

UNIVERSIDADE DE LISBOA
FACULDADE DE CIÊNCIAS
DEPARTAMENTO DE ENGENHARIA GEOGRÁFICA, GEOFÍSICA E
ENERGIA



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**Renewable Energy Cooperative in Portugal:
Electricity retailing supply process**

Nelson André Galvão Ferreira Dias

Dissertação de Mestrado Integrado em Engenharia da Energia e do Ambiente

2014

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Abstract

In collaboration with Coopérnico, the first RES Cooperative in Portugal, this work has as one of its main goals to understand the potential role that RES Cooperatives may have in the future of the liberalised energy sector not only across Europe, but particularly in Portugal. Moreover, based on the experience shared by several RES Cooperatives, including the closer look at the selected four case studies (The Co-operative Energy in the United Kingdom, Ecopower in Belgium, EWS in Germany and Som Energia in Spain), this work came up with a set of recommendations for any RES Cooperative that intends to become a new electricity supplier in its national territory. For instance, the study allows to identify the main reasons why RES Cooperatives are becoming a solid alternative solution to the traditional energy companies, the main barriers a RES Cooperative faces during its electricity retailing supply process, as well as a role of solution that may help to overcome these possible obstacles.

Based on these findings, and with the aim to transform Coopérnico in the first green electricity supplier in Portugal, the work also extends to the full characterisation of the Portuguese electricity sector, including the compilation of all the steps and requirements to become a new electricity supplier in Portugal.

Although the Coopérnico's electricity retailing supply process has already been initiated with the assignment of registration of electricity supplier by The Directorate General for Energy and Geology (DGEG), the final step will only be given after the Coopérnico's General Assembly in mid-December 2014. Then, it will be discussed and assessed the different options available and voted the path to take for the missing process.

Keywords: Deregulation, Liberalisation, EU Policy, EU internal energy market, RESCoop, Community Cooperatives, Citizen participation, Social Enterprise, Renewable Energy Sources, Green Revolution, Sustainable development, National Electricity System, Electricity Supplier, Coopérnico, Competition

Resumo

Em colaboração com a Coopérnico, a primeira cooperativa de energias renováveis em Portugal, este trabalho propõe-se a estudar o papel que as cooperativas de energias renováveis podem vir a ter no futuro do mercado liberalizado, na Europa e em Portugal. Para além disso, com base na análise da experiência partilhada por várias cooperativas europeias de energias renováveis, incluindo os quatro casos de estudo seleccionados para este trabalho (The Co-operative Energy no Reino Unido a Ecopower na Bélgica, a EWS na Alemanha e a Som Energia na Espanha), este trabalho pretende também reunir um conjunto de recomendações para uma cooperativa de energias renováveis poder entrar com sucesso no mercado liberalizado de electricidade. Entre os vários parâmetros analisados, o estudo permite identificar as principais razões pelas quais as cooperativas de energias renováveis estão cada vez mais a tornar-se numa alternativa concreta às tradicionais empresas de energia, as principais barreiras que as cooperativas de energias renováveis enfrentam no decorrer do seu processo de comercialização de electricidade, bem como um leque de possíveis soluções que as podem ajudar a superar estes obstáculos.

Com base nestes resultados, e com o objectivo de transformar a Coopérnico no primeiro comercializador de electricidade verde em Portugal, o trabalho propõe-se igualmente a caracterizar o panorama do sector eléctrico português, incluindo a compilação de todos os passos e requisitos que uma cooperativa de energias renováveis necessita cumprir para se tornar num comercializador de electricidade em Portugal.

Embora o processo de comercialização de electricidade da Coopérnico já tenha sido iniciado, com a atribuição do registo de comercializador de electricidade pela Direcção-Geral de Energia e Geologia (DGEG), o passo final só será dado após Assembleia Geral da Coopérnico que ocorrerá em meados de Dezembro de 2014 onde serão avaliadas as diferentes opções possíveis e votado o caminho a seguir para o que resta do processo.

Palavras-chave: Desregulamentação, Liberalização, Políticas Comunitárias, Mercado Interno Europeu de Energia, RESCoop, Cooperativas Comunitárias, Cidadania, Empresas Sociais, Energias Renováveis, Revolução Verde, Desenvolvimento sustentável, Sistema Eléctrico Nacional, Comercializador de Electricidade, Coopérnico, Competição

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I would first like to acknowledge the support of my family, since the moment I was born they were always there for me. Without them, none of this would be possible.

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Finally, I would like to thank you dear reader. I hope that in the end of your reading you may share the feeling that together we can contribute to a world where clean, renewable energy is the established method for powering energy efficient, environmentally friendly, healthy to resilient communities. As John said, imagine...

