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Towards a Green Internal Electricity Market

The Self-Regulation of European Transmission System Operators for Electricity within EU Multilevel Governance

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Abstract

Due to the 3rd Energy Package of 2009 the regulation of European electricity transmission did change considerably. Before, cross-border electricity issues have been regulated by voluntary contractual agreements between Transmission System Operators. Now, the new-founded Agency for the Cooperation of Energy Regulators (ACER) and the European Network of Transmission System Operators for Electricity (ENTSO-E) are guiding this process together with the European Commission. Currently, these organizations are developing network codes to be implemented as binding EU electricity transmission regulation within the next years. This paper analyzes, if this new regulation process does promote the creation of an internal electricity market as well as a better integration of intermittent renewable ('green') energies due to the multilevel governance approach.

Keywords: EU Energy Policy, Transmission Grids, Renewable Energies, Regulation Theory, Multi-level Governance Theory

JEL Classification: L43, L59, L94

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List of abbreviations:

ACER	Agency for the Cooperation of Energy Regulators
ATSOI	Association of the Transmission System Operators of Ireland
BALTSO	Baltic Transmission System Operators
CACM	Capacity Allocation and Congestion Management
CEER	Council of European Energy Regulators
CEP	Common Energy Policy
DG	Directorate-General
EC	European Commission
EAEC	European Atomic Energy Community
ECSC	European Coal and Steel Community
EEP	European Energy Policy
EIP	European Infrastrcuture Package
EnBW	Energie Baden-Württemberg AG
ENTSO-E	European Network of Transmission System Operators for Electricity
EPI	Environmental Policy Integration
ERGEG	European Regulators' Group for Electricity and Gas
ETS	European Transmission System
ETSO	European Transmission System Operators
EU	European Union
IEM	Internal Energy Market
ISO	Independent System Operator
MS	Member States
NGO	Non-Governmental Organization
NRA	National Regulatory Authorities
RE	Renewable Energies
RES	Renewable Energy Sources
RES-E	Renewable Energy Sources for Electricity
RWE	Rheinisch-Westfälisches Elektrizitätswerk
TEN-E	Trans-European Energy Networks
TSO	Transmission System Operator
TSC	Transmission System Operator Security Cooperation
TYNDP	Ten-Year Network Development Plan
UCPTE	Union for the Co-ordination of Production and Transmission of Electricity
UCTE	Union for the Co-ordination of Transmission of Electricity
UK	United Kingdom
UKTSOA	UK Transmission System Operators Association
VEW	Vereinigte Elektrizitätswerke Westfalen AG

1. Introduction

Since the early 1990s the European Commission (EC) is pushing forward the creation of an internal energy market (IEM) and the liberalization process implied considerable regulatory changes. But the cross-border electricity transmission is bound to monopolistic transmission networks; therefore Transmission System Operators (TSOs) now have to facilitate - additional to the national transport of electricity between producers and consumers - also the competition in the wholesale electricity market as well as electricity flows from one system (or country) to another. Still many interconnections at the inner-European borders are not yet discharging satisfyingly. The reasons are of technical, but especially of regulatory nature.

With its strategies Europe 2020, Energy 2020 and Energy 2050 the EC is also pushing forward targets for the member states (MS), their industries and TSOs towards the reduction of CO^2 emissions in order to decrease the impacts of climate change. One target is the better integration of intermittent renewable energies (RE) (in this paper the terms 'renewable' and 'green' energies are used as synonyms) into the electricity grids. Its realization especially depends on the transmission networks and a reliable and coordinated cross-border electricity management. So a well-functioning interconnection of transmission grids meets both dimensions: the IEM and the better integration of RE. In 2009, the 3rd Energy Package brought considerable regulatory changes. Before, European TSOs did arrange cooperation at the cross-borders due to voluntary contractual agreements. But now the new-founded Agency for the Cooperation of Energy Regulators (ACER), the European Network of Transmission System Operators for Electricity (ENTSO-E) and the EC are by law guiding this process. Together, they are currently developing network codes (NCs) to be implemented as binding EU cross-border electricity transmission regulation. This paper analyzes this new multilevel regulatory process in order to answer the question: *Does the new regulation framework of European cross-border electricity transmission contribute to the realization of an internal electricity market as well as a better integration of intermittent renewable ('green') energies?*

State of Research

Concerning electricity transmission regulation most scientific literature has an economic, industrial engineering or legal background. Literature from political science focuses mainly on institutional changes in order to explain which interests led to the new regulatory structure. Pierre and Peters (2009) indicated a trend towards agencification on the EU-level, which replaces former transnational networks because of functional pressure (Pierre & Peters 2009:

351). According to Egeberg and Curtin (2008) the establishment of EU agencies has become an important part of the European executive. The European energy and climate policy has been addressed by integration theoretical research. For example the extents of decision-power transferred to the supranational level for these two policy areas have been compared (Wettestad, Eikeland and Nilsson 2012). While Pollak et al. (2010) see climate policy as a major driver for developments in IEM policy Hildingsson, Stripple, and Jordan (2012) do claim just the opposite: They are regarding the IEM as an important driver for renewable policy. Scholars have also analyzed the relationship between the creation of an IEM and climate energy goals and identified the second one as a "backdoor" for the EC for influencing national energy policy (Dupon/Radostina 2011), also called "green Europeanization" (Solorio 2011). Concerning the 3rd Energy Package, research has mostly focused on ownership unbundling: This was regarded as an important factor for the creation of an IEM (Eikeland 2011a; Eikeland 2011b). Scholars have also assessed the role of ACER as a new energy regulator on the European level, but regard it as rather weak (Hancher/Hauteclocque 2010). Until now a very small number of researchers have given attention to the NC procedure. While some regard it as an incremental change which represents only little modification to the TSO self-regulation (Hauteclocque/Talus 2011), others see the new procedure as "a radical departure from the bottom-up approach of the regional process" (Squicciarini et al. 2010: 15).

2. Theoretical Part: Regulation and Multilevel Energy Governance

According to Giandomenico Majone regulation is the "purpose of controlling the manner in which private and public enterprises conduct their operations and is (…) as old as government" (Majone 1996a: 9). Its function is "to correct market failures - the inefficient allocation of resources and outcomes in competitive markets" (Majone 1996b: 28). Generally, it is executed by an agency or administration based on a legal mandate. Regulation is not only achieved by law, but also requires expertise of the regulated activity (Majone 1996a: 9). On the integration side regulatory authorities are in charge to abolish barriers to market access for new market entrants, secure a functioning market and to observe market rules. On the correction side they shall reduce the adverse consequences of productive and market activities for human health, the environment and other policies of national welfare (Héritier/Lehmkuhl 2011: 127). 'Regulation' is a mode of the broader concept 'governance'; and means "a new method by which society is governed" (Rhodes 1996: 652-3).

Modes of Regulation and Governance

Majone shaped the idea of the EU as a regulatory state and developed the 'classical approach' towards regulation. According to him, not the function of energy regulation did change in time, but its mode (Majone 1996a: 9). He distinguishes between:

1. *Nationalization:* the traditional European regulation by public ownership or administration. Public enterprises influence the market directly through their production decisions and indirectly through their pricing decisions. In European history, nationalization has been the main mode of economic regulation, especially in infrastructure sector services such as gas and electricity. Public owned industries have mostly been natural monopolies and gave the nation-state the power to impose a planned structure (Majone 1996a:11).
2. *Statutory regulation:* the regulation by an independent, specialized agency. With the liberalization and the establishment of the European internal market it became the most important mode in Europe (Majone 1996b: 47), though it also has been criticized (Majone 1996a: 10). Here, key industries remain in private hands, but specialized agencies with technical expertise develop and enforce rules for their regulation (Majone 1996: 11).
3. *Self-regulation:* here responsibilities are delegated to private or semi-private bodies. This mode of regulation usually offers a higher degree of expertise and technical knowledge within the relevant area than a public agency. Self-regulation by a private body is usually less formalized, public costs of rule-making are lower and adapt quicker and more flexible to changing economic conditions (Majone 1996a: 24). But it is criticized, that regulators could get dominated by the regulated interests (Majone 1996a: 25) and monitoring could be lacking when practitioners are better informed than public authorities. Also their willingness to discover and expose malpractice might be smaller. This is the reason why the presence of a forceful public regulator is needed in order to "guard the guardians". According to Majone, actually there is no distinction between public and private, but rather between mandatory and voluntary standards. And standards are set through a consensus process with government officials and industry representatives. Therefore self-regulation may be useful complementary to statutory regulation, but cannot replace it (Majone 1996a: 26).

