Verbeke, 1998), holds more generally is an interesting area for further investigation, with wider relevance, beyond the specific industry; renewable energy could well serve as possible case. There is also the question of whether the more international orientation of renewables might affect the future development of the other fuels and utilities' predominant generation focus. Our study pointed at

strategic expansion opportunities based on unique FSA positions for some utilities (EDF for nuclear energy, Iberdrola for renewable energy, for example). Additionally, it seemed that (legacy) non-core assets were central to utilities' ability to generate funds through disposals, for subsequent acquisitions in this asset-intensive industry.

Our study also identified EU sub-regions (Table 2), which in conjunction with the accounts of individual firm strategies, points to the potential role of home-region/country differences in the liability of foreignness experienced by utilities, reflecting Asmussen's (2008, p. 1202) observation that "regional integration may be less effective than previously believed, and that significant barriers to international expansion remain also within regions". Some utilities found expanding into a EU sub-region that did not include their home market challenging as commercial approaches often start in nearby sub-regions. In core generation, only E.ON was present in all four sub-regions, while in renewables, within-region expansion was also incomplete, with only E.ON present in three sub-regions, the others in less.

Different responses of home-country governments to regional integration influenced the position of domestic utilities, as some governments supported the emergence of a national champion, while others did not. Furthermore, some governments 'pushed' utilities abroad through a considerable liberalization of their domestic markets, while others provided a safe home market to allow utilities' successful internationalization. These choices then shaped the degree to which other home-region markets were open to firms to enter during the two phases of consolidation in the industry. Our study thus highlights the effect of home-country public policy on utilities' inward and outward investment decisions, using firm-level data, providing a refinement of the macro level work by Dunning et al. (2007). Towards the end of the period of study we also observed home-country governments with significant stakes in the home utility reigning in their expansion to concentrate on the European region, a finding that provides further insight into the role of residual state ownership in MNE strategy, complementing the work of Vaaler and Schrage (2009).

These forces almost certainly played an important role in utilities' incomplete home-region internationalization. The influence of home-country institutions is reminiscent of the larger-scale work by Thomas and Waring (1999) on the institutional influence in key Triad countries (US, Japan and

Germany). Our study adds an exploratory single-sector, within-region account of home-government effects on the international strategies of the seven electric utilities, within a regional institutional policy process. Interestingly, Thomas and Waring's competing capitalisms approach is mirrored in the EU sub-regions that we identified, suggesting that different degrees of liberalization within national markets influenced utilities' strategy, causing friction in internationalization and liabilities faced by utilities from more protected markets versus those from more liberalized markets. However, this deserves further investigation with a larger sample. It would also be interesting to analyze utilities in the UK and the Netherlands, as these countries are most advanced in energy liberalization, but their home-country incumbents have been taken over by foreign utilities. Whereas some of the aspects are idiosyncratic for utilities, others have wider relevance, for sectors and firms confronted with government protection/intervention and/or market liberalization; such complexities related to corporate strategy and FSAs in the context of regionalization are not only faced by utilities.

Finally, it would also be worthwhile to explore possible differences between upstream and downstream internationalization patterns. While we collected data on generation capacity and employees (which can be seen as upstream) as well as revenues (downstream), this was too limited for an analysis; the information available did not suggest differences. However, with proceeding internationalization of the industry as well as further liberalization of the EU electricity market, including separation of generation and sales, it may well become possible to collect better data and thus contribute to the broader debate as to different types of FSAs and liabilities related to upstream versus downstream (cf. Kolk and Pinkse, 2008; Li and Li, 2007; Rugman and Verbeke, 2008c). Another phenomenon that might be further examined is the different path of internationalization in case of two domestic electric utilities, as our preliminary findings, based on a small number of firms, suggest that the more dominant and protected the largest player, the earlier the internationalization/regionalization by the other. While the limited sample is a clear limitation of our paper more generally, its findings provide insight into an industry type that has not received much attention in the regionalization literature and thus also contributed to the ongoing debate by suggesting areas and directions for follow-up research.

