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Networks: Electricity Market Design Convergence
in the USA and Continental Europe

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Abstract

The absence of one broadly accepted design template for liberalised electricity markets induces regulatory competition and institutional diversity. Focussing on continental Europe and the USA, this analysis explores how agents and structures accelerate or impede the move to one standard market design in the electricity sector. It reveals that market design convergence in Europe is driven by the ‘Florence Consensus,’ a tripartite coalition between the European Commission fostering European integration and the internal market, informal regulatory networks between grid operators, standardisation authorities and regulators, who have been coordinating their actions in the ‘Florence Forum,’ and epistemic communities exemplified in the Florence School of Regulation. In contrast, the United States’ Federal Energy Regulatory Commission lacks support among politicians, many states’ public utility commissions, the neo-liberal *intelligentsia* and even industrial lobbying groups to effectively push for a standardised market design. However, design convergence in the USA may be induced by the gradual expansion of multi-state markets operated by regional transmission organisations acting as an ‘agglomerative magnet.’

Keywords: Electricity, Deregulation, Regulatory Competition, Policy Diffusion

JEL Classification: K23, L16, L43, L51, L94, Q48

I. Introduction

While the liberalisation of many formerly regulated industries like banks, airlines or telecommunications has moved swiftly into the era of competition, often with rivalling technologies and phenomena of leapfrogging, some infrastructure services based on networks encounter severe obstacles in the implementation of competitive markets. After prominent failures, liberalisation has completely stalled in water services, and opening up the railroads is hampered by unresolved questions of track ownership and subsidisation of public transportation. The electricity sector is somewhat in a hybrid position. While legislators in a diverse set of countries ratified and, at least partially, implemented competitive elements especially in the wholesale segment of the electricity sector in the second half of the 1990s, many governments who planned reforms have become more sceptical about the actual benefits of power sector liberalisation—exacerbated by the regulatory failure in California—and remain outspokenly reluctant to implement any far-reaching restructuring of the industry. In addition, regulatory practices within the group of countries that have liberalised have not yet converged to a broadly accepted model of market design, and the phase of experimentation seems far from over.

The two major economic powers in the Western world, the European Union¹ and the USA, departed with an ambitious agenda of liberalisation of the electricity supply industry in the mid-1990s. Based on apparent inefficiencies of the traditional rate-of-return regulation and consistent with economic theory emphasising the overall welfare benefits of a market-based approach (see e.g. Joskow and Schmalensee 1983), that initial parallel movement has resulted in strikingly different regulatory outcomes: The European Union's internal electricity market is plagued by horizontal and vertical market power within the member states, it suffers from insufficient cross-border transmission capacity—but it incrementally evolves into a joint market with the harmonisation and standardisation of rules and practices across countries and a strong institutional backing from the European Commission in the context of the larger project of a unified, borderless economic area. In contrast, the regulatory landscape in the United States is split between functioning and expanding competitive wholesale markets in the North-Eastern part of the country and in Texas' independent grid, a hybrid market in California, and a range of traditional service models in the South-East and North-West.

How is it possible that a geographically intertwined but culturally, linguistically and institutionally diverse group of countries without a centralised sector authority achieves a more homogeneous institutional arrangement than a single nation state with a federal regulatory agency for energy? Which mechanisms foster regulatory convergence in the EU, and how do they differ from the processes that characterise the incremental expansion of the North-Eastern market model in the USA? The objective of this paper is to understand why the developments in the USA and in Europe have materialised in such different shapes. For that purpose, we aim to analyse the impact of agents and structures on the respective sector architectures. In particular, we want to answer the following questions: (1) Which roles do different agents play in the regulatory bargaining process? Do they act as a force or counterforce towards convergence? (2) Given the capital intensity and historical embeddedness of the electricity sector as a network industry in the public domain, do legal, political or economic—more generally: institutional—structures induce path-dependence and impede a move towards a standardised design? (3) Combining insights of questions (1) and (2), can we characterise and possibly distinguish the dynamics and mechanisms of regulatory convergence in the EU and the USA and deduce a prediction on the future evolution?

1 The European Union is a political construct that does not include all countries in Europe – most notable exceptions are Norway and Switzerland and a range of countries at the Eastern limits –, but our analysis considers the repercussions of the EU's decisions in respect to electricity relevant to all countries in the common grid area defined by the UCTE.

II. Models of Regulatory Competition—a Literature Overview

The development of electricity sector liberalisation in Europe and the USA bears attributes of a process of regulatory competition, i.e. an intentional selection among different regimes. First, because there are competing models of electricity sector regulation on a global scale, including the traditional rate-of-return approach, single-buyer regimes, and a whole range of new market architectures composed of interchangeable or complementary modules of zonal or nodal transmission pricing, bilateral or compulsory spot markets, day-ahead markets, secondary markets for ancillary services, implicit or explicit auction mechanisms for transmission bottlenecks, etc. Second, state legislators in the USA and governments of EU member states have, as opposed to political decisionmakers in developing or transition countries (see Stiglitz 2002: 42 for a discussion), some political leverage to decide which market design and mode of regulation they want to adopt.

Loosely following the evolutionary paradigm of ‘variation - selection - retention’ that Campbell (1969) applied to socio-cultural systems², regulatory competition exhibits dynamics of trial-and-error learning and of what he calls ‘convergent evolution’ (1969: 78): the emergence of common forms with—in our case—a potential for regulatory convergence on a single market design. The two most prominent approaches to describe the dynamics of regulatory competition are difficult to apply to the electricity sector, though: Theories of a ‘race to the bottom’ and a ‘race to the top’ have been used to explain how national, regional and international regulation converges towards a low-level or high-level equilibrium. The race to the bottom depicts a phenomenon commonly referred to as the Delaware effect, because the US state Delaware has succeeded to attract most incorporations of publicly traded companies due to its attractive corporate laws (Cary 1974, Bebchuk 1992). Especially in the regulation of the environment and labour laws, the theory expects a gradual erosion of stricter standards because of competitive pressures. On the other hand, the ‘race to the top’ in regulation—the ‘California effect,’ as it is coined in response to California’s pioneering role in implementing stricter environmental laws than other states—relies in its underlying mechanism on a coalition between public interest groups and local firms: In a business environment composed of wealthy nations/states, companies seek a competitive advantage by exporting their higher domestic standards to less regulated markets, often with the support of non-governmental organisations who pursue their own value-driven agenda (see e.g. Vogel 1995). Evidence for both phenomena can be found in specific regulatory *modules* of the electricity sector, for example environmental restrictions for the emissions of both local and global pollutants, and safety standards for system stability: The race to the bottom may occur in regional markets, where individual countries are requested to lower their standards, because they are considered a competitive disadvantage directed against competing firms from neighbouring countries, while the race to the top may be induced by governments seeking voter support, in particular after structural difficulties of the system like a major blackout or an accident in a power plant. However, neither the ‘race to the top’ nor the ‘race to the bottom’ theories are suitable for explaining a convergence of electricity market *regimes*, because the implementation of a reform is not limited to the ratification of stricter or more relaxed laws. It rather involves the creation of genuinely new institutions, including a market operator, a system for the dispatch of power plants, and often a new or restructured regulatory agency.

The two race theories may capture some dynamics of supplementary or *peripheral* regulation, whereas an explanation of the shape of *core* institutions or mechanisms of a new market design has to be based on less unidimensional approaches. Going beyond a simple duality, Tiebout’s (1956) model of regulatory competition treats laws as some sort of public goods which are provided by a supply side, namely any jurisdiction, in response to a specific demand by those who ‘consume’ the laws. His model could potentially be further extended to the creation of regulatory institutions. He emphasises that, first, decentralised decision-making leads to greater efficiency, because lawmakers can react

2 His analogy emphasises the organisational learning component and thereby adopts a Lamarckian rather than Darwinian argument (see Campbell 1969: 73 for a discussion on that matter).

more accurately to the expectations of their constituencies. Second, consumers exhibit the mobility to leave their jurisdiction in case that they are dissatisfied with the local regulation. The result is an efficient equilibrium, as opposed to an extreme bottom or top case, in which demand and supply of regulation match in a version of decentralised, competitive federalism. Tiebout's model contains some assumptions that may not fully reflect reality, in particular 'jurisdictional latitude' in the selection of regulatory laws, which means, according to Radaelli (2004: 2), that jurisdictions cannot be limited in the production of their laws by external constraints. Nonetheless, Tiebout's race towards a local equilibrium captures the notion of geographic differences and diverging equilibria for different constituencies and their particular needs, thereby providing an explanation based on neoclassical reasoning—and not evolutionary analogies—why regulatory convergence does not always occur.

The effect of organisational (or institutional) learning based on practices in other jurisdictions—policy 'duplication'—collides with Tiebout's model, although it constitutes a major component of convergence in the regulatory processes of a globalised world (see e.g. Ikenberry 1990, Henisz *et al.* 2004). It is even more important than the impact of military or economic coercion, international negotiations or unidirectional capacity building, according to Braithwaite and Drahos (2000). The authors introduce the notion of 'modelling' and define it as 'action(s) that constitute a process of displaying, symbolically interpreting and copying conceptions of action (and the process itself).' (2000: 581) In that progress, governments 'routinely misunderstand and misrepresent what they are modelling' (2000: 590), though, which gives rise to a multitude of regulatory phenotypes despite one underlying model. Braithwaite and Drahos emphasise that economic or political power relations are not the single most influential factor for the success of a regulatory model, but it is also the model itself that counts. Radaelli (2004: 12) agrees: 'A promoter may have less power than well-endowed pressure groups. But this weakness may be compensated by the power of the model.' Hence, beyond the competition between different interest groups, be it on a national or international level, the quality of a model may emerge as a supplementary factor in regulatory competition.

The races to the top or bottom or towards a local regulatory equilibrium assume that the system is fully flexible to reach the desired state. Criticism towards this dynamic assumption stems from the micro and the macro level. On the one hand, Braithwaite and Drahos see limits of the implementation of regulatory regimes in the restrictions that bounded rationality imposes on actors: 'Histories of globalization involve complex networked actions which means that few, if any, actors have the synoptic capacity to be rational in the way rational choice would have it.' (2000: 30) On the macro level, the systemic and multidimensional character of regulation may exhibit forms of inertia and path-dependence, both in respect to legal and political procedures as well as to the infrastructure component—the hardware, so to speak—, which is not fully covered by the theories discussed above but constitutes an important element in evolutionary approaches. Prominent proponents of path-dependence include North (1990) in economic theory and Roe (1996) in law. Path-dependence is characterised by 'lock-in' effects: Once that a specific solution to a problem or organisational structure is chosen, it becomes more costly, if not technically impossible, to change it, even when the solution or structure proves to be less efficient than a different one which has not been put into practice. North identifies transaction costs as the main inhibitor of allocative efficiency (1990: 86), whereas Roe points to the relative success of the survival of a regime, for example in the case of different organisational models of corporate governance in industrialised countries: 'Even if each national business system produces roughly equivalent governance results, the systems have not yet converged to have identical institutions. Rather, each system has solved basic problems by modifying its own path-dependent institutions' (1996: 657) For Roe, the coexistence of different regimes can be seen as a result of systemic inertia in times of stability and continuity, only disrupted and put into question by catastrophes and crises: 'Nothing important might happen except in crisis. Institutions and rules would be comparatively rigid until a shock hits the system [...] What survives is what is best adapted to persist during the crisis; once the survivors survive the crisis and the maladapted become extinct, nothing much important happens until the next crisis.' (1996: 663) For North, the hegemony of (what he calls) informal constraints remains dominant even when discontinuous or radical changes like

revolutions occur: ‘A deep-seated cultural inheritance that underlies many informal constraints’ transforms revolutionary attempts into compromises with the old system, thereby generating ‘a new equilibrium that is far less revolutionary.’ (1990: 91)

How well do the theories and models that have been presented above explain regulatory convergence and the diverging history of electricity sector liberalisation in Europe and the USA? As previously mentioned, the unidimensional race-to-the-bottom or top theories largely fail to capture the complexity of institutional differences between regulatory regimes. Roe’s and North’s legal and institutional path-dependence could be expected to have an impact in continental Europe, where nation states were shaped independently over the last two centuries and have just recently started growing together, and less so in the United States, which exists as a single nation with a federal government for a roughly equal amount of time. However, in respect to regulatory idiosyncrasies, path-dependence seems more pronounced in the USA than in Europe, a phenomenon that will be investigated in detail in the next two sections. In contrast, the relative homogeneity of the US states under the umbrella of a federal government could imply a stronger effect of modelling (and subsequent convergence) of successful practices across states—with the states acting as ‘regulatory laboratories’—thus rather predicting an opposite outcome than empirical evidence suggests. Tiebout’s equilibrium model acknowledges local optima and comes closer to the notion of decentralised ‘regulatory competition’ that characterises the current state of liberalisation in the US. But can it fully explain why some core features of the North-Eastern model of ‘organised’ markets expand predominantly in their immediate neighbourhood and are not copied in geographically more distant areas of the country? Apparently, the above-mentioned approaches to characterise regulatory competition fail to depict some of the interaction between different levels of political decision-making and provide an incomplete picture of the dynamic complexity of electricity sector reforms. More generally, Radaelli (2004: 19) writes: ‘Fresh theoretical and empirical work should abandon the elusive notions of ‘races’, ‘top’ and ‘bottom’, drop the emphasis on ‘final directions’, and pay more attention to the actors and processes of [regulatory] competition. This is a new direction: conventional models are still informed by ‘black-box’ approaches where economic incentives for competition turn into races without explaining what happens in the box, who acts and how.’ In the subsequent sections, we will open the ‘black box’ and try to disseminate and disentangle the evolution in the USA and continental Europe. We will start with an analysis of the major agents in the *top-down* direction (section III), then turn to the *bottom-up* reaction of interest groups (IV) and the impact of epistemic communities (V), thereafter examine the effect of technical and legal structures (VI), before graphically summarising the main propositions (VII) and giving an outlook on future developments (VIII).

III. Top-Down Inducement, State Reactions, and Second-Best Strategies

Electricity sector liberalisation has often been described as an ideologically induced top-down system alteration. In the EU, the European Commission is the entity in charge of implementing the internal electricity market. In the USA, the Federal Energy Regulatory Commission (FERC) has issued several orders that pushed for institutional transformation and reform. In both cases, the top-down approach has faced substantial hurdles and resistance from the entities in charge of implementation, i.e. in the EU the member countries and in the US the individual states. Consequently, the Commission and FERC have found alternative paths of implementation of their policies. We will first discuss the European case and then the United States.

III.A Top-Down Inducement in the European Union

Of all regional organisations across the globe—including NAFTA, ASEAN, the Mercosur and the South-African Development Community (SADC)—, the European Union has the greatest enforcement powers and the most resourceful institutional endowment. Scholars call the EU polity a ‘regulatory state’ (Majone 1996), because the EU limits its role to the facilitation and setting-up of market rules, at

least in the energy field, as opposed to nation states which have additional means to decide over redistributive issues. The liberalisation process of the electricity sector within the EU was initially based on a consensus between the heads of the member states and has subsequently been translated into internal energy market directives in 1996 and 1998 and refined in 2003. Since then the European Commission acts like a watchdog over the progress of reforms and has made multiple attempts to force member states to implement specific regulatory features, like independent regulatory agencies, or encourage countries to open their markets to new entrants and outside competitors.

For instance, when liberalising its electricity market, Germany chose a light-handed approach with members of the industry and the government trying to find a round-table consensus about market rules, instead of creating an independent regulatory agency. A regime based on negotiated third-party access was established. However, the European Commission insisted on the need of an independent regulatory agency and a regulated access system. Eventually, the German government agreed, created a Federal Network Agency, the Bundesnetzagentur, and shifted the main responsibilities for market surveillance from the Federal Cartel Office to the Bundesnetzagentur. Although a similar regulatory agency had already existed for a number of years in the German telecommunications sector, the compliance with the EU directive presented a significant shift in both mentality and institutional design from a post-WW II consensus-based functioning of the electricity sector to a more Anglo-American style of regulation.