Despite a clear shift towards agencification and self-regulation on the national level a real European "regulatory state" like forecasted by Majone did never emerge. Instead, lots of

"softer" governance modes have been developed in the EU. Héritier and Lehmkuhl (2011) identify:

1. *The delegation of high-expertise regulatory tasks to independent regulatory authorities*: This mode corresponds to Majones statutory regulation. According to Héritier and Lehmkuhl the shift from administration to an independent agency emerges in highly complex areas of market integration such as energy. Additionally, they cooperate within regulatory networks at the European level, which facilitates the exchange of information. In the electricity sector this explains the establishment of the Council of European Energy Regulators (CEER) or European Regulators' Group for Electricity and Gas (ERGEG) (Héritier/Lehmkuhl 2010: 128).
2. *The delegation of regulatory tasks to comitology:* means the expertise-based decision-making and implementation of the EC in cooperation with experts from MS. Usually not just one, but various comitology procedures take place. This mode of governance is often combined with other modes, such as the regulatory networks.
3. *The self-regulation by private actors* is defined by Héritier and Lehmkuhl the same way as Majone. It builds on the expertise of industry actors when formulating public policy measures in energy regulation. This explains why policymakers for long time relied on the expertise of TSOs and left they meet agreements with each other for the cross-border electricity transmission. Also industry associations can commit their members to develop certain targets such as the ENTSO-E in the electricity transmission sector.
4. *The application of benchmarking or the model of best practice under the open method of coordination:* a governance mode of voluntary coordination. In the energy sector it is increasingly used in the course of deregulation. The EC recommends targets which are then monitored by the MS on a voluntary basis (Héritier/Lemkuhl 2010: 129).
5. *The application of arbitration as a mode of alternative dispute resolution by private actors:* a mode that has thus far received little attention. By the business community it is increasingly used in the arbitration of European competition law cases. It is an alternative to litigation in courts, as it offers the possibility of private dispute resolution.
6. *Bipartite and tripartite policy-making:* a social dialogue, which mostly applies to social and employment policy. It allows self-initiated and self-implemented collective agreements between opposing interest groups.

These new modes of governance represent an alternative towards traditional policy-making. They apply on complex (new) market issues and functionally, specialized independent regulatory arenas. They all pursue objectives of market integration or correction (Héritier/Lehmkuhl 2010: 130) and have been adopted in a variety of policy fields such as energy regulation or competition enforcement (Héritier/Lehmkuhl 2011: 128). They all rather flatten the supranational regulatory hierarchy. But the EU also created some mechanisms to emphasize binding enforcements, shown in the next part of the chapter.

New Modes of Multilevel Governance

The Governance Dilemma

The classical multilevel governance approach has been developed as an opposition to more state-centered theories of European integration. It rejects the idea of separated policy arenas, but views domestic and international political arenas as interconnected and actors share decision-making at different levels (Marks, Hooghe and Blank 1996: 346-147). Increasing international cooperation leads to a rising interdependence between institutions and actors. Therefore international institutions have to expand their functional tasks and resources. But often they lack the tools and skills to monitor and oversee the implementation of international rules within the MS, what Keohane (2001) calls the "Governance Dilemma". He identifies a capacity gap which threatens the legitimacy of these international institutions and larger cooperative projects (Eberlein/Newman 2008a: 25).

Transgovernmental Networks

An increasingly important exit from this dilemma represents, according to Eberlein and Newman the "Incorporated Transgovernmentalism" (Eberlein/Newman 2008b: 4). Subnational actors like non-governmental organizations (NGOs) or multinational corporations (MNCs) meet and interact within such transgovernmental networks with their counterparts from other MS (Eberlein/Newman 2008b: 5). Because states have to manage evermore complex international relations, they increasingly shift responsibilities from 'government' to 'governance'. Also national regulatory agencies (NRAs) are cooperating in such networks with novel, regulatory processes and take a critical role in defining and enforcing European rules. An example in the electricity sector is the European Regulators' Group for Electricity and Gas (ERGEG) created in 2000 by the EU, the predecessor of ACER. Such regulatory networks develop because of the thickening density of international interdependence, cross-border information flows and trade liberalization. They produce binding regulation and

cooperate on the harmonizing of the diverse European energy markets. So they coordinate European projects both on the supra- and national level (Eberlein/Newman 2008b: 4). The incorporated regulatory networks are by EU-law integrated into the supranational policy-making process, and are granted the authority to participate in the EU rule-making, enforcement and implementation. They serve to advice the EC, to draft implementation legislation, coordinate national enforcement, promote information exchange among national regulators and make recommendations to the public on emerging regulatory issues (Eberlein/Newman 2008b: 5). European institutions can leverage the expertise of these networks to fill information gaps, while networks bring more transparency into supranational politics (Eberlein/Newman 2008b: 6). Networks consist of relatively stable relationships of non-hierarchical interdependent nature. They do not have principals or administrative and financial capacities, their decision rules are flexible and informal and membership is voluntary (Levi-Faur 2010: 8). Incorporated transgovernmentalism could only emerge due to the liberalization and agencification of the electricity sector on the national level. EU legislation has actively encouraged MS to create independent regulatory agencies and as a result there has been a shift on the national level from executive ministries to independent agencies. Incorporated transgovernmentalism could then be facilitated, because national agencies regulating a liberalized market are more available to coordinate a supranational governance strategy (Eberlein/Newman 2008b: 8).

Agencification

But recent literature has observed that these networks are increasingly replaced by EU-agencies; an evolution that is also called the "agencification of networks" (Thatcher/Coen 2008). Agencies even compete with networks or are capable to capture them, creating an "agencified network". But networks on the other side can also help to empower agencies, creating a new type of regulatory organization, called a "networked agency" (Levi-Faur 2010: 8). According to Levi-Faur (2010) European regulatory agencies are – rather than networks – the preferred option of the EU. Pierre and Peters (2009) define this shift in their study about agencies in the aviation sector as the EC's decision to extend and tighten its control in certain sectors through agencification. Levi-Faur argues, that the EC has managed to "agencify networks and to turn them into mechanisms of European governance and integration". That way it creates a hybrid organization, which is a potential innovation that might also be useful at the global level (Levi-Faur 2010: 8). According to him neither agencification nor networks are actually new features of governance; but the extent to which they have grown since the 1980s in the EU represents a radical change of the construction of the modern state (Levi-Faur 2010: 9).

Also Egeberg and Trondal (2011: 882) expect the establishment of agencies at the European level to be an executive centralization further away from an intergovernmental order. Jevnaker (2012: 106) supposes that ACER and also ENTSO-E could have such an effect, not only due to their role within the NC procedure, but also through other tasks. This kind of decision-making power on the European level could also increase the integration of this policy field in general. Egeberg and Curtin (2008) in contrast argue that this does not transfer power to the European institutions, but only to the independent bodies. But, different to the incorporated transgouvernmental networks of NRAs, whose boards are staffed with representatives from NRAs, the inclusion of an EC representative within ACER increases definitely the influence of the EC on the agency (Egeberg/Trondal 2011). According to Jevnaker the organizational structure of ENTSO-E resembles an agency, because it is a single body, has a principal and speaks with one voice – in contrast to a network. And although this body consists of private enterprises, it has been given a major role in making legislation that applies generally across Europe (Jevnaker 2012: 106). Before there has been a regulatory gap concerning cross-border electricity issues, which has been filled by the voluntary, self-regulatory agreements of TSOs. They were already cooperating at the European level long before and therefore represented a challenge for national regulation. With the institutionalization or 'statutorization' of this inter-TSO self-regulation through the 3rd Energy Package their cooperation was now made mandatory and subject to sanctions. In that way, the regulatory gap could be filled again (Jevnaker 2012: 106). But according to Jevnaker, in general the powers of ACER over ENTSO-E are still weaker than those of national regulators over their respective TSOs at the national level (Jevnaker 2012: 106-107).