Glossary of abbreviations and terms

ACER	The Agency for the Cooperation of Energy Regulators
AEB	Area Electricity Boards
AMF	The Aggregator Market Facilitator
ASECE	Extraordinary Social Support to the Energy Consumer
Belpex	The Belgian electricity power exchange
BETTA	British Electricity Transmission and Trading Arrangements
BKartA	The Federal Cartel Office
BNetzA	The Federal Network Agency
BRUGEL	The Brussels Regulator for Energy
CdG	<i>Catalana de Gas S.A</i>
CE	Cooperatives Europe
CEGB	Central Electricity Generating Board
CGE	<i>Catalana de Gas y Electricidad, S.A.</i>
CLIG	<i>Companhia Lisbonense de Iluminação e Gás</i>
CNE	The National Commission for Energy
CNMC	The National Commission for Markets and Competition
CNSE	The National Commission for the Electricity System
CREG	The Commission for the Regulation of Electricity and Gas
CWaPE	The Walloon Commission for Energy
DGEG	The Directorate General for Energy and Geology
DGS	The Director General of Supply
DSO	The Distribution System Operator
EC	The European Commission
ECB	The European Central Bank
EDP	<i>Electricidade de Portugal</i>
EEC Treaty	The European Economic Community Treaty
EEX	The European Energy Exchange
EIC	Energy Identification Code
ELIA	Elia System Operator
EnBW	<i>Energie Baden-Württemberg AG</i>
EPC	The European Parliament and Council
ENTSO-E	The European Network of Transmission System Operators for Electricity
EPSS	The Electricity Public Service System
ERGEG	The European Regulators Group for Electricity and Gas

ERP	Enterprise Resource Planning
ERSE	The Energy Services Regulatory Authority
EU	The European Union
EWS	<i>ElektrizitätsWerke Schönau</i>
FOU	Full ownership unbundling
GAEMA	The Gas and Electricity Markets Authority
GGs	Overall Management System
ICE-Endex	The ICE-European Energy Derivates Exchange
IDSO	The Independent Distribution System Operator
IEM	Internal Energy Market
IES	The Independent Electricity System
ILO	International Labour Organisation
IMF	The International Monetary Fund
INI	<i>Instituto Nacional de Industria</i>
ISO	The Independent System Operator
ITO	The Independent Transmission Operator
LOSEN	Law Ordering the National Electricity Sector
LRES	The Last Resort Electricity Supplier
MEFP	Memorandum of Economic and Financial Policies
MIBEL	The Iberian Electricity Market
MIET	The Ministry of Industry, Energy and Tourism
MLE	<i>Marco Legal y Estable</i>
MS	Member-States
MU	The Municipal Utility
NESC	The Network Energy Supply Company
NETA	New Electricity Trading Arrangements
NIE	Northern Ireland Electricity
NIEB	Northern Ireland Electricity Board
NSHEB	North of Scotland Hydro-Electric Board
OAPec	Organisation of Arab Petroleum Exporting Countries
Ofgem	Office for Gas and Electricity Markets
OLMC	The Logistic Operator for Switching Suppliers
OMI	The Iberian Market Operator
OMAG	OMIE Market Access Guide
OMIE	The Portuguese division of the Iberian Energy Market Operator
OMIP	The Spanish division of the Iberian Energy Market Operator

ORG	Ordinary Regime Generator
PEN	The National Energy Plan
PURPA	Public Utility Regulatory Policies Act
PV	Photovoltaics
REC	Regional Electricity Companies
REE	<i>Red Electrica de España</i>
REN	<i>Rede Eléctrica Nacional</i>
RES	Renewable Energy Sources
RES-E	Supply of electricity based on renewable energy sources
RESC	The Regional Energy Supply Company
RND	The National Distribution Grid
RNT	The National Transmission Grid
SCAG	<i>Sociedad Catalana para el Alumbrado por Gas</i>
SEM	Single Electricity Market
SEN	National Electricity System
SGTE	<i>Sociedad General de Transportes Eléctricos</i>
SHE	Scottish Hydro-Electric
SME	Small and Medium Enterprise
SP	Scottish Power
SRG	Special Regime Generator
SSE	Scottish and Southern Energy
SSEB	South of Scotland Electricity Board
TPA	Third-Party Access
TSO	The Transmission System Operator
USA	United States of America
UK	United Kingdom
UREGNI	The Northern Ireland Authority for Utility Regulation
VREG	The Flemish Regulator of the Electricity and Gas market
YLCE	Yes, Low-Cost Energy

1. Introduction

Since 1996, several legislative measures have been adopted by the EU members, addressing market access, transparency and regulation, consumer protection, supporting interconnection capacity between countries, and security of supply, with the aim to liberalise and create common rules for the achievement of an European Internal Energy Market (IEM). As a consequence of such measures, gradually the barriers and trading obstacles are being eliminated, allowing the entry of new electricity suppliers in the markets of EU members and, consequently, the possibility to industrial and domestic consumers freely choose the offer that better fits their consumption patterns.