The EU also uses the electricity platform as an instrument for pursuing political interests in its foreign policy. By extending its reach into the South-East European states of former Yugoslavia, Albania, Romania and Bulgaria, it has created the so-called Athens Process and dedicates substantial institutional and financial aid to the development of a regional electricity market. The foremost objective of the Athens Forum is the technical integration of South-East Europe's grid into the main transmission system of the EU, managed by the Union for the Co-ordination of Transmission of Electricity (UCTE), but secondary goals may include a pacification and regional integration of former war adversaries to prevent further conflicts. An electricity trader³ dealing with South-East Europe comments: 'What is interesting about energy is that the EU is using energy as its first tool to build the EU here [in South-East Europe], because they are forcing the countries outside the EU to adopt EU standards years before they get in [...] Energy is right at the heart of it.' A local expert⁴ responds to the question whether the process of convergence will be accomplished in the next five to ten years: 'It will happen much earlier, definitely, because there is a so-called Athens Forum, within this process is controlled by the European Commission, and they force all the countries in the region to do it even faster than the Western European countries did.'

Official EU documents hint towards an element of externally induced convergence. For example, the Electricity Transition Strategy, which was adopted by the Ministerial Council in December 2005, states that 'the European Commission put forward a strategy outlining the principles and the institutional necessities on which the development of the regional electricity market should be based. All South East European countries agreed to adopt European Union legislation and to set up a structure to monitor the operation of the market,' while 'the Treaty Parties agreed in an approach that outlines basic market design elements notably requirements of the EU legislation.' (Ministerial Council 2005: 3 and 16) [italics added]. An indirect critique of the 'harmonisation' efforts of the EU is expressed in a discussion paper of the European Federation of Energy Traders (EFET), which mentions several conditions that have proven to be 'fundamental requirements for the development of a liquid, well functioning wholesale power market,' including a supply-side surplus, non-discriminatory access to domestic high voltage transmission, reasonable transparency of information, etc. EFET states: 'The [...] pre-conditions listed above seem to us both from experience elsewhere, and in the South-Eastern Europe context, axiomatic. It follows that any attempt to *superimpose a*

3 Interview undertaken in Summer 2005 in London. The interviewee remains anonymous.

4 See previous footnote.

standard market design across a number of countries, at a time when some of them still do not display basic fulfilment of all of these pre-conditions, may be doomed to failure.’ (2004: 2) [italics added]

Proposition 1: The European Commission uses the binding character of directives to harmonise the core institutional design within its member states and pursue an expansionary policy by imposing internal standards on potential accession candidates.

III.B ‘Economic Patriotism’ of the Member States

Regulatory convergence may be in conflict with national interests, especially when a critical infrastructure service like electricity is concerned. The EU member states undergo cycles of pro-European and anti-European rhetorics. Even though the general direction is towards greater integration, ‘economic patriotism’ is a powerful, populist counterforce to an identification with the fairly abstract idea of a union that tries to overcome the last 200 years of successful ideological, cultural and linguistic nation-building by creating a multi-faceted demographic colossus with non-democratic and seemingly distant decision-making processes. Given the substantial member state discretion and the Union’s consensus-based enforcement powers in the implementation of European directives, an instinctive protectionist reaction can almost be expected. Glachant and Leveque (2005: 4) write in respect to the internal energy market: ‘The EU national diversity is first and foremost a predictable result of the nature of the compromises between the Member States, formalized by the European Community in the first directive of 1996. According to the insightful commentary of L. Hancher, this first directive allowed nearly everything, except... an integrated internal market! The Second Directive (2003) and its companion regulations managed to reduce the scope of this diversity, but not eliminate it.’

France is the foremost example of an anti-liberalisation agenda in the electricity sector. Heritier (2001: 841) describes the French strategy in the planning phase of the internal market: ‘The French government was concerned that the EdF public service model would not survive the liberalization of the energy sector [...] However, in basically resisting liberalization, France saw a two-fold danger: for one, in the absence of a Council policy, the ECJ [European Court of Justice] could rule against the French import and export monopoly; second, under its competition law [...], the Commission could liberalize by issuing a directive bypassing the Council. In this situation the French government proposed the single-buyer model, which offered the best possibility for maintaining the existing practice.’⁵ Similarly, in Germany all major parties as well as ministries on both federal and *Länder* level expressed scepticism towards the liberalisation of the sector, referring to questions about the security of supply, the universal service obligation and environmental protection (Eising 2002: 99).

Within and during the EU negotiation process, governments learn how to adapt to new circumstances and develop strategies to pursue their national interests, though. Eising (2002) identifies the ‘incremental negotiation technique’ of the Council of the European Union as a major factor in policy learning. It not only reveals each country’s preference set—which could be explained by a fairly static intergovernmental theory of policy negotiations—, but the incremental debate also ‘increases the knowledge about each element of the often highly complex regulatory proposals.’ (Eising 2002: 111) Going further, it could be postulated that while momentum for the internal electricity market gathered pace on a European level, governments learned how to transform their strategy sets from initial opposition to a more subtle approach of formally embracing the concept of liberalisation while pursuing an agenda to protect the values of the old system and the status of their utilities. For the case of France, Finon (2001: 3) identifies the balancing act as, on the one side, ‘to accept the regulations relating to competition, but as little as possible, the aim being to maintain as far as possible public services principles, the capacity for State action in matters of energy policy, and the strategic resources of the historical operator in European and international competition by preserving

5 That proposal was rejected, though, because of its incompatibility with the competition paradigm.

its integration,’ while on the other side ‘to preserve the legitimacy of the sector integration inside the public electricity enterprise by guaranteeing fairness in competition, by the transparent rules of access and the presence of an autonomous and empowered regulator.’ Indeed, after its initial resistance France subsequently complied, albeit hesitantly, with all the directives’ orders. It opened the electricity market from 22% in 1999 to 67% in July 2004, created a regulatory agency and a ‘quasi-independent’ (Finon 2001: 14) transmission system operator. Although Finon (2001: 18) comments that ‘it cannot easily be said that the industrial structures and market rules in France have the best profile by guaranteeing new institutional arrangements,’ the French government has refrained from full non-compliance and has opened the path to regulatory convergence.

Similar developments can be observed in Portugal and Spain. Jordana *et al.* (2005: 16) comment: ‘Liberalization at the national level in electricity moved swiftly beyond the requirements of the EU regime [...] What is most puzzling is the extent to which governments and national communities could adhere to EU rules on the one hand but find particular ways to continue to be engaged in mercantilist policies on the other.’ The authors identify the most common feature of ambivalence towards greater integration: ‘While adherence to the rules of EU regimes constrained uncompetitive behaviour by governments and market incumbents, it did not curtail it. In fact, there are still wide margins for strategic behaviour by politicians to pursue their ‘national interest’ policies. The two countries [Spain and Portugal] stuck to their ‘national champions’ policies.’ (ibid.)

‘National champions’ are local firms that are domestically protected and externally promoted. Theories of strategic trade policy—‘the government becomes the first player in a multi-stage game and can influence the equilibrium outcome of the game played by private agents by altering the set of credible actions open to them’ (see Brander and Spencer 1983)—and endogenous growth theory (Lucas 1988, Romer 1986) deliver the theoretical rationale for a protectionist agenda, further fuelled by general anti-globalisation resentments and fears of job loss and structural change within the firms. Examples of national champions range from EdF to E.On, Endesa Spain and Eletricidade de Portugal. Although European electricity markets are opening up to new entrants in all countries, cross-border transmission capacity is often scarce and limits full integration and competition. In that environment, national champions can use their free cash flows to expand internationally, like EdF and Tractebel in Latin American, and E.On in Eastern Europe, sometimes at the expense of domestic final consumers: The German anti-trust authority, for example, follows closely the interest group theory of regulation suggested by Stigler (1971) and Becker (1983): ‘When evaluating ‘national champions’ one should be aware that the perception of facts may be distorted because the beneficiaries of state intervention are more conscious of its effects and thus make themselves heard in the political process to a greater extent than those who suffer from state intervention.’ (Monopolkommission 2003: 578)

Governments may use domestic policy tools as a way to promote their utilities—often even against the advice of their own anti-trust authorities. One prominent case is the ministerial authorisation of German utility E.On taking over gas utility Ruhrgas, which was opposed by the German antitrust commission and the state of Nordrhein-Westfalen’s court of appeal. Despite two adverse special reports from the Monopolkommission and a temporary suspension induced by the court of appeal, the Federal Minister of Economics pushed the merger in an out-of-court settlement.

The European Commission has only limited authority to prevent governments from establishing national champions. In particular, the right to intervene in a member state’s anti-trust policy only exists if more than 36% of the joint business of the two firms (according to EU accounting rules) is undertaken in other European nations. However, repercussions on a European dimension, especially along the strategic energy value chain of electricity and gas, might occur even in cases below that threshold. In respect to E.On and Ruhrgas, Glachant and Leveque (2005) comment: ‘It is unfortunate the Commission did not claim any jurisdiction over this [the E.On-Ruhrgas] merger. Merger cases EnBW/EdF and EdP/GdP have shown that the Commission is not ready to be lenient in approving alliances that may hinder the liberalisation electricity process.’ Apart from Portugal’s merger between the main gas supplier and the main electricity company (which follows the lines of the E.On-Ruhrgas

case), the authors refer to EdF's acquisition of 34% of German utility EnBW's shares, in which it ordered EdF to sell almost 6000 MW of capacity—but only as *virtual* power plants (VPPs), not as a real divestiture (VPPs will be discussed in section VI.B on property rights, see also Willems 2006 for a theoretical treatment). Newbery (2002: 919) identifies the discretion left to member states as one of the commission's major problems: 'The EU lacks the necessary legislative and regulatory power to mitigate generator market power.'

The notion of creating national champions is, of course, not a feature of *all* EU member states. For example, Holland and the UK have less concentrated ownership structures. However, most of the countries follow a dual approach by officially and legally implementing the directives for energy liberalisation while allowing national champions to emerge. In the case of France, Finon (2001: 13) states: 'France has to manage to preserve its particular features (wide public service obligations and vertical integration) by demonstrating its ability to avoid competition discrimination and being proactive in the removal of direct barriers to cross-border trade, as is the case in the Florence process of access rules harmonisation.' The consensus-oriented, iterative process of EU negotiations and the resulting incomplete-contract character of the Directives strengthen the autonomy and discretion of member state governments in the interpretation of Directives, thereby opening possibilities of political partisanship in favour of domestic utilities.

Proposition 2: The majority of European governments relies more on a weak implementation of anti-trust policies than on outright opposition to regulatory convergence in order to pursue strategies of 'economic patriotism.'

III.C The Commission's Second-Best Strategy: Informal Regulatory Networks

The EU's economic mission—creating a single European market across its member states—is almost inevitably ideologically intertwined with a convergence of regulatory regimes, because borderless trade is facilitated by a harmonisation in rules and practices. However, the European Commission as the implementing body crucially depends on the approval of the member states. Eberlein and Grande (2005: 91) observe: 'On the one hand, thus far the political resistance of member states has not allowed any far-reaching transfer of regulatory powers to a supranational 'regulatory state'; while, on the other hand, the EU framework of rules to which member state regulatory regimes are subject does not fully match the functional need for uniform EU rules.' The authors argue that 'the resulting *regulatory gap* is partly filled by new types of informal institutions, the *transnational regulatory networks*. In certain circumstances, these regulatory networks offer a back road to the *informal* Europeanisation of public regulation.' [italics in the original] (ibid.)

The electricity sector provides an excellent example of this back road to cross-national convergence. Jorge Vasconcelos, the former director of the Portuguese regulatory agency and president of the Council of European Energy Regulators, confirms the existence of a regulatory gap within the EU procedures (2005: 2):

The first Internal Energy Market (IEM) directives defined some common rules to be applied by all Member States in order to open up their energy markets [...] However, these directives provided little guidance as regards cross-border energy trade, development of regional markets, interaction with non-EU markets, development of interconnectors, supra-national integration of energy markets, etc. Hence, a 'regulatory gap' between national markets and the EU internal energy market emerged.

He observes the tendency of establishing diverging regulatory regimes:

Looking at the way legislators and/or regulators started making use of this freedom [to shape their domestic markets], it was soon recognised that implementation of the 'common rules' directives could lead to incompatible trading arrangements and block cross-border trade if nothing was done. In fact, parallel liberalisation of 15 energy markets did not ensure the compatibility—and even less convergence or integration—of these markets. (2005: 7)

Vasconcelos then describes the development towards a transnational regulatory network: ‘The European Commission realized the difficulties arising from the omissions of the first IEM directives and the need for some degree of institutional co-ordination in order to overcome the existing “regulatory gap”.’ (2005: 8) In 1998, the European Electricity Regulation Forum, later called the Florence Forum, was initiated, and in 2000—within the framework of the Florence Forum—the Council of European Energy Regulators (CEER) was founded, mainly as a self-initiative of the regulators to discuss urgent topics more efficiently than in the larger Florence Forum, which includes multiple stakeholders like producers, traders, suppliers, consumers and market operators. As an official interface between the CEER and the European Commission, the European Regulators Group for Gas and Electricity (ERGEG) was established in 2003, whose purpose is to ‘advise and assist the Commission in consolidating the internal energy market.’ With the creation of ERGEG, a direct link was created between national regulatory authorities and the Commission, circumventing and omitting the institutional path via the respective governments. The cooperation between ERGEG and the Commission has certainly benefited from the pro-competitive ideological underpinnings of the national regulators. Compared with the equivalent institutions in the USA, the public utilities commissions, which have been serving their local constituencies in some cases over almost a century by tariff-setting based on rate-of-return regulation, the European regulators came into existence parallel to the liberalisation movement, with the UK regulator and the Norwegian agency being the pioneers in the first half of the 1990s, many other European countries following in the second half of the decade, and France and Germany initiating agencies in the new millennium. The principal *raison d’être* of the national regulatory agencies was the quest for a liberalised national or, later, EU-wide energy market. Hence, the regulatory gap was reduced by a chain of technical co-ordination and advisory committees favourable to liberalisation.

Eberlein and Grande (2005: 101) comment: ‘The most important resource for the informal co-ordination through networks is neither law nor money, but *information*. Particularly in the area of regulatory policy, which overwhelmingly involves knowledge-based, technically specialized areas of regulation, the availability and dissemination of credible information that meets professional technical criteria proves to be the most effective instrument for soft control.’ Harmonisation also occurs on the individual level in some sort of institutional isomorphism: ‘This inclusion in European-orchestrated networks transforms national representatives from “locals” into “cosmopolitans”, thus smoothing the way for a certain convergence of national regulation.’ [italics in the original] (ibid.) In the electricity sector, the absence of a joint European regulatory agency for energy is overcome by increasing coordination between regulators in different subregions, including France and the Benelux, Central Eastern Europe, or the Iberian Peninsula. Coordination was particularly fostered by so-called ‘Mini-Fora,’ which were established at the 11th Florence Forum Meeting and met from December 2004 for a limited period of time on a regular basis, discussing specific questions of closer regulatory cooperation within subregions, mainly on cross-border congestion management in the transmission network with the aim of the introduction of day-ahead co-ordinated market based mechanisms, such as auctions. Market coupling between France, the Netherlands and Belgium has since been implemented as a joint initiative between the respective regulatory agencies and power exchanges. The creation of an Iberian electricity market was envisaged in 2001, but it took several years and government changes in Spain and Portugal, until a joint Council of Regulators, comprising the representatives of both countries’ securities and energy regulatory agencies, was launched in 2005 and was given technical and administrative authority to establish a common organised spot market, located in Spain, and a financial derivatives market, located in Portugal.

Proposition 3: If regulatory convergence cannot be fully achieved on a regional level, informal regulatory networks based on technical co-ordination of specialised state agencies are created, and the integration of sub-regions is fostered by those networks.

III.D FERC's Failed Top-Down Inducement in the United States

In respect to its institutional structure, the regulatory energy landscape of the United States seems at first sight like a projection of the EU and its member states on a single but decentrally organised country: The Federal Energy Regulatory Commission (FERC) decrees standards and suggests features of a standardised market design, while individual states and the state regulatory agencies, the Public Utilities Commissions (PUCs) follow more or less closely the orders. A more thorough analysis of the decision-making mechanisms reveals, however, that substantial differences exist between the EU and the US.