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Table 1. Electric utilities by geographic location (home-country; non-home country), years (2000, 2005, 2010) and regional orientation (home-country; home-region)

PART A: Electric utilities home and non-home revenues (in € mln and % of total), and orientation (HC, HR)*								
MNE	Home country	Total 2010	Home market			Non-home market		
			2000	2005	2010	2000	2005	2010
RWE	Germany	53,320	39,058 (62%) (HC)	23,038 (55%) (HC)	27,283 ⁷ (53%) (HC)	23,820 (38%)	18,781 (45%)	23,439 ⁷ (47%)
E.ON	Germany	92,863	42,050 ³ (51%) (HC)	33,557 (59%) (HC)	49,824 (54%) (HC)	40,933 ³ (49%)	22,842 (41%)	43,039 (46%)
EDF ¹	France	65,200	26,400 (77%) (HC)	30,126 ³ (59%) (HC)	36,200 ³ (56%) (HC)	8,024 (23%)	20,925 ³ (41%)	29,000 ³ (44%)
GDF Suez ²	France	84,478	9,500 (21%) (HR)	9,720 (23%) (HR)	31,502 (37%) (HR)	39,700 (79%)	31,769 (77%)	52,976 (63%)
Enel	Italy	73,377	25,109 (100%) (HC)	33,146 ⁴ (97%) (HC)	30,767 (43%) (HR)	-	913 ⁴ (3%)	42,610 (57%)
Iberdola ²	Spain	30,431	8,511 (90%) (HC)	9,707 (83%) (HC)	14,629 (48%) (HR)	978 (10%)	2,031 (17%)	15,802 (52%)
Vattenfall	Sweden	-	2,565 ³⁴ (73%) (HC)	- (HR)	- (HR)	949 ³⁴ (27%);	-	-
	Nordic	23,725	3,127 ³⁴ (89%)	4,522 ³⁴ (32%)	6,300 ³⁴ (27%)	387 ³⁴ (11%)	9,825 ³⁴ (68%)	17,425 ³⁴ (73%)
PART B: Electric utilities home and non-home employees for 2000, 2005 and 2010								
RWE	Germany	70,856	100,996 (59%) (HC)	43,579 (51%) (HC)	34,184 (48%) (HR)	68,983 (41%)	42,349 (49%)	36,672 (52%)
E.ON	Germany	85,105	103,450 (55%) (HC)	43,219 (54%) (HC)	35,116 (41%) (HR)	83,338 (45%)	36,728 (46%)	49,989 (59%)
EDF ¹	France	158,842	110,089 ² (66%) (HC)	108,557 (67%) (HC)	105,393 (66%) (HC)	57,220 ² (34%)	53,003 (33%)	53,499 (34%)
GDF Suez ²	France	236,116	60,550 (32%) (HR)	-	103,865 (44%) (HR)	127,500 (68%)	-	132,251 (56%)
Enel	Italy	78,313	72,647 (100%) (HC)	46,663 (86%) (HC)	37,383 (48%) (HR)	-	5,115 (14%)	40,930 (52%)
Iberdola ²	Spain	29,641	9,422 (79%) (HC)	9,955 (58%) (HC)	11,899 (40%) (HR)	2,463 (21%)	7,229 ⁴ (42%)	17,742 (60%)
Vattenfall	Sweden	38,179	8,086 (62%) (HC)	8,350 (26%) (HR)	9,000 (24%) (HR)	5,037 (38%)	23,881 (74%)	29,179 (76%)
PART C: Electric utilities home and non-home generating capacity (Mw) for 2000, 2005 and 2010								
RWE	Germany	52,214	-	33,418 (77%) (HC)	34,028 (65%) (HC)	-	9,851 (23%)	18,186 (35%)
E.ON	Germany	68,475	-	25,623 (48%) (HR)	23,345 (34%) (HR)	-	27,990 (52%)	45,130 (66%)
EDF ¹	France	133,900	99,890 (84%) (HC)	98,922 (76%) (HC)	99,100 (74%) (HC)	18,835 (16%)	31,854 (24%)	34,800 (26%)
GDF Suez ²	France	78,200	-	4,818 ² (9%) (HR)	9,384 (12%) (HR)	-	48,804 ² (91%)	68,816 (88%)
Enel	Italy	97,281	56,609 (100%) (HC)	42,216 (92%) (HC)	40,522 (42%) (HR)	-	3,786 (8%)	56,759 (58%)
Iberdola ²	Spain	44,991	18,915 (93%) (HC)	24,502 (88%) (HC)	25,590 (57%) (HC)	1,403 (7%)	3,289 (12%)	19,401 (43%)
Vattenfall	Sweden/ Nordic	39,932	-	16,355 (50%) (HR)	16,951 (42%) (HR)	-	16,093 (50%)	22,981 (58%)