Besides the natural harmonisation of the European energy sector, the environmental issues and the social economy are also other main concerns in Europe for this century that has already started. Thereby, and intending to speed up the process of energy transition and covering the apparent failure in the approximation of tax policies, as well as the reduction of costs and energy pricing charged to European end-users, it has risen in some European countries the emergence of a new generation of social organisations with new business models based on renewable energy sources (RES) and the promotion of a sustainable development.

Regarding the Portugal's case, the social discontent by the current European energy paradigm is also noticeable, which in late 2013 led to the creation of Coopérnico, the first RES Cooperative in the country.

Driven to understand the potential role that RES Cooperatives may have in the future of the liberalised energy sector not only across Europe, but particularly in Portugal, and be a successful guide for any RES Cooperative that aims to get in the national electricity retail market, besides the current chapter, this work is divided into five main chapters:

As baseline for the work, chapter 2 characterised the three European directives wishing to harmonise and liberalise the European IEM. Nevertheless, the chapter starts with a brief historical description about the energy market deregulation worldwide, focusing then in the pre and post European electricity market deregulation.

Chapter 3 is dedicated to the evolution of the cooperative movement, particularly of the energy Cooperatives. Thus, in here it is studied the potential role that RES Cooperatives may have in the future of the European energy sector, including the reasons behind the revival of the energy cooperatives as well as the main challenges these social enterprises face in the current energy model. Finally, it is analysed the need of a new EU energy legislation that protects and promotes the growth of RES Cooperatives in the future of EU energy transition.

In chapter 4, it is characterised four different European electricity markets. For each market it was chosen a social enterprise that demonstrates that this cooperative phenomenon has been a success. The selected examples were: The Co-operative Energy in the United Kingdom, Ecopower in Belgium, EWS in Germany and Som Energia in Spain.

With the help of these four case studies, and the experience of many other RES Cooperatives such as Enerplus, NLD Energie, DE Unie, Enercoop, Zencer, Nosa Enerxía, Greanpeace Energy and GoiEner it is possible to identify a set of references and best practices that may help, with success, any national RES Cooperative entering in the energy market.

Chapter 5 focus on the evolution of the portuguese electricity system. Besides the overall review regarding the legislative framework behind the liberalisation of the portuguese electricity market, in this part of the work it is also done a full characterisation of the national electricity market, including the current energy companies operating on it.

Moreover, using the Coopérnico's process as reference, the chapter compile all the steps and necessary requirements for a RES Cooperative that aims to become a new electricity supplier in Portugal.

Finally, chapter 6 provides the concluding remarks of the all the previous chapters, including the reasons for failure to create an unified, competitive European energy market. Nevertheless, this long and evolutionary process of market liberalisation has brought a new interest in the cooperative model. Thus, besides presenting a review behind the emergence of RES Cooperatives, this chapter also indentifies the reasons why these social enterprises are becoming a solid alternative solution to the traditional energy companies.

2. Energy Market Deregulation

2.1. Towards World Energy Market Deregulation

Since the birth of the European Community, energy has always been considered a key point of the political agenda of the region and, consequently, has seen heavy government intervention, both through public ownership and regulatory reforms. On the bases of this intervention are essential the nature of power supply in the economy and the natural monopoly features of the energy sector.

In the past three decades, emerging and developed countries have been through privatisation, restructuring and deregulation programs in sectors that historically were regulated monopolies and/or state-owned, such as airline transportation, telecommunications, railway, package delivery services, among others. Energy is no exception and, over the same period, this sector has been going through a time of change worldwide with the implementations of progressive reforms. The motivation for the energy market deregulation were driven mostly by economic reasons, political ideology on the faith of market forces, distaste for strong unions, the desire to attach foreign investment and, since the nineties, environmental concerns [1].

Just focusing on energy sector, the first step towards electricity deregulation was made in the USA in the late seventies, and just then diffused to the United Kingdom and, to a lesser extent, to the European continent. But what triggered that move?

The most important of the factors was financial. The oil embargo of the mid-seventies led to serious downturns in many countries economies, which by the early eighties were burdened by foreign debt, budget shortfalls and inflation. Macroeconomic and fiscal depression forced governments to implement economy-wide structural adjustment programs, with the goal of reducing public spending and increasing private capital flows into the economy [2].

Historically, the cost of power production declined as utilities¹ built ever-larger power plants. With the population growth the electricity demand increased requiring more and larger plants, which reduced even further the costs as well as increasing the utility rate base. Consumers had abundant low-cost electricity; regulators oversaw declining rates, increased electrification and economic growth. Meanwhile the utilities and stockholders saw their money grow. Thus, we can say this era was a win-win situation for everyone.