With Order 888, FERC opened up the individual transmission systems to third-party access in 1996, but when it tried to impose a standard market design (SMD) based on the fairly successful rules of the PJM (Pennsylvania-New Jersey-Maryland) market in 2002, it failed to find political support in many jurisdictions. For example, Gray Davis, the then-governor of California, called it ‘nothing less than a hostile takeover of California’s electric grid by the federal government,’ as quoted by Hunt and Sioshansi (2002: 38), who expand that ‘the governor’s four-member appointees to the CAISO’s board (Californian Independent System Operator) voted unanimously to fight FERC on several fronts.’ Opposition was also expressed by representatives of utilities like PNGC Power, a small cooperative from Oregon: ‘Historically, the various regional electrical systems have grown into very different forms to meet regional topography, climates, load distributions, generating system type and ownership patterns. There is no need to implement the entire SMD in parts of the country that are not suffering the perceived ills that SMD remedies [...] FERC should honor and recognize the legitimate differences in regional electrical systems.’ (Scott 2002: 92) Morrison (2005) speaks of ‘some legitimate parochialism’: ‘Regulators in low cost states have a statutory obligation to look out for the interests of consumers in their states. They cannot legally support a policy that will lower electricity prices in a neighbouring state if it does so at the expense of consumers in their own state.’

The intention of FERC to force convergence in market designs across the US was doomed to fail, in parts because of its messianic approach—‘no region has been exempt from market design flaws of one type or another [...] Only standardization of electricity markets design will solve these problems. Our goal is [...] to raise the quality of all electricity markets simultaneously’ (FERC 2002: 3)—, in parts because of the loss of momentum in electricity market liberalisation, which was exacerbated by what Malloy (2004) calls the ‘four horseman of the apocalypse,’ namely the California blackouts, the collapse of Enron, the meltdown of trading activities, and the 2003 blackout in the North-Eastern USA.

A watered-down version, issued in the FERC White Paper on Regional Markets in 2003, accepted the principle of subsidiarity and gave ‘more room for regional implementation’ (DeJong 2004: 14). Since then, a parallel development takes place across the country: a small number of regional markets with a centralised dispatch and competitive features on the wholesale level, especially in the North-East, are prospering and growing, while many states, mainly in the South-East and North-West, have no intention to implement competitive elements in their electricity sector. Texas with a separate grid entered late into the liberalisation process, but learned from the failures of some of its predecessors, whereas California is stuck in a hybrid system with competitive elements but also a legacy of anti-competitive long-term contracts signed in the aftermath of the major supply crisis in 2001.

None of the ‘four horseman of the apocalypse’ has yet appeared in the EU and hampered its liberalisation efforts, and that might explain a major difference in the dynamics of regulatory convergence across the Atlantic: While European regulation encourages the creation of an internal electricity market but delegates the technical details to inter-country expert advisory groups, FERC suffers from an acute problem of legitimacy in defining the overall goal of the process. Many interest groups express explicit scepticism against FERC’s policies. For example, a commentary by the Freedom & Progress Foundation, which was later published in the *Electricity Journal* (Lenard 2004), states:

In the absence of Congressional action, ‘competition policy’ has been driven by FERC, which [...] has not had a consistent policy. The current FERC has been very aggressive in pursuing its particular vision of electricity ‘competition,’ which, to say the least, is quite controversial [...] The

SMD proposal provided very little flexibility. It proposed to design power markets and institutions at a level of detail virtually unprecedented in our economy [...] In sum, SMD was a new centralized regulatory regime, not obviously better than the old one.

The author comments ironically: ‘On the positive side, FERC has been sufficiently constrained so that it is not able to force the new model everywhere. So, to the extent that the new market design is not optimal for all time and every place—as the FERC apparently believes—at least it will not be in place everywhere.’

Elcon, the national association for large industrial users of electricity, claims that—despite their general support for liberalisation—the new markets suffer from the fact that ‘the FERC-Jurisdictional “Organized Markets” simply are not competitive,’ because ‘the “market rules” are simply a form of “competitive bidding”, while ‘units “on the margin” (primarily gas units) set the prices for all units, even those coal and nuclear units that were depreciated by payments from captive ratepayers,’ and ‘regulators keep adding additional revenue streams for generators such as ICAP, LICAP, RPM, etc. [mainly different forms of capacity payments] as means to assure “resource adequacy”, even though these schemes are not working.’ Elcon rhetorically answers its own question: ‘So what have we gained?—A very complicated and expensive new form of regulation—certainly NOT competition.’ (all comments from Anderson 2006a)

The neo-liberal think tank Cato Institute goes even further and recommends an outright return to the old system: ‘The poor track record of restructuring stems from systemic problems inherent in the reforms themselves. We recommend total abandonment of restructuring and a more thoroughgoing embrace of markets than contemplated in current restructuring initiatives.’ Given the scepticism and anti-power liberalisation rhetorics in many jurisdictions, the institute opts for an ideological and institutional retreat: ‘We recognize that such reforms are politically difficult to achieve. A second-best alternative would be for those states that have already embraced restructuring to return to an updated version of the old, vertically integrated, regulated status quo.’ (Van Doren and Taylor 2004: 1)

Although many political and corporate players agree on the superiority of competitive markets in principle, a diverse and broad coalition, ranging from public utilities commissions to large industrial users and neo-liberal think tanks, oppose the Federal Commission’s quest for standardisation and convergence—at least under the designs that have been suggested up to now.

Proposition 4: The US Federal Energy Regulatory Commission has lost the credibility and institutional support to effectively implement a standardised market design.

III.E FERC’s Second-Best Strategy: Regional Transmission Organisations

Since the top-down approach of federal regulatory standardisation has failed, the subsequent level in the hierarchy tackles individual states or intra-US regions. In fact, FERC is still able to play a role in any regional aggregation, because it is responsible for inter-state transmission regulation. This is, to some extent, FERC’s backdoor into the process of regulatory harmonisation, and the commission is actively pursuing a strategy to establish regional transmission organisations (RTOs). But the focus on subregional integration is also based on the success of cooperation between states in implementing the previously mentioned ‘organised’ electricity markets, among them Pennsylvania, New Jersey, Maryland which formed the PJM pool, or the New England states.

In 2002, FERC granted the status of the first functioning RTO in the USA to PJM⁶. PJM has gradually expanded over time, from 10 member companies in 1993, when it was still the

6 PJM already existed as a joint power pool between Pennsylvania and New Jersey since 1927. In the 1950s and 1960s, joint capacity planning and a coordination of operating reserve requirements were launched between the five participating utilities, and in 1973 the PJM pool started to be centrally dispatched. In fact, during the 1970s and 80s PJM operated already under a pool-wide transmission tariff and a cost-based energy market within a single control area. The new

interconnection association, to over 400 members in 2006. It covers 13 states of the USA and the District of Columbia, which includes the capital Washington. It has increased the number of people served from 22 million in 1993 to 51 million people and integrates more than 1,000 generating entities. In 2004, American Electric Power (AEP), one of the bigger electric utilities in the United States, delivering electricity to more than 5 million customers in 11 states and owning the nation's largest electricity transmission system, handed functional control of the flow of wholesale electricity over AEP's high-voltage transmission lines in the company's seven-state Eastern region over to PJM. In the company's Q&A website, AEP justifies its decision in the following way:

FERC encourages utilities to join regional transmission organizations (RTOs) to support and foster robust wholesale power markets. A condition of AEP's merger in 2000 with Central & South West Corp. was AEP's entry into a FERC-approved RTO. AEP chose PJM over other RTOs because it is the most established and mature of the FERC-approved RTOs adjacent to AEP's eastern service territory and has a proven performance record.

PJM became not only responsible for the reliability of the extended transmission system, but AEP's transmission and generation operations, commercial processes and data systems have been integrated into those of PJM (*ibid.*). The joint operating agreement 'represents a major step toward development of a common market, which FERC advocates,' according to AEP's Q&A (AEP 2006).

Future developments of PJM are likely to include a closer cooperation with the Midwest Independent System Operator (MISO) to develop complementing system operations and a joint wholesale electricity market. The new entity would stretch over 23 states, the District of Columbia and the Canadian province of Manitoba. An additional expansion could include the South-West Power Pool (SPP), which gained RTO status in 2004. Albeit not a functioning wholesale market by itself, SPP revised some features, for example by substituting a zonal rate structure for transmission services by a real-time market based on locational marginal pricing, which is modelled on the PJM system. Close cooperation in seams issues, i.e. features of technical, administrative and regulatory incompatibilities, between PJM, the neighbouring New York pool and the New England pool is organised by the North American Energy Standards Board (NAESB) and already fairly advanced, leading to further harmonisation across regions.

US state regulation has often been described as a laboratory where new practices are tested (see e.g. Weiser 2003 for the case of telecommunications). The most successful design features are then adopted by other states or centrally on a federal level. This form of policy diffusion can still be observed in individual design *modules* like nodal pricing. However, the interregional grid structure (with the exception of Texas' separate network) exacerbates the tendency that mimicking of state level experiments has largely been substituted by a radial expansion of regulatory policies according geographical proximity, most notably after the failed experiment in California.

Proposition 5: In the USA, market design convergence follows a regional expansion pattern, induced by the creation of regional transmission organisations.

IV. The Spectrum of Bottom-Up Reactions

The European Commission's and FERC's attempts to implement a standardised electricity market design have been deviated from direct top-down strategies to a control shift towards informal regulatory networks and the creation of regional transmission organisations, respectively. Resistance

(Contd.) _____

competitive PJM model, introduced in 1997, suffered from several design flaws, most importantly a single-zone pricing approach which led to transmission congestion and was soon replaced by a nodal pricing system. Several further modifications of the design took place in order to improve system performance. In January 1999, daily, monthly and multi-monthly capacity markets were introduced, and six months later an auction market for financial transmission rights was established. Locational marginal prices are calculated for each node in the network every five minutes in order to reflect transmission congestion in the electricity pricing. In its current state, the PJM pool corresponds most closely in the country to what the FERC proposed in its standard market design.

from member state governments and public utilities commissions has been a major factor in adopting these alternative paths. As already emphasised in the case of the US, the political bargaining machinery is not limited to these subsequent levels of political decision-making, though. On the contrary, multiple interest groups and stakeholders try to shape the new model according to their preferences. The impact of these bottom-up reactions is particularly pronounced in the absence of a broadly accepted design template and a rather increasing than decreasing uncertainty about the overall benefits of systemic change.

In this chapter, we will discuss the attitudes of major stakeholders towards regulatory convergence. By merging each interest group into one transatlantic section, we directly highlight the similarities and contrast the differences between individual positions in the USA and Europe, thus contributing to a better understanding why the outcome of the bargaining process has been pushed into different directions. In particular, we will examine the positions of traditional utilities, merchant generators, traders, large industrial consumers, and, last but not least, non-governmental organisations and consumer advocacy groups.

IV.A Utilities

Market design convergence may encounter opposite reactions from corporate entities: The foremost advantage of a harmonisation in the regulatory framework for private actors is, of course, a familiarity with the rules, modules and mechanisms employed in the complex handling of subsequent markets, real-time dispatch, transmission pricing etc., which facilitates an expansion into new territories without lengthy adaptation to a new regulatory architecture. Also, companies that rely on cross-border transactions like electricity imports and exports benefit from standardisation. However, diverging market designs can create a comparative advantage of local firms versus new entrants, both from abroad as well as local newcomers, not only by setting up complicated procedures but also by integrating terms and conditions favourable to the incumbent and its specific supply or transmission structure and resource endowment. Under the old public service model, electricity utilities generally enjoyed a demarcated monopoly, and it can be assumed that the predominant strategy of utilities is to preserve their territorial dominance against new entrants by erecting barriers of entry. In the complex field of electricity regulation, a cooperation between the state-level actors and the utility (or utilities) is not implausible, if managers, bureaucrats and politicians share a similar value system, for example because of the same educational background. The dilemma of French politicians to comply with European directives while keeping public sector principles intact, which has already been discussed in section III.B on nation states in the EU, provided some evidence of the difficult change in political and corporate culture:

In France, the Ministry of Industry (Ministère de l'Industrie) and the national utility EdF dominated the domestic decision-making process. During the liberalization process, both actors broadly agreed on their positions. The Ministry of Industry acted mainly as the 'sponsoring department' for the national monopoly utility. Those actors favoring a comprehensive liberalization of the French sector—like the competition directorate in the Ministry of Economics and Finance, several large industrial conglomerates, and some local distributors—did not play a major role. (Eising 2002: 97)

On the European level, the utilities 'even founded an EU trade organisation to defend their domestic positions,' (Eising 2002: 93) called Eurelectric. 'In general, Eurelectric formulated a defensive posture in favour of the status quo and suggested a vaguely defined and minimal market opening to satisfy the Commission plans.' (ibid.) Utilities can also use their knowledge how to influence the regulatory process to their favour: In the EU, a substantial amount of regulatory diversity still exists with respect to the interconnections between the individual markets (section VI.A on seams issues will discuss this topic in more detail). Several proposals for a harmonisation of practices are under discussion, including implicit and explicit auctions of cross-border transmission capacity, but no standardised design has yet been implemented, which gives utilities an opportunity to unilaterally

decree technology-related rules that fit into their strategy set and cannot be easily contested because of information asymmetries. For example, in a response to a consultation regarding the regional market integration between the wholesale electricity markets of the Netherlands, Belgium and France, representatives of the trading branch of Germany's second-largest utility RWE complain:

Especially in Belgium and France, where main parts of generation and supply are in the hand of a single company we can agree to the conclusion that there is a risk of market manipulation of these dominant market players. Moreover this fact might bear the risk to dominate the B-, F- and NL cross border capacities and relevant prices for buying these capacity shares. RWE Trading has a strong interest in having fair, liquid and well working regional markets which are—commercially and electrically—connected to the maximum extent. (RWE Trading 2005)

At the same time, the European Federation of Energy Traders remarks: 'A lot of pro-rata curtailments took place in the direction from Germany to France during the first months of 2005. In order to manage this new situation, RWE Netz and EnBW Netz decided unilaterally, without market consultation nor consultation with neighbouring TSOs, to implement a one-sided and uni-directional (Germany to France) explicit auction mechanism.' (EFET 2005: 4) These local initiatives are certainly short-lived in a converging European regulatory architecture, but they may be indicative for the strategic options that utilities can still use, especially when they are vertically integrated.

In the USA, the American Public Power Association (APPA), a trade association representing publicly-owned electric utilities (state and local ownership) and serving 43 million people, was an 'an early and strong supporter of FERC's open access transmission policy and ISO [independent system operator] formation.' (APPA 2004: 3) The organisation 'also supported the formation of properly structured, cost-effective RTOs, with their promise of independent and non-discriminatory transmission service provided under Open Access Transmission Tariffs.' However, its representatives convey scepticism about one of the main features of FERC's second-best harmonisation strategy, the creation of regional transmission organisation (RTOs): 'APPA members located in RTO regions report substantial, across-the-board problems with spiralling RTO costs, unaccountable governance, lack of understanding of transmission customer and end-user needs and less-than-satisfactory service options. They see more and more RTO services being provided through questionable market mechanisms, and RTO resistance to any questioning of the economic theories underpinning these actions.' (2004: 6) As a consequence, APPA issued a White Paper on electricity restructuring that pledges for adaptability and diversity in regulatory designs, according to technical, institutional and strategic differences: "

Some regions have a history of using contractual arrangements and regional institutions or practices to capture many of the benefits claimed for RTOs at less risk and cost, and have shown a willingness to pursue alternatives to enhance transmission access and the efficiency of existing markets. Other differences include the prevalence of jointly owned generation and transmission, the radial nature of transmission systems connecting remote generation to loads, the predominance of hydropower in the generation mix, differences in population density,

and so forth. The organisation outspokenly opposes convergence according to the FERC proposal: 'The American Public Power Association ('APPA') believes that RTOs are not the only—and in many regions not the best—structure for providing non-discriminatory transmission access. Thus, regional diversity must be acknowledged, and more pragmatic and flexible federal transmission policies implemented to deal with the reality 'on the ground.'" (2004: 2)

Proposition 6: Utilities in the EU and in the USA pursue a dual strategy by officially embracing competition while preserving or fostering regulatory diversity in their home territory.

