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LIST OF ACRONYMS

ACER	Agency for the Cooperation of Energy Regulators
AESAG	ACER Electricity Stakeholder Advisory Group
AHAG	Ad Hoc Advisory Group
BALIT	Balancing inter-TSO
BEUC	Bureau Européen des Unions de Consommateurs (European Consumer Organisation)
CACM	Capacity Allocation and Congestion Management
CAM	Capacity Allocation Mechanisms
CAO	Central Allocation Office
CASC	Capacity Allocation Service Company
CBA	Cost-benefit analysis
CBCA	Cross-border cost allocation
CCGT	Combined Cycle Gas Turbine
CEE	Central East Europe
CEER	Council of European Energy Regulators
CEF	Connecting Europe Facility
CEREMP	Centralized European Register for Market Participants
CMP	Congestion Management Procedures
CRM	Capacity remuneration mechanism
CSE	Central South Europe
CWE	Central West Europe
DG COMP	Directorate-General for Competition (of the European Commission)
DG ENER	Directorate-General for Energy (of the European Commission)
DG SANCO	Directorate-General for Health and Consumers (of the European Commission)
DSO	Distribution System Operator
EC	European Commission
EFET	European Federation of Energy Traders
ENTSOE	European Network of Transmission System Operators for Electricity
ENTSOG	European Network of Transmission System Operators for Gas
ERGEG	European Regulators Group for Electricity and Gas
ERI	Electricity Regional Initiative
ETS	Emissions Trading System
EU	European Union
FCA	Forward Capacity Allocation
FG	Framework Guidelines

FTR	Financial Transmission Right
FUI	France - UK - Ireland
GGP	Guidelines of Good Practices
GHG	Greenhouse gas
GIE	Gas Infrastructure Europe
GRI	Gas Regional Initiative
GRIP	Gas Regional Investment Plan
GTM	Gas Target Model
HHI	Herfindahl-Hirschman Index
HVDC	High Voltage Direct Current
ICER	International Confederation of Energy Regulators
ICT	Information and Communication Technologies
IEM	Internal Energy Market
IFIEC	International Federation of Industrial Energy Consumers
IG	Implementation Group
INEA	Innovation and Networks Executive Agency
ISO	Independent System Operator
ITO	Independent Transmission System Operator
LNG	Liquefied Natural Gas
MS	Member State (of the EU)
NBP	National Balancing Point of natural gas in UK
NC	Network Code
NRA	National Regulatory Authority
NTC	Net Transfer Capacity
NWE	North West Europe
OGP	International Oil and Gas Producers Association
OU	Ownership unbundling
PCG	Project Coordination Group
PCI	Project of Common Interest
PTP	Pre-tax Total Price
PTR	Physical Transmission Right
PX	Power Exchange
RCC	Regional Coordination Committee
REMIT	Regulation on Wholesale Energy Market Integrity and Transparency
RES	Renewable energy source
RIS	Regional Initiatives
RSI	Residual Supply Index

SG	Stakeholder Group
SGTF	Smart Grids Task Force
SWE	South West Europe
TF	Task Force
TSO	Transmission System Operator
TYNDP	Ten Year Network Development Plan
VIU	Vertically integrated undertaking
WG	Working Group

LIST OF EU MEMBER STATES

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

FOREWORD

Europe's energy sector has undergone a continuous evolution, centred on three core objectives: security of supply, sustainability and competitiveness. These goals have informed the overall framework for EU electricity and natural gas markets; with European legislation progressively embedding and reinforcing a set of key principles for its energy markets to provide a non-discriminatory and level playing field for all actors; to be governed by cost-reflectivity and efficiency; and to deliver value for money and reliable services to consumers.

Energy regulators are tasked with promoting the effective and fair functioning of the market in line with those principles. This report captures and explains in concise and clear terms the range of issues addressed by regulators. It provides a welcome and thorough overview of the key elements of Europe's energy policy framework, from wholesale arrangements and market integration to consumer protection and empowerment.

The authors of this comprehensive report have skilfully summarised the main policy objectives and regulatory features of Europe's energy markets, in particular its foundation principles of open markets with non-discriminatory access to network infrastructure and the unbundling of the network operators from the supply and retail segments of the market in order to foster the development of competition and cost-efficient energy systems to the benefit of consumers. They have also reflected on the changing dynamics faced by the sector, providing clarity and insight as experienced specialists in the regulation of the energy sector.

This excellent tour d'horizon should serve as a useful guide to anyone interested in learning about Europe's evolving energy policy and market design.

Lord Mogg
President, Council of European Energy Regulators (CEER)

Chairman of the Board of Regulators, Agency for the Cooperation of Energy Regulators (ACER)

EXECUTIVE SUMMARY

This report is a comprehensive overview of the current status and challenges of the European energy market for electricity and gas.*

The creation of the Internal Energy Market is one of the EU energy policy priority objectives. In February 2011, the European Council set 2014 as the target year for the completion of the energy market, giving the project political urgency. In reality, building the EU energy market is a long and continued process that started with the first Electricity and Gas Directives in the 90´s and will continue beyond 2014.

The energy market is a strategic instrument for achieving EU energy policy objectives with the goal of bringing secure, sustainable, and affordable electricity and gas to consumers; the market aims to accomplish these goals by giving consumers the choice of supplier and providing open market access and competition to existing and new suppliers. This market is a result of a progressive integration of existing national and regional markets, and therefore should be based on secure and coherent cross-border energy infrastructure. Without this infrastructure, the market will always be physically incomplete and will face important limitations to wider EU competition. In addition, the energy market, when operated properly in conjunction with the EU GHG emission trading mechanism, should force stakeholders competing in the market to correctly internalize CO_2 prices. Finally, an integrated EU market will significantly contribute to the diversification of energy supplies by providing support and coordination among Member States (MS) and among EU external suppliers, and will therefore contribute to a more secure energy supply.

This report is addressed to postgraduate students, policy makers, regulators and other stakeholders such as utilities, consumer associations and new service providers. More generally, this report should be relevant to anyone that wants to introduce themselves to the main areas relevant to building a competitive, sustainable and secure European energy market. The report is written mainly from the optics of regulation and policy.

The report proceeds in five chapters. The first chapter introduces the various initiatives and developments regarding the integrated European energy market within the context of broader EU energy policy. Chapter 2 presents the basic legislation known as the Third Package and key institutions of the integrated European energy market. Chapter 3 describes developments currently being carried out for the

* The information and views set out in this report are those of the authors and do not necessarily reflect the official opinion of the institutions where they develop their professional activity.

implementation of the Third Package, highlighting progress on TSO unbundling and certification and Network Codes. In addition, chapter 3 addresses the implementation of REMIT and the Trans-European Energy Infrastructure Regulation. Chapter 4 diagnoses the wholesale and retail markets based on market monitoring reports, and details several specific implementation projects related to regional markets and smart grids development. Finally, chapter 5 looks into the future, giving a perspective of challenges that the European market could face in the coming decade, and providing recommendations from a regulatory point of view.

The basic principles which form the basis of the EU market have been established progressively through the successive Directives of electricity and gas – Directives 96/92/EC, 2003/54/EC and 2009/72/EC for electricity and Directives 98/30/EC; 2003/55/EC and 2009/73/EC for gas.

The design of the EU market clearly separates regulated network activities, namely transmission and distribution, from competitive activities, namely supply and retail. Third parties can access the regulated networks, while wholesale and retail competition takes place in the wholesale and retail markets. Consumers have the right to choose their supplier; this right was progressively introduced from larger industrial consumers to smaller consumers including households.

Different types of unbundling have been considered in the different Directives, including accounting, legal and functional, and ownership separation. For instance, in the second group of Directives, in 2003, transmission and distribution was required to be legally and functionally unbundled from production and supply.

Regarding consumer rights and protection, consumers have the right to be informed on supply alternatives and conditions of supply. These rights include easily comparable and transparent prices, transparent contract conditions, access to dispute settlement mechanisms, and protection in the case of vulnerability. MS are responsible to define vulnerable consumers and the associated protective measures.

The EU energy market design contemplates a decisive role for National Regulatory Authorities (NRAs) to ensure a well-functioning market. NRAs as independent energy regulatory authorities should be designated and appointed in each MS. These regulators are responsible for monitoring and enforcing the non-discriminatory market access principle, together with market transparency and competition. In addition, they are in charge of either setting the tariffs for regulated activities or determining the tariff calculation methods.

The respective roles, objectives, structure, and functions of the European Commission, the Agency for the Cooperation of Energy regulators (ACER), and the Council of European Energy Regulators (CEER) with regard to the Internal Energy Market are described in detail in this report. Furthermore, the dialogue among stakeholders at European level, formalized through different Regulatory Forums for gas, electricity, and consumers, is also presented as playing a key role in the development of the market.

This report gives an overview of steps taken by the concerned parties (mainly the EC, ACER, and the European Network of Transmission System Operators, or ENTSO) to implement the ambitious framework set forth by the Third Package and two additional regulations of special relevance for the creation of the Internal Energy Market: REMIT and the Trans-European Energy Infrastructure Regulation.

The implementation of this legal framework has required several years and a significant effort from all of the parties involved. Profound changes have taken place and will continue to take place with respect to unbundling of TSOs (via certification), EU-wide network coordination, harmonized rules for markets, grid connection and system operation, and market integrity and transparency.

Nowadays the priority focus of this implementation process is on Framework Guidelines (FGs) and Network Codes (NCs). The development of EU-wide NCs is a challenging and resource-consuming exercise which, despite the issues faced during the preparation of the codes, has delivered a useful contribution for the creation of the Internal Energy Market.

This report presents the current status of the EU energy market based on some indicators used by regulators. These indicators measure the evolution of wholesale electricity and gas markets together with retail markets and consumer issues. In addition, this report describes the latest work carried out by regulators, policy makers, and stakeholders for early implementation of the Third Package legislation through a collaborative framework known as Regional Initiatives. Finally, the ongoing initiatives in the field of smart grids led by the European Commission under a specific ad hoc Task Force are detailed.

Wholesale electricity markets present different levels of integration and completeness in day-ahead, intraday and balancing markets. The Electricity Regional Initiative shows that the EU price market coupling for day-ahead trading is a major achievement that should be closely followed by a single continuous intraday market and, in a long-term perspective, by higher coordination and integration of balancing markets.

Wholesale gas markets are still quite immature with the need of developing new hubs, such as the Iberian gas hub, and intensifying cross-border trading. The most important project of the Gas Regional Initiative is the creation of an EU platform for the allocation of cross-border capacities along different time frames. This project constitutes a major milestone for the EU gas market integration.

Retail markets remain local in scope and dominated by incumbents with almost no participation of foreign players. Regulated prices for households and in some cases also for industrial consumers is an obstacle for the development of the market. However, regulators should ensure that effective liberalization is accompanied by increasing competition. Increased competition should in turn result in fair and competitive prices for the benefit of consumers.

A consumer-centric vision is key for developing all the potentials of smart grid technologies and for materializing smart grid technologies' benefits. Interoperability and standardization of functionalities are critical for achieving economies of scale and reducing future costs. For this purpose, the involvement of the ICT sector is also relevant. The role of regulation in this context is to promote innovation in regulated network businesses and to eliminate barriers for new business models and new service providers.

As aforementioned, the main challenges for the construction of the EU energy market in the context of current energy policies and uncertainties in the next decade are presented in the final chapter of this report. This analysis is made from a regulatory perspective. The different challenges are presented in detail by market segments, wholesale electricity and gas markets, retail markets and consumers, and infrastructure development.

European climate and energy policy will continue to be the main driver for increasing shares of renewable energy and energy efficiency. In addition, continuous technological developments of ICT, distributed generation, energy storage, electric vehicles, and demand side-management under the environment of smart grids will transform the way traditional customers interact with the market, increasing these customers' level of engagement and participation through the market entry of new service providers.

The completion of the EU electricity wholesale market while avoiding the danger of State intervention and fragmentation is necessary to ensure that market price signals provide adequate incentives for investing in generation capacities; this is especially true in the case of high penetration levels of renewable. Here, the most important issues to solve are the progressive elimination of support mechanisms for renewable energy, the harmonization of capacity remuneration mechanisms (CRMs) if they are implemented, and the stabilization of CO_2 prices towards values that ensure the market competitiveness of low-carbon technologies.

Gas markets are subject to important uncertainties regarding expected evolution of supply and demand in the next years. The consolidation of an EU single gas wholesale market is related to a more integrated functioning of interconnected hubs with efficient capacity allocation procedures and transparent market prices for balancing areas. Among other benefits, a single market would provide the required flexibility for gas-fired power plants. The necessary cross-border infrastructure investment should be also driven by forward market prices; however, it is important to avoid investments that would place stranded costs on consumers by future underutilization.

The infrastructure package provides an institutional framework for developing the main energy infrastructures needed for integrating the national markets. Here, the Ten Year Network Development Plans (TYNDPs) developed by the ENTSOs should be the tool for identifying and prioritizing the cross-border capacities to be reinforced under adequate economic and environmental evaluation criteria. Furthermore, it is

necessary that regulators continue making progress in the design of better inter-TSO compensation mechanisms, cross-border cost allocation criteria, and procedures to develop the new infrastructures.

Finally, customer empowerment and market engagement will dramatically change the way energy retail markets function today. Customers have the potential to benefit from new technologies, distributed resources, smart grids, and smart meters that could allow them more advantageous and flexible ways to meet their energy needs. Energy efficiency and demand response actions facilitated by new service providers such as market aggregators have the potential to create value for current and future customers. In the end retail markets may ultimately become more open and competitive with more choices for customers. DSOs under this new framework must become more proactive than they have traditionally been, thus becoming neutral market facilitators and system operators of more active distribution grids.

Despite current and forecasted difficulties for achieving a truly effective and integrated EU market, this report concludes that, by far, all the significant effort should be put into creating the target market in the coming years. The consolidation of ongoing implementation work of the Third Package legislation together with identified future developments will allow Europeans to successfully face the high uncertainties that threaten the sustainability, security and competitiveness of our energy supply system.

1 INTRODUCTION

This report is a comprehensive overview of the current status and challenges of the European energy market for electricity and gas. The report proceeds in five chapters. The first chapter introduces the various initiatives and developments regarding the integrated European energy market within the context of broader EU energy policy. Chapter 2 presents the basic legislation and key institutions of the integrated European energy market. Chapter 3 describes developments currently being carried out for the implementation of this legislation known as the Third package, highlighting progress on TSO unbundling and certification and Network Codes. In addition, chapter 3 addresses the implementation of REMIT and the Trans-European Energy Infrastructure Regulation. Chapter 4 diagnoses the wholesale and retail markets based on market monitoring reports, and details several specific implementation projects related to regional markets and smart grids development. Finally, chapter 5 looks into the future, giving a perspective of challenges that the European market could face in the coming decade, and providing recommendations from a regulatory point of view.

This report is addressed to postgraduate students, policy makers, regulators and other stakeholders such as utilities, consumer associations, and new service providers. More generally, this report should be relevant to anyone that wants to introduce themselves to the main areas relevant to building a competitive, sustainable and secure European energy market. The report is written mainly from the optics of regulation and policy, as the two authors have been or are currently involved in energy regulation with the Spanish energy regulatory authority and are working actively in European regulatory institutions.

1.1. THE EUROPEAN ENERGY POLICY

Building a competitive, integrated and interconnected energy market has always been one of the main pillars of the European energy agenda. In 2007, the so called Energy Package published in the Communication from the Commission COM(2007)1,[1] constituted a comprehensive update of the different EU strategies to face the challenges ahead: sustainability, greenhouse gas emissions, security of supply, and competitiveness of the internal market.

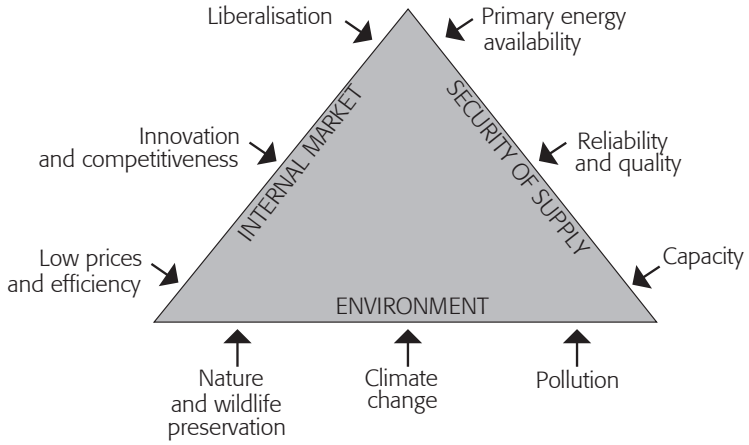
[1] Communication from the Commission to the European Council and the European Parliament of 10 January 2007, “An energy policy for Europe” [COM(2007) 1 final - Not published in the Official Journal].

The European energy policy is formulated as a combination of measures and actions to keep a balance between the three main pillars represented in Figure 1.1: internal market, security of supply, and environment.

The three energy and climate targets that were set for 2020 have guided most of the EU energy policy in recent years; these targets are: i) greenhouse gas emission reductions by at least 20% compared to 1990 levels, ii) 20% of renewable in the EU2020 energy mix, and iii) 20% energy savings through energy efficiency action plans. In addition, policies related to the EU becoming a leader in developing new, low-carbon energy technologies and implementing a common international climate policy has been defined.

Figure 1.1

THE THREE MAIN PILLARS OF THE EUROPEAN ENERGY POLICY



Source: European Commission, "European Smart Grids Technology Platform: Vision and Strategy for Europe´s Electricity Networks of the Future," Directorate for Research, 2006.

1.2. A STRATEGY FOR COMPETITIVE, SUSTAINABLE AND SECURE ENERGY

The Energy Package in 2007 constituted a comprehensive review of existing EU energy policy and a renewed EU-wide strategy; the Energy Package was formulated through specific actions in the three main pillars and complementary objectives.

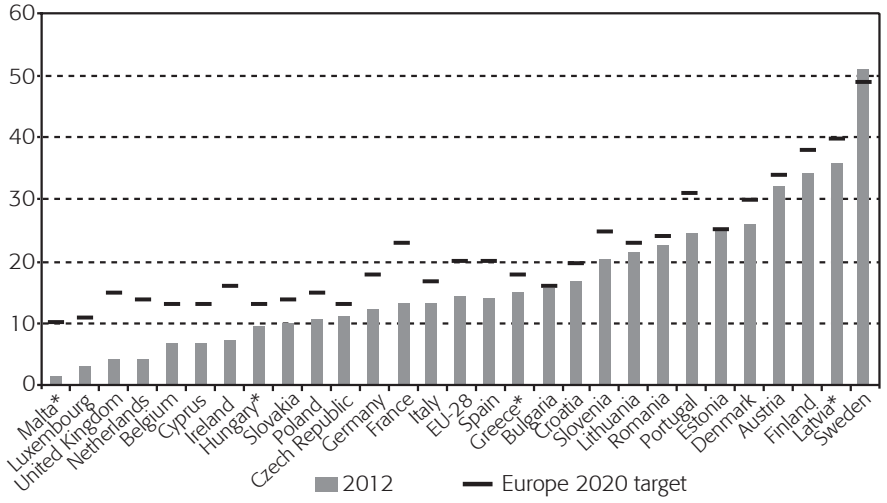
Regarding security of supply, different measures were proposed based on the principles of solidarity between Member States (MS), diversification of supply sources, and diversification of transportation routes in oil, gas and electricity. The EU is highly dependent on imports and is therefore vulnerable to geopolitical,

economic, and supply uncertainties. Addressing these key uncertainties requires strong cooperation among MS and common EU action.

In 2007, energy use accounted for 80% of the EU´s greenhouse gas (GHG) emissions. The EU adopted the Kyoto Protocol in 2002, and established the greenhouse gas emission allowances trading scheme by Directive 2003/87/EC. The EU is strongly committed to meeting the 2020 target for GHG reductions. Two main strategies derived from this GHG objective have been traditionally supported: renewable energy and energy efficiency. The first strategy involves renewable energies. Renewable energies (wind, solar, biomass, biofuels, etc.) reduce emissions and increase security of supply. However, these resources typically cost more than traditional sources; therefore, the 2020 target was imposed to the MSs with actions in three sectors: electricity (renewable production and capture and storage of CO_2), vehicle fuels with 10% of biofuels, and efficient heating and cooling systems. Figure 1.2 shows each MS situation regarding the level of fulfillment of 2020 renewable energy targets. Energy efficiency is the second GHG reduction strategy. This strategy was formulated as an Energy Efficiency Action Plan (2007-2012) with measures to

Figure 1.2

SHARE OF ENERGY FROM RENEWABLE SOURCES AND 2020 TARGET (IN PERCENTAGE OF GROSS FINAL ENERGY CONSUMPTION)



Note: *Estimated.

Source: Eurostat.

increase efficiency in the transport sector, create standards for appliances, improve consumer awareness, improve energy performance of buildings, and increase efficiency in the production, transport and distribution of heat and electricity.

After former Electricity and Gas Directives (first in 1996-98 and second in 2003) the Energy Package in 2007 also established a reinforced strategy to achieve a more effective implementation of the Internal Energy Market. The referred EC Communication called for a more competitive market with clear separation between networks and production and sales activities, proposing clear unbundling rules for transmission system operators. A more integrated and interconnected market would be achieved with more effective regulation at EU level by giving more competences and independence to national regulators, and by increasing the level of harmonization and cross-border trade. In addition, financial and political support for implementing the network investments identified as priorities was recommended. Finally, measures related to energy consumers were proposed; these measures were intended to protect vulnerable consumers, fight energy poverty, and increase the participation of consumers in the market. To achieve the latter, the EC Communication called for providing consumers with more information on market options and supplier switching procedures. As we will see in chapter 2, most of these strategies were implemented through legislation in the new Electricity and Gas Directives in 2009.

In addition to the three main pillars of the EU energy policy (internal market, security of supply, and environment), the Energy Package in 2007 added to other important strategies.

The first additional strategy involved attempts to make Europe a global leader in utilizing existing and developing new technologies for energy efficiency, renewable energy, and CO_2 capture and storage. The strategy selected for continuing investment in research and demonstration projects was the European Strategic Energy Technology Plan with the 7th Framework for Research Program and the Intelligent Energy for Europe Program.

The second additional strategy was related to implement a common EU external energy policy under which the EU and the MSs would speak with a single voice. For example, a single EU voice could be used in the negotiation of international agreements on energy efficiency and climate change. In addition, this voice could be used to establish relations and partnerships with countries from which the EU imports energy (Russia, Norway, Algeria, OPEC), supplies products (USA, China, Brazil, India), or engages in energy and product transit (Ukraine). In the same vein, this strategy also aimed to establish a common policy for helping developing countries, particularly those in Africa, with clean and decentralized generation.

The EU energy policy with specific strategies is renewed periodically under the same described principles. For instance, the 2010 Communication from the Commission COM(2010)639[2] established similar strategies under five priorities: i) 20% energy savings by 2020 with measures and ecodesign requirements in buildings

[2] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions of 10 November 2010 – "Energy 2020 A Strategy for competitive, sustainable and secure energy" [COM(2010) 639 final - Not published in the Official Journal].

and in the transport sector; ii) ensuring implementation of the 2009 Directives for the Internal Market and promoting the development of a package for new cross-border infrastructure; iii) enhancing consumer participation and benefits from markets by supplier switching, best practices of alternative dispute resolution, and complaint handling schemes; iv) developing innovative energy technologies through implementation of the SET-Plan and large-scale European projects on smart grids, storage, biofuels and energy savings in cities and rural areas; and v) strengthening the external dimension of EU with neighboring countries. Two important directives that have been published in the last years and interact closely with the Internal Energy Market are the Directive for the promotion of the use of energy from renewable sources[3] and the Directive on energy efficiency.[4]

More recently, the 2050 energy roadmap[5] and the proposed climate and energy targets for 2030[6] continue addressing new challenges and developing new strategies with the aim of optimizing the difficult trade-off between competitive, sustainable, and secure energy. We will dedicate some analysis from a regulatory point of view to those targets and strategies in the final chapter of the report.

1.3. THE BASIC PRINCIPLES OF A SINGLE INTEGRATED ENERGY MARKET

As it has been stated, the creation of the energy market is one of the EU energy policy's priority objectives. The European Council in February 2011 gave a political impulse to this task by setting the year 2014 as the year that the energy market should be completed. In reality, building the EU energy market is a long and continued process that started with the first Electricity and Gas Directives in the 90´s, and will certainly continue beyond 2014 (as we will show in the different chapters of this report).

The energy market is a strategic instrument for achieving EU energy policy objectives with the goal of bringing secure, sustainable, and affordable electricity and gas to consumers; the market aims to accomplish these goals by giving consumers the choice of supplier and providing open market access and competition to existing

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[3] Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.

[4] Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC.

[5] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions "Energy Roadmap 2050" /COM/2011/0885 final/.

[6] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions "A policy framework for climate and energy in the period from 2020 to 2030" /COM/2014/015 final/.

and new suppliers. This market is a result of a progressive integration of existing national and regional markets, and therefore should be based on secure and coherent cross-border energy infrastructure. Without this infrastructure, the market will always be physically incomplete and will face important limitations to wider EU competition. In addition, the energy market, when operated properly in conjunction with the EU GHG emission trading mechanism, should force stakeholders competing in the market to correctly internalize CO_2 prices. Finally, an integrated EU market will significantly contribute to the diversification of energy supplies by providing support and coordination among member states (MS) and among EU external suppliers, and will therefore contribute to a more secure energy supply.

The basic principles which form the basis of the EU market have been established progressively through the successive Directives of electricity and gas – Directives 96/92/EC, 2003/54/EC and 2009/72/EC for electricity and Directives 98/30/EC; 2003/55/EC and 2009/73/EC for gas. In this section we present the fundamental pieces of the market, while in chapter 2 we will describe the specific provisions introduced by the so called Third Package in 2009.

The design of the EU market clearly separates regulated network activities, namely transmission and distribution, from competitive activities, namely supply and retail. Third parties can access the regulated networks, while wholesale and retail competition takes place in the wholesale and retail markets. Consumers have the right to choose their supplier; this right was progressively introduced from larger industrial consumers to smaller consumers including households.

System operators for transmission, distribution, gas storage and LNG facilities are appointed by each MS, and are in charge of the operation, maintenance, and development of appropriate network facilities. These system operators must guarantee non-discriminatory and transparent access to network infrastructure for all users, and must apply fair, regulated tariffs. In addition, these operators are obliged to provide other operators with information for a safe and efficient interconnected system operation.

Unbundling of regulated activities (transmission and distribution) from competitive activities (supply and retail) has always been an important issue in the design of the EU market, and has progressively evolved along the years. Different types of unbundling have been considered in the different Directives. These unbundling types range from accounting, legal and functional, to ownership separation. For instance, in the second Directives in 2003, transmission and distribution was required to be legally and functionally unbundled from production and supply. In the Third Package, stricter requirements are set for Transmission System Operators, as we will see in chapters 2 and 3.

Another cornerstone of the EU market design is related to consumer rights and protection. The consumer has the right, among others, to be informed of supplier alternatives and conditions to change the supplier. These rights also include easily comparable and transparent prices, transparent contract conditions and

dispute settlement mechanisms, and protection in the case of vulnerability. MS are responsible to define vulnerable consumers and the associated protective measures.

MSs can establish public service obligations for specific undertakings, such as guaranteeing security of supply, meeting economic and social cohesion objectives, protecting the environment, ensuring regularity and quality of energy supply, etc. Controversy exists in this area related to how State intervention may alter or distort the correct functioning of the market, and whether the proposed actions are justified and proportionate. In chapter 5 we will review some of the recommendations and guidelines provided by the European Commission on State intervention, and discuss how that would affect the proper functioning of the energy market.

Finally, the EU energy market design contemplates a decisive role for National Regulatory Authorities (NRAs) to ensure a well-functioning market. NRAs as independent energy regulatory authorities should be designated and appointed in each MS. These regulatory authorities are responsible for monitoring the non-discriminatory market access principle, ensuring market transparency and competition, and setting the tariffs or calculation methods for regulated activities. We will see also in chapter 2 how the Third Package in 2009 created the Agency for Cooperation of Energy Regulators (ACER), which performs a key role in the regulation of cross-border issues and in the completion of the EU-wide Internal Market.

1.4. CONCLUSION

In this introductory chapter, we have established a general framework for the EU energy policy where the EU energy market takes a proper dimension as a fundamental tool for achieving the three main EU energy policy objectives: affordability and competitiveness, sustainability, and security of supply. In addition, the fundamental principles in which our market is based have been depicted. These principles give rise to more integrated wholesale markets, with the aim of achieving a single, EU-wide wholesale market. However, retail markets remain mainly national in scope, although a common, EU-wide policy for protection and empowerment of energy consumers is envisioned. All of these aspects will be described and analyzed in more detail in the following chapters of this report.

2 THIRD PACKAGE AND INSTITUTIONS

In this chapter, we will describe the main legal basis for the Internal Energy Market and the institutional framework that facilitates this objective in greater detail.

Firstly, the Directives and the Regulations of the so called Third Package are analyzed. The "Third Package", building on the legacy of the First Package and the Second Package, intends to go one step further in the liberalization process of the European gas and electricity sectors, and intends to pave the way for a truly integrated European energy market.

Secondly, the respective roles of the European Commission, ACER and CEER with regard to the Internal Energy Market and more specifically to the Third Package are considered in this chapter. Finally, the Regulatory Forums for gas, electricity and consumers are addressed.

2.1. BASIC ELEMENTS OF THE THIRD PACKAGE

The second package proved to be a powerful tool to boost cross-border exchanges of electricity and gas. However, after it was implemented, it became clear that it was not enough; a number of deficiencies regarding the evolution towards a true Internal Energy Market were identified.