The problem came when the Organisation of Arab Petroleum Exporting Countries (OAPEC) cut off the oil supply to the world. Rapid increases in the cost of fuel to operate power plants were equally translated in the retail power prices. The United States of America (USA) made efforts to decouple the electricity system from the world petroleum market through the construction of nuclear and coal-fired plants, which are more expensive than simple oil or natural gas-fired plants. Consequently, the fixed costs of utility operations increased, further increasing retail electricity prices and naturally it led to consumer complaints and the need of new regulatory reforms [2].

By that time, USA were the largest energy market in the world so, as expected, the first move towards electricity deregulation was made by the Americans, with the introduction of the *Public Utility Regulatory Policies Act (PURPA)* in 1978. Briefly, this legislation stated a new class of non-utility generators who could build small power plants and co-generation facilities, known as qualifying facilities and the entrance of new market players called Independent Power Producers. Under PURPA, public utilities were required to buy energy from those power producers at a price equal to the “avoided cost” of the utility. The main goal of this law was to provide increased conservation of electricity, increased efficiency in the use of public power plants and resources by electric utilities and equitable retail for electric consumers [2][4]. With PURPA, the private producer concept has born and a window opportunity for the global energy market was open.

The economic consequences of those measures were felt extremely quickly and in the early eighties the worldwide discussion on energy markets reform has started. Several emerging and developed countries have commenced reform initiatives including liberalisation, privatisation, and restructuring of the energy supply and distribution industry. In the front row was Chile, setting up a wholesale market pool in which power plants would sell their power to retailers, and introducing a law in 1982 allowing industrial consumers to choose their retailer and negotiate their prices freely [5].

Some years later, the European market reform started with the British experience. The success and innovation of the new British market inspired the European Union (EU) energy strategy and became the main driver for further developments.

By 1990, United Kingdom (UK) began the restructuring process with the opening of their wholesale market to the competition, by unbundling transmission from generation and splitting generation into several companies. Retail market were opened up in stages, immediately beginning with the largest industrial and commercial users and concluding with the opening of its residential market in early 1999. We can say the greatest achievement of the British

¹ Despite the different definitions and concept about public utility, when we compare the USA and European countries, typically a utility provides a commodity or service that is considered essential to the ordinary people such water, natural gas or, in this case power. Because utility service is a vital need, it has been considered to be in the public interest to regulate its provision [3].

deregulation was their utilities allowing direct access by letting any type of users choose a power supplier competitively and pay the utility only for distribution service. Under restructuring, utilities may provide combined billing for both the distribution service and for the power [6]. The pioneering nature of the changes in the UK, along with the perceived success of the reforms meant that the “British model” was often used as an archetype for redesigns of other markets, including the modern restructuring of the USA electricity system in 1992 with the first *Energy Policy Act*, which allowed non-utility generators and marketers to compete in the same nascent wholesale markets as traditional vertically-integrated utilities [7].

Along with the UK deregulation, something was happening in the Northern Europe, more precisely in Norway, with the established of a non-full privatisation electricity market in 1991. The main difference between both markets is that UK deregulation was based on integral privatisation while the Norway reform not, meaning that despite the common wholesale market, the retail markets have remained national. Later this energy market was extended to incorporate Sweden, Denmark and Finland forming the world’s first multi-national electricity market, called Nord Pool. [8]

With energy reforms and, consequently, competition spreading through some European countries, the EU decided to adopt a pro-competitive framework that would turn the several EU member-states' energy markets into a unique single European market, that will be explored in the following section. Aiming to achieve a free and open energy sector, since the mid-nineties the EU has been continuing releasing some legislative package with common energy directives for the EU members. However, and in accordance with the *White Paper*² and the *Green Papers*³, the approach of the EU in terms of restructuring energy markets has a broader perspective, which includes besides a developing a more competitive Internal Energy Market (IEM), security of supply and sustainability [1].

In conclusion, the eighties and nineties were marked by the formulation and launching of several deregulation trends that paved the way for electric utility deregulation as we know today. Now that we have an overview about the history of the world energy market deregulation, let’s focus on the electricity market deregulation in EU.

2.2. Electricity Market Deregulation in European Union

Realising that liberalisation and competition would result in internal and external efficiency, based on the UK and other European countries’ experiences, and that the benefits would be passed on to users and the economy in the form of lower prices and better allocation of costs, the European Commission (EC) set up efforts to bring to life the idea of a single energy European market. Moreover, the EC published in 1988 its first concrete proposal on that way,

² According to the glossary of EU legislation, Commission *White Papers* are documents containing proposals for Community action in a specific area. In some cases they follow a *Green Paper* published to launch a consultation process at European level. When a *White Paper* is favourably received by the Council, it can lead to an action programme for the Union in the area concerned. In this particular case, the specified *White Paper* is about “*Completion of the Internal Market*” (1985) [10].