Sources: Companies' annual accounts

Notes: 1) Values for either 2000 or 2001; 2) Values for 2002 or 2003; 3) Sales values; 4) Estimated value; 5) Income before taxes; 6) Operating income; 7) home and non-home-market figures based on external sales figure (€50.722)

*HC: Home-country orientation; HR: Home-region orientation. The orientations per year are assessed based on the assumption that the vast majority of these firms' activities is still home-region based.

TABLE 2. Regional (and EU sub-regional) orientations of the electric utilities (2010)		
	Core energy business⁹	Renewable energy business¹⁰
RWE	<i>home-country orientation¹ (bi-sub-regional in EU⁶)</i>	<i>home-region orientation¹ (bi-sub-regional in EU⁶)</i>
E.ON	<i>home-region orientation¹ (trans-European⁸)</i>	<i>host-region orientation³ (tri-sub-regional in EU⁷)</i>
EDF	<i>home-country orientation² (tri-sub-regional in EU⁷)</i>	<i>home-region¹ / (home) bi-regional orientation⁴ (bi-sub-regional in EU^{6,11})</i>
GDF Suez	<i>home-region orientation¹ (tri-sub-regional in EU⁷)</i>	- ¹²
Enel	<i>home-region orientation¹ (uni-sub-regional in EU⁵)</i>	<i>home-region orientation¹ (uni-sub-regional in EU⁵)</i>
Iberdrola	<i>home-region orientation¹ (tri-sub-regional in EU⁷)</i>	<i>home-region¹ / (home) bi-regional orientation⁴ (bi-sub-regional in EU⁶)</i>
Vattenfall	<i>home-region orientation¹ (tri-sub-regional in EU⁷)</i>	<i>Home-region orientation¹ (bi-sub-regional in EU⁶)</i>

Source: Table 1 and Appendices

Notes: 1) Rugman and Verbeke (2004) define a home-region orientation as when at least 50% of sales are in the home region of the MNE, we assess our measures against this criteria; 2) Home-country orientation is a special case of the home-region orientation where the home country presence alone is enough to meet criteria for a home-region orientation; 3) Rugman and Verbeke (2004) define a host-region orientation as when more than 50% of sales are in a host region of the MNE, we assess our measures against this criteria; 4) Rugman and Verbeke (2004) define a bi-regional orientation as when between 20% and 50% of sales are in each of two regions. EDF and Iberdrola both meet the criteria for home-region orientation in renewables and only marginally fail to meet the criteria for a bi-regional profile. We identify the firms as (home) bi-regional oriented firms as a secondary categorization to recognize how much more they are internationalized in renewables compared to their traditional generation business, and competitors, but still with a dominant home-region presence. This avoids the possibility of them mistakenly being considered bi-regional oriented firms in two host regions; 5) Uni-sub-region orientation refers to an electric utility having a presence in one of the four EU sub-regions; 6) Bi-sub-region orientation refers to an electric utility having a presence in two of the four EU sub-regions; 7) Tri-sub-region orientation refers to an electric utility having a presence in three of the four EU sub-regions; 8) Trans-European orientation refers to an electric utility having a presence in all of the four EU sub-regions; 9) Sub-regional presences for the core business of electric utilities is assessed based on their presence in major EU energy markets, as more detailed data was not available; 10) Sub-regional presences for the renewable business of electric utility is recognized when the region accounts for 5% or more of the overall renewable business activity and / or is emphasized in the annual accounts of a firm; 11) The renewable business sub-regional presence of EDF is made using presence in the large EU energy markets as the data available is limited and the approach is consistent with that adopted for the core business column; 12) Insufficient data to make an assessment.