The European Commission launched an inquiry into competition in gas and electricity markets in 2005,[7] pursuant to Article 17 of Regulation (EC) 1/2003. The energy inquiry responded to concerns voiced by consumers and new entrants in the sector about the development of wholesale gas and electricity markets and limited choice for consumers. The final report, published in January 2007, identified serious shortcomings in the electricity and gas markets.

Firstly, the EC found very high market concentration in most national energy markets, and found that national energy markets generally remained rather isolated. The low level of market integration between Member States was identified as a major barrier for enhanced competition. In many national markets, customers were tied to suppliers through long-term downstream contracts. These long-term contracts resulted in a lack of liquidity, preventing the successful entry of new competitors.

Another important prerequisite of a well-functioning market is transparent, available, and relevant market information. Regrettably, the transparency of energy

[7] http://ec.europa.eu/competition/sectors/energy/inquiry/

markets was found to be very poor, leading to distrust in the pricing mechanisms. Furthermore, the level of unbundling between network and supply interests was assessed as inadequate, which had negative repercussions on market functioning and investment incentives.

Against this background, the EC proposed a Third Package on 19th September 2007. This proposal was negotiated for nearly two years and finally, in July 2009, was formally adopted. The package was published in the Official Journal on 14th August 2009 and entered into force twenty days afterwards. Member States had 18 months to transpose it into national legislation (i.e. the deadline expired in March 2011).

The Third Package is composed of two Directives and three Regulations:

- Directive 2009/72/EC common rules for the Internal Market in electricity.
- Directive 2009/73/EC common rules for the Internal Market in natural gas.
- Regulation (EC) 713/2009 establishing an Agency for the Cooperation of Energy Regulators.
- Regulation (EC) 714/2009 conditions for access to the network for cross-border exchanges of electricity.
- Regulation (EC) 715/2009 conditions for access to the natural gas transmission networks.

The Third Package is characterized by the following key points:[8]

1. A high standard of public service obligations and customer protection

For the first time, the Directives foresee minimum requirements for suppliers and measures to enhance customer protection and empowerment. In this context, the minimum content of contracts with suppliers is specified in the Directives. Another key point for retail markets is the requirement to effect changes of supplier within three weeks free of charge.

According to the Third Package, all customers shall have the right to a good standard of service and complaint handling by their electricity service provider. Furthermore, customers are entitled to receive their consumption data.

Additionally, specific protection of vulnerable customers is required in both sectors: electricity and gas.

2. Structural separation between transmission activities and production/ supply activities of vertically integrated companies ("unbundling")

One of the key points of the three legislative energy packages is unbundling of activities. Indeed, non-discriminatory access to networks is an essential

[8] Reference: presentation "main novelties of the Third Package" available at http://ec.europa.eu/energy/gas_electricity/legislation/legislation_en.htm

condition to guarantee fair competition in both wholesale and retail markets. If effective unbundling is not implemented, the network operator may have an interest in discriminating those market players that do not belong to the vertically integrated undertaking. There are different ways in which a network operator can pose difficulties to the activity of certain market players upstream or downstream. A classical example of problems related to vertically integrated undertakings is how to promote a network extension that may negatively impact on the market share of the vertically related supplier.

The Directives grant Member States a choice between three possible models:

- Ownership unbundling (OU)

  Under this model, the ownership of the TSO must not have any interest in generation or supply activities. In other words: the exercise of control over, and rights in, a transmission operator and at the same time exercising control over, and rights in, an undertaking performing any functions of generation or supply is not allowed.

- Independent System Operator (ISO)

  The transmission grid owner can remain part of a vertically integrated undertaking (VIU) but independent operation of the transmission grid must be ensured through a separate organization which is not owned by the VIU. The Independent System Operator (ISO) must demonstrate that it has at its disposal the required financial, technical, physical and human resources to carry out its tasks. Furthermore, the transmission grid owner is obliged to finance the investments decided by the ISO.

- Independent Transmission System Operator (ITO)

  Under the ITO model, the system operator may remain part of a vertically integrated undertaking (VIU). In that case, numerous detailed rules must be applied in order to ensure effective unbundling. Some of these key requirements are: i) The ITO must be independent from the VIU in terms of representation before the NRA and within ENTSO; ii) The ITO cannot share corporate services with the VIU, including legal services, accountancy and IT; iii) The ITO must be equipped with all the necessary financial, technical, physical and human resources.

3. Stronger powers and independence of national energy regulators

The National Regulatory Authorities (NRAs) welcomed the Third Package's acknowledgement of the key role played by a proper regulatory and institutional framework. Before the Third Package, the powers of NRAs were very different across Member States and in some cases Governments retained typical regulatory powers.

According to the Third Package, NRAs must have the power to fix or approve the transmission and distribution tariffs or their methodologies. Besides, the

NRAs must have the power to enforce the consumer protection provisions. In addition to these classic regulatory functions, the NRAs are granted complementary enforcement responsibilities, such as the power to issue binding decisions on electricity and gas undertakings or the power to impose effective, proportionate and dissuasive penalties on electricity and gas undertakings.

As far as independence is concerned, NRAs must be legally distinct and fully independent from any private or public entity (i.e. not part of a Ministry). Furthermore, NRAs must have an annual separate budget and adequate human and financial resources to perform the corresponding tasks.

4. New tools to harmonize market and network operation rules at pan-European level

A completely new feature of the Third Package compared to the Second Package is the mandate to develop rules to operate markets and networks in the EU on the basis of common principles. The objective is to facilitate cross-border trade and reduce transaction costs to the benefit of consumers and businesses. The EU Network Codes constitute an ambitious initiative for the creation of a true Internal Energy Market where (in principle) the basic rules for market and network operation should apply equally in all the Member States.

The elaboration and adoption of Network Codes require an extensive process, which includes the participation of stakeholders. This process is described in the Regulations of the Third Package and, consequently, it is explained in section 2.3 of this report.

5. A new institutional framework: ACER and the ENTSOs

ACER[9] is the Agency for the Cooperation of Energy Regulators. It was created by one of the Regulations of the Third Package (Regulation (EC) 713/2009). The Agency is one of the cornerstones of a new institutional framework designed to serve the objectives of the Third Package.

The Agency has a wide range of functions. One of the most acknowledged is its key role in the development of technical rules at EU level together with the ENTSOs and the European Commission. Some of its functions refer to executive powers affecting national regulatory frameworks, for example, the Agency can adopt decisions on cross-border issues (under certain circumstances). Other group of functions relates to monitoring several aspects relevant for market integration and cross border trade. In particular, the Agency has the mandate to monitor and report on EU market functioning.

The ENTSOs are the other institutional novelty set forth by the Third Package. A European Network of Transmission System Operators is established for

[9] In this context, ACER is referred to as “the Agency.”

electricity (ENTSOE) and another one for gas (ENTSOG). Among their main functions, we can highlight ENTSOs' key role in developing technical rules at EU level together with ACER and the European Commission. In the area of infrastructures, the ENTSOs develop EU-wide Ten Year Network Development Plans (TYNDP). Other functions of the ENTSOs relate to the promotion of regional cooperation between TSOs.

2.2. DIRECTIVES 2009/72/EC AND 2009/73/EC

The two Directives of the Third Package are very similar in structure and similar with regards to the provisions laid down therein. The Directive 2009/72 deals with electricity and Directive 2009/73 deals with gas. The two of them repeal the Directives of the Second Package (2003/54 and 2003/55 respectively). The Directives establish rules for the organization of the electricity and gas sectors and sets forth a framework for the activities of generation, transmission, distribution and retailing. In this model, an important part of the Directives is the section on third party access. Finally, the Directives detail some provisions on NRAs.

- **Rules for the organization of the sectors:**

Most of these rules are common for electricity and gas. Among them, there are a number of obligations on Member States regarding certain aspects of retail markets and consumer rights. For example, MSs have to ensure that any customer can change supplier within 3 weeks and that customers are entitled to receive all relevant consumption data. This concrete requirement reflects the importance of supplier switching as a prerequisite for effective competition in the European retail market model. The Directives intend to promote cross border competition also at retail market level; customers are entitled to have their energy provided by a supplier regardless of the Member State in which the supplier is registered, as long as the supplier follows the applicable trading and balancing rules and subject to security of supply requirements.

In terms of consumer empowerment, MSs have the obligation to ensure the provision of single points of contact to provide consumers with all necessary information. Furthermore, concerning complaints, in each MS an independent mechanism such as an energy ombudsman or a consumer body must be in place in order to ensure efficient treatment of complaints and out-of-court dispute settlements.

In the area of consumer protection, the MSs are mandated to take appropriate measures to protect final customers and in particular vulnerable customers. In this regard, each MS has to define the concept of vulnerable customer.[10]

[10] The concept of vulnerable customers may refer to energy poverty and, inter alia, to the prohibition of disconnection of electricity to such customers in critical times. Member States shall ensure that rights and obligations linked to vulnerable customers are applied. In particular, they shall take measures to protect final customers in remote areas.

With regards to public service obligations, the Directives make clear that, in order to ensure the maintenance of high standards of public service in the EU, MSs may impose public service obligations on undertakings operating in the gas or/and electricity sectors. These obligations may regard, for example, security of supply, regularity, quality and price of supplies, environmental protection, etc. In addition, MSs are responsible for monitoring security of supply issues.

The Third Package intends to create the conditions for an Internal Energy Market; in this context, MSs as well as National Regulatory Authorities are mandated to cooperate with each other for the purpose of integrating their national markets at regional levels. This regional integration is a first step towards the creation of a fully liberalized market. National Regulatory Authorities shall cooperate with ACER in this respect.

Additionally, the following is set forth with regard to the *electricity* sector:

The Directive 2009/72 goes even further regarding public service obligations and sets forth that MSs shall ensure that all household customers, and, where MSs deem it appropriate, small enterprises, enjoy universal service. Universal service is the right to be supplied with electricity of a specified quality within their territory at reasonable, easily and clearly comparable, transparent, and non-discriminatory prices.

Finally, electricity suppliers are obliged to provide the following information to final customers: i) contribution of each energy source to the overall fuel mix of the supplier. In the case of renewable energy sources, this can be demonstrated through Guarantees of Origin as prescribed at European level by the Directive 2009/28/EC;[11] ii) the environmental impact caused, which depends on the previous point; and iii) their rights in the event of any dispute, as a way to enhance customers' empowerment.

● Generation (only for electricity):

The Directive 2009/72 contains a short chapter on generation, formed by two articles: the first article addresses the authorization procedure and the second deals with tendering for new capacity.

In this area, MSs have to define criteria for granting authorizations for the construction of new power plants taking into account (inter alia) the security and safety of electricity networks, the protection of health and public safety, the protection of the environment, the contribution towards the EU 20-20-20 targets, etc.

In the interest of security of supply, if the private sector initiative is insufficient, the Governments can provide for new power plants (or alternative measures such as energy efficiency/demand-side management) through a tendering procedure. This tendering procedure must be clear, open and non-discriminatory.

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[11] Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.

● **Transmission**

The main *common* provisions for the transmission activity in both, electricity and gas, are structured in two parts:

The first part refers to one of the key points of the Third Package: TSO unbundling and certification. As from 3 March 2012, MSs shall ensure that transmission systems and transmission system operators (TSOs) are effectively *unbundled.* Before an undertaking is designated as TSO, it must be *certified*.[12]

The second part deals with TSO responsibilities. According to the Directives, TSOs are mainly responsible for operating the system and guaranteeing supply, in particular: i) ensuring long-term system ability to meet demand; ii) ensuring adequate means to meet service obligations; and iii) contributing to security of supply.

Furthermore, a second group of TSO responsibilities refers to its role as market facilitator, i.e.: i) providing system information related to operation, development and interoperability of the interconnected system; ii) ensuring non discrimination between system users; and iii) providing users with information they need to access the system.

In addition, with regard to the *electricity* sector, TSOs are responsible for managing electricity flows in the system and collecting congestion rents and payments for inter-TSO compensation mechanisms.

Finally, in the *gas* Directive there is a call for MSs to designate one or more storage and LNG operators, due to their relevance for the overall system operation and their interrelationship with the transmission activity.

● **Distribution network operation**

Much like the provisions for transmission activity, the main *common* provisions for electricity and gas distribution are structured in two parts:

The first part refers to DSO unbundling and designation; MSs have to designate distribution system operators (DSOs), and these DSOs must be unbundled at least in terms of its legal form, organization, and decision making from other activities not relating to distribution. As in the Second Package, MSs may decide not to apply this requirement to integrated undertakings serving less than 100,000 connected customers.

The second part deals with DSO responsibilities. According to the Directives, DSOs are responsible for ensuring long-term capacity, operation, maintenance, development, and environmental protection of facilities. Also, DSOs have a general responsibility as market facilitator and, consequently, must ensure transparency and provide information to system users. DSOs must not discriminate between system users or classes of system users, particularly in favor of its related undertakings.

[12] Certification process outlined in Regulations (EC) 714/2009 and 715/2009 (see next section).

Under some conditions, the Directives give MSs the possibility to apply in their territory the concept of "closed distribution systems". A closed distribution system operates within a geographically confined industrial, commercial or shared services site and does not supply household customers. This concept has been transposed into national law in 10 MSs for electricity and 9 MSs for gas.[13] Those systems are exempted from some of the general requirements.

In addition, with regard to the *electricity* sector, MSs may require the DSO, when dispatching generation installations, to give priority to generating installations using renewable energy sources, waste-to-energy, or combined heat and power.

● Unbundling and transparency of accounts

In both the *electricity and gas* sectors, undertakings have the obligation to keep separate accounts for all its activities, such as transmission and distribution. Moreover, MSs shall have the right of access to the accounts of undertakings while preserving confidentiality.

● Retail markets

Within the rules for the organization of retail markets, transparency and clarity for customers must be ensured. The Directives mandate that MSs ensure that the roles and responsibilities of transmission system operators, distribution system operators, supply undertakings, and customers (and if necessary other market participants) are defined with respect to a set of aspects. The first aspect is contractual arrangements, i.e. how should the contracts that the customer establishes with other actors for activating the energy supply be formulated? The second aspect is the commitments of providers to customers, i.e. what can the customers expect from their energy providers? A final and important aspect is the treatment of consumer data, i.e. who should have ownership of the data; how should it be exchanged; who is responsible for metering and settling? The rules governing those aspects have to be made public.

In addition, there is a particular requirement that only applies to the *electricity* sector: large, non-household customers have the right to contract simultaneously with several suppliers.

● Access to the system

This issue is one of the key areas as a basic principle of the European energy market. In both the *electricity and gas* sectors, MSs must ensure the implementation of a system of regulated third party access to transmission and distribution systems. Therefore, the tariffs for access to the system will be regulated. These tariffs have to be published prior to their entry into force. In this context, undertakings may refuse access to the system only on the basis of lack of capacity.

In the *electricity* sector, the Directive mentions that MSs shall lay down criteria for the authorization to construct direct lines. A direct line is an electricity line linking

[13] Source: CEER Status Review on the Transposition of Unbundling Requirements for DSOs and Closed Distribution System Operators. C12-UR-47-03. 16th April 2013.

an isolated generation site with an isolated customer, or an electricity line linking an electricity producer with an electricity supply undertaking in order to directly supply the supply undertaking's own premises, subsidiaries and eligible customers.

In the *gas* sector, the Directive also allows undertakings to refuse access to the system if this access would prevent the undertaking from carrying out a public service obligation assigned to it. For example, if the access of one more user (of a given size) to a gas network implies that this network can no longer reasonably fulfill a public service obligation related to security of supply, quality of supply, or other possible obligations considered by the Directive, the access of that user is denied. Of course, this kind of situations may indicate a need to reinforce the network; network reinforcement should be tackled in parallel, but usually takes a long period of time. Additionally, MSs or NRAs shall define conditions for access to storage and linepack (the gas that can be stored in the transmission and distribution system pipelines).

- **National Regulatory Authorities (NRAs)**

NRAs take a fundamental role in the implementation of the Third Package, and therefore have a number of functions that are outlined in the Directives. Each MS must designate a single NRA, which must be independent and responsible for the tasks outlined below (inter alia).

NRAs must fix transmission and distribution tariffs or their methodologies. As mentioned in the previous point (access to the system), these tariffs are regulated and, consequently, their approval and publication are classic functions of the regulator. The Third Package aims at ensuring that such tariffs are fixed by an independent NRA in order to control regulated monopolies and to avoid tariffs being used as a political instrument.

Other interesting requirement for NRAs is the duty to cooperate on cross-border issues with other NRAs and with ACER. However, this does not mean that before the Third Package this cooperation did not exist. On the contrary, the Directives recognize the value of NRA cooperation in the context of market integration and, for that reason, the Directives intend to reinforce and institutionalize this cooperation not only among NRAs but also with ACER.

The Directives also confer to NRAs the responsibility to monitor TSO investment plans. This is important due to the implications of network development on competition and security of supply.

NRAs are responsible for monitoring the level of transparency of the market, the effectiveness of market opening, wholesale and retail competition, etc.

With regards to customers, NRAs must ensure that the customer protection measures are effective and enforced. Furthermore, NRAs must guarantee that customers have access to their consumption data.

2.3. REGULATIONS (EC) 714/2009 AND 715/2009

Regulation (EC) No 714/2009 and Regulation (EC) No 715/2009 are very similar in structure and content. Regulation (EC) No 714/2009 sets forth conditions for access to the network for cross-border exchanges in electricity, and repeals Regulation (EC) No 1228/2003. Regulation (EC) No 715/2009 sets forth conditions for access to the natural gas transmission networks, and repeals Regulation (EC) No 1775/2005. It is important to remember that the Regulations are directly applicable in all MSs; they do not need to be transposed.

Both Regulations intend to facilitate a well-functioning and transparent wholesale market with a high level of security of supply by way of harmonizing the rules for cross-border exchanges. The *electricity* Regulation specifically refers to setting fair[14] rules for cross-border exchanges, thus enhancing competition within the Internal Market in electricity. On the other hand, the *gas* Regulation aims at setting non-discriminatory rules for access conditions to natural gas transmission systems, LNG Facilities and storage facilities.

- **Certification of TSOs**

The certification process is explained in the Regulations 714/2009 and 715/2009. Through this process, a NRA certifies that a TSO is effectively unbundled according to one of the three models allowed by the Directives. NRAs must send the European Commission a notification of decisions on TSO certifications. Then, the EC has a period of 2 months to deliver its opinion to the NRA. Finally, the NRA adopts the final decision "taking utmost account" of the EC's opinion. Both the NRA's decision and the EC's opinion are published in the EC website.

- **Creation of the European Networks of Transmission System Operators (ENTSOs[15])**

All TSOs have an obligation to cooperate at the Community level through the ENTSOs in order to: promote the completion and functioning of the Internal Market; encourage and enable cross-border trade; and ensure the optimal management, coordinated operation, and sound technical evolution of the European transmission networks. For that purpose, before 3 March 2011, the TSOs had to submit to the Commission and to the Agency a set of draft statutes, a list of members, and draft set of rules of procedure for the ENTSOs.

The Regulations established that TSOs shall bear the costs of ENTSOs' activities and financing.

The ENTSOs have a key role concerning the development of Network Codes (NCs). This process is thoroughly described in the Regulations 714/2009 and

[14] In practice, "fair rules" involves the establishment of a compensation mechanism for cross-border flows of electricity and the setting of harmonized principles on cross-border transmission charges and the allocation of available capacities of interconnections between national transmission systems.

[15] One for electricity (ENTSOE) and one for gas (ENTSOG).

715/2009. First, the EC, after consultation to ACER and ENTSOs, establishes an annual list of NCs priorities. Prior to developing a NC, ACER submits to the EC non-binding Framework Guidelines (FG), with which the corresponding NCs must comply. Afterwards, the EC formally asks the corresponding ENTSO to develop each draft NC. One year later, the NC must be submitted by ENTSO to ACER; within three months, ACER will issue an Opinion on the degree to which the NC complies with the corresponding FG, and if appropriate, a Recommendation for NC adoption to the EC.

When ACER submits to the EC a recommendation for adopting a NC, the EC can launch the comitology process,[16] which can be summarized as follows. First, the EC convenes one or more meetings of the Electricity Cross-Border Committee (set up by Regulation 1228/2008 and composed of MSs representatives) in order to discuss the content of the NC. In this stage, amendments can be proposed. The EC can consult ACER and ENTSO during this process. After the comitology discussions, the EC proposes a final text for adoption and the Committee votes. If the NC is approved by the Committee, (after fulfilling some formal steps) it is published in the Official Journal of the European Union as a Commission Regulation establishing the concerned Network Code and supplementing Regulations (EC) 714/2009 or 715/2009. Therefore, it becomes directly applicable in all MSs. The same comitology procedure is applied to Commission Guidelines.

In the figure below, the process and timeline to develop a FG and a NC is outlined.

According to the Regulations, the Network Codes shall cover the following areas:

— Network security and reliability.

— Network connection rules.

— Third party access rules.

— Data exchange and settlement rules.

[16] It is worth mentioning here a specific issue with regard to electricity NCs. After the first NCs received the recommendation for adoption by ACER, the EC took a long period of time to analyse a number of concerns. These related to inconsistencies or shortcomings, competition issues or stakeholders' concerns on specific provisions of the NCs, inter alia. But the main issue was identified by the EC legal services: Some draft NCs did not include in the text some rules of relevance for fulfilling the purpose of the draft NC. Instead, the decision on these specific rules was explicitly postponed in the draft texts. In general, these would be proposed by all TSOs and approved by NRAs at a later point in time (usually, the deadlines are specified). According to the EC's legal interpretation, NCs must be self-sufficient or complete in the sense that they have to establish all the relevant rules within the NC's text. If this is not the case, the text should be considered as a "Guideline" which is proposed by the EC for adoption in comitology and eventually would become a Commission Regulation. This explains the long time interval between the ACER recommendation for adoption and the actual adoption of the electricity NCs in comitology and subsequent publication in the Official Journal. This delay did not occur in the majority of the gas NCs.

— Interoperability rules.

— Operational procedures in an emergency.

— Capacity allocation and congestion management rules.

— Rules for trading related to technical and operational provision of network access services and system balancing.

— Transparency rules.

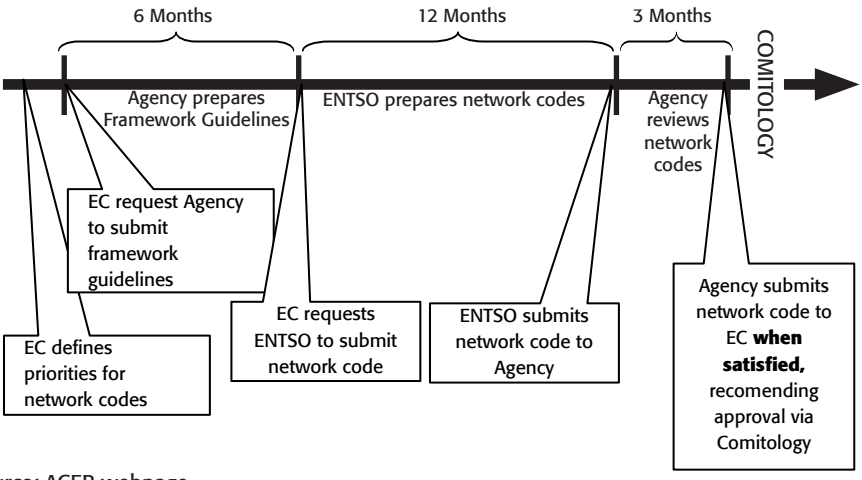
— Balancing rules including network-related reserve power rules.

— Rules regarding harmonized transmission tariff structures.[17]

— Energy efficiency regarding electricity networks.

Figure 2.1

TIMELINE FOR DEVELOPING FRAMEWORK GUIDELINES AND NETWORK CODES BASED ON THE THIRD PACKAGE REGULATIONS



Source: ACER webpage.

Other tasks of the ENTSOs include the adoption of several deliverables, such as: common network operational tools, recommendations for technical cooperation of EU TSOs, a non-binding EU wide ten-year network development plan (produced every two years),[18] annual (activity) reports, annual summer and winter generation supply outlooks, and the annual work program.

[17] In the case of electricity this bullet point adds: "Including locational signals and inter-transmission system operator compensation rules."

[18] In connection with the EU wide TYNDP, there is a mandate for TSOs to cooperate at regional level (and with ENTSO) to publish regional investment plans in infrastructures every two years.

● **Information and congestion management**

More transparency and better coordination are among the objectives of the Third Package; for that reason, the Regulations mandate the TSOs to put in place information exchange mechanisms to ensure system security in the context of congestion management. Furthermore, TSOs must publish non-discriminatory, market-based, and transparent congestion management procedures for cross-border exchanges.

The *gas* Regulation sets forth that TSOs shall offer their services equitably to all network users on a rolling basis in the short and long term. Similar requirements apply for storage and LNG facility operators making those services compatible with the use of interconnected transport networks. Finally, while complying with safety standards of secure network operation, the maximum cross-border capacity shall be made available to market participants.

● **Exemptions**

According to the *electricity* Regulation, new direct current (DC)[19] interconnectors may be, upon request, exempted for a limited period of time from the provisions concerning unbundling, third party access and use of congestion revenue. These exemptions are granted under a set of conditions, the most relevant being the following: i) the interconnector must increase competition in electricity supply; ii) the level of risk is such that the investment would not take place without an exemption; iii) the ownership of the interconnection must be separate, at least legally, from the system operator(s) that operate the system in which the interconnector will be built; and iv) the exemption must not be to the detriment of competition or effective functioning of the internal market (this complements the first condition). An example of a recent case is the so called "ElecLink" electricity interconnector between France and Great Britain.

The same exemption regime described in the electricity Regulation (714/2009) is available in the *gas* Directive (2009/73) for interconnectors, LNG and storage facilities. Moreover, Regulation 715/2009 shall not apply to major new infrastructure (interconnectors), LNG and storage facilities, significant increases of capacity in existing infrastructure, and modifications of existing infrastructure which enable the development of new sources of gas supply under conditions set forth in the Regulation. An example of an exempted project for this reason is the "Nabucco" pipeline that will deliver gas from Azerbaijan up to Austria.

● **Charges/tariffs[20] for access to the networks:**

In both sectors, charges/tariffs for access to the networks shall be applied by TSOs complying with a number of principles (transparency, efficiency, cost reflectivity, etc.).

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[19] Interestingly, AC interconnectors cannot be exempted.

[20] In the electricity Regulation, the term "charges" is used, while in the gas Regulation, the term used is "tariffs."

Furthermore, the *electricity* Regulation establishes that TSOs shall be compensated for hosting cross-border flows in their networks. The compensations are paid by those TSOs from which cross-border flows originate and the TSOs where flows end. The costs compensated shall be based on forecasted costs[21] (this is further detailed in Commission Regulation EU 838/2010).

2.4. AGENCY FOR THE COOPERATION OF ENERGY REGULATORS (ACER)

Regulation (EC) 713/2009 created ACER with the goal of providing EU level assistance for energy National Regulatory Authorities in performing some authorities' tasks, and, where necessary, to coordinate the actions of energy National Regulatory Authorities. ACER was established in order to fill the regulatory gap at the EU level, and to contribute towards the effective functioning of the internal markets in electricity and natural gas. Ljubljana, the capital of Slovenia, was designated as seat of ACER.

ACER is a Community body with its own legal personality. It issues opinions, recommendations and makes decisions on concrete aspects pursuant to the Regulation 713/2009 and other subsequent Regulations[22] which assign tasks to ACER.

Probably the most renowned type of act that ACER issues is the Framework Guidelines.

However, ACER has a wide range of functions that can be grouped in a number of areas. One general task for ACER, as community body, consists of providing an opinion or a recommendation to the European Parliament, the Council, and the Commission (either on its own initiative or upon a request of one of these European Institutions) on any of the issues relating to the purpose for which it has been established.

The organizational structure of ACER has four bodies:

- **Administrative Board:** Composed by members appointed by European institutions (Council, Parliament, and Commission). It is the Governing body of ACER; it appoints the members of the other ACER bodies (including the Director), exercises budgetary powers, and adopts ACER's multi-annual program.

[21] The costs incurred as a result of hosting cross-border flows shall be established on the basis of the forward-looking long-run average incremental costs, taking into account losses, investment in new infrastructure, and an appropriate proportion of the cost of existing infrastructure.

[22] Regulation (EU) 838/2010 on laying down guidelines relating to the inter-transmission system operator compensation mechanism and a common regulatory approach to transmission charging.
Regulation (EU) 1227/2011 on wholesale energy market integrity and transparency (REMIT).
Regulation (EU) 347/2013 on guidelines for trans-European energy infrastructure and repealing Decision No 1364/2006/EC and amending Regulations (EC) No 713/2009, (EC) No 714/2009 and (EC) No 715/2009.

- **Board of Regulators:** Composed of senior representatives of the NRAs (from the 28 MSs). It provides advice to the Director, oversees ACER regulatory activities, and influences (and often approves) the opinions, decisions and recommendations of ACER.
- **Director:** Appointed for 5 years and responsible for representing and managing ACER.
- **Board of Appeal:** Part of ACER, but independent from its administrative and regulatory structure. The Board of Appeal is composed of 6 members and 4 alternates (senior level with a relevant experience). The Board of Appeal deals with complaints lodged against ACER decisions. The decisions of the Board of Appeal may be subject to appeal before the Court of Justice of the European Communities.

In addition, ACER´s Director Decision creates Working Groups through formal Decisions. These Working Groups advice the Director on regulatory tasks, and, in particular, they prepare deliverables for subsequent approval by the Director or by the Board of Regulators. These Working Groups are composed of representatives from the ACER staff, NRAs, and the EC. Currently, the active Working Groups are:

- Implementation, Monitoring and Procedures Working Group (AIMP WG)
- Market Integrity and Transparency Working Group (AMIT WG)
- Electricity Working Group (AEWG)
- Gas Working Group (AGWG)

Countries which have signed agreements with the EU (e.g. Norway) may participate in ACER work, particularly in the ACER Working Groups.