In summary, there has been an evolution in the European electricity sector from nationalization to agencification and self-regulation both on the national and the EU-level. Instead of a command and control regulation new modes of governance have been implemented and a multilevel governance system established consisting of a mix of national and supranational institutions, transgovernmental networks as well an EU-agency, though if it is rather weak. The construction of the ENTSO-E cannot really be defined – because it has elements of a self-regulatory association, an incorporated network as well as an EU-agency.

3. EU Electricity Policy

The European Energy Policy (EEP) was firstly mentioned in the treaties on the European Coal and Steel Community (ECSC) of 1952 and the European Atomic Energy Community (EAEC) of 1957. These treaties included regulations for the coal and steel sector and the use of nuclear energy in terms of peacekeeping and security of supply. In the 1960s there were first proposals for the constitution of a free European energy market and the energy crisis in the 1970s provoked some actions for the decrease of import dependency. But a consequent EEP did not develop until the beginning of the 1990s.

And even today, although energy policy provided an early impetus for European integration, it is not a supranational organized policy field and still remains in the sovereignty of MS. A full-fledged and coherent common energy policy (CEP) does not exist – even on the contrary - it is the weakest area of European integration (Solorio 2011: 1). The MS inhibit a central role within decision processes about energy and are influenced by their individual energy mix, production and transport structure, degree of import dependency, domestic market structures and the relations to their delivery countries. But within the last years the EU was able to gradually extent its competencies in this area through three political "backdoors":

1. the creation of the IEM,
2. the European climate policy and
3. external energy affairs.

Through the lenses of these three fields of competency the EC owns an initiative right, can submit strategies or proposals and balance between national interests (Nötzold 2011: 201). Especially within the last few years an enormous dynamic has developed concerning the energy political strategy of the EU. Global challenges like rising energy prices, imminent congestions of supply and the impacts of climate change let the EEP, in combination with climate policy, switch to the top of the political agenda (Nötzold 2011: 225).

The Internal Electricity Market

According to the EC an IEM has three positive effects:

1. More efficiency at production and consumption due to more competition and competitiveness; and for consumers a free choice of supplier;

2. The improvement of security of supply, because a common regulation offers incentives for investments, liberalized markets can promote a better diversification of energy sources and routes of transport; and European companies get better negotiation positions on the global markets;
3. The addition to a sustainable development, as electricity suppliers from RES get fair access to the market, combined with means for their promotion (Nötzold 2011: 227).

The structure of the European and national energy markets has been debated and changed considerably over the last two decades. In the past, electricity industries have been organized as vertically integrated monopolies and some of them were nationally owned (Meeus et al. 2010: 1). In most European countries they have been protected from competition for a long time (Steger et al. 2008: 2).

The 1996 Electricity Directive (EP 1996) started the liberalization process of the IEM (Steger et al. 2008: 2). It provided a general framework and principles for the introduction of competition in this industry (Squicciarini et al. 2010: 3). Essential was the opening of all electricity and gas markets for customers and the constitution of national regulation authorities to regulate tariffs and tariff systems for network access (Frenz/Kane: 2010: 471). Also the Directive on streamlining electricity and gas and the Regulation about cross-border electricity trade have been implemented. Though the transmission and distribution of electricity remained natural monopolies, every generator should have non-discriminatory access to the grid. But many barriers remained, especially because the MS had very heterogenic structures for energy supply and also partly rejected liberalization (Nötzold 2011: 226). In 1996 the EU did further establish the Trans-European Network on Energy (TEN-E) instrument, which should stimulate cross-border connections, but its financial capacities were low and its results disputed (Egerer et al. 2009: 63).

In 2003 the EP and the EC enacted the so-called Second Energy Package, concerning common rules for an IEM, which should oblige MS to set up effective NRAs (Steger et al. 2008: 2) in order to reduce market dominance, support non-discriminatory network access and to initiate legal unbundling of the transmission and distribution grids and operators. It further should stimulate benefits regarding efficiency gains, price reduction, standards of service (Pielow 2009: 139) as well as information on energy generation sources and their environmental impact (Egerer et al. 2009: 62). But also the Second Energy Package did not

design a concrete IEM and most of the MS kept centralized components (Meeus et al. 2010: 2) and established companies with possibilities of price control (Nötzold 2011: 227). The Third Energy Package, enacted in September 2007 by the EC, aimed for a further opening of the IEM (EP 2009c). It guaranteed equal and open access towards transmission infrastructures and decision independence about infrastructure investments. Additionally, it strengthened the independency of NRAs and claimed the harmonization of their competences (Egerer et al. 2009: 62-63). Further, it promoted a more efficient and better integrated system for cross-border electricity trade and grid operation, as well as a more transparent information flow on the energy market (Nötzold 2011: 228; Egerer et al. 2009: 62-63). The main purpose of this package was the binding ownership unbundling of the electricity networks, questioning the existence of vertical integrated energy supply companies (Frenz/Kane 2010: 472). The clear ownership separation between generation, distribution and transmission was a strong regulatory change. MS could choose between three options: *1) Ownership unbundling* (favored by the EC; it means that generation companies may not be the owners of transmission grids anymore and therefore would be forced to sell the grids); *2) grid management through Independent System Operators (ISOs)* (Here generation companies stay owners of the grids and take part at the profits, but the grid management are adopted by an ISO). Because Germany and France resisted resolutely to these two options, a further one has been introduced, *3) enabling of network operators to stay part of an integrated company*, but under detailed regulation (Nötzold 2011: 230).

Promotion of 'Green' Electricity

Since the 1990s the EU is promoting climate and energy efficiency policies to tackle environmental and energy security challenges. Solorio argues that the EU environmental performance and Environmental Policy Integration (EPI) are even important drivers of the EEP and is calling it "green Europeanization". Due to spillover effects of the climate policy the EU developed a de facto construction of a very limited and sector-based energy policy on the European level (Solorio 2011: 2; Dupont / Radostina 2011: 2).

In its strategies Europe 2020, Energy 2020 and Energy 2050 the EU formulates its targets for the European electricity sector. "Europe 2020 - a strategy for smart, sustainable and inclusive growth" is part of the climate and energy package of 2009. According to the strategy the removing of congestions in key infrastructures such as electricity transmission networks are of high importance. Also, it sets the target to increase the share of RE by 20 percent in the EU

as a whole (EC 2010a: 15). “Energy 2020 – a strategy for competitive, sustainable and secure energy” of 2010 defines these goals more in detail. This EC communication claims the reduction of greenhouse gas emissions even up to 30 percent until 2020 “if the conditions are right” (EC 2010b: 5). It mentions many challenges to be tackled, like a better implementation of internal market legislation and a better development of European networks as well as a better adaptation of the European networks to RES (EC 2010b: 6). According to this strategy, the share of RE has risen to 10 percent of gross final energy consumption until 2008. In 2009, 62 percent of newly installed electricity generation capacity in the EU was from RES, mainly wind and solar (EC 2010b: 12). It further calls for an improvement of pan-European trade in RE (EC 2010b: 14) and a grid infrastructure “which enables renewables to develop and compete on an equal footing with traditional sources” (EC 2010b: 13). Sufficient internal infrastructure and interconnectors across external borders and maritime areas inside and towards neighbors of the EU are claimed. For the modernization and adaptation of infrastructures the strategy defines the need of high investments and mentions ACER and ENTSO-E as the main actors for the implementation of the IEM (EC 2010b: 13). In 2011 the EC published its Energy Roadmap 2050. It proclaims the reduction of emissions by about 40 percent by 2050 (EC 2011: 2) and a share of RES in electricity consumption reaching 97 percent (EC 2011: 4). According to this strategy, the share of final energy demand in the EU will rise to 36-39 percent until 2050. And electricity will have to play a much greater role than today as it will have to contribute to the decarbonisation of transport, heating and cooling. Electricity could provide around 65 percent of energy demand by passenger cars and light duty vehicles. But to achieve this, power generation has to undergo massive structural changes. According to the “high renewables scenario”, the most ambitious one, RES reaches a share of 97 percent until 2050 (EC 2011: 6). In the lower scenarios it reaches at least 55 percent in gross final energy consumption (EC 2011: 7). But seen as a central challenge for that is, besides energy storage and smart grids, the management and regulation of electricity grids. This will be a main responsibility for the EC, ACER and the ENTSO-E (EC 2011: 15).