³ The same glossary states *Green Papers* are documents published by the EC to stimulate discussion on given topics at European level. They invite the relevant parties to participate in a consultation process and debate on the basis of the proposals they put forward. *Green Papers* may give rise to legislative developments that are then outlined in *White Papers*. Again, in this particular case, the specified *Green Papers* are “*The Protection of Utility Models in the Single Market*” and “*Innovation*” (1995) [10].

with the working document entitled “*The Internal Energy Market*”. According to this document, the EC was committed to create an EU-wide integrated energy market by removal of all existing and potential technical and fiscal barriers that difficult the trade of energy products within the Community [9].

The document made references to some points towards a common energy policy (Figure 1), including the removal of differences between countries, open competition between suppliers at a European level, price regulation, environment protection or the connection of EU members' energy transportation grids so the European energy system can “work” as a whole [9].



Figure 1. Ideas behind the creation of the internal energy market

To achieve this such desired IEM, it was set four actions [9]:

- ✓ Carrying out of the provisions concerning the energy sector in the *1985 White Book*;
- ✓ The determined application by the EC of the provisions of Community Law;
- ✓ The attainment of a satisfactory equilibrium energy/environment;
- ✓ Definition of appropriate means, to be selected case by case, in areas specifically related to energy policy.

In the light of the first point, the *1985 White Book* aims are the removal of technical barriers (whether they concern the harmonisation of rules and technical norms between EU members or the opening up of public procurement) and the removal of fiscal barriers (notably by the approximation of indirect taxation).

To keep and reinforce the internal market, in particular to ensure freedom of movement, the EC suggest a strong competition policy. Therefore, guided by the same outlines in the *White Book* on the internal market the EC defined four sets of instruments, including those which ensure the free circulation of goods and services, those in respect of state monopolies of a commercial character, the rules of competition and the state aids.

In relation to the environment protection, it was submitted some proposals to reduce emission standards for all type of combustion plants. Also, the EC believes that an unified energy market is just possible with an harmonisation of safety standards and their applications, though those applications could bring effects to the cost of producing and using energy.

Finally, according to this document, two areas emerge as priorities: energy prices and infrastructures.

The development of energy trade depends on energy prices, costs and tariffs, which vary between Member-States (MS). In order to bring transparency to market, the EC intend to submit a detailed comparative analysis of energy prices plus conclusions and proposals regarding transparency of prices, in particular for large industrial users, an examination of the price structure in the MS, including the conditions, costs and pricing principles applied to transfers of energy, and in conjunction with the parties concerned, an examination of the cost structures in the various energy sectors and assess these cost structures.

The existence of adequate infrastructure is a cornerstone for the transfer of energy and hence a prerequisite with a view to securing flexibility, greater security of supply, and in the final analysis a more integrated Community energy market. Despite the considerable networks for electricity, natural gas, crude oil and petroleum products, the EC intend to go further in this area with the prospect of the IEM, but always in mind that infrastructure operations must satisfy the minimum economic and commercial viability criteria and these operations, in which costs are importants, should be major factors presupposes that must be encouraged.

Introduced the working document, it is time to understand what is on the roots of the European electricity market deregulation. If the text above is dissected quickly came across the idea that there were three considerations behind the paper (Figure 2):



Figure 2. The main reasons behind the 1985 White Book

Electricity market opening was originally aimed at enhancing the competitiveness of European industry against external industries, particularly Japan and the USA. Inspired by the liberalisation experiments all over the world, which are very different in terms of the design and organisation of the electricity market, the EC aimed with this document to develop its own model to improve efficiency, to create a more competitive energy-producing industry, to ensure security of supply and to attract new investors.

Related with the political motives are the economic reasons, in the way European firms are competing against other manufacturers or service-providers which operate on the basis of different economic factors and inputs. Hopefully, with the free access to energy sources under competitive market prices should contribute to the reduction of costs for firms. This reduction can thus lead to greater competitiveness of European firms on the international asset markets, as long as other countries don't succeed in reducing their energy costs by even bigger margins.

Finally, there is a reason, of legal nature, which supports the establishment of the IEM once the legal instruments available to the EC are no different from those which allow the realisation of Europe without frontiers.

By the *Article 8a* of the *EEC Treaty (Single European Act)* the single market is defined as:

“...an area without internal frontiers in which the free movement of goods, persons, services and capital is ensured in accordance with the provisions of this Treaty “

Article 8a EEC Treaty

That means, the free flow of merchandise, the free offering of services and the right to set up anywhere in the EU are applicable to energy products and services related with them.

Despite the significant efforts made by the EC to promote these guidelines, the truth is that it was required an adequate legislative framework that gradually incorporated elements of liberalisation and energy activities within the EU members, which came in 1992, with the celebration of the *Maastricht Treaty* (formally, the *Treaty on European Union*).

From that moment on, the progress of constructing competitive Europe-wide electricity market accelerated very rapidly and after four years of negotiations on energy policy guidelines, the decisive breakthrough was achieved with the adoption in 1996 of the *Directive 96/92/EC*, concerning common rules for the internal market in electricity.