The ACER financial resources come mainly from funding from the general budget of the EU, fees paid to ACER,[23] voluntary contributions from MSs, legacies, donations, or grants.

The main groups of *ACER tasks* are explained below.

- **Tasks concerning the cooperation of TSOs**

ACER controls the cooperation of TSOs and their activities within the ENTSOs. For example, ACER must issue an opinion on the statutes, the list of members, and the rules of procedures of the ENTSOs. Furthermore, ACER monitors on a regular basis the execution of the ENTSOs' tasks through formal opinions on the annual work programs and annual activity reports of the ENTSOs.

A particular mandate to ACER regarding the ENTSOs is the procedure established for the adoption of Framework Guidelines (FGs) and Network Codes

[23] Fees shall be due to the Agency for requesting an exemption decision.

(NCs). As explained in section 2.3, ACER drafts the FGs which the NCs have to comply with. When the ENTSOs submit a NC to ACER, ACER must issue a formal opinion. Moreover, if the NC is deemed as compliant with the FG, ACER may recommend that the EC adopt the NC.

Finally, ACER has the duty to monitor some specific aspects of the cooperation of TSOs such as regional cooperation between TSOs in both gas and electricity.

- **Tasks concerning National Regulatory Authorities (NRAs)**

As stated in the name of the agency, ACER provides a framework of cooperation for NRAs by providing a platform where recommendations of good practices can be made and exchanges between NRAs and market players at the European level are facilitated. In this context, ACER can adopt individual decisions on technical issues as provided in the Directives and Regulations of the Third Package.

According to the Regulation, ACER can take decisions that concern NRAs. For example, ACER has the power to issue an opinion on whether a decision taken by a NRA complies with Community rules; if the opinion is not followed, ACER informs the European Commission and the concerned MS.

- **Tasks concerning cross-border infrastructure**

The terms and conditions for access to a certain cross-border infrastructure should, in principle, be set forth by the relevant NRAs. However, ACER can impose these terms and conditions if the concerned NRAs have not reached an agreement within 6 months, or if the concerned NRAs have jointly requested ACER to intervene. These terms and conditions can include a procedure for capacity allocation, a timeframe for allocation, the terms for shared congestion revenues, and the terms for levying of charges on the users of the infrastructure.

- **Task of monitoring the internal markets of gas and electricity and in particular retail prices (Market Monitoring Report)**

In cooperation with the EC, the MSs, and the relevant national authorities, ACER monitors the internal markets in electricity and natural gas and, where appropriate, informs the European Parliament, the EC, and national authorities of its findings. This is streamlined through the so called annual “Market Monitoring Report.”

2.5. COUNCIL OF EUROPEAN ENERGY REGULATORS (CEER)

CEER was established in 2000 as an association for facilitating the cooperation of independent energy regulators of Europe on a voluntary basis. Therefore, CEER existed before ACER and ERGEG (predecessor of ACER) were established.[24] CEER was the first organization that provided a platform for NRA cooperation at the

[24] ERGEG was established by Decision of the EC of 11th November 2003.

EU level. This cooperation has proved to be essential for the creation of the Internal Energy Market.

At present, CEER is closely linked to and shares similar objectives with the Agency for the Cooperation of Energy Regulators (ACER). ACER is a formal EU Agency created by Regulation (EC) 713/2009 whereas CEER is a not-for-profit association registered in Belgium and set up by the National Regulatory Authorities (NRAs) themselves. On EU issues, CEER works very closely with (and supports) ACER.

CEER intends to be "the voice of Europe's national energy regulators at EU and international level." Through CEER, NRAs cooperate and exchange best practices. CEER acts as a platform for cooperation, information exchange, and assistance between Europe's NRAs. CEER also strives to share regulatory best practices worldwide through its membership in the International Confederation of Energy Regulators (ICER).

The overall aim of the Council of European Energy Regulators (CEER) is to facilitate the creation of a single, competitive, efficient and sustainable internal market for gas and electricity in Europe.

CEER has 33 members: the NRAs of the 28 Member States of the EU, Norway, and Iceland, plus 3 observers: the NRAs of Switzerland, FYROM and Montenegro.

CEER is made up of the General Assembly and the Board of Directors; the latter consists of six directors: the President and five Vice Presidents.

Figure 2.2

CEER STRUCTURE IN 2014. BLACK CELLS: WORKING GROUPS. GREY CELLS: TASK FORCES

		GA				
		Board				
		Secretariat				
IBM WG Implementation, Benchmarking and Monitoring	CMIT WG Market Integrity and Transparency	CEWG Electricity	CGWG Gas	CRM WG Customers and Retail Markets	ISG International Strategy	DSO
Legal	Wholesale Energy Market	Sustainable Development	Gas Storage	Customer Empowerment		Electricity Quality of Supply
Market Monitoring and Reporting		Electricity Security of Supply	Liquefied Natural Gas	Retail Market Functioning		Smart Grids Coordination Group
Incentives Regulation and Efficiency Benchmarking			Gas Infrastructure	Strategy & Communication		

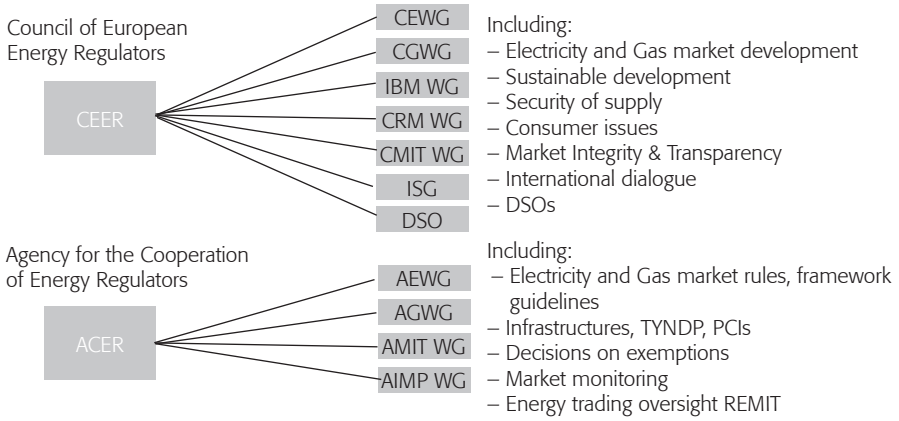
Source: CEER.

CEER organizes its work through Working Groups (WGs), which may be supported by Task Forces (TFs) in charge of specific issues. CEER has established seven working groups (see Figure 2.2). Four of these Working Groups have equivalent working groups in ACER: Electricity WG, Gas WG, Market Integrity and Transparency WG and Implementation, Benchmarking and Monitoring WG (the Implementation, Benchmarking and Monitoring WG's ACER equivalent is the AIMP WG).

In the following figure, we put together the CEER WGs and the ACER WGs in order to compare the areas that are primarily addressed by CEER and by ACER.

Figure 2.3

REGULATORY COOPERATION AT EU LEVEL: TOPICS ADDRESSED BY THE WORKING GROUPS IN CEER AND ACER



Source: Own elaboration.

2.6. EUROPEAN COMMISSION

Within the EC, the Directorate-General for Energy (DG ENER) is responsible for developing and implementing a European energy policy which pursues a triple objective: competitiveness, sustainability, and security of supply. In line with the explanation provided in chapter 1, these objectives can be further detailed in the following way: i) setting up an integrated energy market providing affordable energy, competitive prices and technologically advanced services; ii) promoting sustainable energy production, transport and consumption aligned with 2020 EU targets and 2050 decarbonization objectives; and iii) enhancing security of supply under solidarity between MSs.

The DG ENER monitors the implementation of EU energy laws and makes proposals. In particular, DG ENER promotes the completion of the Internal Energy

Market and support the reinforcement of energy infrastructure through the timely implementation of the Third Package and the Infrastructure Regulation.[25] A related work area of DG ENER consists in ensuring markets deliver objectives in renewables and efficiency.

Furthermore, DG ENER promotes the EU external energy policy, develops strategic analyses and policies, and encourages the exchange of best practices and information to stakeholders.

Under the political guidance of the Commissioner for Energy, the Directorate-General for Energy is structured in several Directorates. One of these Directorates, Directorate B, is specifically dedicated to the creation and development of the Internal Energy Market; more specifically, it is dedicated to the implementation of the Third Package and the Infrastructure Regulation. This Directorate is structured in three units: Networks and Regional Initiatives, Wholesale Markets, and Retail Markets. Furthermore, Directorate B has a unit dedicated to the energy part of the Connecting Europe Facility.

Other Directorate Generals of the EC that deal with energy are *DG SANCO* (Health and Consumers) and *DG COMP* (Competition).

DG SANCO addresses consumer issues and retail energy markets in cooperation with DG ENER. DG COMP enforces EU competition rules in all sectors. It is worth recalling the energy sector inquiry published by DG COMP in the year 2007, which eventually led to the proposals of the Third Package. More recently, the DG COMP published another key document for energy markets, the Guidelines on Environmental and Energy State Aid for 2014-2020,[26] which is addressed in chapter 5.

Finally, a new Executive Agency has been created by the EC: the Innovation and Networks Executive Agency (INEA). This Executive Agency officially began its operations on 1st January 2014 in order to manage several of its major funding programs, in particular, the Connecting Europe Facility (CEF). In this context, an amount of €5.85 billion will be made available for improving the trans-European energy infrastructure for the period 2014-2020. INEA is the successor of the TEN-T EA (Trans-European Transport Network Executive Agency, which was created by the European Commission in 2006 to manage the technical and financial implementation of its TEN-T Program).

2.7. THE ELECTRICITY REGULATORY FORUM

Regulators created the Electricity Regulatory Forum in 1998 to discuss the creation of the Internal Energy Market, cross-border trading, tarification of exchanges, and management of scarce interconnection capacity.

[25] Regulation (EU) 347/2013 of the European Parliament and of the Council of 17 April 2013 on guidelines for trans-European energy infrastructure and repealing Decision No 1364/2006/EC and amending Regulations (EC) No 713/2009, (EC) No 714/2009 and (EC) No 715/2009.

[26] Guidelines on State aid for environmental protection and energy 2014-2020. 2014/C 200/01. Published on the Official Journal of the European Union on 28th June 2014.

Currently, the Forum is led by the EC (DG ENER), and gathers representatives of MSs, ACER, NRAs, ENTSOE, Europex, and other stakeholders of the electricity sector such as Eurelectric, EFET, GEODE, EDSO, IFIEC, etc. It meets twice a year typically in Florence (Italy).

The subjects addressed in the latest editions of the Forum include: implementation of Network Codes, implementation of the Electricity Target Model, Regional Initiatives, infrastructure challenges (TYNDP, PCIs), REMIT implementation, sustainability challenges, capacity remuneration mechanisms, and the future of the European electricity regulation and market design (including demand side response). These issues will be addressed in the next chapters of this report.

This forum is a platform where relevant updates are provided for discussion among the interested parties and, in particular, where the EC guides and follows up on implementation processes.

2.8. THE GAS REGULATORY FORUM

Similar to the electricity forum, the Gas Regulatory Forum was set up in 1999 to create a forum for discussing issues related to the creation of the internal gas market, including tarification of cross-border gas exchanges, allocation and management of scarce interconnection capacity, and technical and commercial barriers for the completion of the internal gas market.

Currently, the Forum is led by the EC (DG ENER), and gathers representatives of MSs, ACER, NRAs, ENTSOG, and other gas sector stakeholders such as Eurogas, EFET, OGP, GIE, IFIEC, etc. It meets twice a year in Madrid (Spain).

The subjects addressed in the latest editions of the Forum include: the role of gas in the future EU energy mix, implementation and review of the Gas Target Model, implementation of Network Codes, Regional Initiatives, infrastructure challenges (TYNDP, PCIs), REMIT implementation, LNG and storage, gas quality, and the future of the European gas regulation. These topics are analyzed in the next chapters of this report.

Furthermore, the Forum follows any urgent issues at the EU level concerning the gas markets such as extreme weather events (e.g. 2012 cold wave) or political crises (e.g. Ukraine) that pose challenges to the gas sector.

2.9. THE CITIZENS' ENERGY FORUM

Established by the European Commission in 2007, the Citizens' Energy Forum's aim is to implement competitive, energy-efficient, and fair retail markets for consumers. It meets once per year in London (UK).

It is led by DG-ENER and DG-SANCO, and includes the participation of CEER, ACER, national and European customer associations (e.g. BEUC), and industry stakeholders.

In the context of this forum, there are some Working Groups, in particular on Vulnerable Consumers, Price Transparency, E-billing. There are also sub-groups, such as the Energy of the Consumer Consultative Group (ECCG). The work of the Smart Grids TF of the EC also feeds into this forum.

The subjects addressed in the latest editions include: consumer protection and engagement, demand response and empowerment of consumers, protection of data and privacy in smart grids, the 2020 Consumer Vision (CEER and BEUC), and the new role of DSOs adding value for consumers in retail markets.

2.10. CONCLUSION

The Third Package has established a comprehensive and ambitious legislative framework as a basis for building the European Energy Market. The provisions of the Third Package introduce significant novelties (such as ACER, the ENTSOs, Framework Guidelines, Network Codes, etc.). There are several institutions and organizations involved in the implementation of the Third Package, each with particular objectives, structure and functions. Furthermore, the dialogue among stakeholders at the European level, formalized through different forums, plays a key role in developing a truly European Energy Market.

This chapter intended to present the legislative basis for the Internal Energy Market. The implementation aspects of this legislation will be explained in the following chapter.

3 IMPLEMENTATION OF EU LEGISLATION

3.1. INTRODUCTION: OVERALL PICTURE

The Third Package legislation came into effect on 3rd March 2011; consequently, ACER became fully operational on that date.

From a regulatory perspective, the European markets must follow some key principles. First, a level playing field must be ensured in order to facilitate fair competition and to avoid discrimination between market players. The second prerequisite for well-functioning markets is transparency. Another key area is the predictability, stability and clarity of market rules and regulatory regimes. Finally, tariffs must reflect the applicable costs, including regulated costs of monopolistic network activities, and provide economic signals for the efficient use of existing assets.

The full implementation of the Third Package provisions will help to put in place these principles, and will therefore facilitate liquid, reliable, competitive and investable markets.

The implementation of the Third Package comprises many aspects, some of which are neither easy nor quick to apply. For example, the Third Package requires the development and implementation of cross-border network rules (Framework Guidelines and Network Codes) to improve clarity and to establish a level playing field. As of 3rd March 2011, the formal process to deliver the awaited Network Codes (NCs) has started; however, this is a complex process that takes several years. Furthermore, once a NC is adopted, its full implementation usually takes more than one year. However, the political agenda cannot afford such a long deadline. For that reason, the European Council, on 4th February 2011, called on concerned parties to complete the Internal Energy Market by 2014.[27] In this context, ACER decided to use the existing Regional Initiatives for the early implementation of those NCs which are pivotal for the completion of the Internal Energy Market. This will be explained in detail in chapter 4.

Beyond the Third Package, there are other relevant EU Regulations that must be taken into consideration, namely: the REMIT (Regulation on wholesale energy market integrity and transparency) and the Trans-European energy networks

[27] "The internal market should be completed by 2014 so as to allow gas and electricity to flow freely." European Council of 4th February 2011. Conclusions on Energy (paragraph 4).

Regulation. These two Regulations address key areas for a well-functioning Internal Energy Market. ACER is deeply involved in the implementation of both Regulations.

To conclude, it is worth mentioning that CEER performs a regular analysis of relevant areas of the EU energy legislation such as sustainable development, financial services, security of supply and customer issues.

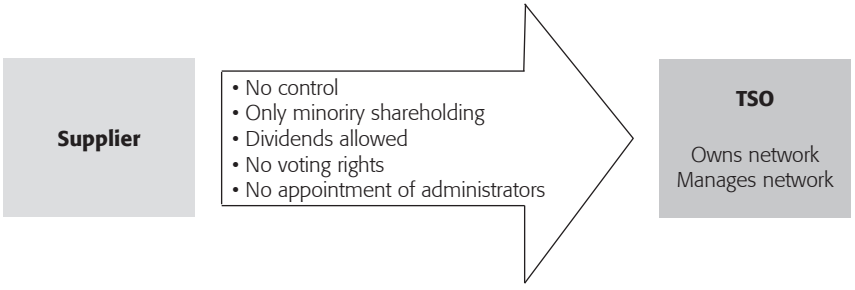
This chapter is structured in three main parts: i) Implementation of the Third Package; ii) Infrastructure Package (in connection with the EU-wide TYNDPs) and iii) REMIT. However, most of the chapter is dedicated to the following key areas of the Third Package implementation: TSO unbundling and certification, the so called "target models," and Framework Guidelines and Network Codes for both electricity and gas.

3.2. TSO UNBUNDLING AND CERTIFICATION

The Directives require effective unbundling of TSOs from producers and suppliers. For that purpose, three models are allowed: Ownership Unbundling (OU), Independent System Operator (ISO), and Independent Transmission Operator (ITO). In addition to the description of the three models given in chapter 2, explanatory figures from the EC have been included below:

Figure 3.1

OWNERSHIP UNBUNDLING MODEL

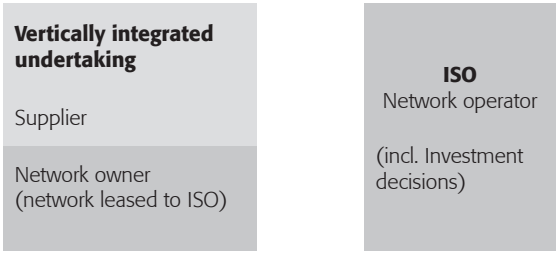


Source: European Commission. Presentation on the main novelties of the Third Package published in the EC website.

The preferred option in the Directives is the OU model because it is the most straightforward way to ensure effective unbundling. The other two options imply higher organizational complexity and deeper regulatory monitoring.

Figure 3.2

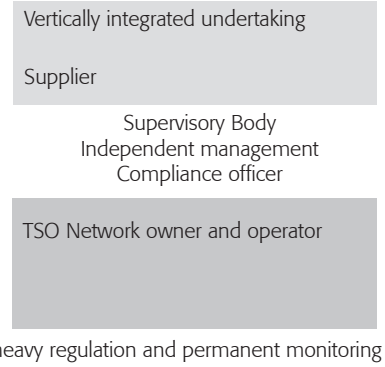
ISO MODEL



Source: European Commission.

Figure 3.3

ITO MODEL



Source: European Commission.

In the ISO model, the transmission owner remains part of a vertically integrated undertaking (VIU), but a new, separate, and independent entity, the ISO, is created in order to operate the system. Consequently a clear-cut separation between ownership and operation of the transmission grid is applied. The ISO model is similar to the OU model in the sense that the ownership of the system operator must not be engaged in generation or supply activities. Therefore, the ISO must comply with the rules of ownership unbundling (i.e. a person cannot exercise control or any right over an ISO and, at the same time, exercise control or any right over an undertaking performing functions of generation or supply). An Independent System Operator must be equipped with sufficient financial, technical and human resources in order

In the following figure, the certification procedure is outlined:

Figure 3.4

STAGES OF THE CERTIFICATION PROCEDURE

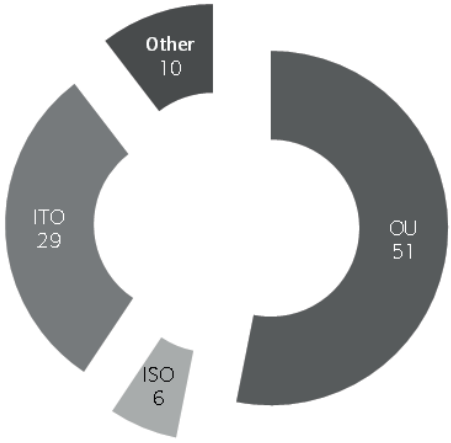
3 March 2012	Final deadline for application by TSOs
4 months	Deadline for draft NRA decision (counting from availability of complete application documentation)
ASAP	Notification of draft NRA decision to the Commission
2 months	Deadline for Commission opinion
2 months	Possible extension in case the Commission decides to involve ACER
2 months	Deadline for final NRA decision (from receipt of Commission opinion)
X	Publication of NRA decision in its Official Journal, i.e. designation of TSO

Source: Annegret Groebel. Presentation on unbundling and certification. 10th EU-US Energy Regulators Roundtable. April 2013.

During a certification procedure, the corresponding NRA and the EC assess whether effective unbundling has been attained. For certification purposes, property

Figure 3.5

NUMBER OF CERTIFICATION DECISIONS CORRESPONDING TO EACH UNBUNDLING MODEL NOTIFIED BY NRAS UNTIL MARCH 2014



Source: Own elaboration.

rights in the transmission grid (assets and associated hardware and software) are understood as direct ownership of the grid or indirect ownership through shares.

Until March 2014, 96 certification decisions have been notified by the NRAs to the EC. These are published in the EC website. Figure 3.5 shows a breakdown of certification decisions by type of unbundling model.

3.3. THE ELECTRICITY TARGET MODEL, FRAMEWORK GUIDELINES AND NETWORK CODES

3.3.1. The Electricity Target Model

A consensus on the most appropriate model for the management of interconnections emerged from the implementation of the Congestion Management Guidelines included in the second package[28] and from the work carried out under the ERGEG Regional Initiatives framework. This Target Model was further defined by the PCG[29] and the AHAG.[30]

The Electricity Target Model (ETM) primarily refers to the way cross border exchanges should be managed. This was formalized in the Framework Guidelines on Capacity Allocation and Congestion Management (FG CACM), which regulates cross-zonal capacity allocation in long term, day-ahead, and intraday timeframes. After the intraday timeframe, this is complemented by the FG on Balancing.

This model assumes the existence of Power Exchanges (PXs) matching demand and supply bids in day-ahead markets in order to set hourly energy prices for each bidding zone. PXs provide a marketplace where wholesale buyers and sellers can exchange electricity in an organized way, with a set of rules, at public prices. This is a sound assumption, as many PXs exist and operate in the EU MSs today.

The ETM acknowledges that cross-zonal transmission capacities are limited and valuable resources because they provide a bridge between market zones. Therefore, it is important to clarify and coordinate cross-zonal capacity calculation and to allocate these capacities in the most efficient way in the different timeframes.

In the majority of the EU MSs, there is just one bidding zone. However, some MSs are divided in several bidding zones in order to reflect structural congestions within the country. Some PXs manage bidding zones in several countries. For

[28] Annex 1 of Regulation 1228/2003.

[29] PCG: Project Coordination Group.

[30] AHAG: Ad Hoc Advisory Group (of stakeholders for the definition of the target model), chaired by ERGEG.

example: OMIE in Spain and Portugal; EPEX Spot in France, Germany, Austria and Switzerland; Nord Pool Spot in Norway, Sweden, Denmark, Finland, Estonia, Latvia and Lithuania; or APX in the Netherlands and Great Britain. Other PXs are active only in one MS, such as GME in Italy, LAGIE in Greece, etc.

The purpose of *long-term capacity allocation* is to offer long-term hedging solutions against congestion costs to market participants. In this respect, the model allows a number of possibilities such as Physical Transmission Rights (with automatic resale if not nominated), and Financial Transmission Rights (either options or obligations). TSOs will only be exempted from issuing Transmission Rights if the market needs regarding long-term hedging are satisfied by liquid financial markets on both sides of an interconnector.

In the *day-ahead* timeframe, there is a single mechanism allowed: price coupling. This means that a single algorithm simultaneously determines volumes and prices in all bidding zones. This algorithm allocates implicitly the available day-ahead cross-zonal capacities; as such, electricity flows from low price areas to high price areas. Once day-ahead energy markets are coupled, price convergence will be ensured when there is no congestion between zones.

In the *intraday* timeframe, the target is to have pan-European, continuous (similar to the continuous market of the stock exchange), implicit trading, with reliable pricing of intraday cross-zonal capacity reflecting congestion. Where there is sufficient liquidity, regional auctions may complement the implicit continuous allocation mechanism.

These cross-border capacity allocation mechanisms are explained in the following pages.

3.3.2. Electricity Framework Guidelines and Network Codes (FGs and NCs)

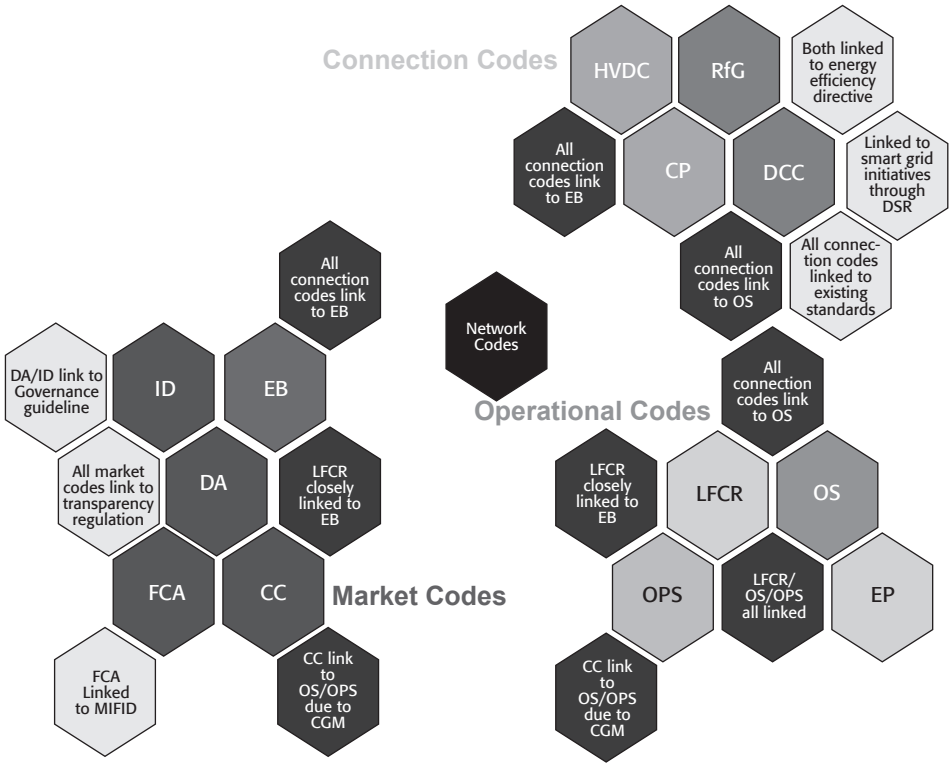
In chapter 2, the concept and purpose of FGs and NCs were explained along with the procedure to establish them.

Interestingly, the NCs, which are binding after formal adoption, must comply with the principles set out by the corresponding FGs, which are non-binding. Therefore, FGs and NCs cannot be analyzed separately. Instead, FGs and NCs form two sides of the same coin; for this reason, this section addresses each FG jointly with the corresponding NC.

The various electricity NCs are building blocks of a complex building where all the pieces are interrelated. The following figure illustrates how all the NCs fit together conceptually:

Figure 3.6

ENTSOE NETWORK CODES OVERALL PICTURE



Source: ENTSOE.

The development of FGs and NCs is planned by the EC, ACER and the ENTSOs. For this purpose, 3 year work plans are agreed upon and reviewed, and, when necessary, take into account the status of ongoing work on the FGs and NCs under development, and the annual priority list established by the EC after public consultation.

Regulation 714/2009 foresaw two additional areas where NCs could be developed: Third Party Access, and harmonized transmission tariff structures. However, the EC has not yet requested that ACER create FGs on these topics.

Finally, it is worth mentioning that Guidelines on data transparency[31] were adopted on 14th June 2013. These Guidelines have some interactions with REMIT.

[31] Commission Regulation (EU) No 543/2013 of 14 June 2013 on submission and publication of data in electricity markets and amending Annex I to Regulation (EC) No 714/2009.

In the following pages, we will go through the FGs that have been adopted since ACER became operational, and highlight the corresponding NCs that have been produced by ENTSOE through mid 2014 (though not necessarily adopted yet in comitology):

FG	NC*
A. Capacity Allocation and Congestion Management	A.1. Capacity Allocation and Congestion Management
	A.2. Forward Capacity Allocation
B. Grid Connection	B.1. Requirements for Generators
	B.2. Demand Connection
	B.3. HVDC connections
C. System Operation	C.1. Operational Security
	C.2. Operational Planning and Scheduling
	C.3. Load Frequency Control and Reserves
D. Electricity Balancing	D.1. Electricity Balancing

Note: * Network Code or, in some cases, Commission Guideline.

Furthermore, at the date of finalization of this report, the NC on Emergency and Restoration is being developed by ENTSOE.

A. Framework Guidelines on Capacity Allocation and Congestion Management (FG CACM)

This FG sets out the model for allocating cross-zonal transmission capacity among market participants. Firstly, the concept of the bidding zone is explained. A bidding zone is the largest area where there is always a single market price. The geographical delimitation of zones involves regular monitoring and should be guided by the principle of overall market efficiency.

According to the FG, the calculation of transmission capacity between bidding zones must be made in an efficient, transparent and coordinated way by the involved TSOs. For this purpose, two methodologies are allowed: flow-based capacity calculation[32] (more suitable for meshed networks), and coordinated Net Transfer Capacity calculation (NTC, more suitable for radial networks).

Once the cross-zonal capacity has been determined, the capacity allocation is organized in a number of ways. Capacity can be allocated explicitly through long-

[32] According to ENTSO-E, the flow-based capacity calculation method limits the exchanges between Bidding Zones directly with the maximum flows on the Critical Network Elements and Power Transfer Distribution Factors. Source: definitions section of the CACM text submitted by ENTSO-E to ACER on 27th September 2012.

term (i.e. monthly, annually) physical or financial transmission rights. Alternatively, capacity can be allocated in the day-ahead timeframe, in which capacities are implicitly allocated through price coupling (i.e. market coupling using the same algorithm for matching all bidding zones). Finally, in the intraday timeframe, capacities can be implicitly allocated in a pan-European continuous trading mechanism; this mechanism can be complemented at regional level with intraday auctions.