The Renewable Energy Directive of 2009 sets a target of 20 percent share of RE in the EU’s gross final energy consumption by the year 2020 (EP 2009a: 17). This legal framework has been adopted as part of the Climate and Energy Package and commits to the Kyoto Protocol of the United Nations Framework Convention on Climate Change. Unlike previous EU legislation on RE, the 20 percent target is legally binding for the MS (Dupont/Radostina 2011: 8). MS are committed to national action plans, reporting, detailed regulation about origin of

energy and access to the grid, as well as criteria about sustainability of bio fuels. But because MS have heterogenic starting points individual targets for each in connection with its growth of GDP have been defined (EP 2009a: 27). Therefore the MS's contribution to be reached varies between ten and 49 percent compared to 2005, whereupon the actual needed increase in some countries to reach the goals is between 13 and 600 percent.

The EC also developed special action plans and measures for particular energy sources, like the Action Plan for biofuels of 2005 (Nötzold 2011: 235). Concerning the electricity sector the package further predicates that 20 percent of electricity has to be produced from RES, construction for electricity transport schemes have to start before 31 December 2016 and the interconnection must be operative before 31 December 2022. The directive also promotes a broad range of different technologies to generate energy by RES (Egerer et al. 2009: 64). Further, the EU promotes demonstration and research projects.

In spite to the costs of the promotion of RE another challenge is the heterogeneous promotion of RE in the MS with each its advantages and disadvantages (Nötzold 2011: 236). Until today, there are two different promotion systems of RES: *1. Green certificates* (quota regulation), which dictate a minimum share to be reached, and *2. Feed-in-tariffs*, compensation for electricity fed into the grid, whereas energy companies are committed to take every kilowatt-hour generated by RES for a legally determined price (Nötzold 2011: 237). National energy regulators mostly play a crucial role at the promotion of RES. But in some countries regulators are not directly involved in the implementation of legislation to promote RES production (Altmann et al. 2012: 94).

Because of the growing political promotion the generation of RE within the EU did significantly increase since the 1990s. The consumption of it in all three energy sectors (electricity, heating, traffic) did grow, so that it is big compared to other industrial nations. The EC assesses, that the 20 percent target is going to be achieved and will even surpass by 2020. But it does not calculate with a linear, but an exponential curve of growth. That means that most of the plants are coming into operations shortly before 2020 (Nötzold 2011: 235).

In summary, the goals of the EEP are the functionalization of the IEM, security of supply, promotion of energy efficiency and energy saving, the promotion of new and renewable energies and the interconnection of energy grids (Frenz/Kane 2010: 466). And due to these

goals the EU can indirectly influence energy political actions on the national level (Frenz/Kane 2010: 446). Many scholars call these programs as quite ambitious and see the EU as a pioneer at the fight against climate change (Frenz/Kane 2010: 472). But some scholars also see the EEP threatened through environmental policies, as they do implement cost inefficiency and often conflict with the creation of the IEM and could lead to mistrust of the general public and large electricity consumers (Meeus et al. 2010: 2). Other scholars argue in the contrary, that the current EU-level regulatory governance outputs in climate and energy policy are not just yet coherent with the climate policy objectives of the EU 2050, therefore environmental and climate measures should be even broadened (Dupont/Radostina 2011: 2). Also, many scholars and environmental NGOs consider the RE 20 percent goal as insufficient as it does not tackle the negative impacts of climate change ambitious enough. According to them, climate change will peak long before the year 2050 (Dupont/Radostina 2011: 9).

Transmission Networks and the Integration of Renewable Electricity

The generation and trade of electricity and gas are less centralized than other energy sources such as fuels and are of necessity bound to conductor lines. The European transmission system has been built over the last 120 years, mostly after World War II. It has been constantly expanded and upgraded in order to meet the emerging high-consuming electricity needs of the power society. Its operational systems were designed according to large centralized energy production systems with a focus on large coal plants, nuclear stations and hydro power plants. Until the late 1990s and the beginning of liberalization, the networks have been mostly nationally built and operated. Therefore their development varies enormously across Europe (Altmann et al. 2012: 63).

The European electricity network is divided into four levels:

1. the low potential voltage grids, which transmit electricity to the private households,
2. the local distribution grids with less than 110 kilovolt,
3. the regional distribution grids with 110 kilovolt and
4. the transmission grids which transmit electricity over long distances and also cross European borders with 380/220 kilovolts.

They are called the “highways” of electricity distribution and form the “integrated network” (Kocheise 2011: 2). In this paper only the transmission grids are of interest, because they are

subject to the internal market and mainly responsible for the integration and balancing of RE. The energy market integration is depending crucially on them, because they connect MS for the transport from power plants in one country to consumers in another (Tangerås 2012: 1644). Their fields of activity are of special interest for European regulation.

Within the liberalization process many of the transmission networks have been privatized. Currently, they are operated by 41 TSOs, who are organized within the European association ENTSO-E. They are responsible for electricity transmission from centralized power station to the main high voltage infrastructure and connect energy production and demand centers. Electricity TSOs operate, maintain and expand the extra-high-voltage power systems, which are composed of lines and transformer stations. But the precise tasks allocated to them vary by the jurisdiction of each country (Riechmann/Roberts 2009: 458). The most important EU-legislation concerning TSOs is the Regulation on conditions for access to the network for cross-border exchanges in electricity of 2009 (EP 2009b). It sets up the establishment of the ENTSO-E and requires TSOs to increase their cooperation and coordination. In order to ensure coordinated and sufficiently forward-looking planning and sound technical evolution of the transmission system, the TSOs are required to create the NCs (EP 2009: 15). Other regulations address charges for access to networks, general principles of congestion management, new interconnectors, and the relationship between ENTSO-E and ACER.

The electricity sector has to contribute the biggest part towards the 20 percent goal of the EU (Nötzold 2011: 237) and to an important amount due to the increasing integration of RE into the network. Directive 2009/28/EC sets the clear target that TSOs and DSOs have to guarantee priority access or guaranteed access to the grid-system towards RES-E. MS are also obliged to facilitate consumption of RE produced in other MS, which requires flexibility measures. Also RE imports from third countries shall be ensured in order to count to the 20 percent target. TSOs inhibit a fundamental role here. They are responsible for the deployment of cross-border transmission and the implementation of new interconnection projects. But the precondition is that they work coordinated and efficient (Altmann et al. 2012: 92). All networks in the area of the ENTSO-E are clocked to the frequency of 50 hertz. The smallest aberrances of this frequency, also in less meaningful parts of the grid, can have serious consequences for the whole network and lead to regional blackouts (Kocheise 2011: 2). Because RES are variable and often not predictable their balancing is a special challenge. When transmission of RES cannot be ensured, TSOs have to pay financial compensation

towards RE producers (EP 2009a: 140) which again has to be paid by the consumers. So the main challenge concerning RE is not its increasing share, but rather the adaptation of the transmission systems to them. The electricity system in Europe was designed according to conventional power generation and lacks the technical and regulatory requirements for the rising integration of RE (Neuhoff 2011: 16). Concerning this a study of the European Parliament (EP) mentions two big challenges: On the one hand, RES are unevenly distributed across Europe; their production is less centralized than fossil power plants, especially in the case of offshore wind (Altmann et al. 2012: 14). On the other hand RES provide a very variable electricity generation, according to weather conditions. This implies certain risks for the stability of the networks. Especially intermittent energy forms such as wind, solar power, wave and tidal require adaptations to and extensions of the electricity grid and its operation (Altmann et al. 2012: 13). It can happen that because of weather conditions countries might have more RES-E generation than they could integrate into their network. This might even lead to negative prices (Altmann et al. 2012: 104). Variable power flows from RES-E generation may cause loop flows. A 'loop flow' occurs for example, when electricity from offshore generation at the German North Sea flows towards the consumption centers in the south. But because of internal congestions in Germany it is not flowing directly, but takes the way over Poland, Czech Republic and Austria. This causes problems, because the cheap RES generation from Germany, which has by EU-law access priority to the grids, threatens the competitiveness of the coal electricity generation of these countries. Additionally, a RES overproduction pushing on the Polish grid can cause other loop flows there (Altmann et al. 2012: 13). And when Poland does not let RES electricity from Germany pass, it gets lost and German TSOs have to pay the generator anyway – which in the end increases the price of RES.