IV.B Merchant Generators and Traders

Merchant generators and electricity traders are a fairly new phenomenon in the electricity sector, and for obvious reasons an offspring of the reforms. As new entrants into markets dominated by the

traditional utilities, they can be assumed to be the keenest supporters of far-reaching liberalisation and the creation of new trading opportunities, crucial for survival and expansion.

In Europe, which saw new entrants in the traditional technologies of thermal generation enter rather through acquisitions of divested assets than through Greenfield investments, merchant generators (or independent power producers, which is a nomenclature more common in the European sphere) do not seem to have a strong independent lobby. If at all, they are absorbed by Eurelectric, whose ambivalent stance towards liberalisation has already been discussed in the previous section.

There might be different reasons for the absence of an efficient lobby organisation of European independent power producers: Merchant generation in Europe, with the exception of the United Kingdom—which follows different mechanisms of regulatory evolution than continental Europe –, is still in its infancy. Furthermore, particular interests of IPPs might be well represented by the influential European Federation of Energy Traders (EFET). Special cases are the providers of renewable energy, which indeed have their own organisations (see next section). The situation in the USA seems to be the inverse of the European case: Merchant generation was starting in the 1980s, after PURPA allowed independent power producers (IPPs) to set up their own plants, and booming during the 1990s with the rise of CCGTs (combined-cycle gas turbines). IPPs are well organised in the Electric Power Supply Association (EPSA), while electricity traders do not have their own organisation and seem to be a sub-chapter of the EPSA. One of the reasons for the low-key appearance of traders in the US might be the downfall of Enron, which provided the most successful trading platform during the 1990s. Hence, we will discuss EPSA's position for the USA and EFET's position for the EU.

EPSA represents the independent power producers in the USA, whose share rose from 5% in 1998 to 40% in 2003 (EIA 2003). The organisation's pro-competitive stance is reflected in their positions towards market design: 'It is important to keep in mind that implementation of market design elements on a piecemeal basis will not provide complete customer value and the reliability benefits of fully functioning competitive markets.' (2005: 5) EPSA mainly backs the standard market design feature proposed by FERC. For instance, it endorses the centrally administered day-ahead, realtime and ancillary services markets, and the management of transmission congestion according to Locational Marginal Pricing (LMP) with a possibility to use financial transmission rights for hedging purposes: 'A congestion management system based on LMP continues to produce the most efficient, least cost and non-discriminatory results when curtailments are necessary.' (2005: 3) Even the highly contested capacity markets are necessary to maintain existing generation and foster new generation investment, according to EPSA, 'when energy price mitigation is a pervasive and structural feature of organized markets.' However, the organisation comments that 'this issue is integrally tied to the problems associated with energy mitigation and the lack of scarcity pricing in the organized markets.' (2005: 4) Instead of radical changes of the existing architecture, EPSA places more lobbying efforts to ensure a fair access to the transmission grid for merchant generators, especially in the systems that still follow traditional regulation, and a non-discriminatory dispatch of its plants. As opposed to many other interest groups in the US (for example, the large industrial users that will be discussed below), merchant generators follow a strategy of general approval of the FERC-proposed market design scheme.

Electricity trading can be pursued as over-the-counter (OTC) transactions, which corresponds to some extent to bilateral contracts, and trading in organised markets. In the US, trading in organised markets has been severely battered by past events. ISDA, the American International Swaps and Derivatives Association, whose contracts are widely used in energy trading, comments (2003: 9):

The effects of Enron's bankruptcy, which shattered more than the illusion of its own creditworthiness, were wide ranging. In particular, the loss of a major trader that had been perceived as investment grade—albeit barely—proved an object lesson in the importance of creditworthiness in financial markets. More immediately, the weak credit standing of many of the remaining energy trading companies now became apparent. The result was a collapse of volume in natural gas and, to a far greater extent, power derivatives markets.

Since then, trading has regained importance. In 2003, for example, ISDA and the Edison Electric Institute (EEI) joined forces to formulate a North American Power Annex to the ISDA Master Agreement Schedule: ‘The Annex was developed to enable market participants to enter into physical power purchases and sales as well as financial derivative transactions under one agreement. It is structured to be consistent with EEI documentation already in use in the North American power market and will offer a new method for documenting power transactions under the ISDA Master Agreement.’ (EEI 2003)

Efforts of standardisation are also undertaken in European electricity trading. In contrast to the USA, trading in the EU did not experience the traumatic consequences of the Enron debacle. Traders in the EU are often backed by powerful parent companies, and their opinions are heard and positions are integrated in the process of establishing a common architecture. Apart from the general urge to fully unbundle transmission and generation activities of the incumbent utilities to create a level playing field without discrimination against new players, traders also lobby in the decision how to regulate cross-border transmission and under which mechanism to allocate capacities, especially in congested lines. EFET, the European Federation of Energy Traders, has issued a series of position papers and is actively involved in the negotiations on the European level. EFET’s positions of course reflect a strive for greater trading opportunities. In the case of transmission capacity, EFET favours explicit auctions and split markets as opposed to a coordinated pricing mechanism on a regional or European level based on implicit auctions, which is considered economically more efficient by many scholars⁷:

It is highly unlikely that the EU will—or indeed should—adopt a common market design for all elements of trading arrangements, even across the UCTE [Union for the Coordination of Transmission of Electricity area]. It would be difficult, potentially impossible, to reach agreement on the precise details of such a market and national TSOs are likely to want to retain some direct control over local rules [...] Neither is it necessarily desirable to adopt such a design, since the economic characteristics of different markets—in terms of fuel mix and plant dynamics—may lead to differences in the ‘optimal’ dividing point between unrestricted competition and the point at which TSOs should take over to balance the system and manage constraints.(EFET 2005b: 2)

The traders conclude: ‘Faced with these difficulties, EFET believes that the key to integrating EU markets successfully is not to prescribe a uniform solution, but to maximise the opportunities for the ‘market to work’ by moving to dynamic, flexible, continuous and inclusive trading arrangements.’ (ibid.)

Nevertheless, the coordination of trading schedules and standardised trading arrangements are one of the major concerns of the traders. In the same position paper, EFET comments (2005b: 1): ‘One of the key barriers to realising this single market vision is the lack of harmonisation and integration between the practical operation of different national markets. Across the EU, market participants face radically different market structures and rules, radically different timetables for the ‘trading day’, different and frequently onerous balancing arrangements, and a plethora of IT platforms for trading and scheduling.’ As a remedy, EFET has developed a set of standardised contracts for energy traders, which are now in use over most of the EU’s connected power grid and are often referred to as ‘EFET contracts.’ The organisation also considers supplementing its contracts with a physical commodity type agreement ‘that could be used to trade numerous different wholesale physical commodities and products.’ (EFET 2005c: 38) EFET is equally active in business process standardisation by harmonising payment dates to facilitate cross-commodity payment netting and cross currency netting, and by developing software tools for electronic deal confirmation matching.

Proposition 7: While merchant generators generally support regulatory convergence, electricity traders favour market designs that maximise trading opportunities. They actively contribute to convergence by the standardisation of trading contracts, data exchange and business processes.

⁷ see Bunn and Zachmann (2006) for a discussion on the French-England transmission case.

IV.C Merchant Generators of Renewable Energy

Independent producers of renewable energy have a very specific agenda in market design convergence. Many renewable energy sources and technologies are not yet commercially viable, which is, according to the proponents of the technologies, mainly induced by the fact that negative side-effects of power generation like global climate change or local pollution are not yet monetarily added to the costs: ‘If externalities were incorporated in the current market prices, the perceived cost of renewable energy would be practically unchanged, whereas the perceived low cost of conventional technologies based on fuel cycles would increase dramatically with the incorporation of their external costs.’ (EWEA 2005: 15) Accordingly, the political will to promote renewable energies has to be translated into subsidisation schemes and mechanisms beyond pure market forces. Implementation tools vary across countries and states in the EU and the US, and the respective approaches towards regulatory convergence follow different strategies. We will first discuss the EU and then compare it with the USA.

A diverse range of measures, including investment-based tax incentives, soft loans, ‘green’ certificates and pre-specified feed-in tariffs, has been implemented in individual European countries, following the old scheme of national energy policies rather than an integrated, EU-wide approach. Denmark, for example, has not only introduced fixed premium prices for wind power and biomass, but has already started in the mid-1970s to actively promote R&D in wind turbine technology. From 1999 onwards, Germany followed a strategy of distributing favourable loans for photovoltaic panels in the so-called 100,000-roofs programme. In addition, with the new millennium the government implemented a law that secures feed-in tariffs for different kinds of renewables.

With its European Directive 2001/77/EC on the promotion of electricity from renewable energy, member states accepted (non-binding) targets on the share of renewables in the overall electricity supply. Although the initiative of the European Renewables Directive was welcomed by marketers of renewables, the European Wind Energy Association—the interest group of the most promising and fast expanding new renewables industry—remains cautious of shifting the responsibility for promoting renewables away from the nation states: ‘Any change towards an EU-wide system at present would stall the development of renewable policies in many Member States by at least another 2-3 years—at a critical time for the technologies. The present efforts of Member States would be wasted and such a move could have devastating effects on national markets where signs of activity are at last beginning to show.’ (2005: 73) In particular, interconnection regulations for wind power differ according to country grid codes and the voltage level at the point of coupling between power producer and transmission infrastructure: ‘The great variety of national regulations is not always an advantage for wind turbine manufacturers. However, a Europe-wide harmonisation of interconnection regulations designed for high penetration situations is also not yet desirable, because some requirements pose an unduly heavy impact on wind turbine design and cost, and hence on the investors and operators of wind farms.’ (2005: 75) Ultimately, pan-European regulation could erode the benefits and special treatments that lobbying groups have tediously but successfully cumulated over the years in a number of countries, and a ‘race to the bottom’ in terms of renewables treatment could be the consequence.

Proposition 8: European marketers of renewable energy have an interest in preserving national regulations with country-specific instruments to promote renewables, instead of establishing joint regulation.

The situation in the USA differs largely from the European experience. Although the US Senate voted in favour of a nationwide Renewable Portfolio Standard, requiring all utilities under the jurisdiction of the Federal Energy Regulatory Commission (FERC) to generate at least 10% of their electricity from renewable energy sources by 2020, the proposal was eventually rejected by the Congress in its 2005 Energy Bill. However, on the state level, Renewable Portfolio Standards (RPS) have become the preferred regulatory option to promote renewables in the US. In 2006, 22 states and the District of Columbia have implemented some form of RPS. Depending on individual state legislation, they determine both time and amount of the increase of certified renewable energies in the

supply mix, ranging from fixed targets, like Minnesota with at least 1250 MW by 2013, to California with a renewables supply of 33% in 2020 (Rabe 2006: 5). RPS can have very different design features. More market-oriented models with renewable energy credits (RECs) that can be sold and bought are implemented in the New England states, while some Western states, like Nevada and New Mexico, follow a more traditional single-buyer approach with utilities obliged to buy renewable energies on long-term contracts. A multitude of differences between individual RPS exist, mainly concerning the geographic eligibility (in-state or regional) and the resource eligibility (which renewables qualify for the standards).

However, one of the most striking features of Renewable Portfolio Standards is that they have spread across the whole spectrum of electricity market designs, from states that still stick to the old monopoly model to states that have established competitive wholesale markets. Irrespective of the status of regulatory reforms in the different states, a development parallel to the stagnating deregulation efforts and the expansion of regional markets has emerged, leading to some regulatory convergence in the niche of renewable energies by policy diffusion and emulation beyond purely radial expansion, with some states being the ‘policy laboratory’ for successful practices that are modelled in states that are not necessarily geographically adjacent to the pioneers. Given the Bush administration’s long resilience against climate change policies, Rabe (2006: 1) detects an ‘unexpectedly high level of state government engagement in developing policies to reduce greenhouse gases’ and even postulates a ‘race to the top’ in US American renewable portfolio standards. Peripheral federal organisations like the Environmental Protection Agency’s Combined Heat and Power Partnership (CHP) support the standardisation of mechanisms by releasing best practices guides for the implementation of renewable portfolio standards (see e.g. CHP 2005).

The manufacturers and service providers dealing with renewable energies play an active role in pushing for a convergence of rules across states. In particular, the legitimacy and credibility of markets for emissions credits and renewable energy credits, also known as tradable renewable certificates (TRCs), or green tags is enhanced by inter-state initiatives like the Green-e Renewable Electricity Certification Programme, which sets up criteria for REC eligibility of renewable resources. Its governance board is advised by representatives of marketers of Green-e certified or REC products, a committee of utilities that offer Green-e certified products, and a number of stakeholders like environmental groups, consumer protection advocates and policy makers. Green-e sets up a standard that allows certified electricity to be transmitted and accredited not only within the defined area of an independent system operator (ISO), a Regional Transmission Organisation (RTO) or a Balancing Authority Area, but also to an adjacent ISO or RTO or Balancing Authority Area region, or even from and to Canada under a compatible Canadian certification scheme.

Proposition 9: In coalition with state lawmakers, some federal agencies, consumer and environmental advocacy groups, US marketers of renewable energy pursue a strategy of regulatory convergence based on Renewable Portfolio Standards and Tradable Renewable Certificates, irrespective of other market design features.

IV.D Large Industrial Users

Large industrial users were among the first and most outspoken supporters of electricity market liberalisation—both in the high-price states of the US as well as in Europe—, for the expected benefits, in particular the direct access to wholesale markets, would increase their bargaining power towards suppliers and allow for substantial cost-savings. In Europe, this theory still holds: IFIEC Europe, the European branch of the International Federation of Industrial Energy Users, pushes for greater integration and for limiting market shares of generators (IFIEC 2005: 2):

Today, IFIEC Europe does not consider the EU to be the relevant market yet; in most cases, relevant markets are, in effect, still the national ones. Therefore, IFIEC Europe invites EU Member states to establish similar rules and measures for their national electricity markets in order to limit market power using an appropriate threshold for generation capacity [...] As long as markets are

not integrated EU-wide competition is blocked with the effect that regional and national markets are more easily dominated by the large generators. Within a European market crossborder trading needs to be as feasible as within today's constricted areas. We need the same economic procedures to buy and sell electricity across borders as they exist today in most national markets.

The organisation encourages efforts by the European Commission to establish an internal energy market: 'IFIEC Europe supports fully the Commission's objective of pan-EU gas and electricity grids, but this is a long way from reality [...] The Commission clearly recognises that the infrastructure development needed presents a long term challenge if the Directive's objectives are to be met. IFIEC Europe agrees with this assessment and strongly supports initiatives leading to a more effective arrangements and preferably, ownership unbundling.' (IFIEC 2006: 2) Hence, the major concern of large industrial users is the strategic use of generators' local market power, which may be alleviated by cross-border interconnections and 'more efficient,' i.e. harmonised trading opportunities, which mainly corresponds to the European Commission's judgment.