Day-ahead and intraday capacities must be physically firm; otherwise, the market results (which are affected by the capacities allocated) would not be firm either. In the long-term timeframe, financial firmness is required at a minimum.

Two NCs have been produced in the context of the FG CACM. The denomination of the first one coincides with the name of the parent FG, and is called the NC on Capacity Allocation and Congestion Management (NC CACM). The second one is the NC on Forward Capacity Allocation (NC FCA).

A.1. Guidelines on Capacity Allocation and Congestion Management (CACM)

The Guidelines on CACM deal with most of the content of the corresponding FG: definition of bidding zones, cross-zonal capacity calculation, day-ahead market coupling, and intraday capacity allocation. Long term capacity allocation, however, is not addressed in these Guidelines.

The scope of these Guidelines goes beyond the model described in the FG in the area of governance. The EC identified that the ambitious market integration targets described in the Guidelines (in particular, the market coupling mechanism) needed a clear governance structure; for this reason, the EC coordinated the elaboration of a set of governance guidelines. Undoubtedly, the objective of market coupling created an unprecedented challenge in terms of coordination between TSOs and PXs at the European level. This challenge justified a set of governance guidelines that specify a significant number of common and important tasks to be performed by TSOs and PXs in a coordinated manner. These governance guidelines were merged with the text prepared by ENTSOE in order to establish a consistent and comprehensive legal framework for short term capacity allocation.

These Guidelines develop the model described by the FG. In particular, they establish the process for reviewing bidding zones delimitation; give criteria for capacity calculation regions and capacity calculation methodologies; establish timings for day-ahead and intraday markets; clarify the organization of the intraday continuous mechanism (e.g. the continuous trade can take place until 1 hour ahead of real time) and the conditions that compatible regional intraday auctions must fulfill; elaborate on the necessary firmness of capacity allocated in day-ahead and intraday timeframes; and elaborate on the tools available to ensure firmness.

A.2. Guidelines on Forward Capacity Allocation (FCA)

The Guidelines on FCA deal with cross-zonal long-term capacity allocation (e.g. monthly, annual) through Physical Transmission Rights[33] (PTRs) or Financial Transmission Rights[34] (FTRs) issued by the corresponding TSOs. The Guidelines set forth that NRAs may exempt TSOs to issue transmission rights where sufficient financial risk hedging opportunities are available.

The Guidelines set out rules regarding the type and quantity of transmission rights which can be allocated, the way in which they are allocated, and the way in which holders of transmission rights are compensated in the case that a holder's right is curtailed.

One key point of these Guidelines is the creation of a single auction platform for allocating Transmission Rights within the EU. This new European platform is justified for efficiency reasons, but needs to be properly regulated and monitored. There will also be a single set of harmonized auction rules.

B. Framework Guidelines on Grid Connection (FG GC)

The main objective of the FG GC is the harmonization of electricity grid connection regimes across the EU. Basically, a grid connection refers to establishing and maintaining a physical connection between the grid user and the distribution or transmission network where the user is connected.

An integrated market poses challenges such as more interactions between neighboring control areas especially in case of high penetration of renewables. This needs a certain degree of harmonization of connection requirements at least within a synchronous area. Indeed, the existence of different national requirements for connection of generators and loads may be an obstacle for the creation of a level playing field at the EU level.

ACER covered the following areas in the FG on Grid Connection: i) minimum standards and requirements for connection, ii) derogations, iii) adaptation of existing arrangements to the Network Codes, iv) compliance testing, compliance monitoring, enforcement, and v) promotion of (real-time) exchange of information and coordination.

Three NCs have been produced in the context of the FG Grid Connection: the NC on Requirements for Grid Connection (NC RfG, applicable to all Generators), the NC on Demand Connection (NC DC), and the NC on High Voltage Direct Current (NC HVDC).

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[33] A PTR is the right to physically transmit energy from one bidding zone to other.

[34] A FTR is the right to receive the market spread between two bidding zones (in principle, this is equivalent to the gain that can be made by transmitting energy physically between those two zones).

B.1. Network Code on Requirements for Grid Connection applicable to all Generators (RfG)

In principle, the NC RfG applies to new generators. This NC establishes four categories of generators depending basically on their size (type A, B, C and D), and sets forth different requirements for each category. These requirements must be complied with at the connection point of the power generating module.

This NC clarifies and harmonizes the roles of generators and network operators with regards to the physical connection. Therefore, it ensures non-discriminatory treatment of generators across Europe, and is based on future generation/demand scenarios. Some of the parameters are set at the European level (so called exhaustive requirements), while others will be set at national level based on local system needs (within ranges set in the code). The most significant requirements refer to frequency ranges, voltage ranges, reactive power, etc.

In addition, the NC contains provisions on compliance (monitoring and testing) and derogations.

B.2. Network Code on Demand Connection (NC DC)

This NC complements the Code on Requirements for Generators by addressing the physical connection between loads and networks as well as connections between distribution and transmission systems. Both NCs are very similar in approach, structure and content.

There are significant requirements for distribution systems as regards the physical interaction with the TSO in the connection point. These relate to frequency, voltage ranges, reactive power, protection and control, information exchange and enabling demand side response services (including for frequency control).

A set of procedures are outlined on operational notification, compliance and derogations.

B.3. Network Code on HVDC connections and DC connected Power Park Modules (HVDC)

The NC HVDC is the last NC that was developed in the context of the FG Grid Connection. While the previous two NCs (NC RfG and NC DC) handled the majority of generators and loads, this NC considers the specific case of direct current (DC) connections. This applies to high voltage direct current cables (usually subsea interconnectors), and to generators (power park modules[35]) that are connected to the

[35] Usually, offshore generators. Defined for the first time in the draft NC Requirements for Generators: "A Power Park Module is a unit or ensemble of units generating electricity, which

- is connected to the Network non-synchronously or through power electronics, and
- has a single Connection Point to a transmission, distribution or closed distribution Network."

main electricity systems via HVDC lines. The requirements refer to the connection point between the HVDC facility and the AC system.

This NC establishes requirements, inter alia, on active power control, frequency ranges, reactive power, voltage ranges, fault ride-through capability, protection, and control.

The approach taken by this NC ensures neutrality among different HVDC technologies.[36]

C. Framework Guidelines on System Operation (FG SO)

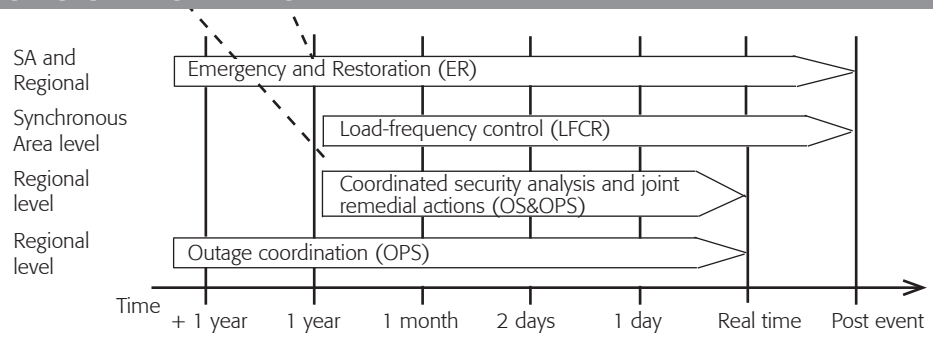
The objective of this FG is to facilitate a harmonized (as far as necessary) and coordinated system operation. For this purpose, the FG addresses coordination issues between TSOs, DSOs and grid users including the implications of renewable energy sources penetration.

This FG covers the following areas: operational security, operational planning and scheduling, load frequency control, staff training and certification, emergency and restoration, and new applications.

ENTSOE has elaborated a set of interrelated NCs that deal with System Operation. Those NCs have interactions with some features of the CACM Guidelines, notably the Common Grid Model,[37] and with the Balancing Guidelines. The following figure illustrates the NCs scope in terms of time and geographical extension (synchronous area or regional level):

Figure 3.7

SCOPE AND INTERACTIONS OF THE NCS RELATED TO THE FG ON SYSTEM OPERATION



Source: ENTSOE. Presentation on System Operation in the 26th Florence Forum.

[36] Namely, voltage source converter (VSC) and line commutated converter (LCC) technologies.

[37] Defined in the CACM: "Common Grid Model means European-wide or multiple-System Operator-wide data set, created by the European Merging Function, through the merging of relevant data."

C.1. Network Code on Operational Security (NC OS)

The Network Code on Operational Security (NC OS) sets out the framework for maintaining a secure, interconnected European electricity transmission system. It contains the common, legally binding principles and rules for operating electricity transmission networks, which all TSOs must follow. This includes legally binding rules for cooperation between TSOs and DSOs. These rules are increasingly important due to the fast growth of distributed, small-scale generation.

This NC has important links with other NCs or Guidelines that relate to system operation, grid connection, and markets. For example, the assessment of operational security is based on the Common Grid Model that is defined for the first time in the CACM Guidelines.

C.2. Network Code on Operational Planning and Scheduling (NC OPS)

The NC OPS is justified by the progressive integration of electricity systems across Europe. The coordinated planning and scheduling of the electricity transmission systems is increasingly challenging. In this context, clear communication and coordination among all European TSOs is key to planning and scheduling the transmission system in a secure manner.

The NC OPS introduces common methodologies for operational security and adequacy analysis. Furthermore, this NC contains provisions regarding how to coordinate the maintenance of assets. Finally, it determines the roles and responsibilities of each actor involved in system operations.

C.3. Network Code on Load-Frequency Control and Reserves (NC LFCR)

The third NC of this family, NC LFCR, aims to control the frequency of the system. European TSOs have been working closely to manage system frequency on a voluntary basis for many years. The NC LFCR builds on a wide range of proven requirements, policies, and standards already in use, but has refined and adapted these requirements, policies, and standards so that they reflect the changing dynamics of the European power system.

This NC is particularly technical and detailed. In particular, this NC sets out frequency control rules for TSOs and for parties providing reserves. Therefore, it has a strong link with the Guidelines on Balancing.

D. Framework Guideline on Electricity Balancing (FG EB)

The FG EB complements the FG CACM with a final building block necessary for the creation of the integrated market. The Electricity Target Model foresaw an integrated European balancing market (managed by the TSOs based on system

needs) after the intraday timeframe (where the market is managed by the PXs based on market participants' needs).

National electricity balancing markets are very diverse with different balancing resources and arrangements. This FG faces the challenge of finding the right trade-off between system security and market efficiency in the process towards a common balancing scheme.

The key issues addressed by the FG EB are the following: gradual integration from regions to a single European balancing market; full balancing responsibilities for all resources (generation and demand) and full openness for generation and demand to offer balancing services; European level harmonization of roles and responsibilities of TSOs, Balancing Service Providers, and Balancing Responsible Parties; standardization of balancing products, balancing energy pricing and imbalance prices; and finally, emergence of cross-border markets for balancing reserves (economic efficiency in procuring and using those reserves).

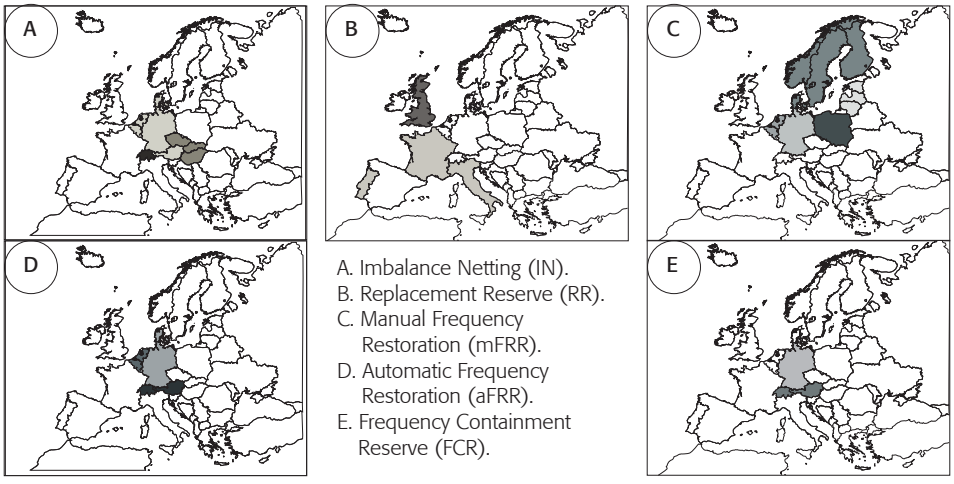
Only one set of Guidelines was developed in the context of this FG, with the same name: the Guidelines on Electricity Balancing.

D.1. Guidelines on Electricity Balancing (EB)

The Guidelines on EB elaborate in detail the framework established by the FG EB. It sets out a series of steps, which, over the course of six years, will

Figure 3.8

GEOGRAPHIC SCOPE OF ENTSOE PILOT PROJECTS FOR THE EARLY IMPLEMENTATION OF THE GUIDELINES ON EB



Source: ENTSOE. Presentation on Balancing in the 26th Florence Forum.

progressively integrate balancing markets to a set of regional markets, and later, to a pan-European market with a common merit order. This will require more changes to existing rules than in any other timeframe in which electricity is traded. The NC foresees the possibility to reserve capacity for cross border balancing exchanges if welfare gain is demonstrated.

The implementation of these Guidelines will be facilitated by pilot projects established under the framework of ENTSOE.

3.4. THE GAS TARGET MODEL, FRAMEWORK GUIDELINES AND NETWORK CODES

3.4.1. The Gas Target Model

Similar to the Electricity Target Model, the NRAs sought the features that a Gas Target Model (GTM) should contain in order to facilitate a coherent set of regulatory evolutions that would be reflected in the FGs and NCs.

The definition of a European Gas Target Model was an initiative of CEER adopted in 2011. The situation at that moment was taken into account as a baseline. From this baseline, CEER carried out an analysis in order to identify what could be put in place in the short term (by 2014); in addition, CEER identified a set of long term issues to tackle (until 2020).

At that moment, the EU gas markets were characterized by the following features: a significant degree of dependence on gas produced outside of the EU (64% of gas consumed in 2009 was produced outside of the EU); an increased need for flexibility due to the increasing renewable share in electricity generation; long-term (25 year), take-or-pay contracts ensuring security of supply and developed infrastructure; storage facilities in Europe providing seasonal and short-term flexibility; poorly developed organized wholesale markets or gas hubs in the EU, with the British (NBP) acting as the most liquid hub; increasing LNG imports (until 2011) and renegotiations of oil-indexed prices of long-term contracts in favor of gas-on-gas pricing.

The Gas Target Model considers the new legal framework set forth by the Third Package. In particular, the FGs and NCs will play a pivotal role in the transition towards a new model which is structured in three parts:

1. Enabling functioning gas wholesale markets

Wholesale markets are understood as entry-exit zones where entry capacity is allocated separately from exit capacity. Any gas that enters into the zone can be commercially delivered to any exit point. Therefore, each entry/exit zone would

constitute a trading hub with harmonized market-based balancing arrangements. If trade is facilitated in an entry-exit zone there should be reliable prices at different timeframes.

The GTM provided an orientation as regards the value of various parameters in a well-functioning and liquid market. For example, the churn rate[38] should be around 8; the HHI[39] ideally should be less than 2000; there should be at least 3 different gas sources per market; the minimum annual gas demand within an entry-exit zone should be 20 bcm; and the RSI[40] should be higher than 110% in more than 95% of the days of the year.

2. Connecting functioning wholesale markets

For attaining this objective, interconnection capacity must be used efficiently. First of all, this means that all market participants should be able to access interconnection capacity. Secondly, unused capacity must be offered back to the market. The efficient use of interconnection capacity will result in gas flows from low priced areas to high priced areas.

Similar to the electricity sector, network users should participate in auctions to purchase network capacity. TSOs would offer standardized "bundled" capacity products (i.e. capacity offered on a firm basis which consists of corresponding entry and exit capacity at both sides of an interconnection point) on a central booking platform. The minimum possible price in these auctions is called the "reserve price", which should reflect the actual infrastructure cost. Transparent, cost-reflective, non-discriminatory tariffs will be set as a basis for reserve prices in the long and short-term auctions.

Furthermore, in short-term markets, efficient allocation mechanisms for capacity are needed to tackle contractual congestion or allocate available capacity. Explicit auctions are acknowledged as more efficient than the generally used system of first-come-first-served allocation. The GTM foresees a potential future platform for gas trading with implicit allocation of interconnection capacity similar to the electricity market model (continuous or intraday trading).

3. Ensuring secure supply and economic investment

Liquid trading hubs and auctions for standardized capacity products coordinated at interconnection points will provide the basis for long-term bookings

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[38] The churn rate is an indicator of the liquidity of a market/hub. It represents the ratio between the total volume of trades and the physical volume of gas consumed in the area served by the hub.

[39] Herfindahl-Hirschman Index is a measure of market concentration. It is calculated by squaring the market share for each supplier and then summing the squares.

[40] Residual Supply Index. RSI = (total supply – largest seller supply) / total demand.

and commitments (e.g. infrastructure development). Consequently, the development of the market will enhance security of supply.

The model favors a market-based approach to test shippers' commitment to book new interconnection capacity (e.g. the so called "open seasons"). For this purpose, TSOs define relevant costs and potential investment needed to put in place new interconnection capacity. Then, shippers submit bids to buy new capacity on a firm basis. If these bids cover a predetermined percentage of the interconnection capacity offered, the investment is approved.

Next steps

Just three years after this model was adopted, the situation has changed significantly: demand is decreasing; the gas price differential between the EU and the USA due to shale gas development has increased; the development of renewable energy in electricity generation impacts the use of gas; focus on security of supply has increased following the events in Ukraine, etc.

Against this background, ACER has reviewed the GTM throughout the year 2014 in parallel to the elaboration of the so called "bridge to 2025", which elaborates on expected future developments in energy regulation until 2025. That will be presented in chapter 5.

In this review, liquidity and harmonization of market rules are regarded as key areas for the evolution of wholesale markets. Another topic being reviewed (given the decreasing gas consumption in Europe) is alternative uses for gas, for example as transport fuel. In addition, the coordination between electricity and gas markets and the difficult situation of CCGTs calls for liquid and flexible wholesale short-term gas markets.

3.4.2. Gas Framework Guidelines and Network Codes (FGs and NCs)

The FGs and NCs related to the gas sector have been developed in a similar way to the electricity ones. In addition, there is one set of binding Guidelines proposed by the EC on Congestion Management Procedures (CMP).

The publication of the first gas NCs and the CMP Guidelines took place earlier than in the electricity sector. The topics addressed are quite similar (capacity allocation, balancing…), but with a different approach taking into account the differences of both sectors.

Like in electricity, the development of gas FGs and NCs is structured in 3 year work plans. At this stage, four FGs have been adopted by ACER and two NCs have been published in the Official Journal of the EU: Capacity Allocation Mechanisms and Gas Balancing. In addition, the Commission Guideline on Congestion Management

Procedures, developed by the EC, has been published. Following, there is a summary table of the gas FGs and NCs that have been prepared so far:

FG	NC
A. Capacity Allocation Mechanisms	A.1. Capacity Allocation Mechanisms
B. Congestion Management Procedures (Commission Guideline)	
C. Gas Balancing	C.1. Gas Balancing
D. Harmonized Transmission Tariff Structures	D.1. Harmonized Transmission Tariff Structures
E. Interoperability Rules and Data Exchange	E.1. Interoperability Rules and Data Exchange

Furthermore, ACER is working in the scoping phase of the FG on Rules for Capacity Trading.

As shown in the table above, for each gas FG there is so far only one NC (in the electricity sector, most of the FGs correspond to several NCs). For this reason the following pages jointly address the content of the FG and the corresponding NC.

A. Framework Guideline on Capacity Allocation Mechanisms (FG CAM)

A.1. Network Code on Gas Capacity Allocation Mechanisms (NC CAM)

Commission Regulation EU No. 984/2013 adopted NC CAM on 14th October 2013. NC CAM's aim is to ensure more efficient allocation of capacity on the interconnection points between Europe´s high-pressure transmission systems. This contributes to ensuring fair and transparent third party access.

One of the main novelties lies in the fact that TSOs will apply harmonized auctions for cross-border capacities. Auctions are held at the same time, with the same products, and under the same rules, in all markets across the EU. For this purpose, a limited number of online-based booking platforms shall be established.

The NC requires bundled capacity products to be offered at both sides of interconnectors, eliminating the risk of being stuck with capacity rights at one side only.

This NC will apply as from 1st November 2015.

Interestingly, before this NC was formally adopted, a significant amendment was identified as necessary: The area of *Gas Incremental Capacity,* which is related to CAM, had not been addressed as such. NC CAM only dealt with the allocation of existing capacity, but did not address the use of allocation mechanisms to trigger investments in incremental capacity, which is a necessary complement. In the future, both existing and new capacity will be allocated and priced in an integrated manner. This will be properly reflected in the NC CAM through an amendment.

In more accurate terms, "incremental capacity" refers to capacity above available technical capacity at existing interconnection points (IP). "New capacity"

refers to the creation of an interconnection between two existing market areas, or reserve flow in an IP with only one single flow direction.

ACER proposed guidelines for amending the NC CAM. This amendment would take into consideration the FG on Transmission Tariff Structures along the following lines: i) the decision to invest must be market-based, i.e. auction or open season; ii) the investment must pass a minimum economic test, i.e. sufficient binding user commitments are needed in order to ensure financial feasibility; iii) conditions to offer new or incremental capacity are set out; iv) coordination between TSOs and NRAs and provision of information must take place; v) new and incremental capacity must be integrated into the annual capacity auctions (regulated in CAM); and vi) "open seasons," market-based tenders out of those procedures, may be utilized only when the interconnection is between three or more market areas or in case of complex projects.

B. Guidelines on Congestion Management Procedures (CMP)

These Guidelines were formally adopted on 24th August 2012 amending Regulation EC 715/2009. They are not based on an ACER FG.

These Guidelines set forth that companies that do not use their reserved capacity have to return it to the market (use-it-or-lose-it) in order to enable other parties to use it. One of the objectives pursued is to maximize the offer of cross-border capacity to the market. For this reason, TSOs are incentivized to sell extra capacity to the market above the technical capacity of the transmission pipelines.

Most of the CMP provisions apply from 1st October 2013, however, some apply from 1st July 2016.

C. Framework Guideline on Gas Balancing (FG GB)

C.1. Network Code on Gas Balancing (NC GB)

NC GB applies to balancing regimes for transmission systems within the EU and to arrangements for cross-border balancing. Gas markets in the EU are fragmented in several balancing zones with different balancing rules. This situation boosts the market power of incumbents and maintains barriers to entry for new entrants.

In some MSs, gas users do not have regular information on their imbalances or cannot trade flexible gas because they lack wholesale liquid markets. This increases their exposure to imbalance charges.

Furthermore, TSOs undertake most of the transmission balancing, keeping long-term contracts and also flexible gas which otherwise could be traded in the market.

The purpose of the NC is to redefine and harmonize the balancing schemes in Europe. Non-discriminatory and transparent balancing systems imply the application of the following principles and measures: i) introduction of a market-based and harmonized daily balancing regime; ii) establishing clearly defined and shared balancing responsibilities between TSOs and network users; iii) ensuring TSO neutrality with respect to all related costs and revenues; iv) harmonization of (re)nomination procedures (timing and communication); v) creation of new rules on imbalance charges, within-day obligations, and operational balancing between transmission systems; vi) provision of accurate and timely information regarding balancing matters.

D. Framework Guideline on Harmonized Transmission Tariff Structures (FG TAR)

D.1. Network Code on Harmonized Transmission Tariff Structures (NC TAR)

At the date of finalization of this report, the NC TAR is under development by ENTSOG. The corresponding FG applies to transmission services offered in all entry and exit points by TSOs. The issues covered by the FG TAR are highlighted below.

The main issue addressed by FG TAR is the methodologies for cost allocation and the determination of the reference price. Four possible methods for cost allocation are allowed, depending on the circumstances of each system: postage stamp, capacity-weighted distance, virtual point, and matrix approach.

The FG addresses the economic test for incremental and new capacity based on market mechanisms (CAM auction or open season) and the reference price at which users can request incremental capacity.

In addition, the FG establishes criteria for TSO revenue reconciliation and criteria for reserve prices. These reserve prices are applicable to firm standard capacity products and interruptible capacity.

Finally, the FG contains provisions on other points, namely on virtual interconnection points and bundled capacity products.

E. Framework Guideline on Interoperability Rules and Data Exchange (FG IO)

E.1. Network Code on Interoperability Rules and Data Exchange (NC IO)

The purpose of this NC is to improve the inter-operability of the gas systems across the EU. Therefore, the content of the NC is rather technical. The issues covered by this NC are highlighted below.

One of the main topics addressed by this NC is the establishment and/or amendment of interconnection agreements (default rules on flow control, measurements, matching of gas quantities, exceptional events, amendment procedures, etc.).

On the technical side, the NC tackles: i) establishing a common set of units to be applied; ii) managing gas quality differences and monitoring of gas quality; iii) managing odorization; and iv) creation of common data exchange solutions.

Finally, a set of provisions on dispute resolution intends to avoid endless discussions on interoperability issues.

3.5. INFRASTRUCTURE PACKAGE AND TEN YEAR NETWORK DEVELOPMENT PLANS (TYNDPS)

3.5.1. Infrastructure Regulation

At the March 2002 Barcelona European Council, MSs agreed that each MS should achieve a capacity of electricity interconnections with neighboring States equivalent to at least 10% of that MS's installed production capacity. However, as of 2011, this target had not yet been met in several MSs. In this context, the EC identified the need to promote a new framework that would be able to deliver the infrastructure necessary to connect national markets. The communication from the Commission[41] entitled "Energy Infrastructure Priorities for 2020 and Beyond – A Blueprint for an Integrated European Energy Network" called for a new energy infrastructure policy to optimize network development at the European level for the period up to 2020 and beyond. This optimization is necessary to allow the EU to meet its core energy policy objectives of competitiveness, sustainability and security of supply. The Council and the European Parliament welcomed this initiative.

The result of the dialogue and negotiations among the European Commission, the Council and the European Parliament was the Regulation (EU) 347/2013 on guidelines for trans-European energy infrastructure.[42] Furthermore, this new Infrastructure Regulation amends the three Regulations of the Third Package by providing additional tasks to ACER and the NRAs.

In this Regulation, 12 priority corridors and thematic areas for electricity, gas, oil and CO_2 transport networks are identified. The main practical purpose of the

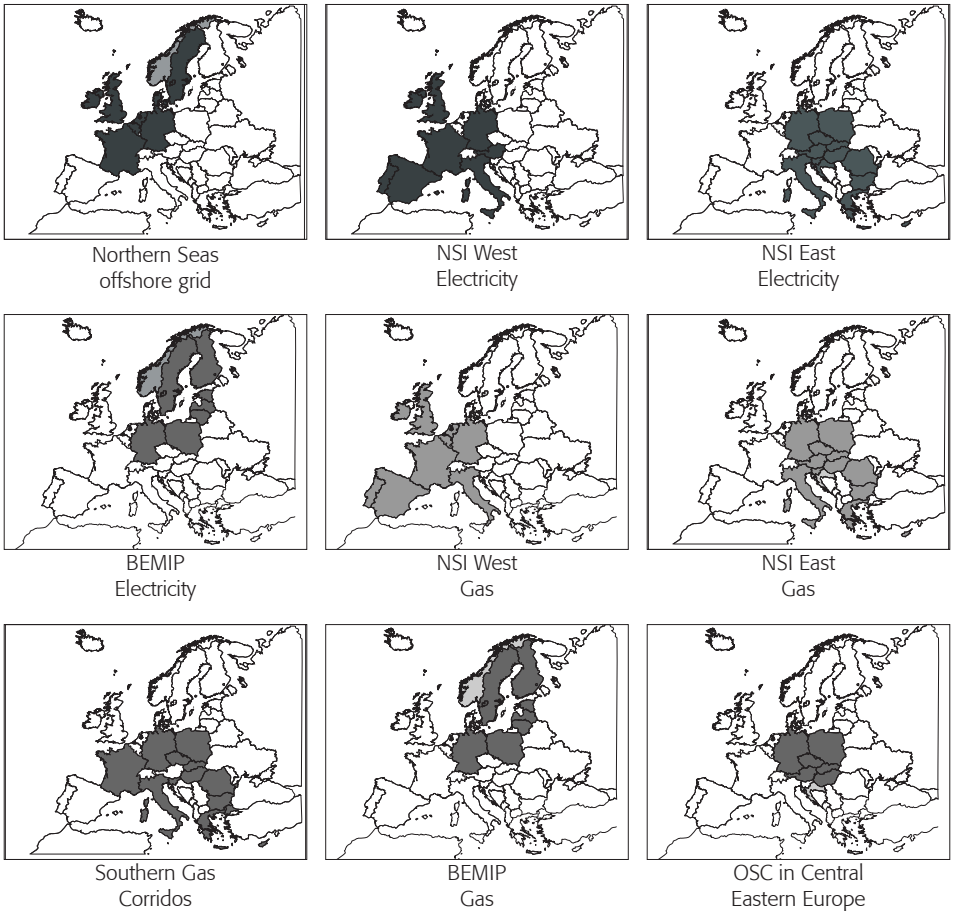
[41] Communication "Energy infrastructure priorities for 2020 and beyond - A Blueprint for an integrated European energy network" (COM/2010/0677).

[42] Regulation (EU) No 347/2013 of the European Parliament and of the Council of 17 April 2013 on guidelines for trans-European energy infrastructure and repealing Decision No 1364/2006/EC and amending Regulations (EC) No 713/2009, (EC) No 714/2009 and (EC) No 715/2009. Decision No 1364/2006/EC laid down guidelines for trans-European energy networks, so called TEN-E.