A key for both the achievement of the IEM and the cost-effective integration of RES-E is the improvement of European grid infrastructure, because it enlarges the destination markets for variable RES-E. The improvement of grid infrastructure can help to increase transmission capacity, reduce congestion and to increase electricity trading. The integration of regions reduces the volatility induced for example by weather, because different geographical areas have different demand curves. The risks of wind overproduction and the negative prices can be reduced. Countries such as Germany, Ireland and Spain have acknowledged the need for further grid expansion in a number of reports. In the policy scenarios up to year 2020 the focus is on better interconnections between Scandinavia and Central Europe, but also between

Spain, Portugal and France (Altmann et al. 2012: 16). There are regions, which are already well connected, such as the Nordic countries, which are connected to the Norwegian and Swedish hydro power sources. Also in the Alps there are strong connections to the surrounding countries due to hydro power. And it is predicted that the increasing share of variable renewables will increase the value of these flexible resources. While in Eastern Europe some countries are well connected, most parts of the region are poorly connected by current standards. The improved interconnection would provide both countries with the necessary flexibility to ensure cost-effective RES integration. The massive deployment of variable RES-E could even have the effect that investments in interconnections are incentivized. In that sense RES would even support the goals of the 3rd Energy Package (Altmann 2012: 101). But a political challenge is that some regions will benefit from new interconnections more than others (Altmann et al. 2012: 63). In the past, many interconnector projects were not realized, because they were conflicting national and company interests. The reason is that, that in Europe still exist different stable price zones. And increased interconnection would allow producers in the low price zone to sell electricity in the high price zones. This would lead to the effect that consumers in the high zone would gain, when prices fall. And consumers in the low price zone would face higher prices (Altmann 2012: 101).

Because the infrastructures are such a crucial point both for the EEP and the Europe 2020 goals, the EC did publish a communication on "Energy infrastructure projects for 2020 and beyond", also called the European Infrastructure Package (EIP). It addresses the "outdated and poorly interconnected energy infrastructure" (EC 2010c: 4) and suggests the creation of "Regional Groups" for each priority corridor (EC 2010c: 10) like. These Groups will have to define each a list of projects of common interest according to the priorities of each European region. They are composed of TSOs, MS representatives and NRAs; so the role of TSOs is expected to be even more influential in the future concerning grid development (EC 2010c: 6). But the technical expansion and interconnection alone is not sufficient. There is also a strong need for binding and reliable regulations concerning cross-border electricity transmission. This is the role of the NCs. They apply exclusively on the regulation of cross-border electricity grid management and operation. A common European grid management does not exclusively correspond to the integration of RE, but it serves all forms of electricity. However, in contrast to the more centralized and nonviable fossil energies it is crucial precondition for the integration of RE. Especially the NCs on capacity allocation and

congestion management (CACM) and on balancing will regulate important areas of market harmonization necessary for the integration of RES. According to the TYNDP of the ENTSO-E, even 80 % of all congestions are directly related to RES integration, either because of their direct connection of RES or because the corridor connects RES and load centers. According to ENTSO-E, the massive development of RES is the main driver for larger, more volatile power flows, over larger distance across Europe (ENTSO-E 2012a: 56). Therefore additional regulatory efforts for the stability and security of the system at a high level penetration are needed. The electricity balancing market integration is the major regulatory challenge (Altmann et al. 2012: 104). TSOs have to improve their grid management concerning RE integration, such as supply-side management (e.g. reducing RE production at certain times by active plant management), demand-side management (e.g. incentivizing consumers to increase consumption during periods of high production and to decrease it during periods of low production) and electricity storage (which is very small today compared to the amount of RE generation to be integrated) (Altmann et al. 2012: 13).

In summary, TSOs are currently facing manifold operational challenges: they need to integrate new and renewable electricity generation, have to enhance interconnectivity with neighboring operators and countries, optimize their strategies which are subject to regulatory and market constraints and ensure system reliability while also improving operating and investment efficiency. Another challenge for former vertically bundled companies is the unbundling process – which means the separation of generation, distribution and transmission (Riechmann/Roberts 2009: 457). The increasing integration of RE can have benefits on the security of supply, because they reduce the dependency on fossil fuels. They are endless, and decrease the risk of resource scarcity. RES-E deployment can help to reduce energy price volatility and improve energy conditions for poorer or remote areas (EP 2009a: 16) and therefore provide an important stimulus towards greater electricity market integration. But several implications of the ongoing large scale RES-E deployment can also stay in contrast to the single market objective, such as the loop flows caused by overproduction and access priority of RES (Altmann et al. 2012: 101). Another political challenge is the potential negative impact of infrastructure deployment on the environment and people, which is going to play an increasing role in EU energy policy (Altmann et al. 2012: 18). The NCs will tackle regulatory problems of infrastructure development and grid management at the European cross-borders, such as the management of congestions or grid balancing. This does serve all

forms of electricity generation. But for a reliable integration of RES they are a very necessary precondition.

The ACER and European Energy Regulators

Europe's NRAs do currently cooperate on the European level within two bodies: the not-for-profit network CEER and the EU-Agency ACER. While ACER is focusing on its statutory tasks related to cross-border market development and oversight, CEER addresses a much broader variety of issues (CEER 2011: 4). The regulatory tasks and market issues range from customer rights and empowerment to renewable integration and climate change objectives to the technological development of electricity and gas networks. CEER has been established in Brussels in 2000 of ten national regulating bodies. Its goal is to strengthen cooperation between European NRAs and the EU-institutions (Wallnöfer 2008 165-166). NRAs cooperate voluntarily through CEER in order to create an IEM to the benefit of consumers (CEER 2011: 3). Its membership and activities reach within and beyond EU borders; currently it consists of 31 members. The activities of CEER are partly overlapping but also cooperating with the ones of ACER (CEER 2012a: 4). ACER in contrast represents a significant shift in energy regulation, as it is a European Community body with legal personality. It has the status of an EU Agency, inhibits its own staff and resources (CEER 2011: 3). The ERGEG, which has been founded in 2003, is its predecessor. It has been the official advisory body of the EC on IEM issues. Further it has been in charge to improve cooperation, coordination and vice-versa consultation of NRAs in order to minimize inconsistencies and segmentations of and between national markets (Wallnöfer 2008: 166). According to the EC the work of ERGEG has been positive for the IEM, but the cooperation among its members has always been on a voluntary basis. In 2007 the EC and ERGEG itself stated that cooperation between NRAs should take place within a Community structure with clear competences. An independent central entity should be established: the ACER (Regulation 2009: 1). Due to this, the ERGEG was dissolved in July 2011 (CEER 2011: 3). ACER officially began to operate in March 2011. It assigns a key role in the completion of the IEM for both electricity and gas (ACER 2011: 11) and shall close the regulatory gap at Community level. In future it is going to be of particular importance, because its purpose is to foster and implement binding cooperation among NRAs in the building up of a pan-European energy infrastructure system. The ACER is in charge for two major tasks:

1. the preparing and reviewing of framework guidelines for network connection due to NCs and
2. the monitoring of projects of common interest presented by the Regional Groups and the overall Community goals (Altmann et al 2012: 94).

ACER inhibits binding decision and sanctions competences and is responsible for collecting and analyzing data on wholesale energy market transactions and other relevant data to identify possible instances of market manipulation or insider trading. The Agency comprises four bodies:

1. *The Administrative Board* is composed of nine members appointed by the Council of the EU, the EC and the EP and is charged with the administrative governance of the Agency.
2. *The Board of Regulators* consists of senior representatives of the NRAs, one for each MS and one non-voting representative of the EC. The Board plays an important role within the regulatory tasks of the Agency and reports its opinions, recommendations and decisions to the Community institutions.
3. *The Director* is responsible for representing the Agency and is in charge of its management (ACER 2011: 11).
4. *The Board of Appeal* is independent of its administrative and regulatory structure. In front of it any natural or legal person can lodge an appeal against a decision taken by the Agency (ACER 2011: 12).

Besides the reporting to the EP and the Council as well as the consulting of European institutions at energy topics, ACER participates at the regulation of European grids and can decide about modalities and conditions of access and operation of cross-border infrastructures, if NRAs do not find an agreement (Nötzold 2011: 230). It also contributes to the implementation of guidelines on trans-European energy networks – in particular when providing its opinion on the non-binding Community-wide Ten-Year Network Development Plans (TYNDP) (EP 2009d: 2). It monitors the regional cooperation between TSOs as well as the activities of ENTSO-E. Its involvement here is essential in order to ensure that the cooperation between TSOs proceeds in an efficient and transparent way for the benefit of the IEM (EC 2009: 3). Indispensable is the independency of the agency towards TSOs, generators as well as NRAs (EP 2009d: 2). The ACER is also required to inform the EC if cooperation

between TSOs does not produce the results which are needed or if a NRA does not implement the opinion, recommendation or decision of the Agency appropriately (ACER 2011: 11).