TABLE 3. Background information on the electric utilities							
Dimensions	RWE	E.ON	EDF	GDF Suez	Enel	Iberdrola	Vattenfall
Home Country	Germany	Germany	France	France	Italy	Spain	Sweden
Formation Year	1898	2000	1946	2008	1962	1992	1909
Privatization Year	Private Firm	Private Firm	2005 (partial)	GDF (partial 2004)	1999 (partial)	Private Firm	State Owned
Ownership	Listed	Listed	Listed	Listed	Listed	Listed	Listed
<i>Private</i>	85%	100%	15%	64%	~ 69%	100%	-
<i>Public</i>	15%	-	85%	36% (golden share)	~ 31%	-	100%
Emerged from a merger?	No	Yes	Government driven industry consolidation	Yes	Government driven industry consolidation	Yes	Government Owned
Political influence on / support for firm emergence	Yes (Local)	Yes (National)	Yes (National)	Yes (National)	Yes (National)	No	Yes (National)
Strategy in 2000	Diversified Utility	VEBA (Conglomerate) VIAG (Conglomerate)	Focused Integrated Electric Utility	GDF (SOE gas monopoly) SUEZ (diversified utility)	Integrated Electric Utility	Hidrola (Private Electric) Iberduero (Private Elec.)	Integrated Electric Utility
Strategy in 2010	Integrated Electric Integrated Gas	Integrated Electric Integrated Gas	Integrated Electric (Some Gas)	Integrated Electric Integrated Gas	Integrated Electric (Some Gas)	Integrated Electric (Some Gas)	Integrated Electric (Some Gas)
Primary mode of growth	Acquisition	Merger / Acquisition	Acquisition	Merger / Acquisition	Acquisition / Joint Ventures	Acquisition	Acquisition
Primary Electricity Generation Fuel	Coal / Gas	Coal / Gas / Nuclear	Nuclear	Gas/Hydro	Gas/Hydro	Gas/Renewables/Hydro	Coal/Hydro/Nuclear
Key events for Mergers & Acquisitions, Joint Ventures and alliances	Thames Water (UK, 2000) American Water (US, 2001) Innogy (UK, 2002) Essent (NL, 2009)	Suez Lyonnaise des Eaux (FR, failed 2000) PowerGen (UK, 2002) Ruhrgas (DE, 2002-2003) Granninge (SE, 2003) Stake in Gazprom (RU, 2004) Talks with Scottish Power (Failed 2005) Endesa Assets (ES, 2006-2007) OGK-4 (RU, 2007)	EnBW (25%) (DE, 2001) Hidroelctrica del Cantabrico via EnBW 60% stake (ES, 2001) SPE (10%) (BE, 2001) Edenor (Controlling stake) (AR, 2001) Seeboard (UK, 1998-2002) Edison (80.7%) (IT, 2001-2011) Constellation Energy (US, 2008-2010) British Energy (UK, 2008)	Gas Natural (11.3% by Suez) (ES, 2007) International Power (UK, 2010-2012)	Gruppo Camuzzi (40%) (IT, 2001) Viesgo (ES, 2001) Slovenske Elektrarne (SK, 2004-2006) Suez (BE, failed 2006-2008) Electrica Muntenia Sud (67.5%) (RO, 2006) OGK-5 (RU, 2007) Endesa (ES, 2007-2009)	Endesa (ES, failed 2001) Gamesa (ES, strategic alliance, 2002) Gas Natural bid for Iberdrola (ES, rejected by regulator 2003) Rokas (49.9%) (GR, 2005) Scottish Power (UK, 2006) CPV Wind Ventures (US, 2007) EDF Approach (Rejected 2008) Elektro (BR, 2011) Possible merger with RWE (Not pursued 2011)	HEW (DE, 1999-2001) EW (75%) (PL, 2000-2006) Bewag (DE, 2001) GZE (75%) (PL, 2001-2006) VEAG (DE, 2002) Elsam Asset Share (DK, 2005) Amec wind business (UK, 2008) Nuon (NL, 2009)
Key Disposals	Hochtief (DE, 2004) Heidelberger Druckmaschinen (DE, 2004) Thames Water (UK, 2006) American Water (US, 2008) Apirion Distribution Network (79.4%) (DE, 2011)	Gelsenwasser (DE, 2003) Thuega Network of Municipal Holdings (DE, 2009) Long-distance Distribution Network (DE, 2009) US Electric / Gas Assets (2010)	Sale of South American Assets (BR/AR, 2005-2006) British Energy (20%) (2009) Network Business (UK, 2010) EnBW (25%) (DE, 2010)	Italian natural gas transmission network (IT, 2011)	Regulatory mandated generating capacity, market share falls from 68% to 41% (IT, 2001-2005)	Gas business (US, 2010)	50Hertz Transmission (DE, 2010) Polish/Belgian/some Finnish Assets (2011)