Nevertheless, and despite this important mark towards European energy market deregulation, the final objective was, and still it's today, far from being complete, due to the significant differences between EU members regarding the energy market development.

The next section explores the obstacles that slowed down the progress of the IEM, particularly the establishment of public utilities and natural monopolies within each national energy system, which naturally limit competition and create cautious markets.

2.3. European Electricity Market

In order to better understand the deregulation process it is necessary to analyse how the European energy market operates before and after deregulation.

On the contrary of the other commodities, the energy market has quite unique characteristics (Figure 3). Electricity represents a product that cannot be differentiated in terms of quality or features, it cannot be stored and its cost is heterogeneous depending mostly on the way it is produced. Also, the demand of electricity is highly inelastic and as it has no substitutes, the supplier must be sure he can deliver as much electricity as it is required at any given moment. Finally, the transmission and distribution of electricity depend on the distance, but also on the resistance in the networks. That means, in the case of congested network infrastructures, it is possible that inefficient generators located in a particular location could provide cheaper electricity than efficient generators in other place.

Due to all these factors, the energy sector has been organised as a state-owned monopoly in most European countries and the liberalisation process can often be quite complex [11].



Figure 3. Characteristics of the electricity

The fact that the electricity sector is considered extremely important for the economic development for all other sectors justified as well the intervention of the government, through direct and indirect State subsidies to maintain a stable industry.

Since the adoption in 1996 of the First Directive, and despite the countless directives with specific deadlines for the full European market liberalisation, the context is far from the once desired integral energy market open to competition. In spite the previously mentioned security of supply and the complexity of this commodity, there were also other reasons for failure to create an unified, competitive energy market [12]:

- ✓ Deliberate government interference motivated by a desire to support the main players in each electricity market;
- ✓ Lack of interest by dominant players or governments to build additional transmission lines to facilitate cross-border trade;
- ✓ Weak enforcement of EU directives at country level.

Looking back, it is safe to say, the European energy market liberalisation has reached different levels as each EU members approached the process in their own way [11]. While a number of countries followed the path of liberalisation in order to maintain the community prosperity, evolution, international competitiveness and economic growth, others have done so only on paper and preferred to maintain the government monopoly [13].

Twenty-five years ago electricity sector was a heavily regulated industry in almost all MS, dominated by national or regional, vertically integrated monopolies engaged all the four sectors, as generation, transmission, distribution and supply networks (Figure 4). In other words, they were the main actors from generation through distribution and supply to final consumers.

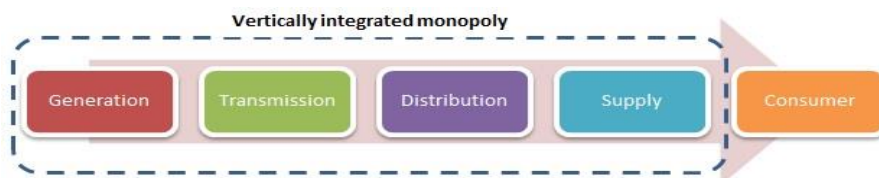


Figure 4. Fully state-owned energy market

Understanding this situation could not carry on, the EC began to challenge the existence of monopolies and exclusive rights, on the grounds that they made the existence of an IEM impossible. Nevertheless, at the time there was no realistic chance of getting the agreement of all or probably even a qualified majority of EU members to discuss the liberalisation of the European energy at the Community level and, for that reason, the EC decided to use the *Articles*

of the *EEC Treaty* relating to competition law and the rules on free movement to force MS to abandon these monopolies.

As mentioned above, there were no special provisions on energy policy. Despite various *EEC Treaties*, for instance those relating to approximation of laws, the common commercial policy, consumer protection, economic and social cohesion, environment, taxation, and, once again, competition, free movement and the internal market, none were applicable to the energy sector or provided scope for Community instruments capable of triggering significant effects on its administration.

However, by the *Article 90*, the *EEC Treaty* stated that [14]:

“undertakings entrusted with the operation of services of general economic interest or having the character of a revenue-producing monopoly shall be subject to the rules contained in this Treaty, in particular to the rules on competition, insofar as the application of such rules does not obstruct the performance, in law or in fact, of the particular tasks assigned to them. The development of trade must not be affected to such an extent as would be contrary to the interests of the Community.”

EEC Treaty, Article 90, Part Three, Title VI, Chapter 1, Section 1

And supported by the *ex Article 82* of the *Treaty establishing the European Community* (TEC) [15]:

“Any abuse by one or more undertakings of a dominant position within the common market or in a substantial part of it shall be prohibited as incompatible with the common market insofar as it may affect trade between Member States.”