The ENTSO-E

As proposed in the 3rd Energy Package, the European TSOs are organizing and integrating on the European level within the association ENTSO-E. It was founded in 2008 with the purpose to coordinate the activities of the TSOs in order to promote the development of a pan-European electricity grid and to lead to the establishment of the IEM. Its predecessor is the association of European Transmission System Operators (ETSO), which has been founded in 1999 in order to decrease international electricity trade barriers (Wallnöfer 2008: 165). The ETSO has been combining the already existing regional associations of Continental Europe (Union for the Coordination of the Transmission of Electricity; UCTE), Scandinavia (Associations of TSOs from Norway, Finland. Denmark, Sweden and Iceland; NORDEL), Ireland (Association of the Transmission System Operators of Ireland; ATSOI) and Great Britain (UK Transmission System Operators Association; UKTSOA) (Kocheise 2011: 2). In 2001 the ETSO was rearranged into an international organization and expanded to more and more members of Middle and Eastern Europe such as the Baltic Transmission System Operators (BALTSO) (Wallnöfer 2008: 165; ENTSO-E 2010: 22). The first union for the cooperation of TSOs has even been founded already in 1951 in order to coordinate the transport of electricity: the UCPTE, which has been the predecessor of UCTE and was for long time the world-wide biggest voluntary organization of electricity transmission companies (Wallnöfer 2008: 164). The ENTSO-E now replaced all the former electricity TSO associations and is today one of the major actors at the European level concerning electricity. Its main goals are modeled on the basis of the three main pillars from the 3rd Energy Package:

1. *ensuring security of supply,*
2. *decarbonizing the energy sector* and
3. *creating effectively competitive markets.*

Significant is, that participation and cooperation of all TSOs in the EU has now become obligatory, pursuant to article 4 of the Electricity and Gas Regulations. This is in sharp contrast to the voluntary nature of the previous cooperation schemes (Vlachou 2012: 5). Within the ENTSO-E each MS is represented with its TSO. Exceptions are Austria, Germany and Great Britain, who have several TSOs. In the case of Germany for example these are

Amprion (the formerly grid of RWE and VEW), EnBW Transportnetze, TenneT (formerly E.ON) und 50Hertz Transmission (formerly Vattenfall) (Kocheise 2011: 2). Therefore ENTSO-E is currently composed of 41 European TSOs from 34 MS and associated partners. ACER has an observing membership to the ENTSO-E.

Member countries of ENTSO-E (ENTSO-E 2010: 23).

Together they run over 305.000 km of transmission lines, with more than 828 GW of power generation and 525 million citizens served. The ENTSO-E speaks with one voice for all EU TSOs with regards to all technical and market issues (Altmann et al. 2012: 92). The tight integration of TSOs within the ENTSO-E shall improve the solidarity between MS and reciprocal support in cases of congestion of energy supply (Pielow 2009: 140). They shall cooperate formally and develop binding common regulation, security norms for cross-border trade, uniform conditions and agree on investments (Nötzold 2011: 229). Also TSOs of third countries may become members, what reflects their importance for the functioning of the EU electricity market. The legal status of the ENTSO-E is the one of an international non-profit organization, but it also has differences to that in terms of the available status of participation for TSOs and their institutional structure (Vlachou 2012: 2). Apart from being statutorily defined, the tasks assigned to the ENTSO-E are much broader than those of previous cooperation schemes. It is entrusted with the elaboration of NCs, the adoption of common network operation tools, research plans, community-wide TYNDPs, recommendations on the technical cooperation of EU and third-country TSOs, annual work plans, reports and annual summer and winter supply outlooks (Vlachou 2012: 5). It proposes and implements standardized market integration and transparency frameworks to facilitate competitive and integrated continental-scale wholesale and retail markets. Further, it shall facilitate the integration of new generation sources, particularly RE, and thus the achievement of the EU's greenhouse gases reduction goals. The main purposes of ENTSO-E are:

1. to pursue the co-operation of the European TSOs both on the pan-European and regional level and

2. to have an active and important role in the European rule setting process in compliance with EU legislation (ENTSO-E 2010: 22).

The working structure of the association consists of Working and Regional Groups, coordinated by three Committees (System Development, System Operations, Markets), supervised by a Management Board and the Assembly of ENTSO-E, and supported by the Secretariat, the Legal and Regulatory Group, and Expert Groups. In terms of voting process, there is a two-tier system: the first part with equal voting weight to each MS represented in the ENTSO-E and the second with voting weight reflecting the population of MS and its status of being "a country of a special EU grid connection significance". With respect to the decision-making processes, the General Assembly uses two types, depending on whether the decision is taken on a single proposal or whether there is a choice to be made among more. Decisions such as the adoption of NCs require a simple majority: the approval by votes cast by members present or representing at least sixty per cent of both the first and the second part of the voting rights cast (Vlachou 2012: 4). All ENTSO-E members, non-EU ones included, participate in the NC drafting process and have the right to vote.

4. Analysis: The New Regulatory Framework

In the European electricity sector concerning the creation of NCs, a multi-level regulatory process has been evolved, in which three of the above mentioned modes of governance have been mixed:

1. the regulation by agencies,
2. the regulation by comitology and
3. the regulation through self-regulation of private actors.

It will be shown how these modes are exactly embedded within this multilevel system. The NC development process is currently still going and until now, none of the NCs has been adopted as EU-law yet. Therefore their effectiveness on the markets and interconnection of transmission grids cannot be clearly assessed yet. But this paper is not about the outcome of the NCs, but about the regulatory process towards the development of NCs in order to assess, if this governance structure is able to promote 'green' internal market goals (the in the Europe 2020 and 2050 mentioned goals of the EC to the promotion of renewable electricity).

The Development of Network Codes

Former rules concerning cross-border electricity transmission issues have been regulated due to voluntary (self-regulatory) contractual agreements between the TSOs. The reason is, that

European electricity markets have been historically managed on a national basis, by state-owned vertically and integrated monopolists (or quasi-monopolists). In that context, cross-border transactions did take place due to the cooperation among national utilities (Squicciarini et al. 2010: 1). But the 3rd Energy Package provides new regulatory tools and a new governance structure (Squicciarini et al. 2010: 2). Now the EU inhibits an influential role within this area. In comparison to previous cooperation schemes the new process represents a significant regulatory shift in two aspects:

1. NCs are adopted in more areas than previous technical rules,
2. their adoption by comitology makes them legally binding for all market participants contrary to the previous practice (Vlachou 2012: 5).

According to Article 8(6) of Regulation 714/2009, the NCs currently cover the following areas, while also taking into account regional specificities:

1. network security and reliability rules including rules for technical transmission reserve capacity for operational network security;
2. network connection rules;
3. third-party access rules;
4. data exchange and settlement rules;
5. interoperability rules;
6. operational procedures in an emergency;
7. capacity allocation and congestion management rules;
8. rules for trading related to technical and operational provision of network access services and system balancing;
9. transparency rules;
10. balancing rules including network-related reserve power rules;
11. rules regarding harmonized transmission tariff structures including location signals and inter transmission system operator compensation rules; and
12. energy efficiency regarding electricity networks (ENTSO-E 2012b: 3).

The NCs are adopted by a complex procedure, which involves an institutional interplay among the ENTSO-E, the ACER and the EC as well as extensive consultations with stakeholders (Squicciarini et al. 2010: 2). The ENTSO-E inhibits a central role here and is responsible for drafting the NCs - also because TSOs traditionally have been the one establishing common technical rules (Vlachou 2012: 1). ACER is responsible for the regulatory review. The final outcome shall become legally binding EU law through the adoption by comitology from the EC. This allows greater commitment by MS and also

establishes a binding framework with limited scope for regional differentiation (Squicciarini et al. 2010: 2).