Regulation is to identify a group of Projects of Common Interest (PCIs) in these corridors and thematic areas. The priority corridors are identified in the figure below.

Figure 3.9

PRIORITY CORRIDORS ACCORDING TO THE REGULATION 347/2013 (NSI: NORTH-SOUTH INTERCONNECTIONS; BEMIP: BALTIC ENERGY MARKET INTERCONNECTIONS PLAN; OSC: OIL SUPPLY CONNECTIONS)

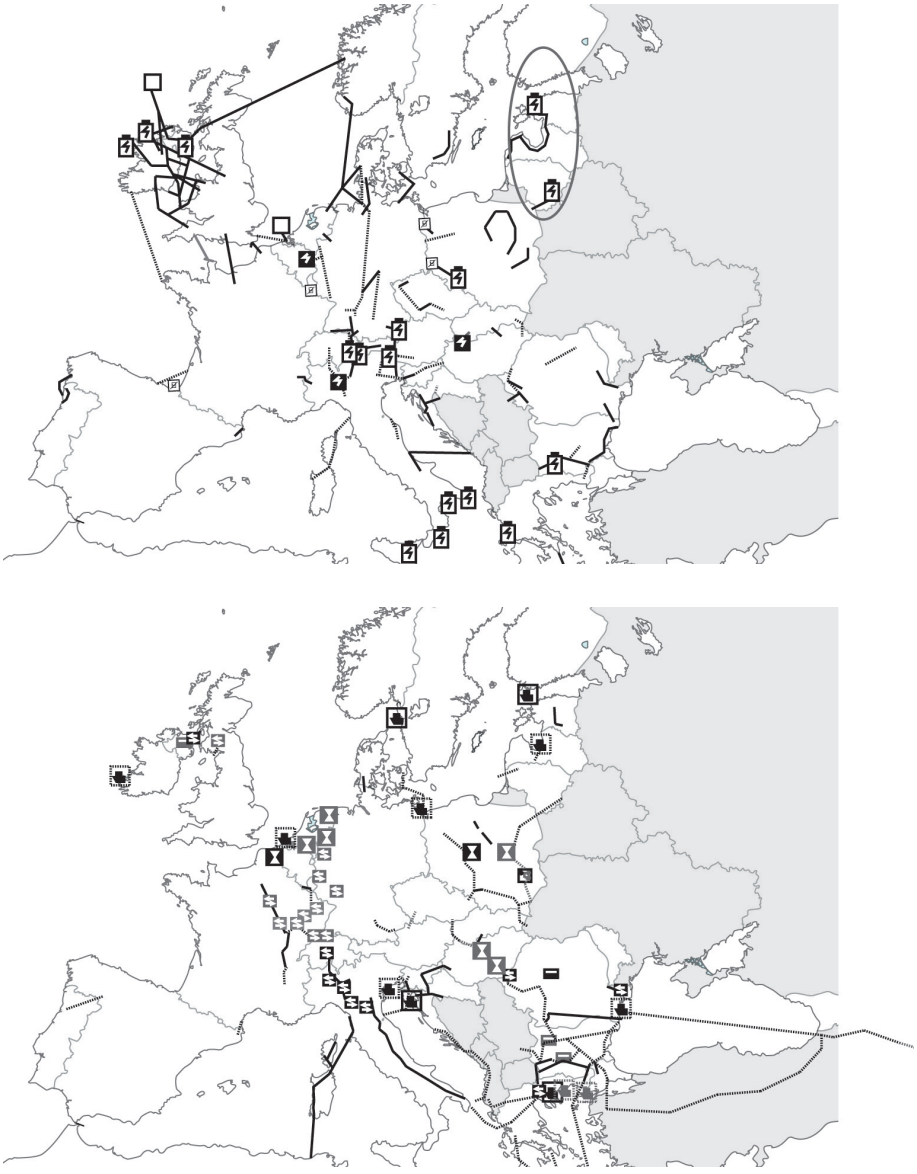


Source: European Commission website.

This Regulation establishes selection criteria and a selection process for EU Projects of Common Interest (PCIs). Most of this process takes place at the corridor level in the so called "Regional Groups." These Regional Groups gather the EC, Member States, NRAs and project promoters. The EU formally adopts a list of PCIs every two years.

Figure 3.10

OVERVIEW OF THE PROJECTS INCLUDED IN THE FIRST EU LIST OF PCIS ADOPTED IN OCTOBER 2013. ELECTRICITY PROJECTS IN CONTINOUS LINE AND GAS PROJECTS IN DOTTED LINE



Source: European Commission.

In addition to selecting PCIs, the Regulation sets forth a specific framework for PCI implementation and monitoring. PCIs are prioritized by means of a unique and streamlined permit granting process. In all the stages of PCI selection and implementation, transparency and public participation must be ensured.

There is a strong link between PCIs and the TYNDPs (Ten Year Network Development Plans) that are prepared by the ENTSOs. The TYNDPs form the basis for the selection of projects as PCIs. In other words, PCIs should be chosen among projects already included in the TYNDPs. Furthermore, this Regulation requires the ENTSOs to develop methodologies for an energy system-wide cost-benefit analysis (CBA) at the EU level for PCIs. The methodologies developed by the ENTSOs will be applied for the preparation of each subsequent TYNDP developed by the ENTSOs.

Another interesting feature of this Regulation is a set of provisions elaborating on the possibility to reach cross-border cost allocation (CBCA) decisions among several NRAs (if relevant). The idea is to enable an investment with cross-border positive impacts by involving other Member States that would receive benefits from this investment. Moreover, ACER and NRAs are invited to analyze possible regulatory incentives for PCIs in order to facilitate successful PCI development and implementation.

Finally, financial assistance from the EU Connecting Europe Facility is possible for projects that fulfill certain criteria. The Connecting Europe Facility finances projects in three sectors: transport, energy and telecommunications.

ACER has several tasks regarding the energy Infrastructure Regulation. The first mandate is to ensure cross-regional consistency in PCI selection by providing an opinion on the PCI draft lists that result from the work of each Regional Group. Secondly, ACER must monitor the implementation of PCIs. In particular, ACER should make recommendations to overcome relevant delays, should delays occur. Furthermore, ACER must submit an annual report on the progress of implementation of PCIs to the Regional Groups.

3.5.2. TYNDPs

According to Regulations EC 714/2009 and EC 715/2009, ENTSOE and ENTSOG respectively will adopt non-binding, EU-wide Ten Year Network Development Plans every two years. In addition, ENTSOE will develop a generation adequacy outlook for electricity and ENTSOG will develop a supply adequacy outlook for gas. These plans are not binding, but they provide a substantial reference and a key tool for coordinating transmission investments at the EU level.

The main objectives of the TYNDP are to identify investment gaps and key infrastructure projects, mainly in cross-border capacities. TYNDPs contribute to the completion of a competitive, integrated, and well-functioning market. The

EU-wide TYNDP builds on national investment plans, taking into account regional investment plans which are published every two years. In fact, the regional electricity investments plans are part of the ENTSOE EU-wide TYNDP. Therefore, three layers of investment plans exist:

ACER monitors the implementation of EU-wide TYNDPs and issues an opinion on their consistency with national investment plans. In addition, ACER provides an opinion and recommendations for improvements in TYNDPs after submission by the ENTSOs.

ENTSOE published the first TYNDP in 2012. The first issuance incorporated a top-down approach for a 2020 EU scenario and first steps towards a cost-benefit analysis (CBA) methodology. ENTSOG published the first TYNDP in 2011.

ENTSOE and ENTSOG formally submitted the organizations' respective proposals for CBA methodologies in November 2013 as required by Regulation (EU) No. 347/2013. In the first half of 2014, ACER and the EC issued their opinions on these methodologies and recommended specific enhancements.

3.6. REMIT

The Regulation (EU) 1227/2011 on wholesale energy market integrity and transparency,[43] also known as REMIT, was published on 8th December 2011. Its aim is to define and prohibit market abuse, market manipulation, attempted market manipulation, and insider trading (trading energy using inside information).[44] For this purpose, REMIT sets forth a specific legal framework for monitoring wholesale markets at the EU level in order to detect and deter market abuse. This Regulation provides for the enforcement of prohibitions and sanctioning of breaches at the national level.

The role of ACER in the development and implementation of REMIT is essential. Therefore, this Regulation assigns new tasks and responsibilities to ACER. In practice, this means a substantial change in the structure and activities of the Agency.

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[43] Regulation (EU) No 1227/2011 of the European Parliament and of the Council of 25 October 2011 on wholesale energy market integrity and transparency.

[44] According to Art. 2 of REMIT: 'inside information' means information of a precise nature which has not been made public, which relates, directly or indirectly, to one or more wholesale energy products and which, if it were made public, would be likely to significantly affect the prices of those wholesale energy products.

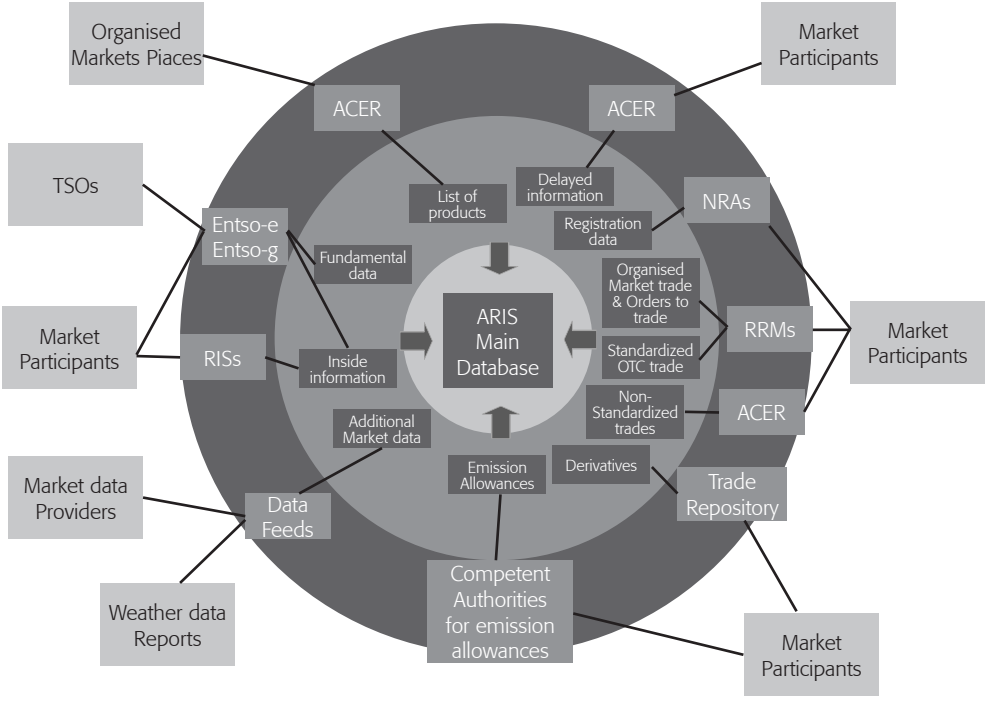
ACER, in close cooperation with NRAs, is responsible for collecting and analyzing data to detect potential breaches of requirements under REMIT. NRAs will carry out investigations and impose penalties to stop and prevent such breaches. Therefore, there is a need to adapt national legislations regarding NRAs competences.

The implementation of REMIT has required a significant amount of work by ACER and the NRAs. For example: ACER has published non-binding guidance in the application of REMIT definitions (art. 2) aimed at NRAs; ACER has produced a standard template for notifications to ACER of the use of inside information; ACER and the NRAs have signed a MoU for exchange of information, etc.

The implementation of REMIT comprises two main phases. The first phase starts with the entry into force of Regulation (EU) 1227/2011. This was published on 8th December 2011 and entered into force 20 days afterwards. After this Regulation came into force, the prohibitions and obligations of REMIT applied to market participants. Six months later, ACER was obligated to determine and publish the

Figure 3.11

OVERVIEW OF ARIS



Source: ACER Workshop on REMIT, 11th July 2013.

data format for the registration of market participants. The new NRA competences related to REMIT enforcement had to be implemented into national law eighteen months after REMIT's entry into force.

The second phase of REMIT implementation started with the entry into force of the implementing acts that the EC was obligated to adopt pursuant to article 8 of the Regulation. Three months this entry into force, all market participants should be registered in the CEREMP (Centralized European Register for Market Participants). Finally, six months after the entry into force of the EC implementing acts, data collection and monitoring by ACER and the NRAs began

ACER has issued recommendations to the EC on the records of wholesale energy market transactions. In this regard, data to be provided by market participants (which will be determined by the EC implementing acts) can be grouped in two categories: trade data, and fundamental data in relation to the ENTSOs transparency platforms.

Data collection is performed by ACER in coordination with NRAs. This is facilitated by a complex IT platform called ARIS (which stands for ACER's REMIT Information System), sketched in Figure 3.11.

In connection with this topic, the Commission Regulation (EU) 543/2013 on submission and publication of data in electricity markets[45] makes European electricity market information more precise and comparable. TSOs will be required to submit fundamental information related to generation, load, transmission and electricity balancing for ENTSOE to publish on a central information transparency platform.

3.7. CONCLUSION

This chapter gives an overview of steps taken by the concerned parties (mainly the EC, ACER, and the ENTSOs) to implement the ambitious framework set forth by the Third Package. It also outlined the steps taken to implement two additional Regulations of special relevance to the creation of the Internal Energy Market: REMIT and the Trans-European Energy Infrastructure Regulation.

The implementation of the above policies and regulations has required several years and a significant effort from all of the parties involved. Profound changes have taken place and will continue to take place as regards the unbundling of TSOs (via certification), coordinated EU-wide network planning (thanks to the TYNDPs and PCIs lists), creating harmonized rules for markets, and harmonizing grid connection requirements and system operation (via NCs). In addition, changes are taking place with regard to market integrity and transparency.

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[45] Commission Regulation (EU) No 543/2013 of 14 June 2013 on submission and publication of data in electricity markets and amending Annex I to Regulation (EC) No 714/2009 of the European Parliament and of the Council.

The primary focus of the chapter is on FGs and NCs. The development of EU-wide NCs is a challenging and resource-consuming exercise, which, despite the issues faced during the elaboration of the NCs, has delivered a useful contribution to the creation of the Internal Energy Market.

The status review of the gas and electricity markets will be addressed in the following chapter. That analysis of current developments together with the monitoring of the effects of the full implementation of the EU legislation will influence decisions on the design of the future target models for electricity and gas.

4 CURRENT STATUS AND LAST DEVELOPMENTS OF THE MARKET

4.1. INTRODUCTION

In this chapter we present the current status of the EU energy market based on indicators used by regulators in the regulators' market monitoring reports. These reports are developed to monitor the evolution of wholesale electricity and gas markets together with retail markets and consumer issues. In addition, we describe the latest work carried out by regulators, policy makers, and stakeholders on the early implementation of Third Package legislation. This work is being carried out through a collaborative framework known as Regional Initiatives. Finally, we detail the ongoing initiatives in the field of smart grids; these initiatives are largely being led by the European Commission under an ad hoc Task Force.

4.2. MARKET MONITORING AND PERFORMANCE

The current status of energy markets in Europe and the progress made in practical terms towards the construction of the EU market can be analyzed by using information collected by European regulators. This information is typically made public through the regulators' market monitoring reports.[46]

In this section we will focus first on wholesale electricity and gas markets and then on retail markets and consumer issues.

4.2.1. Wholesale electricity markets

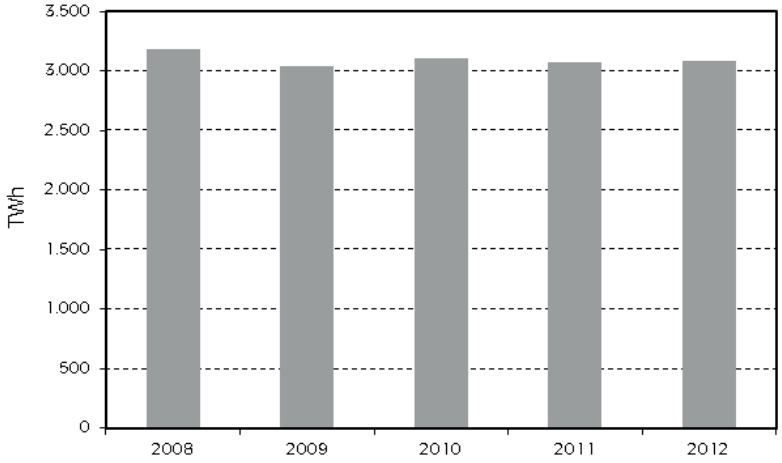
The evolution of the electricity demand along the last years in Europe is represented in Figure 4.1. The effects of the economic crisis can be seen. Indeed, the demand in recent years is still lower than the demand prior to the crisis.

Wholesale electricity prices in Europe evolve differently in each Power Exchange and region. Figure 4.2 represents the evolution of wholesale electricity prices in one month in the 10 trading regions. Important price differences can be observed between the different markets.

[46] ACER/CEER Annual Report on the Results of Monitoring the Internal Electricity and Natural Gas Markets in 2012. November 2013.

Figure 4.1

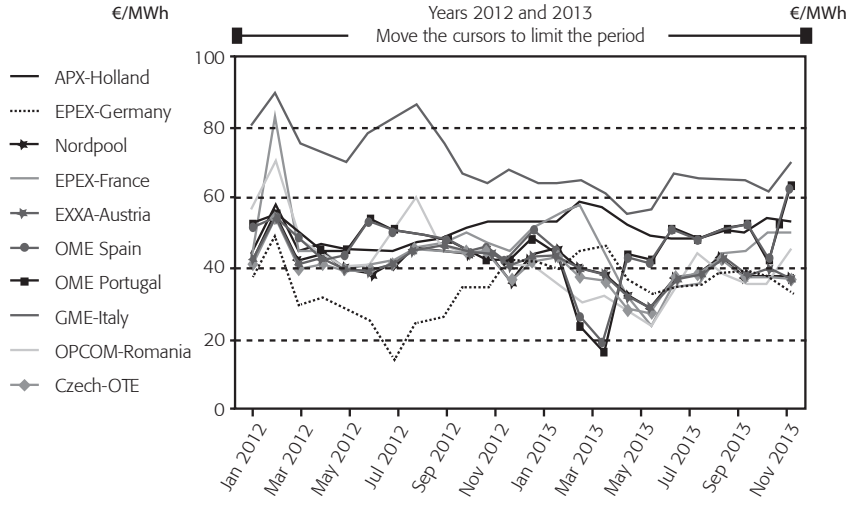
ELECTRICITY DEMAND IN EUROPE 2008 TO 2012 (TWH)



Source: ACER, based on Eurostat (8/8/2013).

Figure 4.2

WHOLESALE ELECTRICITY PRICES IN EU REGIONS

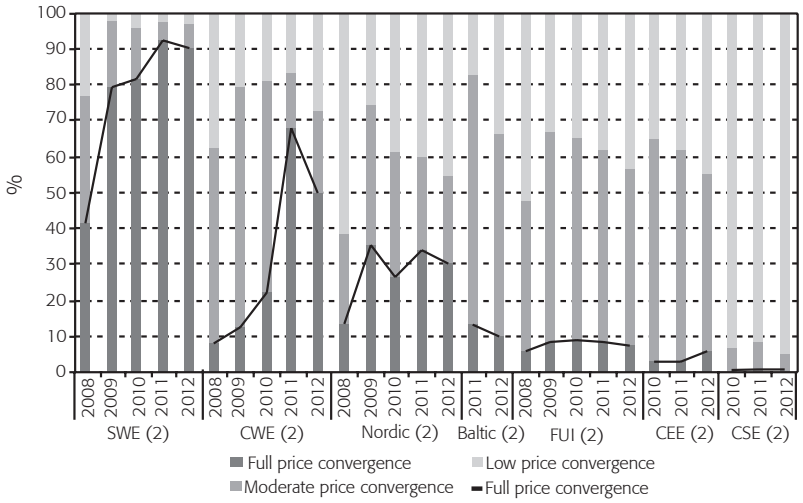


Source: OMIE, annual market report 2013.

Within the different regional markets, price convergence is low, with the exception of the SWE as shown in Figure 4.3. The market coupling mechanism implemented through the Regional Initiatives in the day-ahead market explained in section 4.3 constitutes an important driver of price convergence. In addition, harmonization of capacity calculation methods and investment in new cross-border infrastructure should increase cross-border trading and price convergence.

Figure 4.3

PRICE CONVERGENCE IN EUROPE BY REGION (RANKED) (PERCENTAGE)



Note: The numbers in brackets, e.g. SWE(2), refer to the number of bidding zones per region included in the calculations.

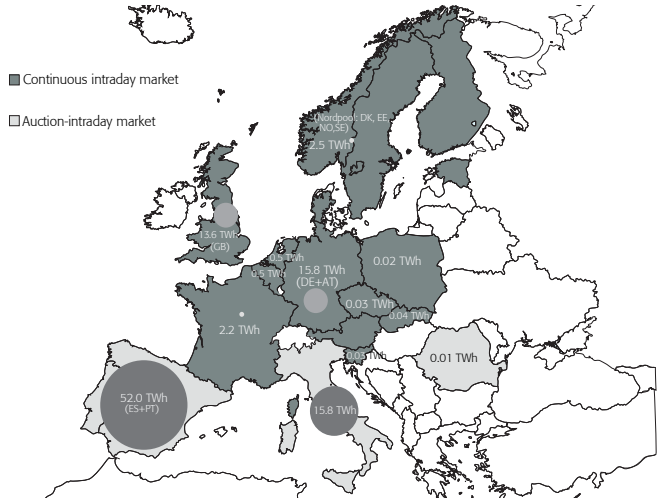
Sources: Platts, PXs and data provided by NRAs through the Electricity Regional Initiatives (ERI) (2013) and ACER calculations.

The current situation in intraday markets is characterized by multiple designs with fragmented markets by regions and low liquidity. Figure 4.4 represents this situation. An important percentage of interconnection capacity remains available after day-ahead gate closure to be used in intraday cross-border trade, as detailed in Figure 4.5. Therefore, the efforts by the Regional Initiatives are also focused on building a continuous implicit intraday market coordinated with regional auctions. The goal is to ensure sufficient liquidity, as explained in section 4.3. More efficient intraday and balancing cross-border trade would benefit mainly, but not only, the integration of intermittent and variable renewable energy sources and flexible resources (gas-fired generation and demand flexibility).

Short-term electricity markets (intraday and balancing) for pricing electricity flexibility provided by gas-fired power plants (CCGT) require an efficient, integrated,

Figure 4.4

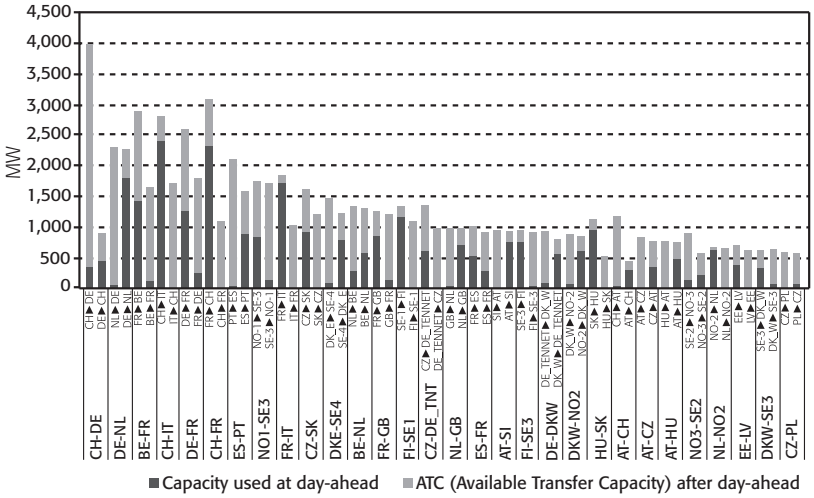
INTRADAY LIQUIDITY AND DESIGN IN NATIONAL MARKETS – 2012 (TWH)



Source: The CEER national indicators database (2013).

Figure 4.5

AVAILABLE TRANSFER CAPACITY AFTER DAY-AHEAD GATE CLOSURE - 2012 (MW)



Note: Only borders with an average NTC higher than 500MW are shown.

Sources: ENTSO-E, data provided by NRAs through the ERI, Vulcanus (2013) and ACER calculations.

and well-functioning gas market. This is devised in the Gas Target Model and associated Network Codes (balancing gas hubs, storage and line-pack capabilities, nominations and re-nominations of capacities, bundled capacity at cross-border interconnectors, and secondary markets for capacity and gas commodity).

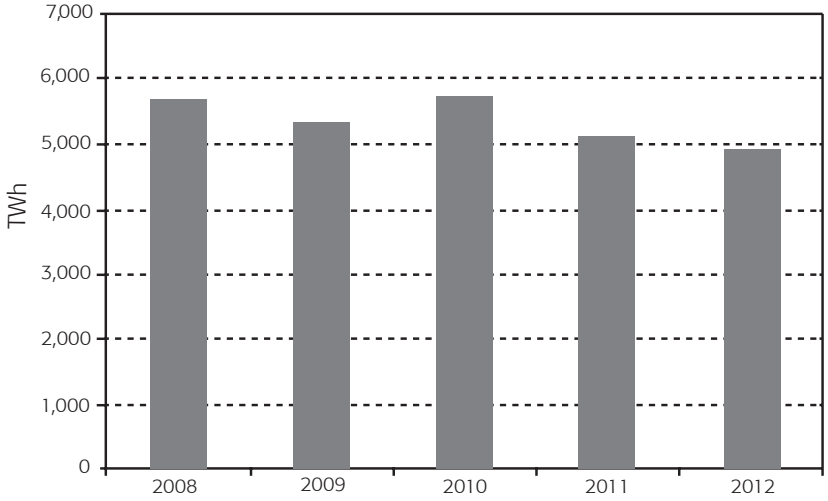
4.2.2. Wholesale gas markets

In the last years, gas demand in Europe has shown a steady declining pattern, as presented in Figure 4.6. This trend, much like the demand trend in electricity, has been heavily driven by the economic crisis. In addition, high gas prices helped to reduce household and industrial consumption. Gas-fired power plants showed lower utilization factors due to increasing shares of renewables and coal. Coal prices became more competitive than gas prices in Europe due to cheap imports from the US. In the US, the effect was the opposite: cheap shale-gas replaced coal; this coal was then exported to the EU.

Despite gas demand reduction, gas prices in the EU have increased due to lack of competition in terms of geographical sources. LNG premiums paid in Asia are clearly decoupled from the low shale-gas prices in the US. See Figure 4.7 for more details. On the other hand, EU gas prices are still indexed to oil prices through long-term contracts.

Figure 4.6

GAS DEMAND IN THE EU-27 (TWH)

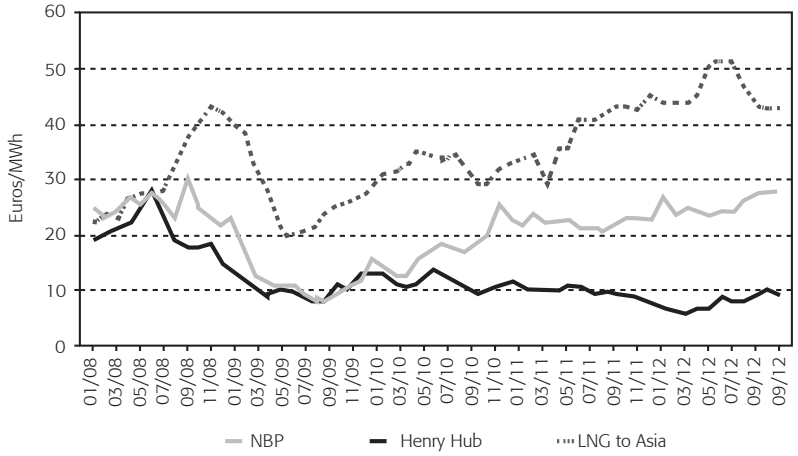


Note: Gross inland gas consumption (GIC).

Source: ACER, based on Eurostat (26/6/2013).

Figure 4.7

INTERNATIONAL GAS WHOLESALE PRICE EVOLUTION (EUROS/MWH)

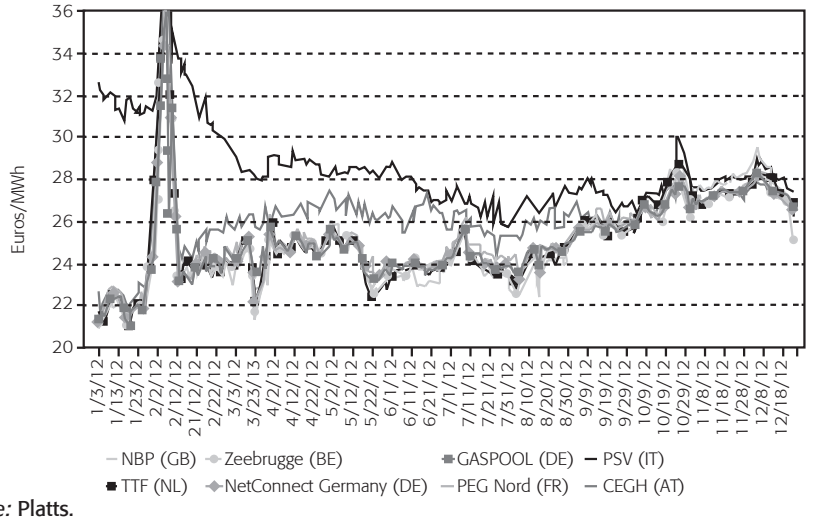


Source: Platts, Thomson Reuters.

Despite increasing hub-to-hub trading and convergence in day-ahead prices, (with the exceptions for GB and NL), gas hubs remain national in scope with limited liquidity and congested interconnectors. This situation is shown in Figure 4.8.