Such abuse may, in particular, consist in:

- (a) directly or indirectly imposing unfair purchase or selling prices or other unfair trading conditions;
- (b) limiting production, markets or technical development to the prejudice of consumers;
- (c) applying dissimilar conditions to equivalent with other trading parties, thereby placing them at a competitive disadvantage;
- (d) making the conclusion of contracts subject to acceptance by the other parties of supplementary which, by their nature or according to commercial usage, have no connection with the subject of such contracts.”

TEC, Article 82, Part three, Title VII, Chapter 1, Section 1

The EC argued that monopoly rights disrespected the *EEC Treaty* requirements on the free movement of goods and establishment. Moreover, the EC further alleged that monopolies were

not even necessary to achieve essential public service objectives and because of that, slowly, EU members vertically owned companies' rights have been successfully challenged.

Thereby, forced by the EC, most EU members started the deregulation of the electricity market by adapting the European directives to their own legislation. It must be pointed out that in some countries liberalisation of the sector began before the release of the First Directive framework and later modified certain aspects of their own laws in order to accommodate certain European rules.

Just focusing on the opening up of the market, each EU country is a special case in itself, even though they are all rapidly moving towards total opening.

The best European example is the UK market, followed close by the Noord Pool (Scandinavia market). Actually, these markets were the firsts to be fully functional and liberalised as already remarked.

Regarding to the most competitive market in the EU, the level of consumer participation in the UK energy supply markets is among the highest of any market in the entire world, where almost all users (96%) know that they can change energy suppliers and most (70%) feel confident that they know how to do this.

Although also liberalised, the Noord Pool however is not fully privatised. In fact, public ownerships is still dominating the region. A few major power producers have a dominating position in their national markets but none has a big share (more than 20%) of the Noord Pool. Basically, it shows that the degree of integration increases the level of competition among the market players and it is reflected on the high level of consumer participation [1].

Besides these markets, there is another important market in Europe, the Continental European market. Within this market there are several regional groups, which differ in their features.

Among the EU members that are part of this huge market, the first to be fully liberalised was Germany. Germany started the liberalisation process around 1998 with the First Directive of EC - promotion of diversification of energy supply, reduction of energy costs and improvement of energy efficiency and development of renewable energy sources (RES). As part of the Central European model of organisation, in Germany there was never a national electric monopoly established under the government. However, though a big number of energy suppliers were active on the German electricity market before the deregulation started, the market was not highly competitive [13].

There are also two particular markets that are worth mention: the Italian market and the French market.

In the beginning, France has preferred to follow the minimum steps required by the EU in terms of deregulation. Thus, the deregulation process started only in 1999 but the level of state protection was still very high, postponing all the process evolution. However, the status of the main supplier EDF, which had a market share of 98%, started being challenged around 2004, and the French's electricity market was slowly open to liberalisation [13].

The Italian case is quite similar to the French as there is also a main supplier, ENEL, that has been ruling the market for a long time, despite the several difference showed by the Italian electricity market since the adoption of the First Directive framework, in 1999. For instance, the creation of a public company, *Gestore della Rete di Trasmissione Nazionale*, responsible for operating and carrying out the required maintenance and development of the national network [4].

Keeping in the same region, Austria's electricity market was partly opened to liberalisation in 1999, then the whole market was liberalised in the beginning of the century and a voluntary energy spot market of Austria – EXAA – was established [1].

The Benelux countries, Netherlands and Belgium, transposed the First Directive to their laws in 1998 and 1999, respectively, and at the moment both have an almost 100% fully deregulated electricity system.

Regarding the Iberian countries, Portugal and Spain, together they set up the common Iberian electricity market, MIBEL, in order to open up their market to competition. In the context of the markets liberalisation processes, where the activities of the network operators are considered natural monopolies and are therefore subjected to economic regulation, the production and selling of electricity are open to competition [16].