Sources: Schulke (2010), Company annual accounts, Company websites; Financial Times articles (see methodology section for explanation) [Given the large number of sources for the findings presented here, we do not provide detailed references; full referencing is available from the authors upon request]. **Note:** ISO 3166 Standard Country Codes used between brackets: Argentina (AR), Belgium (BE), Brazil (BR), Denmark (DK), Greece (GR), France (FR), Germany (DE), Italy (IT), The Netherlands (NL), Poland (PL), Romania (RO), Russian Federation (RU) Slovenia (SK), Spain (ES), Sweden (SE), United Kingdom (UK), United States of America (US).

Appendix A. Main geographic markets for the utilities in 2010										
Triad Regions	Europe (EU)					NAFTA	Asia	Rest of World	Statements on main markets from 2010 annual report	
Company	Northern Europe	Nordic	Southern Europe	Central and Eastern Europe	Other	-	-	-		
RWE	Germany (HC) United Kingdom Netherlands Belgium	-	-	Poland Czech Republic Hungary Slovakia	Turkey	-	-	-	<p>“Among our core markets are Germany, the United Kingdom, the Benelux countries as well as Central Eastern and South Eastern Europe”</p> <p>“The markets of North Western Europe continue to be attractive for us, although they still harbour weak growth potential in terms of electricity and gas consumption”</p> <p>“In particular, the Central Eastern European countries and Turkey distinguish themselves through good growth prospects”</p>	
E.ON	Germany (HC) United Kingdom Netherlands Belgium	Sweden Finland	France Italy Spain	Czech Republic Romania Hungary Slovakia Bulgaria	Russia	-	-	-	<p>“Europe is and will remain our home market and the main focus of our business operations”</p> <p>“The Central Europe business unit has significant operations in Germany, Belgium, France, the Netherlands, Hungary, Czech Republic, Slovakia, Romania, and Bulgaria”</p> <p>“The U.K. business unit has significant operations in the United Kingdom”</p> <p>“The Nordic business unit has significant operations in Sweden and Finland”</p> <p>“The New Markets business unit has solid market positions in Russia, Italy and Spain”</p>	
EDF	United Kingdom Netherlands Belgium Switzerland	-	France (HC) Italy Spain	Poland Austria Hungary Slovenia	-	United States	China Vietnam Laos	Brazil	<p>“The EDF Group is active in more than 30 countries. Its global operations focus on three core businesses: generation, networks and sales and trading”</p> <p>Sales (% of total) per business unit (BU): France (55%), United Kingdom (15%), Italy (9%), and Other International Activities (11%), so around 85%-90% of sales are generated in Europe with France, the UK and Italy as main markets</p> <p>Other International activities (11%) includes activities in Europe (Poland, Belgium, Austria, the Netherlands, Slovakia, Switzerland, Hungary, Germany), North America (United States), Latin America (Brazil), and Asia (China, Vietnam, and Laos)</p>	