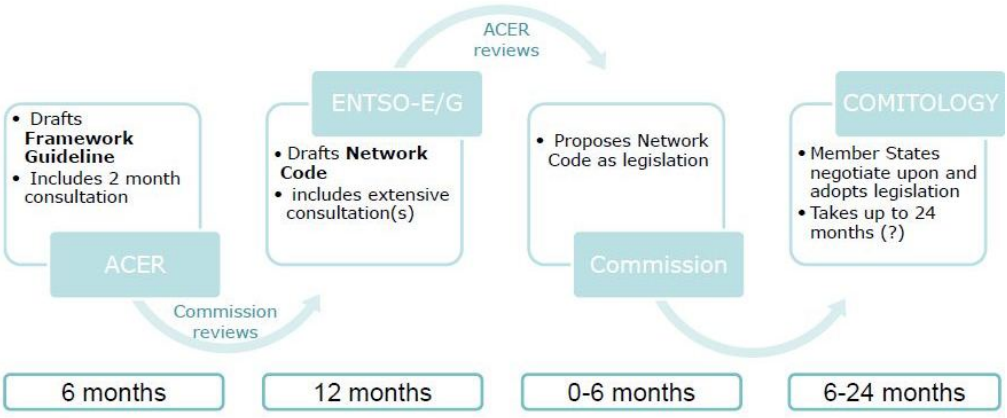
The procedure begins with the publication of an annual priority list by the EC after consultation with ACER, ENTSO-E and other relevant stakeholders. Additionally, ENTSO-E can adopt NCs by themselves, which are not defined by this list (Vlachou 2012: 6). Afterwards the EC requests ACER to establish a framework guideline within six months, followed by a two-month period of consultation with stakeholders. The framework guideline sets principles on which the NC shall be developed. For example it must contribute to non-discrimination, effective competition and the efficient functioning of the market. If the EC considers that these objectives are not sufficiently achieved it may request ACER to review the framework guideline and resubmit it. In case ACER fails to submit or re-submit it, the EC ultimately takes over the elaboration itself (Vlachou 2012: 6). The idea of EU framework guidelines originated from ERGEG's concern that TSOs might develop NCs that did not address the right issues. But it should be noted that also the 3rd Energy Package does not provide a clear definition of what draft guidelines should include and that there are no clear provisions to the binding effect of NCs. Also the list of network areas covered by the Regulation 714/2009 is very extensive and no priorities are provided in the legislation (Hauteclocque/Talus 2011: 9).

In the second step the EC requests ENTSO-E to develop a NC in line with the framework guideline within a maximum period of twelve months. This is the momentum, in which the EU still relies strongly on the self-regulatory practice and expertise of the European TSOs. The ENTSO-E conducts now an extensive consultation process at an early stage and in an open and transparent manner, involving all relevant market participants. Before the adoption of NCs, the ENTSO-E has to indicate how the opinions received during the consultation have been taken into consideration or state the reasons for the contrary. But in practice, however, these consultations are put under considerable strain because of the tight deadlines set by the Electricity and Gas Regulations and limited resources (Vlachou 2012: 7). So the main part, in particular the development part of the NCs, is still in the responsibility of the TSOs. That means that the self-regulation of TSOs is still a very important mode of governance within the new regulatory structure of the 3rd Energy Package.

When ENTSO-E has finished its draft NC, ACER gives an opinion on it within three months, following consultation with relevant stakeholders. So there can be identified two statutory parts in this regulatory framework: the drafting of framework guidelines and the monitoring of the draft NC by the ACER. So, statutory regulation and self-regulation are applying here complementary to each other.

Then the NC is submitted to the EC recommending its adoption if it should be in line with the framework guidelines. If the ENTSO-E has failed to develop the NC within the above-mentioned time period or if TSOs are not fully complying, the EC can ask ACER to prepare a draft NC itself following consultation and submit it for adoption.

The final stage of the procedure is the adoption of the NC from the EC by comitology (Hauteclocque/Talus 2011: 9; Vlachou 2012: 6). So in that stage both the supranational and the intergovernmental levels are coming into play. It is interesting to see that, though the EC has path-guiding role, the final decision-making about the NCs is still in the competence of the MS. The whole procedure is depicted in the following figure.



Process for the development of Framework guidelines and Network Codes (Marcelis 2011: 4).

But the EC also has the right not to adopt the NC despite ACER's recommendation. The EC can adopt one or more NCs on its own initiative bypassing the ENTSO-E, in case the ENTSO-E has failed to develop it or ACER has failed to develop a draft NC or even upon the recommendation of ACER. But this institutional route is an "ultimum refugium" for resolving eventual blockages. Its aim is mostly to put pressure on the actors to deliver the expected outcome (Vlachou 2012: 7).

In order to keep the NCs up to date, there is also the possibility of an amendment of NCs. This procedure shall help in case of eventual adaptations to the market or technical evolutions. The

amendment procedure is quicker and more flexible than the adoption one, the central role in it is entrusted to ACER. The draft amendments to NCs may be proposed to it by any person or on ACER's own initiative. Following consultation with stakeholders, ACER makes reasoned explanation and proposals to the EC. The EC may adopt these amendments by comitology.

Until now no NC has been implemented yet, therefore it is not really possible to assess the effectiveness of these codes. The NC on CACM has been submitted by the ACER to the EC in December 2012. That means that the draft NC developed by the ENTSO-E was in line with the framework guidelines of the ACER and it can be concluded that the self-regulatory process among the TSOs and the stakeholders did work well. Now the EC has to overlook it and submit it to the comitology. The NC on Requirements for Generators has also been submitted to the EC, but it decided that it should be overviewed again and gave it back to ACER. The other NCs are still within the self-regulatory development and consultation stage by the ENTSO-E.

NCs finally shall be adopted as EU Regulations. This is an instrument capable of ensuring speed and effectiveness. Regulations are binding for market participants and directly applicable to all. They do not have the need for a lengthy transposition as in the case of EU-Directives and are prevailing over national law. But they are enforceable by the NRAs, because ACER is not an energy-regulator, but an EU-agency. NCs are detailed rules covering only cross-border network and market integration issues. They do not prejudice the right of MS to establish national rules. But they can have 'spill-over' effects on national arrangements, which again may require changes to national arrangements (Marcelis 2011: 5). Further they are direct and indirect means of judicial review (Vlachou 2012: 15). The NCs will appear in the form of very detailed papers, composed similar to Regulations or Directives. The only so far published NC is the CACM (ENTSO-E 2012c). It consists of 97 Articles treating technical methods towards common and coordinated capacity calculation. Until now it has no binding status, because it has not yet been passed comitology. The NC on CACM covers the day ahead and intraday market timeframes and the process for calculating capacities in a coordinated manner. It is the first of the NCs which will define a common set of European market rules. Its purpose is to outline the architecture and provide the rules to allow continuously traded intraday markets and implicit day ahead auctions. It also sets rules for defining and reviewing bidding zones. Within the 'self-regulatory' part of the NC development, the stakeholder advisory group has been discussing the NC with stakeholders.

The group includes representatives from the Association of European Energy Exchanges, Eurelectric, the European Federation of Energy Traders, the European Wind Energy Association, the European Chemical Industry Council and the International Federation of Industrial Energy Consumers. It has met throughout the course of developing the NC. Alongside the stakeholder group meetings there have been held numerous bilateral meetings with interested parties and two open workshops (ENTSO-E 2012d: 6). According to the ENTSO-E this NC clearly focuses to a significant extent on creating effectively competitive markets and will also have beneficial impacts on both security of supply and the ability of the network to integrate significant volumes of renewable energy. When placed alongside the other NCs the CACM code will form a small part of a coherent set of rules designed to deliver this trio of objectives (ENTSO-E 2012d: 10).

In summary the governance structure of the market integration process has shifted from a voluntary one to one with binding and enforceable rules and effective decision making (Squicciarini et al. 2010: 2), but still with self-regulating elements. Before, the TSOs have been organized cross-border electricity issues due to voluntary legal contracts. NRAs could influence this process, but the EU did not have any competences here. The only European-level organization influencing this process was the ERGEG, which is an example of voluntary network governance in the electricity sector. But the membership was also voluntary and the ERGEG did not have any sanction competences. The ACER in contrast is not a regulatory network, but an EU-agency and owns a clear regulatory competence concerning the creation of NCs by EU-law. Concerning the activities and legal status of the ENTSO-E one can see a shift from self-regulation towards another, rather unclear organizational creation. Though ENTSO-E is a European association and represents the (economic) interests of its members, it acts, is organized like and is embedded into a regulatory process similar to an agency. Though the TSOs still draft in a 'self-regulatory' manner their own NCs, this drafting process is by law embedded into a multi-stage regulatory process. Further it is organized similar to an agency. Therefore this paper argues that there has been a shift - both applying to European NRAs and TSOs - from a rather voluntary networking organization towards a more centralized, EU-agency-like organization. And especially concerning ENTSO-E there is an interesting mixture of self-regulatory and regulated elements. This whole regulatory change can be explained with the attempt of the EC to enforce more binding IEM rules.