On the national level, large industrial customers may prefer specific solutions diverging from the competition paradigm, though, when it is favourable to their business interests. For example, large industrial users of electricity in Spain have been eligible to sign so-called 'interruptibility contracts', which allows for discounts on their (regulated) electricity price if they are willing to get their electricity cut off in moments of demand-supply imbalances. Fraser and Van Siclen (1999) comment in a joint OECD/IEA report: 'As there is substantial surplus of supply in Spain, most large consumers have been willing to accept this discount.' In addition, they have been exempted from paying additional costs associated with independent power production if they purchase their power on the market, a privilege named 'special regime.' (ibid.) The 'interruptibility contracts' have not been abolished since liberalisation, but were actually renegotiated in 2006. AEGE, the Spanish association of large consumer of energy, considers it an essential tool to integrate effective demand-side management into the dispatch, given that 600 MW can be cut instantaneously for a short period of time, and a total of 3,500 MW can be interrupted for longer periods, albeit with previous announcements. The association asserts: 'The most vulnerable clients [in the electricity market] are the energy-intensive companies manufacturing products that are exposed to global competition [...] Since 20 years, Spain is pioneering very powerful demand side management with low tariffs. Thanks to those instruments, the Spanish primary industry has been able to compete with its Central European colleagues after Spain's integration into the Common Market.'⁸ (AEGE 2006: 29) Perez-Arriaga (2005: 94) criticises: 'The problem of this type of mechanisms [apart from the Interruptibility Contracts, Perez-Arriaga also refers to special night tariffs for residential consumers] is that they do not reflect the real system prices, but an approximation undertaken ex-ante by the regulator without a coherent methodology of calculation.'⁹

In the USA, the national association for large industrial users of electricity (Elcon) 'was the earliest advocate for competition. In the mid-80's Elcon saw the benefits of large, seamless, nondiscriminatory electricity markets with standard rules for all consumers. We [i.e. Elcon] believed then—and still believe now—that 'real' competition would discipline artificially high prices that came from regulation.' (Anderson 2006b: 4) However, any congruence about the future direction of regulation in electricity markets between FERC and Elcon does not exist. In particular, Elcon's position towards the most successful market model¹⁰, the PJM 'organised market' with nodal pricing and some form of capacity payments, representing to a large extent FERC's standard market design, provokes fierce

8 The original text is as follows: '*Los clientes más vulnerables son las empresas intensivas en energía fabricantes de productos sometidos a competencia global [...] España, sin embargo, es pionera, desde hace 20 años, en señales de gestión de demanda muy potentes, pero bajo tarifa. Gracias a esas medidas de gestión, la industria básica española ha podido competir con sus colegas centroeuropeos tras nuestra incorporación al Mercado común.*'

9 The original text is as follows: '*El problema de este tipo de mecanismos es que no reflejan los precios reales del sistema, sino una aproximación realizada ex-ante por el regulador sin una metodología coherente del cálculo.*'

10 Elcon's critique has already been presented in section III.D on FERC's attempt to implement a standard market design.

opposition. The Executive Director of Elcon asserts that ‘today’s “market” conditions are worse than traditional regulation, and that today’s “market” structure is not sustainable.’ (Anderson 2006a: 3) Elcon addresses a number of—what they consider—‘design flaws,’ including price caps and nodal pricing. The organisation’s concern is that effective competition can only be induced by a different market design. In respect to price caps, they state: ‘True competition requires that prices must not be administratively capped or mitigated [...] such actions reduce the market incentives that would assure resource adequacy.’ (Anderson 2006b: 3) Nodal pricing and financial transmission rights are equally counterproductive, according to the organisation:

While advocates of the LMP pricing scheme asserted that the LMP prices would ‘incent’ the construction of new generation or transmission to mitigate the constraints, the facts simply do not support such assertions. Nodal pricing actually creates a greater DISINCENTIVE to build, and today’s ‘financial transmission rights’ (FTRs) in place of physical transmission rights simply do not protect consumers from the very significant congestion costs of the transmission constraints. [capital letters in the original] (Anderson 2006b: 14)

While industrial users and the European Commission agree on the core design of a future integrated market in the EU, the fundamental opposition of industry groups in the USA against ‘organised markets’ following FERC’s standard market design shows that a broadly accepted regulatory design has not yet emerged.

Proposition 10: Large industrial users do not support regulatory convergence if they believe that the predominant market design is suboptimal or if they fear losing country-specific privileges.

IV.E Environmental NGOs and Consumer Advocacy Groups

Non-governmental organisations, and in particular environmental protection and consumer advocacy groups, have become important players in the political landscape (Boli and Thomas 1997, Paterson 1999). In municipal, national, regional and international decision processes they serve as watchdogs, advisers, lobbyists, and increasingly institutionalised intermediaries between the polity and its voting base. With the rise of the internet, local campaigns can now have global repercussions, and especially the environmentalist community takes advantage of the non-hierarchical immediacy of the diffusion of information to attract worldwide attention for their causes.

In the EU, NGOs have long realised that an increasing number of decisions with a major economic, social and environmental impact has shifted from the member states to Brussels. Simmonds (2005: 28) estimates that around 700 interest groups are actively lobbying in EU matters, with the bulk of them representing business (70%). The remainder is split between the professions (10%) and public interest groups (20%). Of those, trade unions, environmentalists, consumer advocacy groups and other interest groups account for approximately 3%. The EU has chosen a formal consultation process to integrate particular interests into their often complex procedures. For energy matters, the European Energy and Transport Forum serves as a platform to express opinions. The Forum regularly assembles representatives of various backgrounds, including industry lobbying groups like the Asociación Española de la Industria Eléctrica (UNESA), the European Renewable Energy Council (EREC) or the European Wind Energy Association (EWEA). It furthermore provides a platform for people like the vice-president of the European Federation of Regional Energy and Environment Agencies, the president of the European branch of the international federation of industrial energy users (IFIEC) or the chief advisor of the European Alliance of Companies for Energy Efficiency in Buildings (EURO-ACE). Apart from some academics and members of think-tanks, the unions also send several envoyés, like a representative of the German industry union for mining, chemistry and energy (IGBCE). The Forum publishes its opinions on a frequent basis or related to special events. For example, after the blackouts in North America and Italy it issued an opinion paper on the role of electricity transmission system operators and how to strengthen the security of supply in late 2003 (European Energy and Transport Forum 2003).

However, the composition of interest group representatives and the form of joint statements may have disadvantages regarding the unbiased attention towards the diversity of opinions within the EU. In the case of the role of the EU at the World Summit for Sustainable Development, key environmental NGOs criticised that ‘the EU Sustainability Strategy initiative is a case study in terms of how not to do public participation. The time period allowed for public comment on the Consultation Paper was far too short to ensure meaningful debate and input.’ (Bernstein 2001: 5) In addition, the NGOs claim that ‘while multi-stakeholder processes are useful in their own right, it is imperative that civil society organizations have the opportunity to formulate their own positions without the pressure of having to reach consensus based results with other stakeholders with whom they may not share a community of interests.’ (ibid.)

Energie-Cités, an organisation comprising 140 members, mainly municipalities, but also inter-municipal structures, local energy management agencies, municipal companies and groups of municipalities extending over 24 European countries, is equally sceptical about the EU decision-making process. In their ‘Heidelberg Declaration,’ Energie-Cités’ Board of Directors expresses full support for the European Commission’s ‘Intelligent Energy’ approach in areas like buildings, renewable energy sources, cogeneration, or product eco-design. The board quotes the conclusions of the Report on the debate of the EU’s Green Paper, which claims that ‘local and regional authorities have a pivotal role to play, because they are close to actual situations and local actors and have a significant influence on final energy consumption through the decisions they make.’ (Energie-Cités 2006) However, the board states, ‘in reality, the role left to local and regional authorities within the Community thought process and proposals remains marginal, despite some recent progress.’ Similarly, the Federation of German Consumer Organisations (VZBV), an NGO acting as an umbrella for 39 German consumer associations, responds to a public EU consultation on how the EU carries out consultations on internal market policy (VZBV 2006: 5): ‘The VZBV has the impression that especially at conferences, where access is restricted, there is an imbalance between industry and consumer/NGO participation. The VZBV therefore calls upon the Commission to ensure that the whole spectrum of stakeholders participates at conferences.’

In respect to the delegation of regulatory powers to expert agencies and the rise of informal regulatory networks determining the details of the internal electricity market, Byrne and Mun (2003: 60) see a potential danger:

The process of establishing regulatory agencies or other kinds of controlling bodies needed for liberalised electricity markets has tended to date to reinforce the authority of centralised and largely autonomous organisations. These include power exchanges, independent system operators, and regional transmission organisations, all of which diminish the range of local decision-making and governance [...] Partly because of the complexity involved in adequate management of liberalised electricity systems, technical knowledge tends to be further empowered at the cost of citizen-based political deliberations.

The authors claim: ‘Without explicit efforts to reinsert democratic principles in the process of power liberalisation, electricity markets are likely to be controlled by and serve the interests of already powerful economic and technical entities.’ (ibid.) Eberlein and Grande (2005: 106) agree: ‘Informalization, as we know, privileges ‘decision-relevant’ or ‘blockage-capable’ interests, while excluding others. Access to informal decision-making bodies like the transnational regulatory networks we have studied is necessarily selective, and it is not subject to any classical democratic control [...] From the viewpoint of democratic legitimacy, informal forms of governance must accordingly be regarded as dubious.’

Non-governmental organisations claim that the EU’s focus on competition in the internal energy market hampers the other two objectives of sustainability and security of supply, which were in the identified in the European Commission’s 2006 ‘Green Paper for a European Strategy for Sustainable, Competitive and Secure Energy’ (European Commission 2006). In particular, the Green Paper ‘does miss the chance to put energy efficiency into the center of the EU’s energy policies’ and fails to

suggest mandatory targets for renewable energy sources (Rocholl *et al.* 2006: 8). Further NGO claims not (yet) implemented in the internal electricity market include a full information disclosure regarding the environmental impact, the percentage contribution of each energy source to the commercial fuel mix, and the disclosure of the overall fuel mix of an electricity supplier. Although the EU has set up procedures to integrate suggestions from various stakeholder and lobbying organisations, it can be assumed that consensus on the actual market design could be achieved less easily and convergence would be delayed if environmental NGOs and consumer advocacy groups were more broadly included in the negotiation process.

Proposition 11: The selective structure of European NGO and consumer advocacy group participation in market design decisions fosters transnational harmonisation and convergence.

While in the EU's top down approach to electricity sector liberalisation environmental NGOs and consumer advocacy groups have expressed doubts about the participatory openness in the 'opaque' EU decision-making process (Anderson *et al.* 2005: 24), the situation in the USA is fairly different. The lack of FERC's authority to impose a standard market design has left possibilities for NGOs to influence the outcome of regime change. A typical case for the influence of NGOs was the restructuring process in the US state Oregon. Enron, one of the most influential proponents of deregulation, tried to achieve the implementation of a market architecture close to its own business interests: 'The conflict over competitive markets reached a crescendo when power-marketer Enron purchased Portland General Electric, Oregon's biggest utility, and used it as a stage to promote a radical deregulation proposal. Enron filed its proposal with the PUC, promising to create retail competition for all customers by forcing them by law away from the utilities into the laps of non-utility suppliers.' (Eisdorfer 2002: 26) However, widespread opposition arose. A representative of the NW Energy Coalition, an alliance of more than 100 environmental, civic and human service organizations, and businesses in Oregon, Washington, Idaho, Montana, Alaska and British Columbia, describes the strategy as follows:

The solution was not to break down into environmental, consumer and low-income constituency groups but to come together in one grand public interest coalition: the Fair and Clean Energy Coalition. We ultimately had more than 100 organizations join the coalition [...] senior groups, faith groups, neighborhood groups in addition to the usual consumer and environmental energy suspects. We defeated the Enron plan at the PUC [public utilities commission] and took the fight to the legislature [...]. And, most importantly, we won. (Jenks 2005)

The final design retained a number of features, including a regulated system for retail customers, special features to promote renewable energies and energy efficiency, and a charge imposed on large industrial customers 'for the unpaid portion of assets created to serve their needs before deregulation.' (*ibid.*) The representative of the Citizens' Utility Board contends: 'Oregon has designed an electricity-restructuring law that uniquely addresses major technological, policy, and economic changes in the industry without surrendering to the pressure to deregulate completely, as so many other states have done.' (Eisdorfer 2002: 27)

Another example for successful NGO action in the USA is the Cape Light Compact initiative for electric aggregation in Massachusetts. As early as 1993/94, organisations, businesses and interested individuals from the Cape Cod area developed the Barnstable County Energy Management Plan. One of its objectives was to explore legal ways how to aggregate demand on the municipal level and to organise a 'competitive franchise' scheme. In 1997, a formal proposal was set up, and after town meetings and town council votes, the 'Cape Light Compact' was founded in 1998 as an inter-governmental organisation of all 21 Cape Cod and Martha's Vineyard towns and Barnstable and Duke counties, comprising 187,000 individual consumers. However, several legal hurdles and the intervention of power generators on grounds of anti-competitive mechanisms prevented the Compact to become operational before 2002. In particular, electric companies Duke and Dominion raised concerns that the 'opt-out' rule for individual consumers provided a competitive advantage for the

chosen supplier ‘at the expense of consumer choice.’¹¹ (DTE 2001: 4) The legal battle was eventually won by the Compact. Bacon (2001) writes: ‘Their [the participating municipalities’] experience was instrumental in winning the inclusion of an ‘opt out’ provision in Massachusetts electrical deregulation law, called ‘community choice.’’ In 2002, the Compact not only started serving around 45,000 customers in the area, but it also established a regional energy efficiency programme and several voluntary green tariffs promoting the construction of new renewable capacity in the area. Despite its long preparation time and initial difficulties, the concept of community choice aggregation was adopted by other states in the US: ‘This [the Compact rules] provided a successful model for other communities where market conditions were more favourable. A group of 95 communities in Northeastern Ohio for instance secured a contract for 350,000 residential consumers in early 2001 working with the same industry professionals who work for the Compact.’ (Energie-Cités 2003: 3)

Proposition 12: In the USA, NGOs and consumer advocacy groups use the states’ regulatory discretion to foster market designs that are adapted to local preferences.

V. Epistemic Communities

The reactions from interest groups and stakeholders of the electricity industry exhibit a remarkable range of attitudes towards regulatory convergence. However, all positions have in common that they tend, almost by definition, to represent the financially motivated interests of their constituencies, be it in accordance with the top-down suggested market design or in opposition to regulatory convergence. In contrast, academia and the world of scholarly investigation bear, at least theoretically, the privilege of *a priori* neutrality and a positivist thrive towards economic optimality, reached by deliberate theorising and open discourse. Since Kuhn’s (1962) introduction of the human element in scientific paradigm change, the latently unbiased stance of academia has been under scrutiny, though, and in a context of postmodern eclecticism the academic community is not immune against fragmentation and partisanship for one concept or another.

Haas (1992) developed the idea of an epistemic community as a ‘network of professionals with recognised expertise in a particular area and an authoritative claim as a source of policy-relevant knowledge within that domain or issue area.’ Epistemic communities have evolved in the process of professionalisation and specialisation of knowledge: ‘The growing technical uncertainties and complexities of problems of global concern have made international policy co-ordination not only necessary but also increasingly difficult [...] The expansion and professionalisation of bureaucracies and the growing technical nature of problems have fostered an increase in the deference paid to technical expertise, and in particular, to that of scientists.’ (1992: 3 and 11) According to Haas (1992: 3), epistemic communities share the same set of normative principles and beliefs. Furthermore, their logic follows similar causalities, and they apply the same techniques of evaluating knowledge in their domain of expertise. They also pursue resembling practices in terms of influencing policy outcomes, a feature that Haas calls ‘policy enterprise.’

One epistemic community played an important role in liberalisation policies: the ‘Chicago Boys,’ a group of academics trained at the University of Chicago and convinced of the superiority of free-market principles over state control. They influenced the politics of Ronald Reagan in the USA and Margaret Thatcher in the UK, but also spread their neo-liberal economic views either directly or indirectly via international lending organisations into many countries. Especially the World Bank and the IMF relied in their loan policies on principles developed by the Chicago Boys; the organisations’ agenda got a fairly polarised reception under the name of ‘Washington Consensus,’ referring to a joint position of academics, the federal government and the international lending organisations (Williamson 2000, Naim 1999). Kogut and MacPherson (2004) test the impact of both IMF loans as well as the

11 The opt-out rule automatically includes all customers in the municipality in the scheme, as opposed to the opt-in rule that requires customers to explicitly state that they want to participate in the programme.