GDF Suez	Germany United Kingdom Netherlands Belgium Luxembourg	-	France (HC) Italy Spain Greece Portugal	Poland Romania Hungary Slovakia	Turkey	United States Canada Mexico	Thailand Laos Singapore	Brazil, Argentina Chile, Peru, Panama, Costa Rica, United Arab Emirates, Bahrain Oman, Saudi Arabia, Qatar	<p>For electricity generation the geographical spread is: 27% Benelux & Germany, 21% Middle East, Asia & Africa, 17% Europe (other), 11% France, and 8% North America; so 55% of electricity is generated in Europe</p> <p>Geographical region Benelux & Germany includes Germany, the Netherlands, Belgium, and Luxembourg</p> <p>Geographical region Europe includes Italy, Spain, Portugal, United Kingdom, Greece, Poland, Hungary, Romania, Slovakia</p> <p>Geographical region North America includes United States, Canada, and Mexico; South America includes Brazil, Argentina, Chile, Peru, Panama and Costa Rica</p> <p>Geographical region Middle East, Asia & Africa includes United Arab Emirates, Bahrain, Oman, Qatar, Saudi Arabia), Turkey, Thailand, Laos, and Singapore.</p>	
Iberdrola	Germany United Kingdom Netherlands Belgium Switzerland	-	France Italy Spain (HC) Greece Portugal	Poland Austria Czech Republic	-	United States Mexico	-	Brazil Bolivia Guatemala	<p>“The Group is present in the electricity markets of 13 countries: Spain, France, Germany, Italy, the Netherlands, Belgium, Austria, Portugal, Switzerland, United Kingdom, Greece, Poland and the Czech Republic”</p> <p>“Iberdrola is now the leading Spanish energy group, the 5th largest company on the Ibox 35 by market capitalization, the world leader in the wind sector, and one of the five largest global power companies”</p> <p>Revenues (% of total) per geographical area: Spain 48%, United Kingdom 27%, Rest of Europe 1%, United States 13%, and South America 11%</p>	

Appendix A. Main geographic markets for the utilities in 2010										
Triad Regions	Europe (EU)					NAFTA	Asia	Rest of World	Statements on main markets from 2010 annual report	
Company	Northern Europe	Nordic	Southern Europe	Central and Eastern Europe	Other	-	-	-		
Enel	Belgium	-	France Italy (HC) Spain Greece Portugal	Romania Slovakia Bulgaria	Russia	-	-	Brazil Argentina Chile Colombia Peru	<p>“Significant results were also achieved in the Iberia and Latin America Division in 2010. Division’s revenues grew 15% to €31.3 billion about 25 million customers served in Iberia and Latin America in the electricity sector and about 1 million in Iberia in the gas sector”</p> <p>“The foreign companies in the International Division have contributed to the Group’s result with their excellent performance” (International Division includes Slovakia, Russia, Romania, France, Belgium, Bulgaria)</p> <p>Revenues (from third parties, % of total): Italy 50%*, Iberia 42% (of which Spain/Portugal 68%; and Latin America 32%), and International 8% *(BUs for Italy includes Sales, Generation/Management, Infrastructure/Networks, Engineering, and Services)</p> <p>The Iberia and Latin America division of Enel was established through the takeover of Endesa (home market: Spain) in 2009</p>	
Vattenfall	Germany Netherlands Belgium	Sweden (HC) Finland Denmark	-	Poland	-	-	-	-	<p>“The core markets are Sweden, Germany and the Netherlands. In 2010 operations were also conducted in Belgium, Denmark, Finland, Poland and the UK”</p> <p>“Vattenfall’s core markets – Germany, Sweden and the Netherlands – together account for 85%–90% of the Group’s cash flow. In these three countries’ Vattenfall has advanced market positions”</p> <p>“Vattenfall’s other markets are Denmark, Finland, Poland and Belgium. The UK is not a core market, however, it is considered to have a special role as a growth market – particularly in offshore wind power”</p>	