Figure 4.8

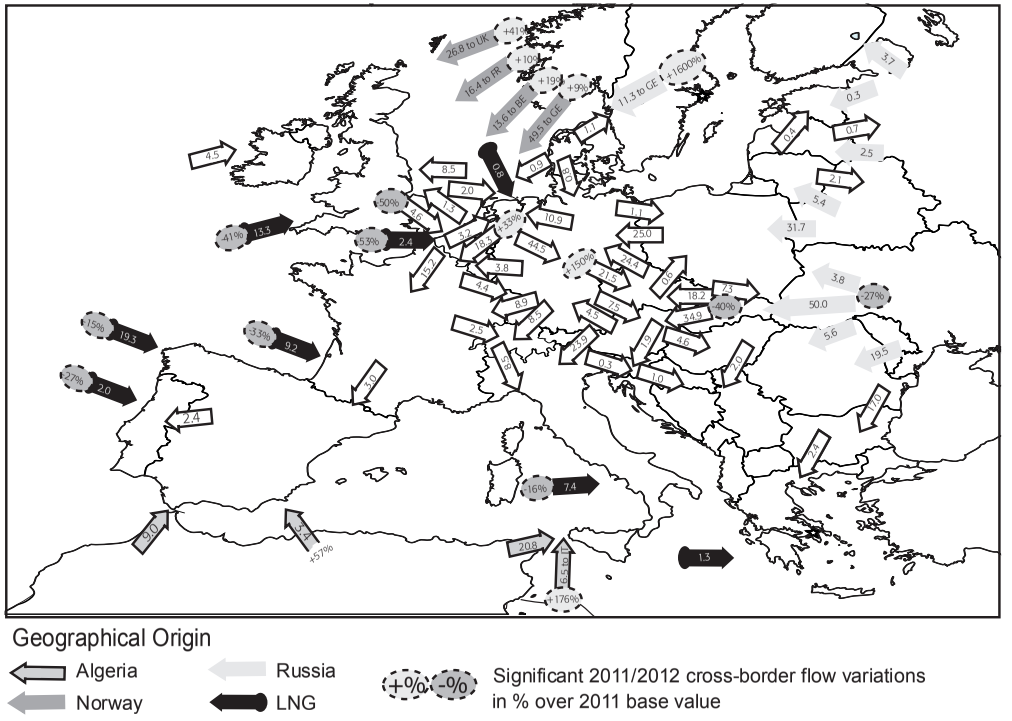
DAY-AHEAD GAS PRICES AT MAIN EU HUBS (EUROS/MWH)



Source: Platts.

Figure 4.9

EU CROSS-BORDER GAS FLOWS (BCM/YEAR) IN 2012 AND VARIATIONS WITH RESPECT TO 2011 (PERCENTAGE)



Source: IEA and Agency calculations.

Figure 4.9 shows the traded volumes in the interconnections and variations with respect to 2011. The figure also shows the main geographical sources for EU imports: Russia, Norway, Algeria and LNG.

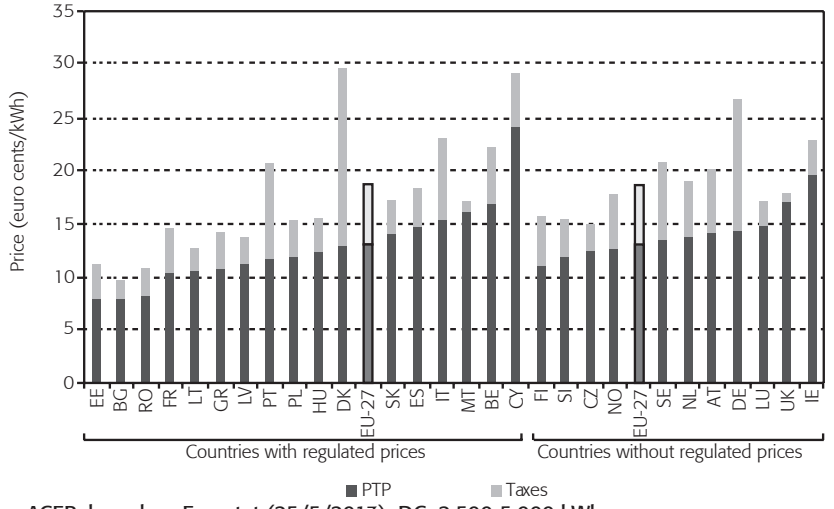
The current situation of cross-border flows is still dominated by heterogeneous and non-fully transparent interconnection tariffs and by long-term contracts that complicate or prevent economically efficient cross-border flows. In this sense, there is a need for improved information on tariffs and more transparent, market based capacity allocation mechanisms. The implementation of the EU Gas Target Model through the ongoing development of Network Codes and the transparency platform currently developed by ENTSOG are fundamental tools for achieving a more liquid and well-functioning EU gas market.

4.2.3. Retail electricity markets

Retail electricity prices for households and industrial consumers differ widely across EU MS. Part of this difference is driven by very different levels of taxation, as seen in Figure 4.10 and Figure 4.11. The main factors explaining retail price differentials among countries are: i) the level of regulation of tariffs (there are still countries with regulated prices), ii) the degree of effective competition in the retail market, iii) the methodology for calculating network charges, and iv) the taxation

Figure 4.10

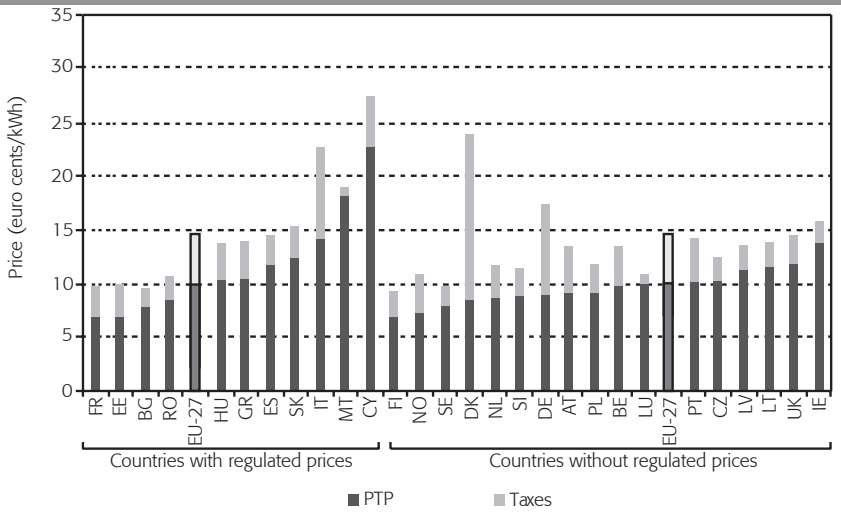
ELECTRICITY PRICES FOR HOUSEHOLDS EU 2012
(EURO CENTS/KWH)



Source: ACER, based on Eurostat (25/5/2013), DC: 2,500-5,000 kWh.

Figure 4.11

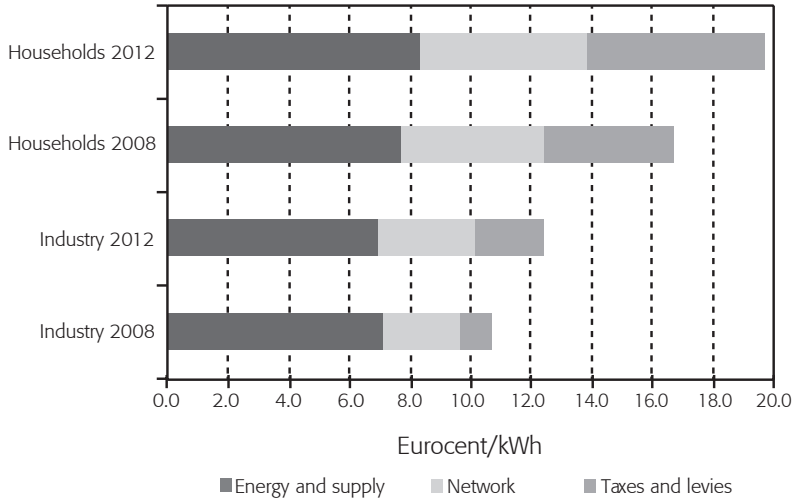
ELECTRICITY PRICES FOR INDUSTRIAL CONSUMERS EU 2012 (EURO CENTS/KWH)



Source: ACER, based on Eurostat (25/5/2013), DC: 2,500-5,000 kWh.

Figure 4.12

RETAIL ELECTRICITY PRICE EVOLUTION BY COMPONENT



Note: Includes taxes in the case of households; excludes VAT and other recoverable taxes in the case of industry but other industry exemptions are not included (not available).

Source: Eurostat.

regimes. In most countries the energy component represents less than half of the final price. In recent years, the regulated components of the final price (network charges, RES-support, or taxes) have substantially increased.

Figure 4.12 represents the retail electricity price evolution for households and industrial consumers. The share of the energy component has decreased since

Table 4.1

ELECTRICITY PRICE REGULATION AND SWITCHING RATES FOR HOUSEHOLDS EU 2012

MS	Switching in and out allowed	% of household customers under regulated prices in 2012	Customer segments covered by regulation	Frequency of price updates (months)	2012 switching rate for household consumers
Belgium	√	8%	1/4	6	14.8%
Portugal	√	90%	2/4	12	13.2%
Spain	√	59%	3/4	3	11.6%
Denmark	√	80%	2/4	3	3.7%
Italy	√	80%	2/4	3	6.4%
Northern Ireland	√	90%	2/4	NA	2.0%
France	√	93%	4/4	12	3.6%
Poland	√	99%	2/4	12	0.6%
Greece	√	100%	3/4	12	4.0%
Slovakia	√	100%	2/4	12	5.0%
Latvia	√	97%	1/4	Whenever needed	0.0%
Hungary	√	98%	2/4	12	1.6%
Bulgaria	√	100%	2/4	12	0.0%
Lithuania	√	100%	2/4	12	0.0%
Romania	Only switch out	100%	4/4	12	0.0%
Estonia	Only switch out	100%	4/4	Whenever a supplier seek a new price	0.0%
Malta	X	100%	4/4	Whenever needed	NA
Cyprus	X	100%	4/4	Ad hoc	0.0%

Source: ACER, based on CEER national indicators database (2013) and ACER questionnaire on regulated prices (2013).

2008 in favor of network and tax/levy components. Network costs have increased by 18% for households and 30% for industrial consumers; while taxes and levies have increased by 36% for households and 127% for industry, before exemptions. Network costs have increased at a particularly rapid pace in distribution. There is a need for a better benchmarking of distribution network costs between MSs in order to identify best practices. The same applies to taxes and levies; indeed, a great level of disparity exists between MS´s policies. Regarding Europe´s international competitiveness, industrial retail electricity prices are more than twice those in the US and Russia, 20% more than in China´s but 20% less than those in Japan.[47]

Supplier switching rates vary greatly among countries. There is no clear correlation between potential savings and switching rates. Non-economic factors such as dual supply and billing (electricity and gas) may explain higher rates, while other factors such as loyalty to local publicly-owned suppliers may explain low rates. Table 4.1's last column reports the supplier switching rates in 2012.

Regulated prices exist for households in 18 out of 28 EU countries, as shown in Table 4.1. Under this situation, it is recommended to progressively develop competition. This can be accomplished by allowing free opting in and out of regulated prices, setting regulated prices above costs of supply, and frequently updating regulated prices following actual supply cost variations. The development of retail electricity markets in the EU suffers several additional difficulties that need to be overcome in the next years. MSs and regulators should enhance transparency in all components of the final price, especially in regulated prices. This transparency should make clear what portion of the bill stems from RES-supports, network charges, and different taxes/ levies. There is a need for online price comparison tools, screening of abuses and customer complaints, and easy supplier switching procedures. In many countries, incumbents dominate the retail market, and there is almost no presence of foreign firms. Finally, MSs need to adequately implement the rules regarding the functional and legal unbundling of DSOs.

4.2.4 Retail gas markets

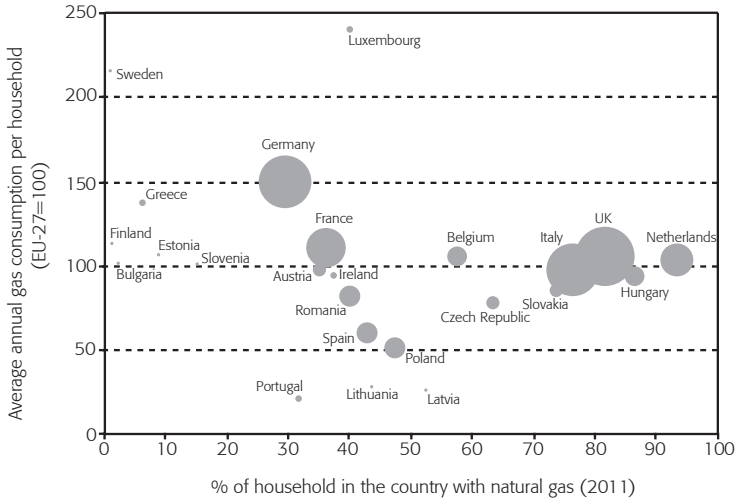
The level of penetration and use of natural gas for household consumption differs greatly among EU countries. Figure 4.13 represents this situation.

Retail gas prices also vary among countries for household and industrial consumption. Figure 4.14 and Figure 4.15 represent prices before and after taxes. Retail markets for gas face the same kind of difficulties as retail markets for electricity: limited entry of new players, markets dominated by few incumbents, low levels of competition, and low supplier switching rates.

[47] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions "Energy prices and costs in Europe." COM(2014) 21/2.

Figure 4.13

NATURAL GAS HOUSEHOLD CONSUMPTION IN 2011

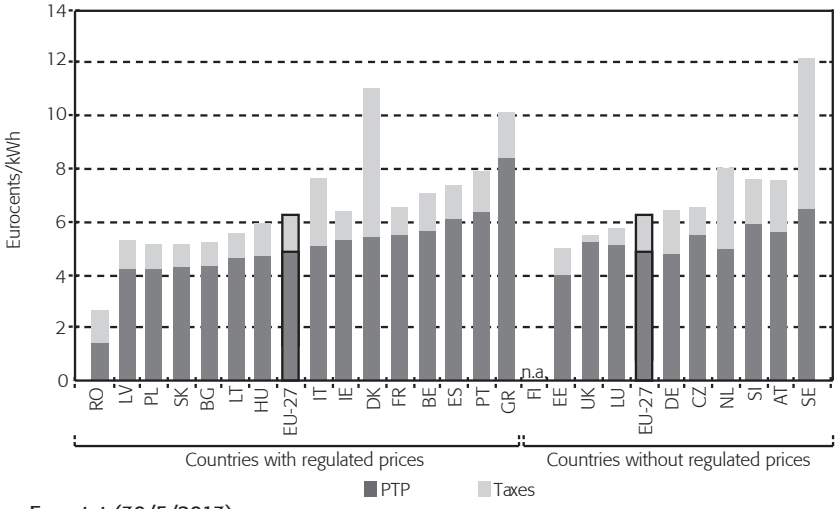


Note: The size of the grey circles reflects the magnitude of household gas consumption in each country. The number of households is generally smaller than the number of residential addresses (homes) in any given country.

Sources: ACER, based on Eurostat (30/5/2013) and CEER National Indicators (2012).

Figure 4.14

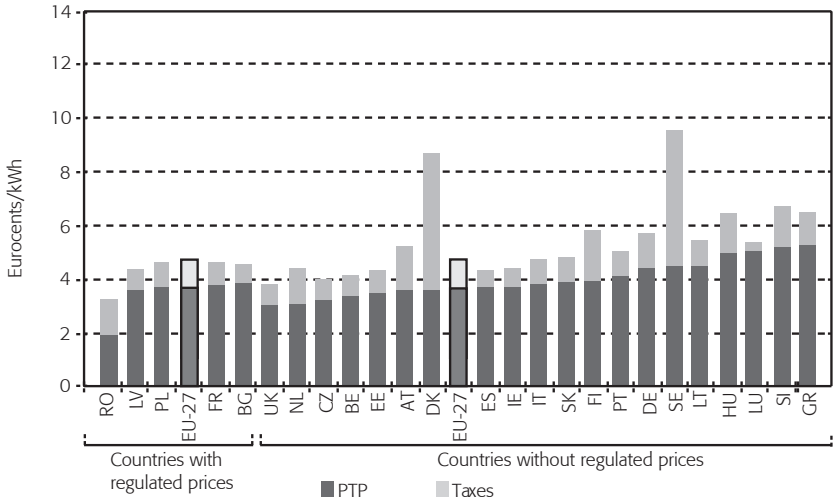
GAS PRICES FOR HOUSEHOLDS IN EU 2012 (EURO CENTS/KWH)



Source: Eurostat (30/5/2013).

Figure 4.15

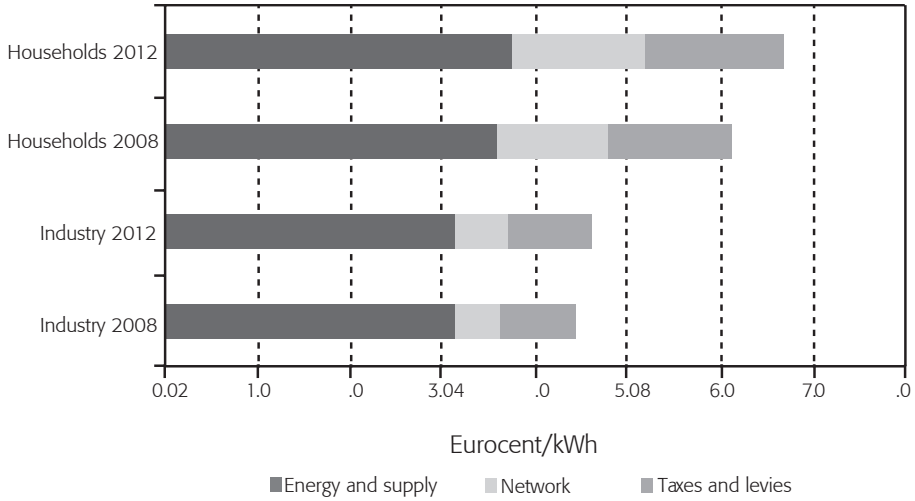
GAS PRICES FOR INDUSTRIAL CONSUMPTION IN EU 2012 (EURO CENTS/KWH)



Source: ACER, based on Eurostat (30/5/2013).

Figure 4.16

RETAIL GAS PRICE EVOLUTION BY COMPONENT



Source: EC, Metadata Member States. Includes taxes in the case of households; excludes VAT and other recoverable taxes in the case of industry.

The evolution of retail gas prices in the period 2008-2012 mirrors the evolution of retail electricity prices in the same period, as shown in Figure 4.16. The energy component has been roughly stable, while network costs, taxes, and levy components have increased significantly. The network component has increased by 17% for households and 14% for industry, and taxes increased by roughly 12% for both households and industry. The price gap with other international partners in the case of natural gas is larger than for electricity. EU industry gas prices are three to four times more expensive than those of the US, India, and Russia, 12% more than China´s, and less than those of Japan.[48]

Table 4.2

GAS PRICE REGULATION AND SWITCHING RATES FOR HOUSEHOLDS EU 2012

MS	Switching in and out allowed	% of household customers under regulated prices in 2012	Customer segments covered by regulation	Frequency of price updates (months)	2012 switching rate for household consumers
Belgium	Yes	8.4%	4/4	6	12.8%(1)
Bulgaria	No	100.0%	4/4	--	0.0%
Denmark	Yes	n.a.	1/4	3	3.2%(1)
France	Yes	84.0%	4/4	12(2)	4.9%
Greece	No	100.0%	3/4	1	0.0%
Hungary	Yes	97.1%	3/4	12	n.a.
Ireland	--	65.6%	1/4	6	17.0%
Italy	Yes	n.a.	2/4	3	4.5%
Latvia	No	100.0%	3/4	1	0.0%
Lithuania	No	100.0%	1/4	6	0.0%
Poland	Yes	100.0%	4/4	12	0.0%
Portugal	No	90.3%	3/4	12	6.1%(1)
Romania	No	100.0%	4/4	--	n.a.
Slovakia	Yes	99.9%	2/4	12	9.3%
Spain	Yes	30.9%	2/4	3	19.4%(3)

Notes: (1) Data for 2011. (2) For all costs. Supply cost can be updated more frequently. (3) Data for Spain include intra-group switching.

Sources: CEER National Indicators database (2013) and ACER questionnaire on regulated prices (2013).

[48] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions "Energy prices and costs in Europe." COM(2014) 21/2.

Regulated prices for household and industrial consumers still exist in the EU. Indeed, 15 out of 24 countries have price regulation for households with different levels of coverage, as shown in Table 4.2. Price regulation should be progressively removed as conditions for competition develop. Therefore, the implementation of the Third Package provisions are relevant regarding the opening up of what have typically been concentrated wholesale markets, developing infrastructure and cross-border trade, and enhancing consumer engagement and easing supplier switching procedures.

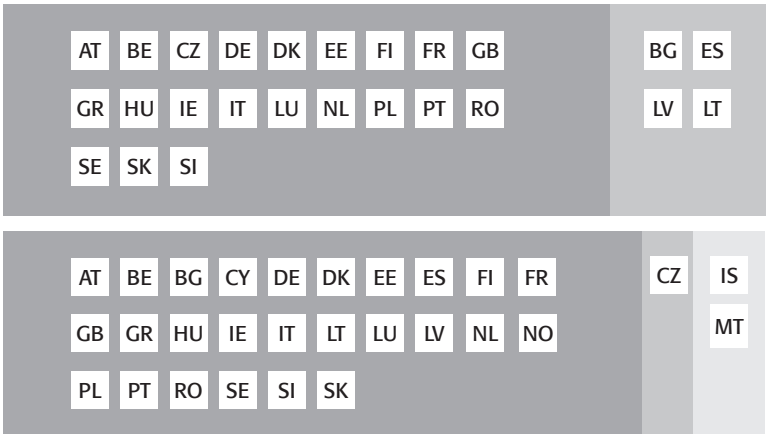
4.2.5. Consumer rights and empowerment

The current status of the implementation of provisions of the Third Package concerning rights and protection of energy consumers also differs by country. CEER regularly monitors the level of definition and identification of suppliers of last resort, the track record of meeting the obligation to limit the supplier switching processes to three weeks, the definition of the concept of vulnerable customers, and the existenceof independent dispute settlement mechanisms. In most of these issues, the level of fulfillment is currently progressing satisfactorily. However, there are still countries with some pending duties. For the sake of illustration, the situation regarding dispute settlement mechanisms is shown in Figure 4.17.

Complaint handling is another important issue for consumer protection and empowerment in the market. Despite CEER recommendations on classification

Figure 4.17

EXISTENCE OF INDEPENDENT DISPUTE SETTLEMENT MECHANISMS



Source: CEER national indicators database (2013).

Figure 4.18

NUMBER OF COUNTRIES WHERE ELECTRICITY COMPLAINTS (BY CATEGORY) EXCEEDED 5% OF THE TOTAL NUMBERS OF COMPLAINTS RECEIVED BY NRAS IN 2012

Source: CEER national indicators database (2013).

and reporting methods,[49] there remains a lack of harmonization across countries in the way complaint data is collected. Figure 4.18 represents data regarding electricity complaints classified by category.

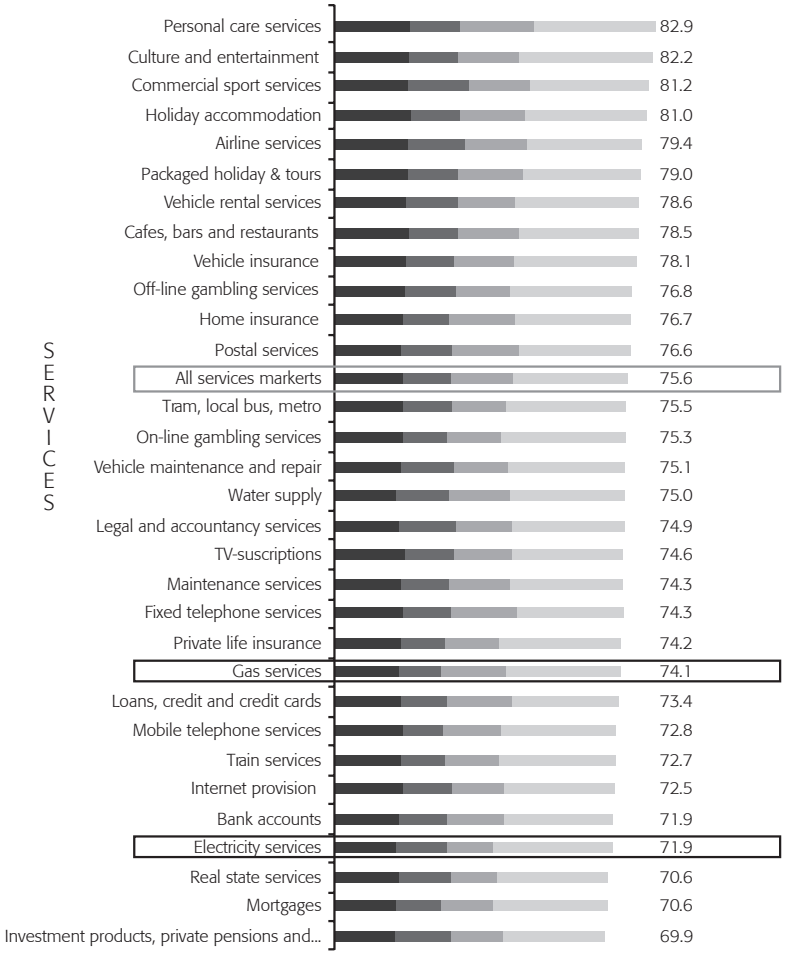
Given the flaws highlighted above, the level of consumer satisfaction with gas and electricity services is currently low in comparison to other goods and services. The EU Consumer Markets Scoreboard is a tool of the European Commission (DG SANCO) that examines the performance of services markets (not solely electricity and gas), taking into account the opinion of EU consumers, on issues such as: i) trust in retailers, ii) comparability of offers, iii) available choice in terms of retailers, iv) quality of services, v) easiness of switching, and vi) experience of problems and associated complaints. Electricity and gas services score low in comparison to other EU services markets, as seen in Figure 4.19.

Empowering customers in the market can be improved through ICT and other technologies. One technology that can particularly empower customers is smart meters. In this respect, customers need better information about the potential benefits of those technologies and the associated implications of those technologies

[49] CEER, "Status Review of the Implementation of the GGP on Complaint Handling, Reporting and Classification as of 1 January 2011" Ref: C11-CEM-45-03, 5 September 2011.

Figure 4.19

MARKET PERFORMANCE INDICATOR FOR CATEGORIES OF SERVICES MARKETS. CONSUMER SCOREBOARD OF SERVICES MARKETS AT EU IN 2013



Note: The Market Performance Indicator (MPI) indicates to what extent a given market brings the desired outcome to consumers. It is a composite index incorporating four key components: "comparability," "trust," "problems & complaints" and "expectations". Each component has an equal weight of 1/4.

Source: EC. Monitoring Consumer Markets in the European Union. GfK. June 2014.

in aspects such as privacy and data security. CEER has developed guidelines and recommendations on these issues.[50]

[50] CEER, "Status Review of Regulatory Aspects of Smart Metering: Including an assessment of roll-out as of 1 January 2013" Ref: C13-RMF-54-05, 12 September 2013.

CEER also provides guidelines and recommendations on best practices for consumer issues such as online price comparison tools,[51] non-discriminatory switching, transparent billing,[52] and sources of consumer information and protection.[53]

Despite the increasing price pattern in electricity and gas observed in the last several years, households and industrial consumers can improve energy efficiency and adopt other actions and innovations such as demand response in order to reduce their energy bills. However, due to the economic crisis, vulnerability and energy poverty are still very important issues for consumers that cannot afford high energy costs. MSs should ensure that adequate and well addressed protection measures are implemented for those consumers.

Finally, regulators, together with consumer associations, have issued a 2020 vision for Europe´s energy consumers based on four principles: reliability, affordability, simplicity, and protection and empowerment. Monitoring of the implementation of those principles is an ongoing task performed by regulators. This task is of great relevance to the construction of a European energy market that should effectively deliver benefits to customers.

4.3 REGIONAL INITIATIVES FOR MARKET INTEGRATION

The Regional Initiatives (RIs) for Market Integration were launched in 2006 by ERGEG[54] and were transferred to ACER in 2011. They constitute an own-initiative project of the energy regulators to speed up the integration of Europe's national energy markets. The RIs established seven electricity and three gas regions as an intermediate target on the path towards an integrated EU energy market.

The RIs constitute a framework for cross-border cooperation which translates in concrete market integration projects. The RIs allow a constructive dialogue between market participants and regulators.

The activities of each region are structured through a number of regional groups. The first regional group is the Regional Coordination Committee (RCC), which is composed of the region's NRAs. This group sets the priorities and steers the work program of the region. The second group is an Implementation Group (IG) which includes Transmission System Operators (TSOs), Power Exchanges (PXs), and other relevant operators such as interconnector operators, gas hubs, etc. Finally,

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[51] CEER, "Guidelines of Good Practice on Price Comparison Tools" Ref: C12-CEM-54-03, 10 July 2012.

[52] CEER, "Electricity and Gas Retail market design, with a focus on supplier switching and billing: Guidelines of Good Practice" Ref: C11-RMF-39-03, 24 January 2012.

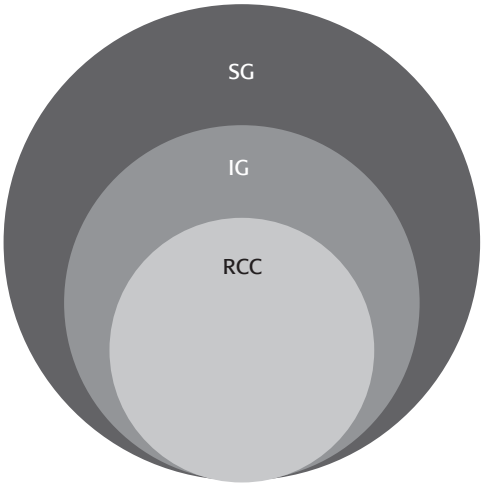
[53] CEER, "Status Review on customer access to information on energy costs, sources and energy efficiency schemes" Ref: C13-CEM-65-04, 16 December 2013.