(physical) presence of Chicago-trained economists on the likelihood of privatisation policies across 93 countries between 1980 and 1997. In concordance with a number of other studies, they do not find statistical evidence that economic crises on their own caused the spread of neo-liberal policies. They rather detect the effect of an epistemic community among scholars of economics: ‘It is not the economic profession in general, but a particular breed of economic ideology [as diffused by Chicago-trained economists] that appears to be consequential for explaining the rapidity by which an economic policy is adopted. This finding is an unusual demonstration that ideas are consequential even if the leading academic protagonists are not holding directly positions of power.’ (2004: 30)

Electricity sector reforms require a highly specialised expertise because of the unique characteristics of the power flow, the non-storability of electricity, the need for instantaneous match between supply and demand, and the different generation technologies. Before liberalisation the decision space has predominantly been the domain of engineers, who developed optimisation algorithms for dispatch and long-term capacity planning. Since the introduction of competitive elements, though, an increasing number of economists and lawyers have entered the field, with their subject-specific thought and decision patterns based on a different iterative logic and rationale. Rather than justifying and preserving the rate-of-return status quo, the intellectual challenge to create markets for a service that has for a long time been considered a natural monopoly attracts scientists across the disciplines. An academic participating in the European process of liberalisation describes the motivation for a joint policy enterprise¹²: ‘The basic attitude of economists is generally in favour of competitive markets; engineers worked towards developing the technical feasibility of unbundling the networks while maintaining security; political scientists saw a new stage in the fascinating progress of Europe, and legal experts were pleased with facing the challenge of developing a new legal system and finding ways through innumerable obstacles.’

Communication between experts becomes crucial in the transmission and exchange of ideas, and epistemic communities have been forming across the globe. At the same time, politicians need informed advice, because the complexity of the sector prevents them from acquiring knowledge of all the details of electricity supply, and seek legitimacy and reputation by relying on external, preferably academic (i.e., ‘unbiased’) competences.

A number of academic clusters have formed to do research on regulation in liberalised electricity markets, including the University of California Energy Institute in Berkeley, the Carnegie Mellon Electricity Industry Center, the University of Cambridge-MIT energy and environment co-operation, CERNA, the Centre for Industrial Economics at the Ecole des Mines in Paris, which provides input for SESSA, the Sustainable Energy Specific Support Assessment (SESSA) of the EU, or the Institute for Technological Research at the Universidad Pontificia Comillas in Madrid. Of all the active clusters, two groups that have been designed to bring together academics, regulators, business executives and politicians will be analysed in more detail¹³: the Florence School of Regulation in Europe and the Harvard Electricity Policy Group in the USA. They both organise several workshops and conferences per year, tackling all topics of electricity market reforms, from the treatment of reactive powers in secondary markets to the role of power exchanges in cross-country integration, and are primarily financed by stakeholders of the energy industry.

The Harvard Electricity Policy Group (HEPG), which exists since 1993, is jointly directed by an economist of Harvard’s Kennedy School of Government and by a lawyer and former commissioner of the Public Utilities Commission of Ohio. As stated in its 2004 information brochure (HEPG 2004), one of its objectives is ‘to address key problems related to the *transition* to a more competitive

12 Interview in January 2007, interviewee remains anonymous.

13 All academic clusters and networks of professionals occupy different niches in the regulatory process, some of them more technical or simulation oriented, others more focussed on advancing and adapting economic theory to the dynamics of the reforms. The selection of those two groups does by no means indicate any special status; it is rather linked to the fact that they have been studied more closely than others by the author.

electricity market.’ [italics added] HEPG’s research director has been instrumental in developing design features of the most successful US American electricity markets, including the methodology for locational marginal pricing and financial transmission rights. He has academically transformed FERC’s standard market design into what he calls ‘Successful Market Design’: ‘SMD [i.e., Successful Market Design] is necessary. There is no dichotomy for an open access model. There is no theory and no experience that identifies any viable alternative. There is no need to *assume* that SMD is the only model that works, the evidence makes the case.’ (Hogan 2005: 20) However, HEPG functions in a strictly non-partisan way and ‘takes no position on any issue and discussions focus on informing and analyzing, rather than necessarily forming a consensus.’ (HEPG Brochure) It is aimed at bringing together ‘electricity industry executives from public power and investor-owned utilities, independent power producers, consumer advocates, regulators, energy officials from both state and federal governments, representatives of the environmental and financial communities, and academics.’ (ibid.) The large range of participants includes representatives of public utilities commissions who oppose any liberalisation in their states, and members of organisations like APPA, the American Public Power Association. It can be assumed that HEPG’s role as a podium for finding best practices of system transformation in the heyday of US liberalisation during the second half of the 1990s had to be redefined given the lack of a common ‘policy enterprise,’ as it is the EU’s underlying agenda of European integration and its pragmatic manifestation, the internal market. HEPG meetings may now rather serve as a forum for informational exchange and informal dialogue, thereby reducing uncertainty about intentions and actions and creating a common, technology-focussed language among the agents involved in the sector.

The Florence School of Regulation (FSR) has been founded in 2003 as an initiative of the Council of European Energy Regulators (CEER) in association with the European Commission and has been integrated into the Robert Schuman Center for Applied Studies at the European University Institute (EUI)¹⁴. The FSR’s mission is to create ‘a European forum where policy and business decisionmakers, regulators, regulated companies and academics from different countries who are involved in the energy sector can meet. Activities include the discussion of regulatory concepts, practices and policies; the dissemination of best practices; foreseeing new challenges and requirements and the development of a common regulatory language and regulatory culture, along with norms of accountability.’ (FSR 2006) The School provides a training course for European regulators, too, which attracts not only young professionals from the emerging and expanding European regulatory agencies, but also interested individuals from countries outside Europe, including North Africa and the Middle East. By the joint formation of evaluation principles and norms, and by the strong networking component of the meetings, the Florence School of Regulation contributes not only to a diffusion of ideas, but also to a cross-border collective regulatory culture.

Proposition 13: Epistemic communities accelerate regulatory convergence by providing a platform for academic exchange, forming a common language between regulators, and channelling consensual knowledge to political and corporate decision-makers.

VI. Structural Complexity and Path-Dependence

The preceding sections of our analysis implicitly assume that systemic change is the result of a multi-layered, political bargaining process and is assisted by the academic guidance of epistemic communities. Path-dependence introduces a new element into the equation: Regulatory convergence may be unlikely, because the existing institutional—i.e. legal, economic or cultural—conditions

14 The choice of location seems coherent, because the EUI is the downsized version of some of the EU’s original member states’ project to establish a European elite university. In its current form the EUI trains doctoral students in social sciences and invites postdoctoral students and professors for research, thereby creating a platform for intellectual exchange, policy-relevant research, and a formation of principled beliefs under the ‘policy enterprise’ of a politically, economically and somewhat culturally unified Europe.

impede the implementation of a specific design. Again, we examine closely the differences between the Europe and the USA in order to determine to what extent structural characteristics affect the dynamics of the process and whether they differ East and West of the Atlantic.

Structures in the electricity sector are mostly the result of human agency transforming ideas into physical reality, like transmission lines, generation plants or a dispatch algorithm. But structures also encompass the linguistic, cultural and socio-economic traditions and institutions of countries, which might be less tacit but nonetheless responsible for collective routines and some systemic inertia that may be difficult to overcome. For example, EFET comments: ‘A significant barrier for network users across the European power network is that numerous network operators send communications only in their national language. This refers to the day-to-day communication as well as setting up the bilateral legal agreements between the two parties. This causes disadvantages for foreign network users but more importantly delays significantly the communication between both parties.’ (EFET 2005b: 6) Linguistic diversity is a fairly general, somewhat Babylonian difficulty of EU integration, while other structural features are unique to the electricity sector and can be found in both Europe and the USA. In the following two sections, we will specifically concentrate on barriers to convergence due to ‘seams’ issues and ownership structures/property rights in respect to vertical (re-)integration and preferential dispatch.

VI.A Regional Integration and ‘Seams’ Issues

The USA and the EU envisage the integration of electricity systems, which have evolved independently, into larger regional markets. Regulatory convergence relies on a harmonisation of rules and procedures that, given the complexity of the electricity supply, can be costly and difficult to implement.

In the USA, the discourse circles around ‘seams’ issues: ‘A seams problem occurs when differences in business practices, market design, reliability rules, or software platforms between regions impede trade between the regions. When these seams problems prevent the economic exchange of energy, they increase transactions costs.’ (FERC 2002: 3) Numerous factors can create seams. The North American Energy Standards Board (NAESB) collects complaints about seams issues from corporate players, categorises them, assigns priorities and identifies whether they are currently addressed by the RTOs. Some of the seams are based on the lack of coordination between regulators and can be removed if joint agreements are achieved. For example, the North American Energy Standards Board (NAESB 2003) reports of ‘pancaking’ between the North-Eastern markets, where transaction margins from one regional market to the next are of the same magnitude or less than the prevailing export charges, which removes incentives to transact business. Similarly, differences in definitions, requirements, deliverability and recall procedures in capacity markets have hampered the ability of suppliers to sell ICAPs (installed capacity) between Northeast independent system operators. Other seams issues are more technical and require joint IT systems. Between the New England, New York and PJM markets a company complains of transmission checkout failure, which means that operators curtail transactions due to mismatched tag data, different MW volumes, etc.: ‘The curtailment of transactions due to data incompatibility [is] disruptive to both the marketplace and the reliable operation of the grid.’ (NAESB 2004) Another problem is the lack of uniformity in scheduling requirements, like deadlines for reserving transmission services or energy bids into real-time markets between neighbouring power pools: ‘RTOs have different ramp rates and scheduling requirements that require market participants to complete multiple submissions for the same transaction.’ (ibid.) While some critics ‘express concern’ that FERC’s reliance on RTOs is counterproductive because the ‘reversion on smaller markets [than on a standard market design] could perpetuate problems in moving electricity between markets’ and thus reinforce seams, others argue that ‘resolving this issue [the seams] is merely a question of political will. The real challenge seems to be bringing state regulators in line with the RTOs in setting good rules for the market place.’ (DeJong 2004: 22)

Several initiatives have been established to coordinate action on seams between state regulators, regional transmission organisations, and firms; for example, the Seams Steering Group Western

Interconnection (SSG-WI), which was founded in 2001 to address commercial issues at the boundaries between proposed RTOs in the Western states of the USA and to create a competitive and seamless West-wide wholesale electricity market. It is composed of representatives of the California Independent System Operator and the filing utilities of the proposed Grid West and WestConnect RTOs and has published several reports on transmission expansion. According to an assessment by the Western Governors' Association (WGA) in consultation with the Committee on Regional Electric Power Cooperation (CREPC), the SSG-WI suffers from its status as an ad hoc group without a legal status, a 'fragile institutional structure and inadequate funding.' (WGA 2005: 8) In respect to seams issues like pancaking, non-uniform scheduling practices, proliferation of control areas and underutilization of transmission capacity, the report comments: 'The West does not have in place effective institutions to devise regional solutions to these issues. In the absence of an interconnection-wide institution(s) to deal with these issues it is increasingly likely that 'solutions' will be developed in national forums such as North American Energy Standards Board.' (WGA 2005: 10) The authors express doubts about convergence based on national standards, though: 'Because of physical differences and differences in how the Eastern and Western grids are operated, the solutions developed at the national level may or may not work in the Western Interconnection.' (ibid.)

A more successful track record of tackling seams issues can be found between the regional markets of the North-Eastern USA: New York, PJM and New England. A representative of the New York Independent System Operator counts 45 seams issues that have been resolved between 2000 and 2005, including similar emergency programs called under very similar system conditions with similar or identical price floors, or programs under which demand response can obtain ICAP credit by virtue of participation in an emergency/reliability program (Kelley 2005). The coordination is further enhanced by the creation of joint working groups and protocols, for example the Interregional Coordination and Seams Issue Resolution Agreement between New York and New England, or the NYISO and PJM Interregional Coordination Agreement.

The structural complications of market integration in the US is paralleled by fairly similar problems in the fragmented national systems of the EU. For example, EFET (2005b: 5) remarks in respect to information technology:

Most national market operators for electricity and gas have adopted IT solutions in isolation from each other. [...] Widespread isolated IT development has hitherto often entailed market participants having to procure different IT solutions for each national market, interconnector and/or control area in each commodity. [...] There are multiple protocols for data exchange between various providers of similar services (TSOs, exchanges etc.) across and indeed within each national market, involving implementation of many interfaces, a need for translation of messages between different implementations of the same protocol and in some cases parallel but overlapping IT infrastructures.

Many scholars dealing with the creation of an internal European electricity market point to cross-border interconnection and congestion management as a major challenge, which in the American context could be classified as seams issues. Glachant and Leveque (2005: 7) comment:

Today, one of the strongest protectionist forces on the EU's internal market is that congestion management is exclusively, or predominantly, domestic or based on domestic criteria. In practice, congestion at the 'borders' appears as the outcome of domestic decisions and priorities decreed separately in each Member State. There is no real comprehensive operational cooperation to minimise congestions at the borders or to maximise the capacity available at the interconnections.

Economic inefficiencies at borders are not resolved very easily, given the strategies of some players and the heterogeneous structure of settlements. Implicit auctioning with nodal pricing, as it exists in some North-Eastern markets in the USA, would be—according to many scholars and practitioners—the preferred outcome, but 'given that a full European nodal approach is currently some distance from political reality, could an incremental approach via regional market coupling be pursued?' Brunekreeft, Neuhoff and Newbery (2004) ask. Market coupling would be an intermediate

step of overcoming technical and institutional hurdles in the implementation of a regional market. It suggests creating a joint dispatch between neighbouring markets, while integrating cross-border network constraints into the dispatch algorithm. According to a joint proposal of ETSO and EuroPEX (ETSO-EuroPEX 2005), it ‘avoids change to local procedures and arrangements, and supports local market variations,’ while having the capacity to evolve over time from small to larger country clusters. Although it needs *some* harmonisation of intraregional transmission modelling, data transfer, and publishing formats, it can be considered a transition to a more integrated model. The fact that EuroPEX, the Association of European Power Exchanges, and ETSO, the European Transmission System Operators, promote their flow-based market coupling model together (EuroPEX would be in charge of the market coupling, whereas ETSO would do the flow-based modelling) already indicates that there are business interests not only in favour of preserving national interconnection mechanisms, but also in favour of greater integration. In fact, market coupling between Belgium, France and the Netherlands has been actively pursued by the power exchanges and regulators in the respective countries.

The role of technical agencies seems even more influential in seams issues than in other areas of regulation. Defining technical standards related to the grid may be a precursor for further convergence. The European group of transmission system operators, UCTE (Union for the Coordination of Transmission of Electricity), whose system extends from Lisbon to Warsaw and from Denmark to Greece and supplies around 450 million people, pushes for compliance with its standards by periodically modifying and releasing its Operation Handbook (OH). Until now, compliance with the rules is only secured by a private contract among the TSOs within UCTE, but, according to the wish of the Council of European Energy Regulators (CEER), it shall be complemented with an EU-wide legislation in the future. By their EU advisory body ERGEG, the regulators stress ‘the need to ensure the binding character of the ‘new’ rules, compliance monitoring and enforcement procedures.’ (ERGEG 2005: 1)

The technical nature of many seams issues somewhat hides and underestimates the importance of the institutional embeddedness and the willingness of agents to cooperate in order to create seamless markets. While the US appears to be converging on seams issues in the organised markets in the North-East, driven by participants in the markets, federal agencies like the North American Energy Standards Board and the coordination between independent system operators and RTOs, the example of the failure to set up effective structures to deal with seams issues in the diverse regulatory environment of the Western US suggests that important drivers for harmonisation are the informal cooperation of regulatory agencies and lobbying efforts of stakeholders. In the USA and in Europe the creation of seamless markets faces less hurdles from technical incompatibilities than from strategies of organisational survival.

Proposition 14: In areas with adequate institutional support, seams issues are gradually resolved through informal regulatory networks, stakeholder lobby initiatives and technical standardisation agencies.