Source: Annual Accounts

HC = Home country

Appendix B. Renewable energy activities for the utilities in 2010						
Company	Main subsidiary / business unit	Established	Installed capacity (MW)	Capacity by geographical region (MW)	Capacity by technology (MW)	Additional statements and information
RWE (2012 report)	RWE Innogy	2008	3,744 MW	32% Germany 35% United Kingdom 14% Netherlands 12% Spain 3% Poland 4% Other countries	30% Biomass 44% Wind Onshore 4% Wind Offshore 21% Hydro 1% Other renewables	RWE Innogy: "Bundling renewables activities and competencies across RWE Group" "Focus on capacity growth in commercially mature renewable technologies, i.e. wind, biomass and hydro" "Research & Development and Venture Capital to drive the development of emerging technologies, e.g. solar, geothermal, marine" "European focus" "RWE Innogy operates 2,430MW of the total 3,744 MW of installed capacity of the RWE Group" "Has approximately 1.450 employees in 5 European countries" RWE has 797 MW in hydro-electric generation capacity (2012) which is included in the reporting for RWE in this section
E.ON (2011 Report)	E.ON Climate & Renewables	2007	4,190 MW	53% United States 12% Iberia (Spain / Portugal) 11% United Kingdom 9% Italy 6% Nordic (Sweden / Denmark) 5% Germany 2% France 2% Poland	85% Wind Onshore 11% Wind Offshore 4% Other renewables	E.ON C&R: "We focus on what we do best and where we can add the most value: Making and marketing energy in competitive, converging international markets" E.ON C&R: "Responsible for E.ON's global activities in industrial-scale renewable power generation" E.ON C&R: "Operating a geographically balanced portfolio with 4,190 MW capacity across Europe (47%) and North America (53%)" E.ON C&R: "We are implementing a new strategy to transform our company into a global provider of specialized energy solutions" E.ON C&R: "Wind onshore focus regions: United States, United Kingdom, Poland, Nordic countries, Spain, Italy" E.ON C&R: "Has 804 employees of 36 nationalities in 11 countries, and is the global #3 in offshore wind and global #8 in onshore wind" E.ON has 5,548MW in hydro-electric generation capacity (2010) which is not included in the reporting for E.ON in this section
EDF (2011 Report)	EDF Energies Nouvelles	2004	3,486 MW	51% Europe (Ex. France) (United Kingdom, Spain, Portugal, Italy, Germany, Greece, Bulgaria, Belgium, Turkey) 34% North America (United States, Canada, Mexico) 15% France	86% Wind 9% Solar PV 5% Other renewables	EDF EN: "The EDF Energies Nouvelles group operates in 13 countries in Europe and in North America, and has around 3,000 employees" EDF EN: "From the very outset, EDF Energies Nouvelles focused on expanding outside France as market conditions were not very favourable in its domestic market at the time" EDF EN: "From a base in several European countries and the United States, the Group gradually broadened its sights to the whole of Europe and North America" EDF EN: "Onshore wind, the core segment, is driving and will drive future growth thanks to the Group's diversified portfolio of high-quality projects in ten countries" EDF EN: "In the space of ten years, EDF Energies Nouvelles has become a major player in the global wind energy industry" EDF EN: "Growth is based on diversified geographical presence and a multi-field expertise" EDF has 21,500MW in hydro-electric generation capacity (2010) which is not included in the reporting for EDF in this section
GDF Suez (2010 Report)	n/s	n/s	3,198 MW	n/s	69% Wind 30% Biomass 1% Other renewables	GDF Suez: "GDF Suez has a production capacity of 963 MW in the biomass and biogas in Europe, where it is the leader, in the United States and South America" "There is a particular focus on wind turbines with a capacity of 2,205 MW, making the Group the leading operator on the Belgian and French markets and number two in Portugal (...) several projects are also being run in Europe, Canada, Latin America and Morocco" "GDF Suez is also present in the solar energy sector, including the production of photovoltaic cells and modules in France and Belgium and investments of several dozen MW in France and Portugal" GDF Suez has 10,744MW in hydro-electric generation capacity (2010) which is not included in the reporting for GDF Suez in this section