[54] ERGEG: European Regulators Group for Electricity and Gas. With ACER fully operational (since March 2011), ERGEG was dissolved (Commission Decision of 16 May 2011 repealing Decision 2003/796/EC) with effect from 1 July 2011.

there is a Stakeholder Group (SG) which incorporates other market players such as traders, suppliers, customers, and generators. The RCC chairs the IG and the SG. In each region, there is a lead NRA that acts as a facilitator.

Figure 4.20

DIAGRAM OF THE STRUCTURE OF REGIONAL GROUPS OF THE ERI AND GRI



Source: Own elaboration.

In 2010, the EC and NRAs considered it useful to evaluate the Regional Initiatives with the goal of assessing whether any modifications to the process, composition, or governance could further enhance the RI's effectiveness and contribution to the completion of the Internal Market. As a result of a thorough analysis, the EC published in December 2010 the Communication COM(2010)721 final titled "The future role of Regional Initiatives." Some of the recommendations put forward by this Communication have been put in practice. As a result of the Communication, the RIs contribute to accelerating the implementation of the Network Codes and the Third Package. In other words, the RIs have become a tool for enforcing a part of the Third Package, and, more specifically, a tool for enforcing the provisions related to regional cooperation. In this context, market integration projects such as market coupling must be pursued by the RIs as an utmost priority. As a result of the Communication, the EC also invited the regions to identify regional infrastructure priorities, coordinate cross-border investment, and assess security of supply at a regional level. These goals have been carried out in particular in the Gas Regional Initiative (GRI). In addition, the EC suggested that ACER should coordinate and monitor the work of Regional Initiatives.

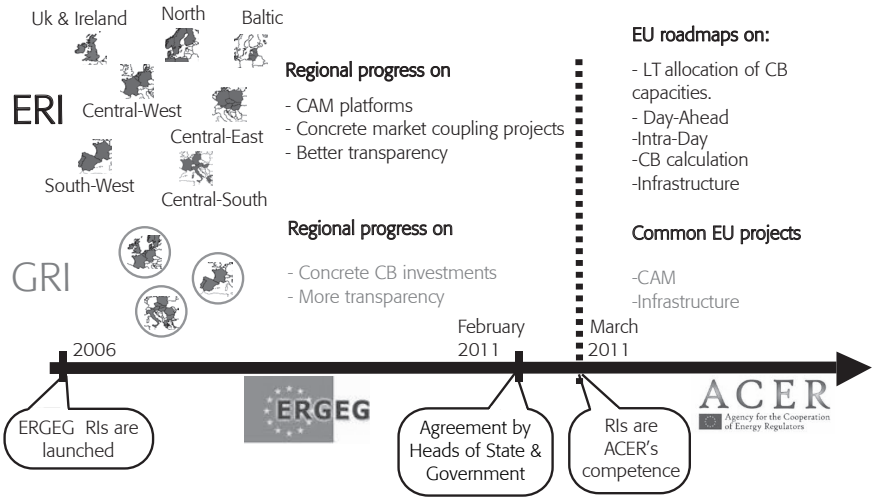
However, there are two key recommendations of the EC that have not been implemented. The first refers to a change in the number and geographic composition of the regions of the GRI.[55] The second refers to the creation of a Regional Steering Committee (RSC) including ACER, the EC, the MSs, and the NRAs from the region along with the Regional Coordination Committee (RCC).

Figure 4.21 shows the main areas where progress was achieved until March 2011 (under ERGEG) and the new priorities and approach after March 2011 (under ACER). The new role of the RIs was influenced by the EC Communication and by the statement from the European Council in February 2011 calling for the Internal Energy Market to be completed by 2014.

Since 2011, ACER has developed a vision for the RIs based on: i) a more project-oriented approach with roadmaps, milestones, project leaders, and periodic

Figure 4.21

REGIONAL INITIATIVES. FROM ERGEG TO ACER



Source: Own elaboration.

[55] Quote from the COM(2010)721 final: "Given the importance of developing new gas infrastructure and new interconnections for the creation of the internal gas market and for security of supply reasons, the Commission proposes to split the current "South, South-East" region into three new regions for gas including the Baltic States and the Nordic countries as follows:

- New Central-South region: IT, AT, SK, SI, HU, RO, BG, EL;
- New Central-East region: DE, PL, CZ, SK, AT;
- New BEMIP region: SE, FI, EE, LV, LT, PL, DE, DK.

[…] There are also reasons to combine Italy with the current South region (encompassing France and the Iberian Peninsula)."

reporting schemes; ii) a more pan-European dimension, from regional to cross-regional projects; iii) stronger stakeholder involvement, in particular through AESAG[56] and other stakeholder groups; iv) a more adequate governance structure relying on Electricity Regional Initiative (ERI) and Gas Regional Initiative (GRI) coordination groups chaired by the Heads of the Electricity and Gas Departments of ACER. Furthermore, the NRAs are requested by ACER to report about progress and ongoing work through the ACER Board of Regulators when appropriate.

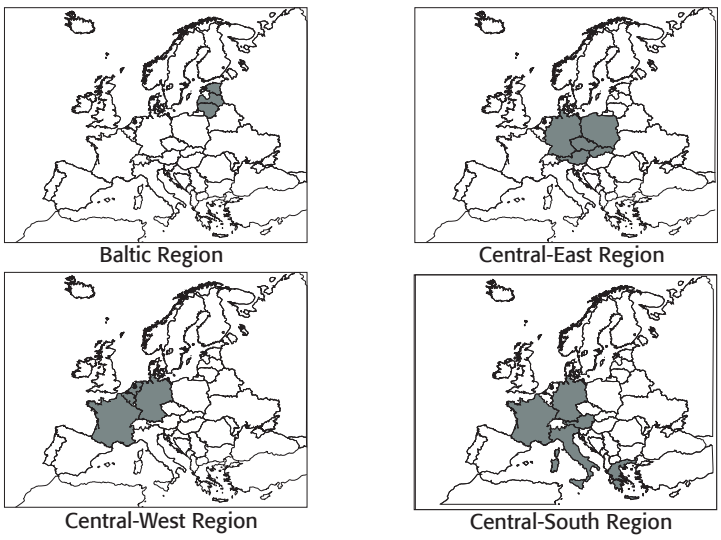
4.3.1. Electricity Regional Initiative (ERI)

The seven regions of the ERI stem from the Congestion Management Guidelines annexed to Regulation 1228/2003. There are important overlaps among regions. For example, France and Germany are included in four different regions. These overlaps are intended to ensure the compatibility of the models implemented in each region, and to pave the way for an eventual merger in a single market.

The following figure shows the geographic configuration of the seven regions of the Electricity Regional Initiative:

Figure 4.22

REGIONS OF THE ELECTRICITY REGIONAL INITIATIVE (ERI)

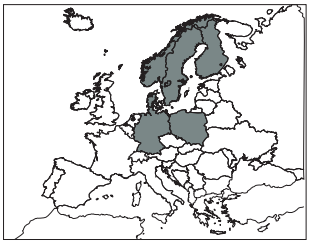


Source: 2012 ACER RIs Status Review Report.

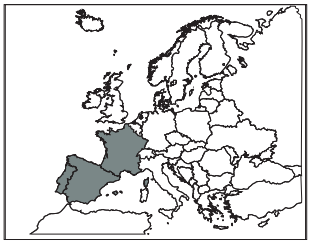
[56] The ACER Electricity Stakeholder Advisory Group (AESAG) was established by ACER in March 2011 as a platform to support the implementation of concrete projects to pave the way to the Internal Energy Market (IEM).

Figure 4.22 (continued)

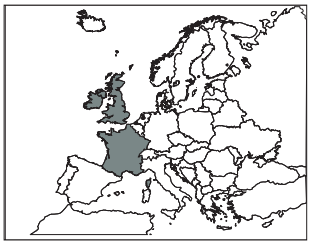
REGIONS OF THE ELECTRICITY REGIONAL INITIATIVE (ERI)



Northern Region



South-West Region



France, UK and Ireland Region

Source: 2012 ACER RIs Status Review Report.

Under the ERGEG framework, each region had its own multiannual work plan with similar priorities. The dialogue among regions on capacity allocation and congestion management issues resulted in a preliminary consensus on the main points of the Target Model for the EU. In 2011, when ACER became operational, this model was further refined, as explained in chapter 3.

In order to achieve the ambitious objective expressed by the European Council in February 2011 (the completion of the Internal Energy Market by 2014), ACER proposed four cross-regional roadmaps in line with the Electricity Target Model explained in chapter 3:

- Day-ahead timeframe: a single European price coupling optimizing the use of day-ahead cross-border capacities. A single matching algorithm (so called Euphemia) is implemented by the participating Power Exchanges in order to harmonize price formation in all the coupled areas. This optimization algorithm automatically allocates the day-ahead cross-zonal capacities in the direction that maximizes overall social welfare. The power flows induced by the executed orders, resulting in the net positions, do not exceed the capacity of the relevant network elements.

- Intraday timeframe: a single European continuous implicit mechanism for a cross-border intraday market facilitating the adjustment of market participants'

positions close to real time. This mechanism will be supported by a platform that is being developed by a provider selected by the participating Power Exchanges. In principle, the cross-zonal capacities will be allocated for free to the associated transactions, but this model is required to evolve in order to provide capacity pricing.

- Long term timeframe: a European allocation platform for long-term transmission rights with a single point of contact and one set of harmonized auction rules.
- Capacity calculation: a Flow-based capacity calculation method for short-term capacity allocation in highly meshed networks improving network security and the level of available cross-border capacity. This only applies in Central-West and Central-East Europe.

Significant progress was achieved in the day-ahead roadmap by the end of 2014. Day-ahead market coupling has been implemented in North-West Europe, comprising the Central-West, the Nordic regions, and Great Britain (as from 4th February 2014). In addition, Day-ahead market coupling has been implemented in South-West Europe (as from 13th May 2014). The term used for this extended market coupling arrangement is "Multi Regional Coupling." Other market areas are joining this mechanism, namely Italy, Slovenia, Switzerland, Czech Republic, Slovakia, Hungary and Romania.

The intraday roadmap has suffered continuous delays for several reasons. As a result, the EC follows this project closely. It is estimated that the development of the pan-European continuous platform will not be finished before the end of 2015.

The roadmap on long term capacity allocation has also faced some difficulties. The Central Allocation Office (CAO[57]) and the Capacity Allocation Service Company (CASC[58]), the two regional allocation platform operators, signed a Memorandum of Understanding in 2013 for creating a single platform for the allocation of long-term transmission rights. In addition, ENTSOE is developing a proposal for harmonized European allocation rules; these rules should be ready by mid 2015.

Finally, the roadmap on flow-based capacity calculation has experienced some difficulties, especially in Central-East Europe. After the successful launch of daily parallel run publication of flow-based capacities[59] on 24th February 2014 in Central-West Europe, it is expected that go-live should happen by the end of 2014.

These cross-regional roadmaps entailed a fundamental change in the RIs concept. A separate work plan for each region does not make sense anymore. Instead, a plan comprising all the regions for each of the aforementioned cross regional

[57] CAO website: http://www.central-ao.com/

[58] CASC website: http://www.casc.eu/en

[59] In parallel with the NTC calculation that is applied for obtaining and allocating the capacities, flow-based calculation is performed and its results are published just for information.

roadmaps reflects a truly European-minded approach. Indeed, a truly European approach intends to gather all the planning for all regions into an integrated market.

It is worth mentioning that a cross-regional roadmap for balancing was not adopted by ACER. However, some regions have worked on balancing market integration initiatives such as BALIT.[60] Additionally, in 2013 ENTSOE promoted a number of pilot projects for the early implementation of the model set forth by the FG on Electricity Balancing.[61]

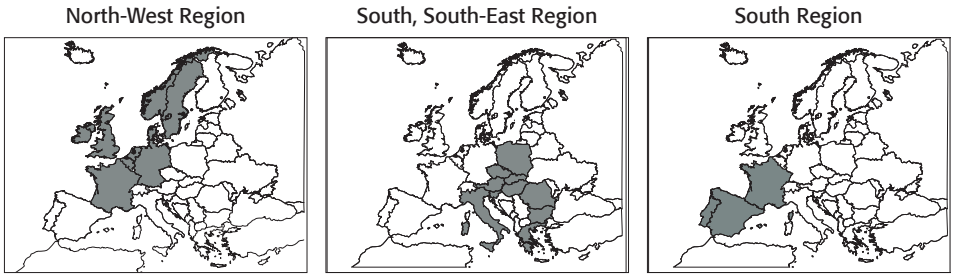
This early implementation process of the Electricity Target Model must be coherent and coordinated and performed in parallel with the formal development of the relevant FGs and NCs.

4.3.2. Gas Regional Initiative (GRI)

The GRI is structured in three regions with different starting points and priorities. The North-West and the South South-East regions are very wide, comprising ten MSs each. The South region only comprises three countries: Portugal, Spain and France.

Figure 4.23

REGIONS OF THE GAS REGIONAL INITIATIVE (GRI)



Source: 2012 ACER RIs Status Review Report.

In the framework of ERGEG, the three regions have developed regional work plans. These work plans include projects in areas such as capacity allocation mechanisms (CAM), congestion management procedures (CMP), market transparency, and infrastructure development.

[60] "Balancing Inter TSO" is a platform for cross border balancing energy exchanges owned by RTE.

[61] See pilot projects on Electricity Balancing in chapter 3 (section 3.3.2).

The early implementation of NCs has been considered a crucial task for the GRI since 2011. In this context, the GRI has allowed the identification of regional pilot projects. When a project exceeds the regional level, it seems appropriate to set up a specific process at the European level, with ad-hoc working structures that include all the relevant parties involved. This has been the case for the early implementation of the NC on CAM, which is facilitated by the CAM cross-regional roadmap developed by ENTSOG and ACER. This roadmap has facilitated the early implementation of harmonized auctions of bundled cross-border capacities. A key part of the roadmap refers to governance (i.e. describing the roles and responsibilities of all parties involved) and to reporting on the implementation process.

In this context, the PRISMA[62] platform for cross-border capacity allocation started its operation in April 2013. This has become the main European platform for gas capacity allocation. PRISMA's shareholders are gas TSOs from different European countries.

In addition to the mentioned cross-regional roadmap, the focus of work in the three gas regions until 2014 was determined by the regional work plans 2011-2014. The regional projects under the framework of ACER address areas like: implementation of CMP Guidelines, interoperability, tariffs, early implementation of the NC on Gas Balancing, security of supply, gas regional investment plans (GRIPs), hub development, etc.

After more than seven years with the same geographical configuration for the GRI, ACER opened again the debate about whether this configuration is the most appropriate. The composition of the regions was a matter of debate in 2010, but no decision was taken, and the composition of the regions remained unchanged.

4.4. SMART GRIDS

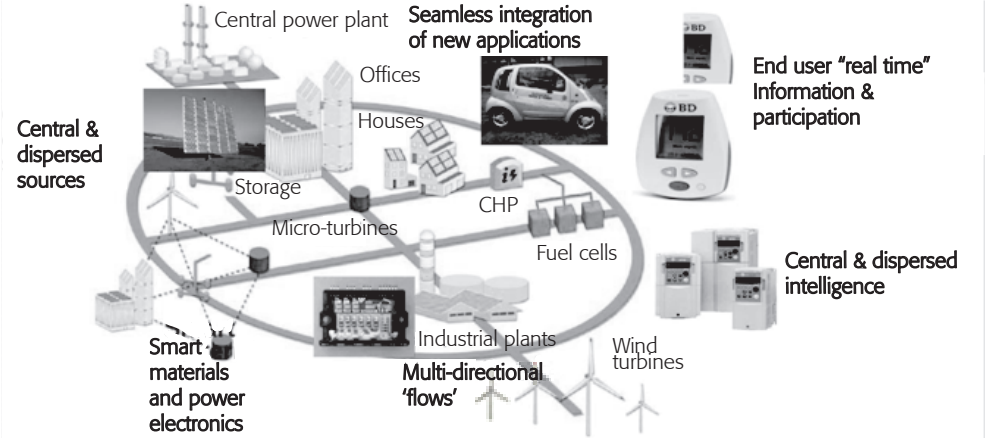
The field of Smart Grids is a technology, policy and regulatory field identified by the European Commission as an essential tool for the transition of our energy system towards the low carbon economy of the future. According to the definition adopted by the EU, "a Smart Grid is an energy network that can cost efficiently integrate the behavior and actions of all users connected to it – generators, consumers and those that do both – in order to ensure efficient, sustainable power system with low losses and high levels of quality and security of supply and safety."

Smart grids are playing a central role in the integration of distributed and renewable energy resources, and are empowering energy consumers with new applications. Figure 4.24 represents the different technologies and functions under the concept of smart grids.

[62] PRISMA website: https://www.prisma-capacity.eu/web/start/

Figure 4.24

TECHNOLOGIES AND APPLICATIONS UNDER THE CONCEPT OF SMART GRIDS



Source: EC. Presentation by Manuel Sanchez, "Smart grids from innovation to deployment," FUNSEAM seminar, Madrid, 14 March 2014.

4.4.1. EU policy drivers and services provided by smart grids

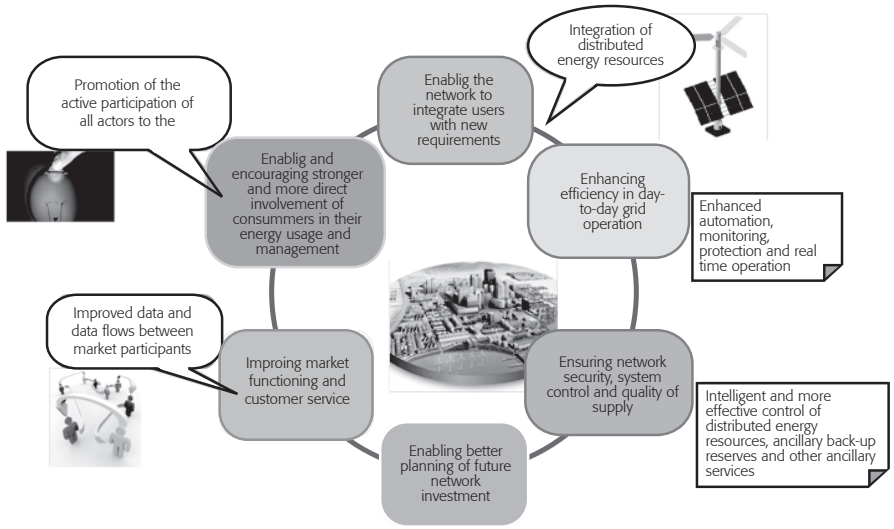
The European Commission is leading and developing a continuous work for bringing smart grid technologies from research and innovation to wide implementation. There are a number of EU policy drivers that justify this initiative. Firstly, there is a need to transition to a low-carbon economy with cleaner and more sustainable energy resources. Secondly, there is a need to guarantee high quality, secure, and economically efficient supply under a market environment. Finally, there is a need to empower consumers with better information and higher levels of engagement. This engagement can be accomplished by playing an active role in the market, having access to better choice of suppliers or energy sources, and by integrating themselves in the system so that consumer can not only consume but also produce energy.

According to the EC Communication on Smart Grids from Innovation to Deployment (EC COM(2011)202), smart grids would provide six high level services.[63] These services are represented in Figure 4.25.

[63] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions of 24 April 2011 – "Smart Grids: from innovation to deployment" [COM(2011) 202 final.

Figure 4.25

HIGH LEVEL SERVICES PROVIDED BY SMART GRIDS



Source: EC COM(2011)202.

4.4.2. The Smart Grids Task Force

The Smart Grids Task Force (SGTF) was set up by the European Commission at the end of 2009. It involves stakeholder representatives from regulators, ICT companies, TSOs, DSOs, consumers, and technology suppliers. In addition to the aforementioned EC Communication on Smart Grids from Innovation to Deployment, the SGTF has provided recommendations for standardization, consumer data, and security. This work has led to several mandates to the European Standardization Organization,[64] the adoption of recommendations on smart meters,[65] and guidelines for cost/ benefit analyses of smart grid projects.[66]

The SGTF is organized in several working groups. The first, standards and interoperability, is in charge of monitoring the work by standardization organizations. The second, privacy, data protection and cyber-security, developed impact assessments and proposed security measures for smart grids. The third, regulation, works on data management processes, regulatory proposals, and incentives for smart grids and demand flexibility. Finally, the working group on infrastructure and

[64] Mandate M/490 for smart grids (March 2011); Mandate M/468 for electric vehicles (June 2010); Mandate M/441 for smart meters (March 2009).

[65] Commission Recommendation of 9 March 2012 on preparations for the roll-out of smart metering systems (2012/148/EU).

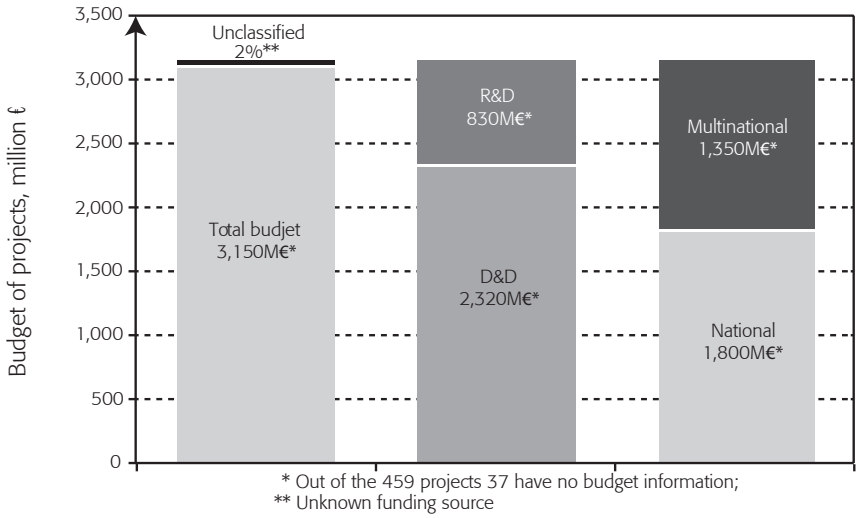
[66] Guidelines for conducting cost/benefit analyses of Smart Grid projects (April 2012).

technology identifies projects of common interest and develops industrial policies for smart grids.

From 2002 through present day, €3.15 billion has been invested in 459 European smart grid projects.[67] Figure 4.26 represents how this investment has been distributed among research and development (R&D) projects, demo and deployment (D&D) projects, and national and multinational projects.

Figure 4.26

TOTAL BUDGET OF EUROPEAN SMART GRID PROJECTS



Source: JRC.

4.4.3. Smart meters

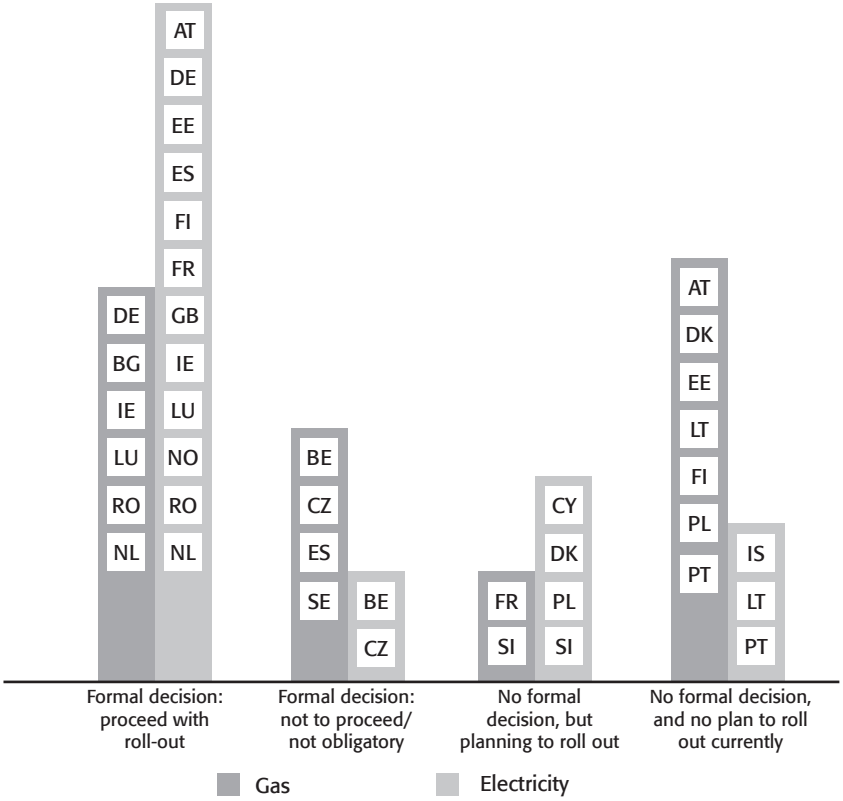
Smart meter roll out is taking place already in several EU countries. Some countries have adopted formal decisions to proceed or not with the roll-out, generally depending on the results of cost/ benefit analyses. Other countries have not adopted a formal decision yet, as is represented in Figure 4.27. The data represented in Figure 4.27 has been modified and updated in a recent report from the Commission.[68]

[67] JRC Science and policy reports "Smart Grid Projects Outlook 2014."

[68] Report from the Commission "Benchmarking smart metering deployment in the EU-27 with a focus on electricity." COM(2014) 356 final.

Figure 4.27

SMART METER ROLL-OUT DECISIONS



Source: CEER Status Review of the regulatory aspects of smart metering, including an assessment of roll-out as of 1 January 2013, Figure 2.

The EC issued a recommendation for the preparation of the roll-out of smart meters[69] together with a set of minimum functionalities that should be met. In electricity, it is expected that a massive roll out covering around 72% of EU consumers with 195 million meters and an investment of up to €35 billion will occur by 2020.

4.5. CONCLUSION

In this chapter we have reviewed different monitoring indicators followed by regulators to assess the current situation of the EU energy market.

[69] Commission Recommendation of 9 March 2012 on preparations for the roll-out of smart metering systems (2012/148/EU).

Wholesale electricity markets present different levels of integration and completeness in day-ahead, intraday, and balancing markets. The Electricity Regional Initiative shows that the EU price market coupling for day-ahead trading is a major achievement. This should be closely followed by a single continuous intraday market and, in the future, by higher coordination and integration of balancing markets.

Wholesale gas markets are still quite immature, and new hubs such as the Iberian gas hub need of developing. In addition, intensified cross-border trading is necessary. The most important project of the Gas Regional Initiative is the creation of an EU platform for the allocation of cross-border capacities along different time frames. This project constitutes a major milestone for the EU gas market integration.

Retail markets remain local in scope and are dominated by incumbents with almost no participation from foreign players. Regulated prices for households and in some cases industrial consumers are an obstacle for the development of the market. However, regulators should ensure that effective liberalization is accompanied by increasing competition resulting in fair and competitive prices for the benefit of consumers.

A consumer-centric vision is key in order to develop smart grid technologies to their full potential and to materialize the benefits of these technologies. Interoperability and standardization of functionalities are basic for achieving economies of scale and reducing future costs. For this purpose, the involvement of the ICT sector is relevant. The role of regulation in this context is to promote innovation in regulated network businesses (transmission and distribution), and to eliminate barriers to entry for new business models and new service providers.

5 CHALLENGES AHEAD AND THE FUTURE OF THE MARKET

In this final chapter of the report we describe the main challenges for the construction of the EU energy market in the context of current energy policies and uncertainties in the next decade. In the same manner as the preceding sections, the following analysis is from the perspective of regulators.[70] The different challenges are presented in detail by market segment. This section analyzes wholesale electricity and gas markets, retail markets and consumers, and infrastructure developments. Despite current and forecasted difficulties for achieving a truly effective and integrated EU market, this analysis concludes that significant effort should be put forth towards this goal in the next years. The consolidation of ongoing implementation work of the Third Package legislation, together with future identified developments, will allow Europeans to face successfully the high uncertainties that threaten the sustainability, security, and competitiveness of our energy supply system.

5.1. THE CONTEXT: ENERGY POLICY AND UNCERTAINTIES

The EU 2050 energy roadmap[71] and the recent EC communication[72] setting a policy framework for climate and energy in the period 2020-30 renewed the EU commitment with objectives that will set up the energy agenda for the next decade. Those objectives are basically: i) reducing GHG emissions by 40% and reaching at least a 27% share of renewable energy at the EU level by 2030; ii) improving energy efficiency to reach 25% energy savings by 2030; iii) consolidating the EU Emissions Trading System (ETS) as the central instrument for the transition to the low carbon economy by introducing a market stability reserve in 2021 which would provide price stability; and iv) achieving a competitive market that delivers secure and affordable energy for all consumers and builds consumer confidence and trust in the market.

However, the achievement of all those objectives is plagued by a series of uncertainties and difficulties that should be carefully identified and analyzed. If

[70] Many of the ideas in this chapter are inspired by a recent report released by ACER: "European Energy Regulation: A Bridge to 2025." Public Consultation Paper. 29 April 2014.

[71] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions "Energy Roadmap 2050"/OM/2011/0885 final/.

[72] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions "A policy framework for climate and energy in the period from 2020 to 2030" /COM/2014/015 final/.

ignored, these uncertainties and difficulties could seriously impact the task of building an integrated and efficient market, and could lead to fragmentation, uncoordinated national interventions, and, in the end, to inefficiencies.