VI.B Property Rights

The template of a restructured, competitive electricity system foresaw vertical unbundling between the industry’s segments of generation, transmission and distribution. Joskow (1996: 361) distinguishes between a *structural* separation through divestitures, a *functional* separation within existing vertically integrated firms, and a hybrid model that preserves integrated ownership but delegates *operational control* of the grid to an independent system operator. In addition, Joskow suggests that ‘the competitive segments, in particular generation, may have to be restructured horizontally through divestiture to create a generation market in which there is ‘enough’ competition so that horizontal market power is not a significant problem.’ (ibid.) Property rights are a fundamental impediment to effective segmentation of ownership; they are anchored in the very philosophy of capital as one of the pillars generating wealth and economic growth, and they guarantee protection against arbitrary expropriation.

One of the major differences between national electricity sectors is the way how property rights are allocated: While in some countries—mostly in the industrialised world—private, entrepreneurial initiatives started to provide electricity as a bundled service to industrial and wealthy residential customers and then got complemented with municipal units like the German Stadtwerke to connect and supply the larger public under a universal service obligation, other countries—in particular in the developing world—saw central governments push for large-scale electrification as a core infrastructure service from the very beginning. Many systems underwent a phase of nationalisation in the middle of the 20th century, either as a product of decolonisation, or as a consequence of Keynesian politics and a redefinition of infrastructure services in the welfare state. Paradoxically, state ownership has since facilitated the most common top-down induced transition towards the unbundled competitive design model, because it enables governments to reorganise property rights in the sector according to textbook IO (Industrial Organisation) theory. Restructuring the electricity sector in England & Wales, for example, was a fairly easy task for the UK government, because the Central Electricity Generating Board (CEGB) was fully state-owned and state-controlled. Other countries have a more complex ownership structure, like Germany with more than 800 public or private entities that own assets in the sector, which makes restructuring a more discretionary and complex challenge, because a large number of decision-makers are actively involved in the process. However, ownership segmentation of the sector is not always an impediment to reform, as the Norwegian experience shows, while the fact of having just one large state-owned utility does not inevitably lead to an easy implementation of reforms, if the influence of traditionalist interest groups and a specific public service mentality prevail, as it is the case in France.

In comparison with changes in legislative texts, which can be implemented at a fairly low level of transactionary friction, property rights exhibit stronger characteristics of path-dependence, for they are costly to modify and might be subject to sustained political resistance by stakeholders. The diverging types of ownership allocation induced different control models already in the pre-reform epoch of rate-of-return regulation, especially concerning the interaction between the utilities and the respective public administration that determines appropriate tariff levels and coordinates integrated resource planning—federal or state-level ministries or agencies or municipal or district governing bodies. Instead of modifying the existing ownership structure to comply with the design template of a new, vertically unbundled market including a competitive generation segment, the high transaction costs of transformation may lead to the inverse constellation: a necessity of adapting the rules of the new regulatory regime to respond to the sector's property patterns, thereby exacerbating the evolution of niche market designs that try to address country-specific institutional arrangements. Alternatively, it may result in a wave of 'modelling' and policy bandwagoning of successful non-template practices across countries.

We will assess the likelihood of complications on the path to convergence in two dimensions. First, concerning the generation segment, different models have been implemented to mimic politically infeasible horizontal divestitures in the EU, whereas in the US a trend of preferential dispatch of generation subsidiaries of former utilities can be observed. Second, the functional and operational separation of transmission assets—falling short of full vertical unbundling—also leads to diverging design schemes.

Ownership concentration in generation can be a decisive factor for frequent intervention by antitrust authorities and regulators. Newbery (2005: 21) addresses the issue: 'Outside Nordel [the market in the Scandinavian countries], interconnection is typically inadequate to address country-level concentration, and absent these conditions for competition, the choice of market design is unlikely to adequately mitigate market power, although some designs may facilitate collusion more than others.' Given that outright divestiture of the utilities is legally and/or politically not yet feasible in most member states (notable exceptions are England and Italy), the European countries' regulatory agencies and the European Commission have chosen different models to deal with strategic behaviour of their incumbents. For example, Spain introduced a system of Competition Transition Charges (CTCs)

which are calculated as the difference between the tariff revenues and the costs of the regulated activities plus some subsidies for coal generation. They were initially intended as a compensation for the utilities' stranded costs, but have the politically welcomed side-effect to create an incentive to keep prices below a threshold defined by the regulatory authority for each generator to receive a payment. The CTCs can be considered a form of contract for differences (Newbery 2005: 16) or an implied price cap (Fabra 2005: 48). The concept and the calculation of the CTCs have been a target of criticism from analysts, primarily for the lack of transparency and a fixed, exogenous baseline price corresponding to the marginal costs of a CCGT plant (Crampe and Fabra 2004: 8). One new market entrant in Spain has claimed that wholesale prices have been manipulated and are set below costs (Fabra 2005: 48). It is foreseeable that the Spanish CTC will be substituted by a different compensation scheme before its official end in 2010, with the options ranging from paying a lump-sum to firms for the residual CTCs to some form of vesting contracts like in the UK (ibid.). The CTC's implied price cap may be replaced by some other mechanism that limits the potential exercise of market power. One design element that would actually allow the Spanish market to operate with reduced market power but without modifying the current oligopolistic ownership structure has been suggested by Perez-Arriaga (2005): the introduction of virtual power plants.

Virtual power plants (VPPs) have become the predominant design scheme to cope with horizontal market power in the EU. They are used as a merger remedy or address the dominant position of the incumbent. The first country that implemented VPPs was France in 2002, where the European Commission requested EDF to virtually divest 6,000 MW of its capacity as a precondition for acquiring a stake in the German utility EnBW. In 2003, the Belgian Competition Council followed the Commission and imposed a 1,200 MW virtual divestiture on Electrabel. One year later, the Dutch competition agency NMa forced Nuon to sell virtual 900 MW over five years because of its acquisition of Reliant Energy Europe, one of the major power generating companies in the Netherlands. Similarly, Danish, Italian and Czech regulatory authorities have imposed virtual divestitures. Two types of VPPs exist: 'In Belgium, antitrust authorities oblige the incumbent to sell *financial VPPs*, while in the Netherlands the regulator has been discussing *physical VPPs*. The main difference between financial and physical VPPs is that a physical VPP is associated with a specific generation plant while a financial VPP is not.' (Willems 2006: 3) Willems (ibid.) shows that virtual divestitures do not have the same effects as real divestitures, with financial divestitures being even less effective than physical divestitures. The European Commission and national regulators embrace the concept, though, as a behavioural rather than structural remedy for a structural phenomenon. Given the associated introduction of a range of different assignment protocols and auction proceedings that reflect the diversity of instruments available, virtual power plants can be considered to be an example of Braithwaite and Drahos' concept of 'modelling,' in which a successful new policy model spreads across countries in slightly varied forms.

Whereas Europe has embarked on virtual power plants as a second-best alternative to real divestitures, US regulators face a dilemma in respect to reintegration and preferential dispatch. Although generation assets owned by utilities decreased from almost 90% to 63% between 1995 and 2005 (Johnston 2006 in the New York Times), some of the restructured utilities grant preferential dispatch to their divested generation companies. In other cases, parent companies still own both the utilities and the formerly integrated power producers: 'Some regulators allowed utilities to favor the sister companies with long-term contracts even if they did not offer the best price for electricity.' (ibid.) For example, Robert McCollough, a utility economist and consultant, writes (2006: 1): 'In Maryland, regulated Baltimore Gas & Electric transferred its generation assets to Constellation, its unregulated parent. For the last five years, the state has conducted auctions where the bidders, the winners, and even the bidding process are hidden from public view [...] The same supplier always wins the same auction to serve the same customers - albeit at greatly increased prices.' In some states like Texas, companies have even been allowed to fully reintegrate their ailing generation subsidiaries back under the umbrella of the parent utility (New York Times 2006).

As a reaction to these encountered forms of reintegration, FERC has strengthened its surveillance role under Section 203 of the Federal Power Act in 2005. In particular, it is now authorised to examine whether acquisitions may result in potential cross-subsidies between a public utility or an electric utility company and its non-utility associate like a power marketer or a generator without captive customers, while beforehand the Commission only had to determine that a proposed transaction would be ‘consistent with the public interest.’ (Hunton & Williams 2006: 4) This move is mirrored by greater vigilance of the state Public Utilities Commissions. For example, the California Public Utilities Commission (CPUC) approved Southern California Edison’s (SCE) acquisition of the 1054 MW Mountainview plant that was still under construction at the time of the deal; ‘at the same time, though, CPUC found ‘vexing weaknesses’ with the structure of SCE’s proposed transaction. So the commission attached caveats to its approval to insulate ratepayers from some of the risks SCE proposes to undertake.’ (Burr 2004) The article, published in *Public Utilities Fortnightly*, comments: ‘Such a give-and-take approach might allow regulators to approve individual transactions, while also addressing lingering concerns about competition and market power.’ (ibid.)

The virtual power plant approach of European regulators as well as the greater vigilance—but not outright refusal—of acquisitions and practices leading to reintegration and horizontal market power in the US suggests that disputes settle at a less-than-optimal equilibrium of regulatory intervention. Theories of a perfectly competitive electricity market design would dictate more rigorous separation and divestiture, but the lack of political and societal bargaining power as well as the uncertainty about efficient market mechanisms for resource adequacy and reliability prevent regulators and politicians to push liberalisation further.

Proposition 15: Regulators converge on second-best strategies to tackle vertical reintegration and horizontal property rights issues in the generation segment.

Closely linked to the phenomenon of vertical reintegration is the question how to deal with transmission assets. In the economic-theory version of competitive electricity markets, they are the segment in the electricity system that most closely corresponds to a natural monopoly. As opposed to most undertakings in the US, transmission assets have been separated and put under public or (regulated) private control in a number of countries in Western Europe, for example in the UK’s pioneering England & Wales market. Economic theory has been even more influential in developing countries like Argentina or Colombia, where the impact of international financial organisations was greater and their vision of an ideal market could be more easily implemented than in most stubbornly incrementalist countries of the industrialised world.

In its Directive 2003/54/EC, the European Commission requires all member states to functionally and legally unbundle transmission services from other activities of the utilities, thereby enhancing a process of structural convergence. Despite a considerable variety in the actual implementation of the directive—as at the end of 2005 an EU report (Gómez-Acebo and Russell 2005) documents that 7 out of 18 analysed member states had fully transposed it, 10 had partially transposed it, and only one country, Portugal, was lagging severely behind—the trend towards legal and functional unbundling within the EU establishes a single model of (somewhat incomplete) corporate separation. Problems with legal and functional unbundling have mainly occurred in respect to vertical foreclosure, especially in establishing a non-discriminatory access to the grid. In the EU, some transmission system operators (TSOs) have been suspected to erect barriers to entry if they are affiliated to an integrated company (Slingerland *et al.* 2006: 8). In its Sector Enquiry, the Competition Directorate General of the EU (European Commission 2006: 7) states: ‘The market structure suffers from a systemic conflicts of interest resulting from the vertical integration, in many cases, of the supply, transport and distribution level.’ The Commission criticises the slow progress in establishing a ‘level playing field’ and recommends that ‘further measures such as **full structural unbundling** (i.e. separation on the supply and retail business from monopoly infrastructures) should be considered.’ (ibid.) [bold characters in the original] While the Commission has successfully been delegating the task of a European-wide harmonisation of standards to informal regulatory networks, unbundling apparently necessitates the

political weight of a higher hierarchical level to be implemented by member states. The power of the Commission does not stretch into core property rights, though, which remain unaffected under the Unbundling Directive.

In the USA, the transmission system remains to a large extent in the hands of private utilities. In 1995, around 140 different control area operators, largely corresponding to vertically integrated utilities, were running the grid. Joskow (2004: 30) speaks of a ‘highly balkanized structure of ownership’ in the transmission sector, which would be difficult to overcome and consolidate in fewer control areas and horizontally integrated transmission companies spanning large geographic areas: ‘In a country that supports private property rights, it is very difficult to force private incumbent utilities to implement vertical and horizontal ownership restructuring initiatives of this kind.’ (Joskow 2004: 4) However, by implementing Order 2000 FERC encouraged the creation of Regional Transmission Organisations, which are responsible for managing the power flows across the previous control areas. Joskow criticises: ‘These independent entities [i.e. RTOs] own no transmission assets, have no linemen or helicopters to maintain transmission lines and respond to outages, and are not directly responsible for the costs of operating, investing in, or the ultimate performance of the transmission networks they ‘manage’.’ (2004: 30) However, since the advent of RTOs—to some extent modelled on the grid operators in the North-East US—an increasing number of utilities have transferred their operational control to RTOs. The case of AEP joining PJM has already been discussed. Especially smaller utilities are likely to ally with RTOs. For example, Allegheny Power, an investor-owned utility serving 1.5 million customers in Pennsylvania, West Virginia, Maryland, and Virginia, provides several reasons why it decided to join PJM for the control of its transmission system, among others the possibility of getting involved in a robust energy market, utilising the experience of PJM across multiple reliability councils and control areas, and ‘meeting FERC and State Commission expectations in an expedited manner.’ (Pfaffmann 2002: 13)

Both the EU and the US experience with vertical unbundling are characterised by the persistence of property rights of vertically integrated utilities, which leads—similar to preferential dispatch and the lack of horizontal divestiture in the generation segment—to a top-down push towards second-best solutions. While the European Commission is able to exert some direct leverage to implement functional and legal unbundling via its directives, the delegation of operational control of US transmission assets to RTOs is the maximum level of integration reached by FERC’s orders. The impact on market design convergence differs accordingly:

Proposition 16: In the EU, member states gradually adopt one template of legal and functional unbundling, whereas across the Atlantic owners of transmission assets comply with operational rules established by the respective RTOs.

VII. Synthesis: Regulatory Convergence, the Florence Consensus and an Agglomerative Magnet

The puzzle of institutional diversity in US American and European electricity sector regulation has been, at least to some extent, clarified by positioning the major agents in their attitudes towards finding a new general model of sector organisation: A number of players seem to have similar objectives on both sides of the Atlantic, in particular academic communities who are actively supportive of regulatory convergence, and the newly emerging branch of electricity traders who develop standardised contracts, thus reinforcing a bottom-up harmonisation of practices. These two groups are in a minoritarian position, though, when confronted with the amount of agents pursuing the objective of preserving the old *status quo*. To this cluster belong the traditional utilities in the US and in the EU, the non-governmental organisations and consumer advocacy groups, who openly promote local diversity, and to some extent the large industrial users, who officially embrace convergence—but only as long as it does not harm their grandfathered privileges. Given the objectives of the entirety of those agents, electricity sector liberalisation should evolve in parallel paths in the US and in the EU,

reinforced by a similar degree of structural path-dependence in respect to vertical integration and a ‘balkanised’ ownership structure of transmission assets.

However, our analysis suggests that property rights issues and the agendas of the above-mentioned agents are less influential than other emergent dynamics. In particular, decision-making in the EU is governed by a polity consensus about the benefits of an internal energy market, as being part of the commitment to a broad EU liberalisation agenda (Eising 2002: 114). The supra-national authority of the European Commission in the supervision of progress towards open and competitive markets is complemented by informal regulatory networks between grid operators, standardisation authorities and regulators, which fill the ‘regulatory gap’ left to member state discretion in the directives (Vasconcelos 2005, Eberlein and Grande 2005). As opposed to the Public Utilities Commissions in the United States, which have a long-lasting public service tradition, European energy regulatory agencies have been founded as a by-product of the liberalisation process and have their joint *raison d’être* in the implementation of free-market principles, similar to the Commission’s mission to maintain the momentum of ever-increasing European integration by the creation of a single trade area. Furthermore, an EU-wide academic network has formed and has been actively promoted by the Commission, for example via the SESSA programme. The academic network provides theoretical and educational input for politicians and the growing number of national regulators to assimilate congruent positions and practices, thereby contributing to institutional isomorphism by mimetic and normative adaptation. The tripartite coalition between the European Commission, informal regulatory networks and epistemic communities is exemplified in the ‘Florence Process.’ It has been instrumental in developing joint positions in the Florence Forum and subregional Mini-Fora, while being academically supported by the Florence School of Regulation. We would therefore suggest that market design convergence in the EU is energised and reinforced by a ‘Florence Consensus,’¹⁵ which exhibits autodynamics beyond the formal control of national governments and somewhat substitutes and compensates the lack of a European-wide energy regulatory authority.