Appendix B. Renewable energy activities for the utilities in 2010

Company	Main subsidiary / business unit	Established	Installed capacity (MW)	Capacity by geographical region (MW)	Capacity by technology (MW)	Additional statements and information
Iberdrola (2011 Report)	Iberdrola Renovables	2001	13,690 MW	43% Spain 39% United States 8% United Kingdom 10% Other Countries (Brazil, Mexico, Germany, Hungary, France, Portugal, Italy, Poland, Romania, Greece)	97% Wind 3% Other renewables	Iberdrola Renovables: "Installed capacity rose 9.2% to 13,690 megawatts (MW) across the Group (...) approximately 57% of total installed capacity is now located outside of Spain" "With a presence in 23 countries, it has the largest project portfolio in the industry (62,613 MW) which increased by 4,197 MW in 2010" "assets in operation in the most important markets of the world (Spain, United States, United Kingdom, Republic of Ireland, Greece, France, Poland, Portugal, Mexico, Germany, Brazil, Italy and Hungary)" "84% of new capacity in 2010 was installed outside of Spain (with 56% in the United States), thus strengthening the process of geographic diversification. The international area represents 57% of installed capacity." Iberdrola has 9,898MW in hydro-electric generation capacity (2010) which is not included in the reporting for Iberdrola in this section
Enel (2010 Report)	Enel Green Power	2008	6,102 MW	45% Italy 25 % Iberia (Spain / Portugal) 13% North America (United States / Canada) 11% Latin America (Mexico, Costa Rica, Guatemala, Nicaragua, Panama, El Salvador, Chile and Brazil) 6% Europe excluding Italy, Spain, Portugal (Greece, France, Bulgaria, Romania)	44% Wind 42% Hydroelectric 12% Geothermal 2% Other renewables	Enel GP: "With more than 600 plants operating in Europe and the Americas in a total of 16 countries to date, the Group's net output in 2010 amounted to 21.8 TWh" "In Europe, Enel Green Power is present in Italy, Spain, Portugal, Greece, France, Romania and Bulgaria" "In North America, Enel Green Power is present in 20 US states and 2 Canadian provinces through Enel Green Power North America" "In Latin America, Enel Green Power Latin America operates 33 plants in Mexico, Costa Rica, Guatemala, Nicaragua, Panama, El Salvador, Chile and Brazil" "Has 2,955 employees of which 62% work in 'Italy and Europe' and 24% in 'Latin America and Iberia'" Enel has 31,034MW in hydro-electric generation capacity (2010), of which 2,539MW is included and 28,495MW is not included in the reporting for Enel in this section. Excluding hydro from Enel Green Power, Italy accounts for 36%, Iberia and Latin America for 42%, Europe (non-Italy, non-Iberia) for 9% and North America for 13%.
Vattenfall (2010 Report)	n/s	n/s	1,896 MW	27% Denmark 23% Sweden 23% United Kingdom 17% Netherlands 7% Germany 3% Other Countries	76% Wind 24% Biomass	Vattenfall: "Vattenfall will continue to expand in offshore wind power in the North Sea countries – the UK, Germany and the Netherlands – and onshore in prioritised markets" "Vattenfall is one of the world's leading wind power developers and operators and is currently building nine wind farms in six countries" "900 turbines operating in Sweden, Denmark, Germany, Poland, the Netherlands, Belgium and the UK" Vattenfall has 11,516MW in hydro-electric generation capacity (2010) which is not included in the reporting for Vattenfall in this section

Source: Annual Accounts

Notes: n/s = not specified