Scholars argue that the negotiations among non-state actors within ACER or ENTSO-E concerning NCs now can be better conducted under the threat imposed by sanctions connected to non-compliance with specific deadlines (Jevnaker 2012: 106). But others such as Meyer (2012) argue, that a credible threat of governmental intervention could also be contra-productive, because it increases the number of veto players and makes the remaining self-regulatory processes politically salient. But it can be noted that the EC could extend its power considerably concerning the process towards binding measures on technical and operational cross-border issues. The power of ACER is considered as rather weak; the agency has until now a rather advisory role and cannot itself enact binding guidelines for NCs. The ENTSO-E however can also initiate the process of formulation of NCs codes beyond the EC agenda and therefore inhibits still quite a lot of self-regulatory power. But it can be criticized that the whole procedure for adopting NCs is still uncertain (Hauteclocque/Talus 2011: 9). Another weakness is that there is no provision in the 3rd Energy Package which ensures that ENTSO-E has appropriate incentives to really act in the interest of European consumers (Squicciarini et al. 2010: 3). Both, the stakeholders and ACER have stressed the need for more extensive and transparent consultations from ENTSO-E (Vlachou 2012: 8). The whole procedure has advantages in terms of adaptability, flexibility and timeliness compared to the adoption by formal legislation (Vlachou 2012: 10). But most scholars such as Vlachou (2012) consider the adoption of common NCs as the most promising elements of the 3rd Energy Package concerning the conclusion of the IEM (Vlachou 2012: 1). But still, also with the 3rd Energy Package, the structure of the IEM, besides the denial of liberalization, is criticized. Because the public and political focus has been on the design of unbundling, other important aspects have been neglected, such as the rise of new providers and needed investments in power plants and grid capacities. The development of the infrastructure inside the EU is an essential precondition for cross-border trade and still, transmission capacities between MS are very low. Also, there is the question, whether transmission governance along national borders is still optimal in a multi-national energy market (Tangerås 2012: 1644), or if its regulation should rather be centralized even more on the European level.

Towards a Better Integration of Renewable Energies?

For European TSOs it is not easy to deal with a heterogeneous European regulatory framework. The need for more harmonization is felt, especially for high voltage connection of wind energy. And the NCs represent a first step into this direction (Altmann et al 2012: 19). According to the study of the EP (Altmann et al. 2012) the development of binding European

NCs is an example of how the IEM and the renewable objective can be achieved at the same time. NCs are relevant for both cross-border trade and the cost-effective integration of offshore wind farms into the European electricity network. Apart from the TSOs themselves, especially variable generators benefit from the possibility of correcting their forecasts close to real time, which requires intraday trading possibilities and short gate closure times (Altmann et al. 2012: 104). Also the ENTSO-E sees the nine priority NCs as important provider of market based frameworks enabling the integration of growing amounts of renewable and low-carbon energy into the power system. It mentions that the IEM is a key instrument in delivering other EEP goals such as the climate goals of the EC (ENTSO-E 2012e). So, yes, the NCs and its new regulatory structure serve indirectly a better integration of RE and lead indirectly to a 'greener' internal electricity market. Though the TSOs still inhibit much self-regulatory competence, the outcomes are now much more legally binding.

But it has to be noted that NCs are an important precondition for a better integration of RE – but they do not necessarily enforce it. The NCs are not the only precondition for the achievement of a 'green internal electricity market'. They need to be completed with the development of grid infrastructure, which also relies, similar to the NCs, to an important amount on the 'self-regulation' of TSOs - even if the EC increasingly widens its power in this policy field. The Ten-Year-Network-Development-Plan (TYNDP) 2012-2022 of the ENTSO-E provides information on the planned and envisaged transmission investment projects "of European significance". It identifies a need for €104bn of investment in transmission and interconnection projects of pan-European significance. It estimates that 80% of projects are related to supporting the integration of RES. These figures highlight the important role RES in the future of the IEM (CEER 2012b: 18). The TYNDP includes numerous projects either dedicated to connecting new RES, or more energy-efficient power plants, or bound to transporting it towards consumption areas. The plan acknowledges two different approaches for scenario consideration: a "topdown" and a "bottom-up" approach. In the past the TSOs have been mostly using the bottom-up approach. It defines power system and grid development by tackling upcoming needs when they emerge and builds on the present situation and transmission system. A top-down approach would instead consider the future scenarios and targets, for example 2020, 2030, 2050. It would define the related transmission grid needs, and then apply the trajectory for achieving the target situation. According to Altmann et al. a shared vision of European power system should utilize both approaches.

In summary, not just the new regulatory structure and the NCs, but also investments, grid development as well as the public acceptance of the network development projects play crucial roles at the realization of a 'Green Internal Electricity Market'. However, the creation of NCs serves definitely the creation of an IEM. And many scholars see the creation of the IEM as a necessary condition for the integration of RE and the 3rd Energy Package as one essential tool for achieving the EU climate goals (Dupont / Radostina 2011:10).

5. Conclusion: A 'Greener' European Transmission Regulation?

It has been shown that the EC could gradually expand its influence on the EEP through the three areas of competency: The IEM, climate policy and external energy affairs. Through these "backdoors" it could realize a regulatory evolution in the electricity sector within the last few years from nationalization to agencification and self-regulation, from command and control towards new modes of governance. And to the establishment of a multilevel governance system in the EU consisting of a mix of national and supranational institutions, transgovernmental networks as well as EU-agencies. Last but not least there is the ENTSO-E whose construction cannot really be defined – because it has elements of a self-regulatory association, an incorporated network as well as an EU-agency.

TSOs are currently facing manifold operational challenges: they need to integrate new and renewable electricity generation, have to enhance interconnectivity with neighboring operators and countries, optimize their strategies which are subject to regulatory and market constraints and ensure system reliability while also improving operating and investment efficiency. Currently they are developing within the ENTSO-E the NCs which shall be implemented as binding EU-law and tackle problems of grid management at the European cross-borders, such as the management of congestions or grid balancing. These forms of grid management serve all forms of electricity generation. But for a reliable integration of RES they are a necessary precondition. Altogether it can be stated that the new regulatory structure towards rule-making at cross-border electricity transmission is more binding than the former one, though there are still elements of self-regulation, and enforces the TSOs to find an agreement due to sanctions. That way TSOs can contribute to the use of new technologies or concepts such as efficient generation, demand side management, smart grids and energy storage and support energy efficiency. They further can develop the transmission networks in order to enable RES to evacuate their power and play a role in realizing environmental neutral generation. NCs a precondition for the better integration of RE and therefore do serve them.

Further, the creation of NCs serves definitely the creation of an IEM. And many scholars see the creation of the IEM as a necessary condition for the integration of RE and the 3rd Energy Package as one essential tool for achieving the EU climate goals. Therefore this thesis argues, that the new multilevel structure with elements of self-regulation serves a better cross-border grid-management and also the integration of RE. However; NCs can be a milestone towards a better integration of RES, but they do not guarantee the achievement of certain climate goals like Europe 2020 or 2050. They can make the electricity market 'greener' than today, but do not promise a 'green' market in the sense of a share of 100% RES.

Remarks and further Research

There are still many questions to be answered. For example it is not clear yet whether ENTSO-E, which 41 TSOs from 34 countries, is really able to effectively act in the interests of European consumers, though there is regulatory oversight by ACER and the EC. So it would be interesting to research on the democratic legitimacy of the whole governance structure, as the new network lines to be built in Europe will affect many people directly. Also there is not sufficient scientific analysis and evaluation concerning the monitoring performance and effectiveness of the newly established ACER towards ENTSO-E. This would also help to assess if a further empowerment of the ACER should be considered. Very important will also be the evaluation of the final NC output. Then there will also be a lot of scientific work on their implementation and their effectiveness on the market.

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