The following graph maps the triangular relation graphically¹⁶: Stretching across the core of technological, academic and political concordance, the Florence Consensus shows how the European

15 Despite using a similar nomenclature, the ‘Florence Consensus’ differs from the Washington Consensus in three important characteristics: First, in its autopoietic and somewhat loose nature as an alliance among meso-level political and economic agents and academic clusters. In contrast, the Washington Consensus reflected an accordance between some of the world’s most powerful institutions: the US federal government, and the Bretton Woods organisations World Bank and IMF, relying on theoretical input from the highly influential University of Chicago-based neoclassical school of economics, which – after years of failed import substitution policies and fiscal instability in developing countries, and a decline in the belief in Keynesian welfare-state economics in industrialised nations – had gained an almost paradigmatic status in the Western hemisphere. Second, the Washington Consensus was composed of a well-defined set of conditions of good governance, including fiscal discipline, interest rate liberalisation, a competitive exchange rate, etc. (Williamson 2000), while the Florence Consensus has an evolving pattern of a common policy enterprise with no ex-ante defined regulatory preference beyond the pursuit of greater integration. As one interviewee involved in the Florence meetings describes it: ‘In Florence [...] there has been no consensus among participants to be imposed outside: there has been a patient work of stakeholders with initially divergent positions towards a greater consistency in their attitudes, which is very useful but is still much less than a consensus.’ (Interview in January 2007, interviewee remains anonymous) Third, the global diffusion of policies based on the Washington Consensus was reinforced by the financial leverage that the international financial organisations could utilise by imposing some type of conditionality when they issued loans, in particular to developing countries, whereas the parties involved in the Florence Consensus can only rely on an informational advantage.

16 In the centre, the core drivers for and elements of convergence are located: the European Commission, its Directives and the regulators for the European Union. Drivers – both in terms of agents and concepts – that impede or delay convergence are gradationally lined up when moving towards the periphery. Different underlying patterns indicate different spheres of influence: To the top (north), resistance from the political and socio-political sphere (north-west) and political economy fields (north-east) increases. To the right (east), adverse corporate interests are depicted. To the bottom, technological and structural constraints dominate. Finally, the left (south-west and north-west) depicts opposition from academic clusters and think tanks, respectively. For obvious reasons, these fields are overlapping. For instance, technology bears a component of strategic corporate interests, the academic input of new design proposals as well as political influence.

Commission's strive towards convergence benefits from the academic support of epistemic communities as well as the technological and informational coordination of transnational regulatory networks in liaison with the regional transmission coordination organisation. The graph also shows that the EU also has a number of actors that are located far from the centre, though: Especially nation states have an ambivalent position by promoting convergence in accession countries and geographically close regions, while pursuing policies of economic patriotism on domestic grounds. Similarly, vertically integrated utilities use their informational advantages in respect to technology in order to defend their territorial incumbency. However, the force of the Consensus seems to prevail.

One satellite of particular mimetic convergence emerges in respect to the EU's diffusion of the Virtual Power Plants model instead of outright divestitures, indicated by the sub-circle with the dashed line.

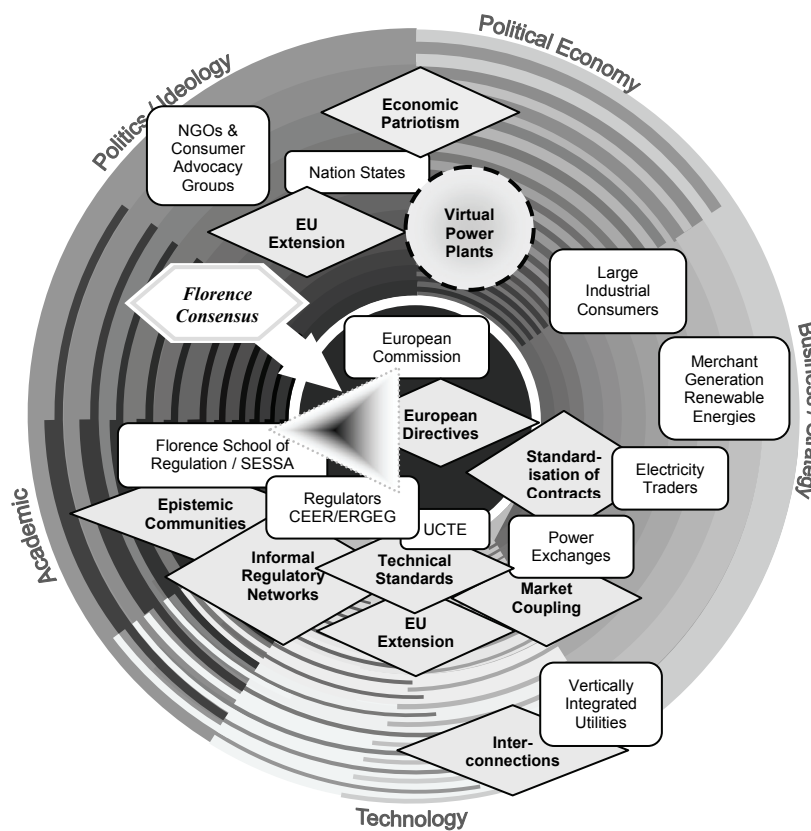


Figure 1: Convergence Map EU
(distance from the centre indicates diverging positions towards standardisation)

In contrast, the evolution in the United States has drifted from an initial embracing of market principles into a diffuse spectrum of atomistic attitudes about how to proceed with liberalisation, exacerbated by regulatory failures like the first Californian market architecture and corporate failures like Enron. FERC, the Federal Energy Regulatory Commission, has hampered the process of convergence by the attempt to rapidly impose a standard design of 'organised markets,' whose efficiency is questioned as not being liberal enough by industry lobbying groups, a number of academics and neo-liberal think tanks, whereas consumer advocacy groups and public power utilities consider it an illegitimate intrusion into the regionally diverse, well adapted models of traditional

supply structures. Most importantly, public utilities commissions of a significant number of states oppose any standardised top-down approach to regulatory convergence.

The following graph maps the current situation in the USA. In the centre, the core drivers for and elements of convergence are located: FERC, its Standard Market Design and the Regional Transmission Organisations. Merchant generators, traders, some epistemic communities as well as some pro-competitive public utilities commissions appreciate FERCs proposals, while almost all other agents are openly opposed. In the graph, Renewable Portfolio Standards have their autonomous evolution across the states, a feature that has been discussed in section IV.C; therefore they are distinguished by a sub-circle with dashed lines

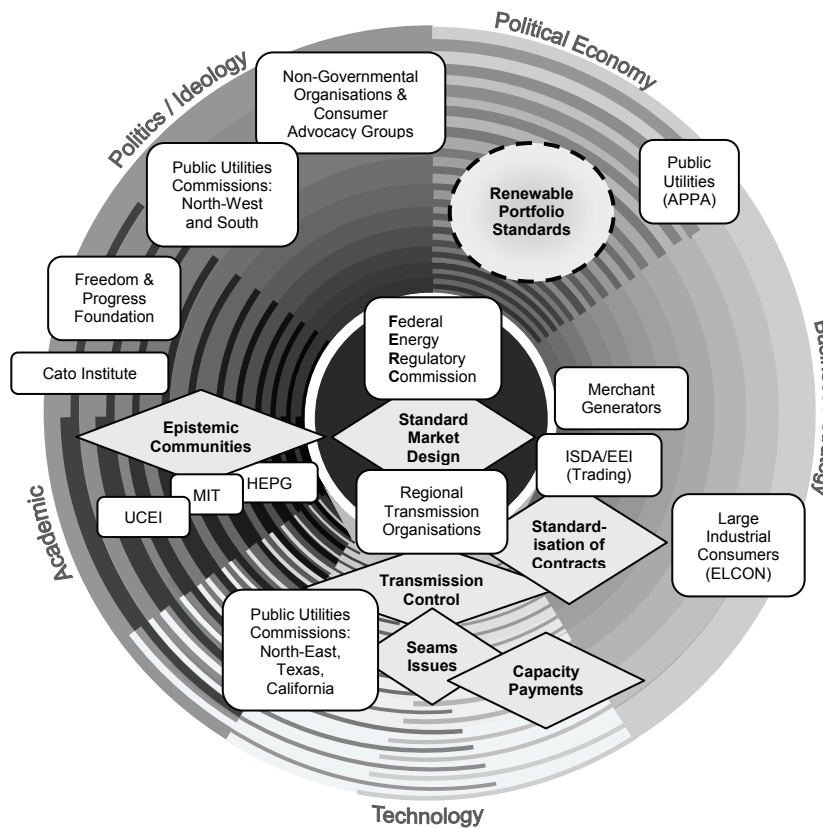


Figure 2: Convergence Map US

(distance from the centre indicates diverging positions towards standardisation)

It appears likely that for the foreseeable future large parts of the United States, especially in the South-East and the North-West, will have no incentive to adopt the predominant model of the regionally most integrated markets in the North-East. Seen from the perspective of classical democratic control, resistance from US state authorities, lobbying groups and grass-roots movements bears a stronger component of democratic participation and legitimacy than the ‘opaque’ EU decision-making process, thereby coming close to Tiebout’s theory of multiple regulatory equilibria and corresponding to the American ideal of ‘regulatory federalism.’

Market design convergence in the USA will be constrained to the incremental, radial expansion linked to the creation of regional transmission organisations, which reduce technical and procedural incompatibilities between neighbouring transmission owners and centralise the dispatch. They act as

an ‘agglomerative magnet’¹⁷ by attracting an increasing number of companies in geographical proximity of RTOs.

Similar to informal regulatory networks, the ‘agglomerative magnet’ type of diffusion in the North-Eastern states of the USA can significantly contribute to the adoption of a single model. By definition, it remains a regional phenomenon, though. It differs from regulatory networks in that it offers the possibility for each constituency to individually decide whether to join the regime or establish an independent design. The magnet metaphor also points to the fact that for a newly participating entity the rules of the game are already predefined by the existing model, and any desired modifications are likely to face severe obstacles, thus adding a layer of path-dependence to the process that—assuming that the initial design is not yet perfect—prevents the system from reaching optimality with an increasing number of participants.

VIII. Conclusions and Outlook

One of the lessons of more than a century of commercial power supply is that the electricity sector is always in a state of criticality, be it induced by the alternating topics of security of supply, the efficiency of public enterprises, generation technologies, the public service character and equity, or environmental concerns. As a critical infrastructure component the electricity industry is not likely to be spared from political interventionism on a cyclical basis. Insofar, any theory of a lasting regulatory equilibrium would probably fail to provide a sufficient explanation, since that equilibrium is fragile and in a process of constant redefinition. Theories of regulatory *competition*, which set up conditions for market design convergence (or diversity) and identify the relevant mechanisms, are more easily applicable to the sector. Conventional theories like the race-to-the-top or race-to-the-bottom approaches can only be validated for peripheral features of market designs, though, like the previously discussed Renewable Portfolio Standards in the US or the resistance of renewable energies marketers to lobby for European-wide renewables standards in the EU. Tiebout’s classical equilibrium model, on the contrary, represents a valid approach to describe the phenomenon of regulatory federalism encountered in the diversity of market designs in the USA. However, it has to be complemented with the agglomerative magnet as a parallel development. The reasons for the diffusion of the North-Eastern market model despite the sustained resistance of multiple, nationally organised interest groups are complex, especially when considering the motivation of individual corporate grid owners shifting operational responsibility to RTOs, but they point to the success of FERC’s organisational learning process leading to the selection of a second-best strategy to foster convergence. The European Commission has also embarked on a second-best strategy by circumventing the authority of national governments in its institutional support for informal regulatory networks. The increase of independent regulatory agencies outside the traditional Anglo-American context (see Gilardi *et al.* 2006 for an analysis of Europe and Latin America) indicates that even in regions with a less institutionally stable environment than the EU transnational regulatory networks may play a major role in the diffusion of best practices and become a driver for convergence in regulatory competition within the foreseeable future. North’s theory of path-dependence can be applied to both the continental European and the US American ownership structure of the industry, while Roe’s (1996) observation that major (legal) changes occur only as a response to system breakdowns may not fully describe the evolution of sector reforms in the USA: The reform movement started off in states with high electricity costs and as a spillover effect from other formerly regulated industries—hence *not* from an outright crisis of the system. Roe’s theory of inertia can to some extent be helpful in understanding the subsequent events,

17 Dunning (1998: 51) uses this terminology in respect to the choice of location of multinational enterprises: ‘There is a suggestion, too, that the presence of other foreign investors in a particular country is becoming more significant, both as an ‘investment-stalk’ or signalling effect to other firms less familiar with that country [...], and as an agglomerative magnet by which firms benefit from being part of a geographical network or cluster of related activities and specialized support services.’

though: The repercussions induced by the California market crash and Enron's bankruptcy shattered the belief in liberalised markets and motivated many state commissions and politicians to stick to the old models instead of experimenting with new forms of governance, thus revealing an instinctive conservatism when confronted with uncertainty and change. Modelling, policy bandwagoning and imitation have not been identified as *core* drivers of regulatory convergence in the USA and continental Europe, but they may occur in other regions of the world, in particular in industrialised countries outside the major trading blocks, in isolated systems and in the emerging economies in South-East Asia (for a categorisation of *global* drivers of market design convergence, please see Weinmann 2007). Also, late-starters like Texas and Ireland with their independent grids and, after the initial design failure, California have been actively seeking to unify best practices from regimes elsewhere.

Global electricity sector liberalisation is at a critical point in its development: Especially in North America claims of reversal and a return to the old system of vertical integration and rate-of-return regulation—according to Watts (2001) still the most effective hedging option for consumers against high prices and for suppliers against too low prices—find supporters among politicians, small consumers and even the industry. The existing market designs have still not delivered the expected benefits in terms of retail choice or price decreases due to competitive pressures (Ruff 2003); they are rather considered an illegitimate transfer of power from public utilities commissions who act in the best interest of their customers (Morrison 2005) to anonymous, federally imposed super-agencies. The criticism is reinforced by spiralling costs for the new regulatory organisations and system operators (APPA 2004). But also in many countries of continental Europe liberalisation is perceived to have unilaterally benefited the producers and suppliers of electricity, which are now allowed to operate under a short-termist, Darwinian business logic, exploiting their market dominance to impoverish residential consumers while disrespecting their societal responsibilities, polluting the environment with dirty and cheap technologies and failing to secure adequate investments in generation and transmission extensions.

One of the principal reasons why resistance to market design convergence in the US and, to some extent, in Europe is outspoken and successful can be found in the fact that no single model has emerged as the favourite mode of reorganising the sector efficiently and under criteria of finding the balance between market forces and business logic on the one hand, and resource adequacy and reliability on the other hand, thus impeding Campbell's 'convergent evolution.' (1969: 78) While most scholars challenge the necessity of price caps and capacity payments, as they exist in the North-East US, the additional benefits of nodal versus zonal transmission pricing schemes, the appropriate signalling of investment incentives by financial transmission rights, mechanisms of market coupling, organised versus fragmented dispatches, the role of power exchanges and trading, and the implicit or explicit allocation of cross-border transmission capacity are theoretically contested and practically often unresolved. Not only different phenotypes of markets, but also genotypes of designs exist on both sides of the Atlantic, which gives rise to the impression that the academic community, which should take the role as guiding entity in a joint 'policy enterprise,' is atomised in itself. In that environment (and well outside the EU), niche designs like cost-based pools or the previously described Oregon model might even survive without eventually transforming into more widespread schemes.

The multitude of positions and strategies portrayed in this analysis suggests that in both the United States and in Europe the power of one unifying design model does not exist. While the EU compensates this crucial component of restructuring by incremental trial-and-error learning fostered by the Florence Consensus, the USA has predominantly embarked on two trajectories: the first leading to radially expanding convergence of 'organised markets' under the auspices of regional transmission organisations, and the second in largely preserving the status quo of the traditional, locally adapted model under a form of anti-federal grassroots empowerment and protective parochialism.

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