One critical issue is the growth and integration of renewable generation in electricity markets. The developments already made in this area in some countries have shown that the design of support mechanisms may impact the functioning of the market and may create a non-level playing field. For instance, conventional generation investments such as combined cycle generation turbines (CCGTs) may have difficulties realizing initially projected market revenues if increasing shares of renewable energy lower utilization hours and depress wholesale market prices. On the other hand, important amounts of new installed renewable generation obtain revenues under a regulated regime, typically feed-in tariffs, with almost no market risk. Achieving a level playing field that allows market forces to drive generation investments, while meeting the energy and climate policy targets, is one of the main challenges to ensuring the long-term sustainability of this market.

The increasing deployment and promising future of new decentralized technologies for generation, storage, and demand pose new challenges for the operation and sustainability of the traditional centralized system. These technologies include solar photovoltaics, batteries, and electric vehicles, and are typically located directly at the consumer premises or connected to distribution grids. The integration of these sources in retail markets and the potential for aggregation and participation at the wholesale level require some adaptation of retail and wholesale markets and require the definition of the future role of Distribution System Operators (DSOs).

At the same time, energy market actors are building large off-shore wind power plants and have plans to develop large renewable power plants, for instance in North Africa. These large scale renewable power plans would export part of their production to Europe through new interconnectors in direct current (DC), and would be a part of the so called Super Grid. Those projects require huge investments and therefore careful evaluation through well coordinated transmission plans. These plans should fall under the already established framework of the ENTSOE EU-wide TYNDP and future projects of common interest. Again, market forces are of singular relevance to guiding those investments; otherwise, consumers could end up paying for any inefficiencies that result from bad decision making.

Consumer market participation and engagement is another important uncertainty. This uncertainty is related in some way to the development of new ICT and energy end-user technologies that may strongly impact consumer behavior in energy efficiency, demand-side participation, and generation. As we have stated, changes caused by the influx of decentralized sources will impact the design of retail markets and the relationship and dynamics between wholesale and retail. The challenge is to make a more integrated market with more active demand participation at the individual and aggregated level.

A threat to incumbents operating in areas associated with distributed energy resources comes from the potential disruptive role of new, distributed service providers. The competition between small, decentralized sources and traditional centralized generation is taking place every day with more intensity. This competition is creating a debate over how the electric power system of the future will develop.

On the gas market side, there are also big uncertainties. On one side, gas demand in recent years has been shrinking because lower industrial consumption and increasing shares of renewables in the power sector have reduced consumption from gas-fired power plants. On the other hand, the developments in shale-gas, mainly in the US, and the low prices of gas extracted using the fracking technology make the future of this fossil fuel promising. Today, Europe has important uncertainties regarding the adoption of fracking technology. The EU lacks a common policy for the exploration and exploitation of potential sources. The future of shale-gas imports from the United States and other large producers and the evolution of natural gas prices in the global market is another important source of uncertainty.

The future of end-uses of natural gas is also uncertain. For example, on one hand, gas-fired vehicles would increase gas consumption in the transportation sector. On the other hand, the shift towards electrifying heating loads would push in the opposite direction.

Finally, EU industry competitiveness and energy affordability for households is another major concern related to the future evolution of electricity and gas prices. In chapter 4, we reviewed the increasing trend in retail electricity and gas prices observed in the period 2008-2012. The EC 2030 climate and energy policy framework and the EU 2050 energy roadmap forecast that fossil fuels prices will continue to increase and will continue to act as a driver of energy prices in the future. Electricity costs are likely to increase through 2020 as new investment in infrastructure and generation capacity is developed. Beyond 2020, electricity costs should stabilize due to the increasing shares of renewable energy that will replace fossil fuel production.[73] Regarding competitiveness with other international partners, energy prices in the EU through 2035 will continue to be higher than in the US and China but will likely be lower than those in Japan.[74]

Under this broad view of energy policies and uncertainties, the design of the EU market should be robust and flexible enough to create a level playing field in which existing and new technologies, solutions, and players compete for providing services and add value to energy consumers. Figure 5.1 illustrates the sources of benefits in the EU energy market coming from integration and diversification.

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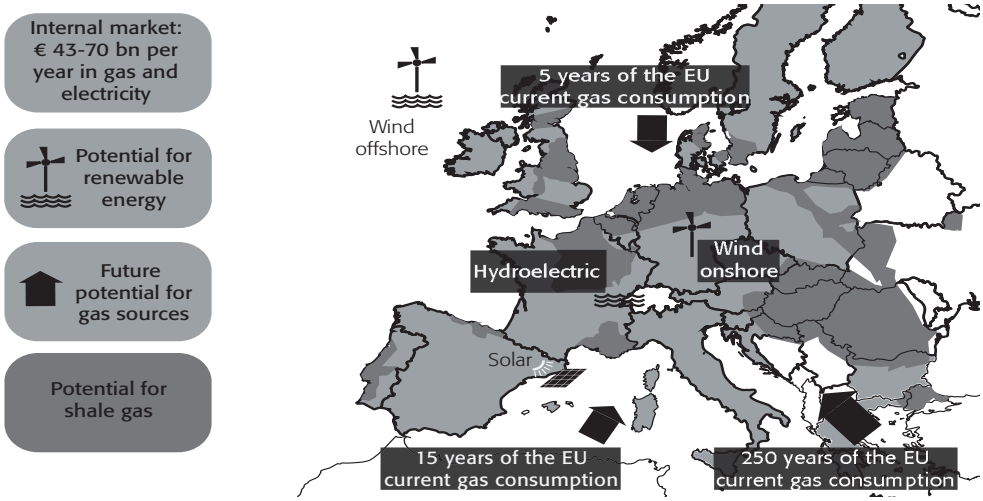
[73] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions “Energy prices and costs in Europe.” COM(2014) 21 /2.

[74] International Energy Agency, “World Energy Outlook 2013.”

Figure 5.1

POTENTIAL BENEFITS COMING FROM DIVERSIFICATION AND MARKET INTEGRATION



Source: EC. "Climate and energy priorities for Europe: the way forward." Presentation of J.M. Barroso to the European Council. 20-21 March 2014.

5.2. ELECTRICITY WHOLESALE MARKETS

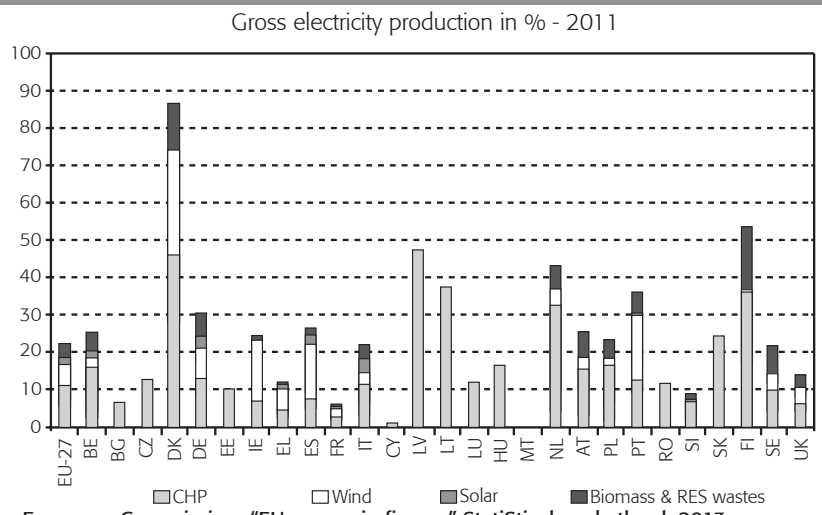
The vision of regulators for achieving an integrated EU-wide wholesale electricity market accommodating important and growing shares of renewable and distributed generation requires some strategies and actions. These strategies and actions are discussed in this section.

In Figure 5.2, we see the shares of renewable and combined heat and power (CHP) electricity generation in EU MS in 2011. Those shares have increased significantly in recent years due mainly to national support schemes. Some technologies such as small-scale solar PV are connected to distribution grids and are known as distributed generation. However, other technologies such as on-shore wind are connected both to transmission and distribution grids; therefore, not all wind power plants can be considered distributed generation. With some technologies reaching a high level of maturity, deployment costs becoming increasingly competitive without any additional support, and the renewed EU energy and climate objectives, it is expected that the share of renewable and CHP technologies will continue growing in the next decade.

A main enabler for the integration of wholesale electricity markets with increasing shares of renewables is to increase the level of interconnection capacity among borders. This was acknowledged by EU MSs more than a decade ago. This

Figure 5.2

RES AND CHP ELECTRICITY PRODUCTION SHARES IN EU MS



Source: European Commission: "EU energy in figures" StatiStical pocketbook 2013.

view has been reinforced by the planning role for the European network assigned to ENTSOE and the Infrastructure Package identifying the priority corridors and the projects of common interest. The successful implementation of this legislation is crucial to ensuring the achievement of this target.

Another important issue is to increase the proportion of flexible resources to counteract intermittency and variability of renewable (wind and solar) resources. Achieving this goal via market mechanisms requires well-functioning balancing markets that enable the right price signals for procuring flexibility and that allow and encourage participation from all resources (generation, demand, and storage). At the same time, all parties must assume their balancing responsibilities, and exemptions that were used in the past for the promotion of renewables must be avoided.

The Communication from the Commission in 2013[75] provides insightful recommendations that must be followed by MSs implementing schemes that promote and support renewable sources. MS intervention should be minimized to support more mature technologies and overcome market failures. Research and development programs are the most adequate tools for supporting emerging technologies. Investment in renewable generation and production decisions by RES owners should be mainly driven by the market. Market prices should be the main justification for investments and energy production, and all generation

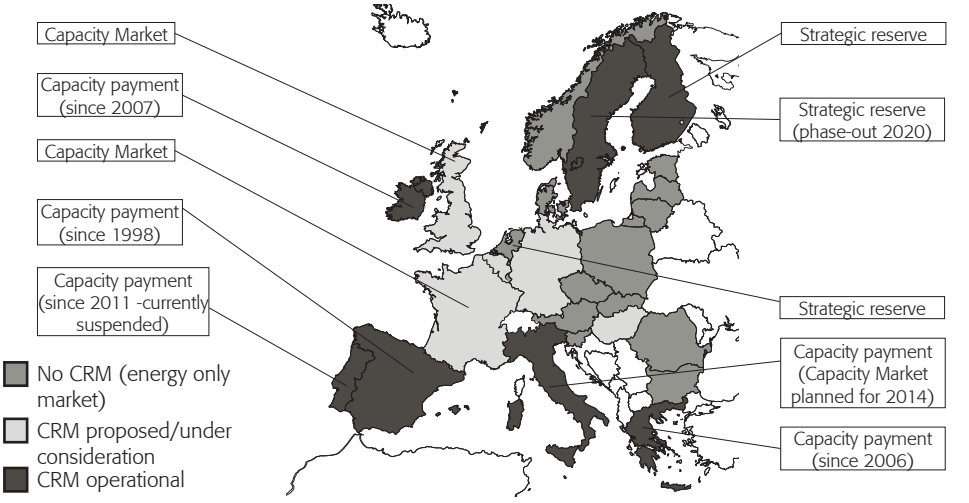
[75] Communication from the Commission "Delivering the internal electricity market and making the most of public intervention." C(2013) 7243 final.

technologies should be exposed to risks in the same manner. Therefore, schemes that supplement market prices, such as feed-in premiums or quota obligations, are more appropriate than those that do not, for instance, feed-in tariffs. This support would be reduced progressively when ETS CO_2 prices stabilize at higher levels than today and externalities are internalized in electricity market prices. This will increase the market competitiveness of RES technologies. The use of competitive tendering procedures as allocation mechanisms is also recommended for new RES entrants. A review of market design rules has to be undertaken in order to create a technology neutral playing field with similar rights and obligations for all producers. For instance, balancing obligations should be set for all parties without discrimination. Balancing markets must integrate all potential providers including all technologies and players which meet the established technical requirements. A level playing field for users of the transmission and distribution networks has to be created by designing cost-reflective grid connection charges, grid use-of-system charges, and rules of system use. These charges and rules should put renewables and conventional generators on equal footing. All of these measures would create a less distorted market where RES and conventional technologies would compete in a level playing field. In addition, these measures would provide economically efficient and stable price signals needed by investors and existing market players.

Another important issue is the provision of generation adequacy through the so called Capacity Remuneration Mechanisms (CRM). This issue is even getting more

Figure 5.3

CAPACITY REMUNERATION MECHANISMS



Source: ACER. Pursuant to Article 11 of Regulation (EC) No 713/2009, the Agency for the Cooperation of Energy Regulators reports on: "Capacity remuneration mechanisms and the internal market for electricity" of 30 July 2013.

relevance in the EU due to increasing shares of intermittent renewable energy. In Figure 5.3 we can see the current situation and expected developments regarding this issue in MSs.

CRMs present different forms in national markets: capacity payments, capacity markets, or strategic reserves. The main idea is to complement the energy market already established in the EU target model with a product (capacity/flexibility) or technical requirement (strategic reserve) for ensuring higher levels of security of supply in the different time frames. The providers of this product/service, until now mostly centralized generators, obtain an extra income for their generation capacity availability. This income is additional to other revenues that they obtain in the energy market for selling their production or reserves. In Europe, the design and implementation of CRMs has been addressed mainly at the national level. However, with the completion of the integrated EU market, a deep review of CRMs necessity and impacts on the functioning of the market is needed.

The Communication from the Commission in 2013[76] providing guidelines on State intervention and the Guidelines on State aid in 2014[77] deal with the issue of CRMs. Some of the recommendations are as follows. The identification made by the concerned MS of the adequacy problem to be solved should be consistent with the EU-wide generation adequacy assessments made periodically by ENTSOE. All interactions with and support from neighboring MSs should be taken into account. The concerned MS should justify its conclusion that alternative and complementary ways of providing adequacy are not enough to solve the detected problems. These alternatives could include facilitating demand side response or expanding the interconnection capacity towards neighbor MSs with generation surplus. In addition a demonstration of why the market cannot provide the needed resources should be carried out. In this sense, it is important to ensure that regulatory failures that may constitute an obstacle to the provision of adequacy have been removed before the CRM is implemented. Such failures or obstacles include caps on wholesale market prices, retail price regulation, existing support schemes for fossil and nuclear generation that do not incentivize more flexible operation, and poor design or functioning of intraday, balancing, or reserve markets.

In the case of successful justification of the need of a CRM at a national or regional level, the aforementioned Commission Communications also provide some recommendations for the CRM's implementation. The contracting of capacity under the CRM should be awarded through competitive mechanisms such as auctions or tendering. These tenders should be open to both existing and new technologies. Both generation and flexible demand sources should be allowed to participate in those tenders as well. The auctions should be open to sources from other MSs, accounting for restrictions in the available cross-border transfer capacities. Those

[76] Communication from the Commission "Delivering the internal electricity market and making the most of public intervention." C(2013) 7243 final.

[77] Communication from the Commission "Guidelines on State aid for environmental protection and energy 2014-2020." C(2014) 2322 final.

competitive bidding processes should be designed so that the resulting remuneration for capacity would tend to zero as the system adequacy reaches appropriate levels. Finally, the implemented CRM should not distort or have adverse effects on the operation of the day-ahead and intraday markets.

Under increasing shares of renewable energy and the proliferation of distributed energy resources (both generation and demand response), a higher level of interaction and cooperation between TSOs and between TSOs and DSOs is needed for the effective functioning of the EU integrated wholesale electricity market. It is clear that the current framework established by the Third Package and the mandate for developing Network Codes has strengthened the level of cooperation among TSOs and between TSOs and ENTSOE. A key provision of the Third Package was the creation of ENTSOE, and an important facet of the Network Codes is the detailed technical and economic regulation. However, a significant amount of work in the implementation of these policies and regulations remains. This work includes planning and real time operation, both of which require closer cooperation.

In addition, the full integration of distributed resources as market actors is of fundamental importance. This can be accomplished through smart grids, market aggregators, and other service providers. Improving the interaction and cooperation between TSOs and DSOs is crucial to achieving this integration. Here, the institutional framework at the EU level has not yet been developed. The European Commission is leading working groups and task forces regarding this issue, but a reflection is needed on this point. There are views that demand a major guidance towards an EU institutional framework for DSOs. The experience with the current developments of Network Codes and the role played by TSOs and ENTSOE together with rethinking the roles of DSOs[78] would shed light on this issue.

5.3. GAS WHOLESALE MARKETS

The target model for the development of the gas market in EU has followed the same general design patterns as the target model for the development of the electricity market. This design features gas hubs as commercial trading and entry-exit regions, the allocation of interconnection capacities in the various time frames discussed, and efficient, liquid trading from balancing to forward contracts. In reality, there is uneven implementation of the model among regions, liquidity and price transparency in some national markets is lacking, and the need for cross-border infrastructure is subject to high levels of uncertainty based on the evolution of supply and demand.

Integrating gas wholesale national and regional EU markets under this climate of uncertainty in demand and supply requires several actions and measures. These actions and measures are presented in this section from the viewpoint of regulators.

[78] "From Distribution Networks to Smart Distribution Systems: Rethinking the Regulation of European Electricity DSOs." THINK Project. June 2013. http://think.eui.eu

There is a need for increasing the efficiency and liquidity of markets. In the context of this need, the first priority is the implementation of Network Codes. However, together with this priority, gas hubs such as the Iberian hub must continue to be developed. Analysis of the current configurations of entry-exit zones is needed in order to identify structural network bottlenecks and congestions, to coordinate capacity allocation procedures for better use of existing infrastructure, and to increase liquidity of forward markets. Increasing the liquidity of forward markets would in turn provide a more stable framework for investors in new infrastructure. Ensuring sufficient liquidity in the forward timeframe can be better achieved by the consolidation of gas hubs, by enabling capacity products for accessing neighboring hubs, and by enlarging virtual trading zones. These zones could include, for instance, several balancing areas.

It is clear that cross-border infrastructure improvements are needed, and the TYNDP, developed by ENTSOG, is the correct tool for identifying the necessary investments. However, under the current climate of high supply and demand uncertainty, a balance should be found between encouraging infrastructure and minimizing risk. Encouraging infrastructure could enhance competition, diversify sources of supply, and increase cross-border trade. On the other hand, this infrastructure is at risk of incurring stranded costs if the infrastructure is underutilized.

Regulators and TSOs are working on harmonizing network tariffs at the EU level. A regulatory framework that takes into account the impact of potential declines in gas demand on grid charges should be considered. In this light, a properly designed framework could reduce stranded costs and avoid a negative spiral that could impact customers and prices. Gas network providers face similar problems to electricity network providers in systems where distributed generation and storage are decreasing metered energy. Indeed, “the death spiral” is an extreme scenario in which many consumers avoid paying for network costs, creating massive amounts of stranded assets.

As noted in previous sections, greater amounts of back-up and flexible sources are needed as the share of intermittent renewable generators in the market increases. Gas-fired power plants are filling the role of back-up and flexible generators and are well positioned to continue to do so. This increased utilization of gas for back-up and flexibility purposes requires additional flexibility in the wholesale gas market and a higher degree of integration with the electricity market. For instance, different nomination periods in balancing between gas and electricity may provoke higher imbalance costs for these power plant operators. In addition, the access to gas storage and line-pack for gas demands should be facilitated. Finally, incentives for TSOs to maximize system flexibility could be implemented.

5.4. INFRASTRUCTURE DEVELOPMENTS

Infrastructure development is one of the main challenges facing the creation of an integrated EU-wide market. It is estimated that roughly EUR 200 billion in

energy infrastructure will be required through 2020. However, energy infrastructure investment is characterized by market failures. Therefore, regulated assets are subject to access and tariff regulation. The adopted target models for gas and electricity include regulated transmission assets, national investment plans, and unbundled TSOs. This format gives regulators and regulation significant, making proper regulation crucial for success in this difficult and complex task.

The infrastructure package created a framework for minimizing delays in the planning and deployment of infrastructure by monitoring and facilitating permit procedures. In addition, a pan-European planning approach is implemented through, with the TYNDP playing a key role identifying Projects of Common Interest. When justified, those projects can be granted State aid on top of tariff revenue financing.[79] The effective implementation of the legislation concerning the infrastructure package is crucial to building the EU energy market.

The completion of wholesale electricity and gas markets with well-functioning coupled market zones and effective capacity allocation mechanisms will provide the right environment to detect the most valuable investments in the system. Market prices and adequate congestion management should deliver the right signals and should be the best driver of investment decisions.

There are still difficult tasks that need greater regulatory coordination and development. The inter-TSO compensation mechanism is needed in electricity and will be needed in the future for gas. The objective of this mechanism is to allocate part of the infrastructure costs in an area to users that transit energy through this area but are located in other areas. This is a complex issue that is frequently discussed and has never been totally solved. However, it is of fundamental importance in an integrated market with intense cross-border transactions. Furthermore, according to legislation, new cross-border infrastructure needs technically sound and justified cost allocation procedures among involved TSOs. These procedures must take into account estimates of future use and benefits to network users. Again, this is a difficult and complex issue that needs strong regulatory coordination.

The continuous improvement of regulatory schemes to acknowledge regulated investments made by TSOs and DSOs is another crucial issue. Regulators are working to move from traditional, cost based regulation to regulatory schemes that apply output-based evaluation and incentive schemes for efficient operation and investment decisions.

5.5. CONSUMERS AND RETAIL MARKETS

The EU integrated market should be based on protection and empowerment of consumers that actively participate in retail markets. EU regulators, together with

[79] Communication from the Commission "Guidelines on State aid for environmental protection and energy 2014-2020." C(2014) 2322 final.

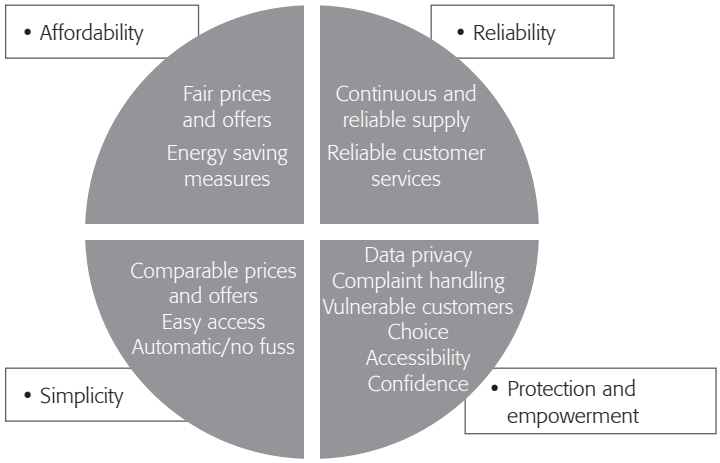
the EU consumer association, have developed a 2020 vision[80] for energy consumers based on the principles illustrated in Figure 5.4: reliability, affordability, simplicity and protection and empowerment.

Enhancing active participation of customers through technological advances that enable energy efficiency and demand response will benefit markets, but require actions and strategies that we will present below.

Residential and commercial consumers need clear and trustworthy information on market prices, products, and services. As stated in chapter 4, the level of satisfaction that EU customers have with their electricity and gas services is extremely low in comparison to other products or services. With the advent of new technologies and the potential rollout of smart meters and home automation, data privacy and security is of maximum importance. Ongoing work should ensure that these issues are clearly solved and consumers trust and use these new technologies to their benefit. Additionally, local generation sources (e.g. solar panels or micro CHP) or smart devices (e.g. thermostats for controlling residential air conditioning or heating pumps) should be integrated into the market, allowing consumers, aggregators, or new service providers to benefit from these innovations. Markets should be adapted and procedural barriers eliminated to efficiently integrate those resources.

Figure 5.4

PRINCIPLES OF THE 2020 VISION FOR EUROPE'S ENERGY CUSTOMERS



Source: CEER. "2020 vision for Europe's energy customers: A discussion paper." CEER-Ref: C12-SC-02-04. 24 April 2012. http://www.ceer.eu/

[80] "A 2020 Vision for Europe´s Energy Customers." A Joint CEER-BEUC Statement. 12 November 2012.

Some rules and actions have been recommended by the European Commission for the promotion and facilitation of deployment of demand response.[81] If consumer's bills were based on wholesale market price signals, they would be encouraged to actively participate in reducing consumption in high price peak hours and in hours of system stress. DSOs, suppliers, aggregators, and new service providers, all require clear rules on data exchange and protocols, and individual concerned customers must provide specific consent. Aggregators that voluntary aggregate interested customers to provide system services based on market participation is of key relevance to obtaining the potential benefits derived from market revenues. EU standards for smart grid equipment and demand response technologies should be in place in the short-term (e.g. proposed by the end of 2014).

This framework of standardization should be extended to business processes that facilitate the penetration of smart grid technologies and new services. This includes time-of-use and dynamic pricing; data exchange and management for metering consumption/production; and supplier switching, cyber-security, and quality of service monitoring.

As previously noted, most retail markets remain national in scope. There is a need to open markets by eliminating barriers to entry of suppliers and service providers from other MS. Market monitoring and periodical reporting tasks performed by regulators should be improved and reinforced in this context.

In addition, there is a dearth of credible, comparable and verifiable information on aspects related to the formation of final consumer prices and costs. The drivers of transmission and distribution costs and the levels of taxation and subsidy mainly for the industrial consumers are particularly opaque.[82]

The role of DSOs in distribution grids and retail markets should be reviewed in light of the influx of distributed resources and active energy consumers/ prosumers. DSOs in the regulatory framework of the EU are highly regulated businesses involved in developing network activities. In addition, DSOs with more than 100,000 connected customers face mandatory functional and legal unbundling rules. There is a need to ensure that DSOs act as neutral market facilitators. In this sense, the correct implementation of current mandated unbundling rules is of special relevance. Indeed, it is critical that the DSO act as a neutral facilitator and not impede the development of new supply services. New providers of, for instance, load control, energy usage, or prosumer aggregation services should be allowed to use the information required for access and development of their businesses with the consent of the interested consumers. For example, third party access to information provided by smart meters, which is currently in the hands of the DSOs, is a major and controversial issue.

[81] Communication from the Commission "Delivering the internal electricity market and making the most of public intervention." C(2013) 7243 final.

[82] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions "Energy prices and costs in Europe." COM(2014) 21 /2.

It is also envisioned that DSOs in the future will take actions to operate their networks in a more proactive way, using local flexible demand and generation resources. In this way, DSOs could achieve a more secure operation avoiding, for instance, local congestion or network problems while maximizing the use of existing grid infrastructure. It is clear that the regulatory framework should be adapted to contemplate under which rules and commercial agreements these resources can be used by the DSO and the incentives or economic compensation that providers should receive for offering such flexibility. In this sense, the operation of distribution grids and the future role of DSOs as system operators resemble the practices performed by TSOs today. In addition, it is expected that, in the future, the interactions and coordination among DSOs and TSOs will become more relevant because of these manageable resources connected in distribution grids.

Network tariff design should be reviewed to take advantage of these new distributed resources and flexible demands. Regulators should explore time-of-use and locational grid tariffs in order to encourage the efficient use of networks. Under this design, there must be a balance between expected grid benefits and the potential costs. Benefits could be derived from better use of the grid and reduced future grid investments. On the other hand, consumers with inflexible or non-adaptable consumption patterns could experience extra costs under new tariff designs. A menu of choices that cater to the different customer categories should therefore be available.

Finally, affordability can be an issue in some MSs. If we consider the downturn in the economy, a downturn in household purchasing power has been accompanied by increasing end user energy prices (in particular due to increasing taxes and levies), as shown by the EC communication on energy prices and costs.[83] Furthermore, an adequate treatment of vulnerable consumers is requested by the Third Package Directives. However, in practice, protection schemes for these consumers may not be effective in some MSs.

5.6. CONCLUSION

In this final chapter of the report we have presented, from the point of view of regulators, the main challenges expected to face the building of the EU energy market in the next decade.

EU climate and energy policy will continue to be the main driver for increasing shares of renewable energy and energy efficiency. In addition, continuous technological developments on ICT, distributed generation, storage, electric vehicles and demand side-management under the environment of smart grids will transform

[83] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions “Energy prices and costs in Europe.” COM(2014) 21 /2.

the way traditional customers interact with the market. These technologies will increase customers' level of engagement and participation and will enable the entry of new service providers.

Completing the EU-wide wholesale electricity market while avoiding the danger of state intervention and fragmentation is closely related to the goal of ensuring that market price signals provide adequate incentives for investing in generation capacities, even in case of high penetration levels of renewables. The most important issues to solve here are the progressive elimination of support mechanisms for renewable energy, the harmonization of CRMs (if they are implemented), and the stabilization of CO_2 prices towards values that ensure the market competitiveness of low-carbon technologies.

Gas markets are subject to important uncertainties regarding the expected evolution of supply and demand. The consolidation of a single EU gas wholesale market is related to a more integrated functioning of interconnected hubs with efficient capacity allocation procedures and transparent market prices for balancing areas. Among other benefits, a consolidated market would provide the required flexibility for gas-fired power plants. Cross-border infrastructure investment should be driven by forward market prices. However, it is important to avoid investments that would place stranded costs associated with underutilized assets on consumers.

The infrastructure package provides an institutional framework for developing the main energy infrastructures needed for integrating the national markets. Here, the TYNDPs developed by the ENTSOs should be the tool for identifying and prioritizing the cross-border capacities to be reinforced, assuming that the investments meet economic and environmental evaluation criteria. Furthermore, it is necessary that regulators continue to make progress in the design of better inter-TSO compensation mechanisms and cross-border cost allocation criteria and procedures for new infrastructure.

Finally, customer empowerment and market engagement will dramatically change the way energy retail markets function. Customers can benefit from new technologies such as ICT, distributed resources, smart grids, and smart meters. These technologies allow customers to meet their energy needs in more advantageous and flexible ways. In addition, energy efficiency and demand response actions facilitated by new service providers and market aggregators can create value for customers. In the end, retail markets will end up being more open and competitive with more choices for customers. In the context of an active distribution grid, the DSO must become more proactive, and act as a neutral market facilitator and system operator.

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