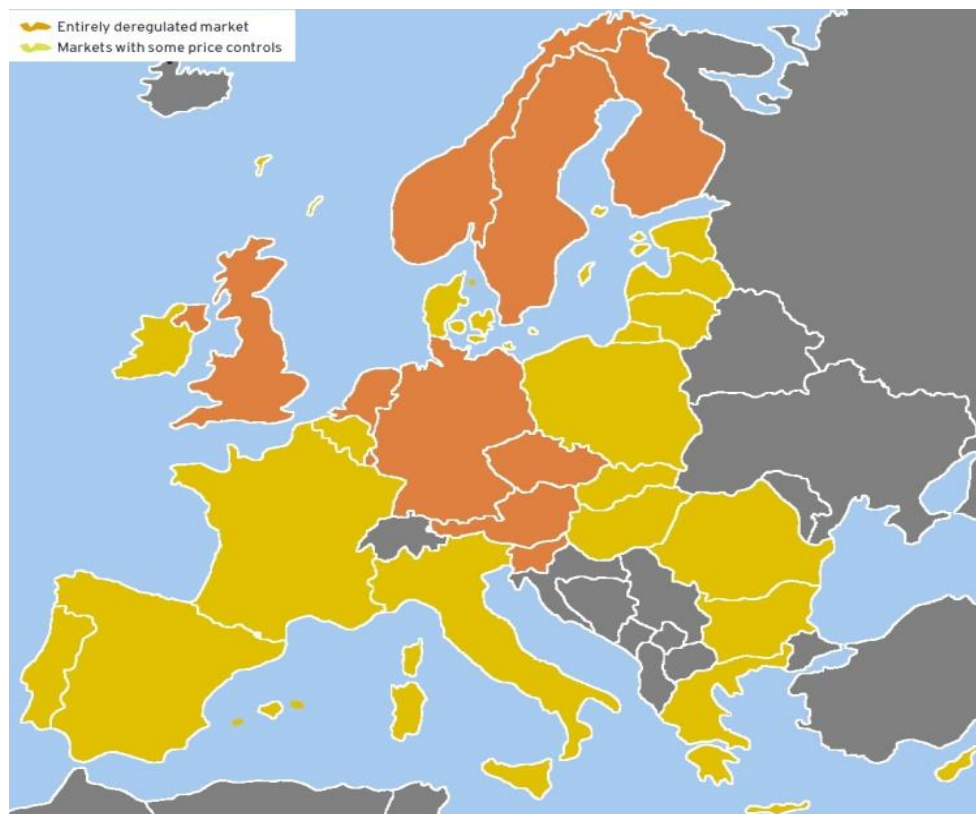


Figure 5. EU's electricity market deregulation by 2007 [17]

With the adoption of the Second Directive, all EU members opened up their electricity markets to competition. By 1st of July 2007, the deadline stated by the document to implement this action, only 13 countries had opened their markets to competition.

Thus, even though most of European consumers are now free to choose their electricity supplier, this does not mean that energy markets have been fully deregulated. In fact, only ten countries had completed total deregulation by 2007 (Figure 5). But what is preventing the total deregulation across Europe?

Basically, there are several types of price controls in place in some national electricity markets which hinder pricing and competition. Moreover, certain countries are striving to control their domestic energy assets and support their so called national champions [18].

The latest Directive (*Directive 2009/72/EC*) can be the response to these issues. In order to Europe finally reach the desired common energy market, the document proposes energy companies engaged in both electricity generation and transmission must either sell off their entire transmission business, or they may retain ownership rights but will be forced to outsource transmission activities to Independent System Operators. The directive also proposes the establishment of a joint European energy regulator and that network oversight rules be made more uniform.

Summarising the European market structure, the completion of the IEM by 2014, the latest published deadline, is far from being achieved. Although national market structures have changed in the last decades, only a few countries have a fully deregulated electricity market, making the European electricity market quite heterogeneous.

From one side, UK, Sweden, Norway, Denmark, Finland and Germany had fully (or very close to fully) deregulated electricity market, whilst on the other side there are countries, like France, Italy, Portugal, with national monopolies and public ownerships. In between there is a range of mixed cases, including most of the countries that follow the Central European model organisational market. That means, a mix between public and private capital.

2.4. The Internal Electricity Market Directives

Looking back to European IEM legislation it is possible to identify a pattern of successive waves regarding to liberalisation legislation. A new reform package has been introduced every six years, after the EC has come to the conclusion that the existing regulatory framework does not go far enough towards the IEM. But why is that?

The repeated amendments to the legislation is caused by the continuing failure, reflect of differences in EU members' approaches to the implementation of the directives, and of the failure to prevent the established monopolies with regard to market entry, market exit and pricing.



Figure 6. Evolution of the European Internal Electricity Market Directives

So far, the EU has adopted three different legislation packages (Figure 6), including accompanying regulation. The First Directive, adopted in 1996 concerning common rules for the establishment of an European IEM was followed by a further electricity directive. The Second Directive, adopted in 2003, was a more complex framework having as ultimate goal to set up the legal frame for full market liberalisation. Plus, attached to the directive there was a regulation named *1228/2003/EC*, focused on issues such as the network access for cross-border energy trading. The Third Directive, adopted in 2009, was the last framework released. This document, also known as the Third Package, amended the existing legislation and supported the

further opening of the energy markets and established an *Agency for the Cooperation of Energy Regulators (ACER)* by way of a regulation (*Regulation(EC) 713/2009*).

2.4.1. The First Directive

The *Directive 96/92/EC* is known for being the kick starter of the liberalisation in the European electricity sector. This set of legislation introduced, for the first time, common rules for the organisation of the sector, and established progressive market opening with the submission of pioneering measures in all areas of activity (generation, transmission, distribution and supply) [19].

Basically the First Directive's most important issue was the split between competitive sectors, as generation and retail supply, from the natural monopoly activities of transmission and distribution networks (non-competitive sectors) (Figure 7 and 8).

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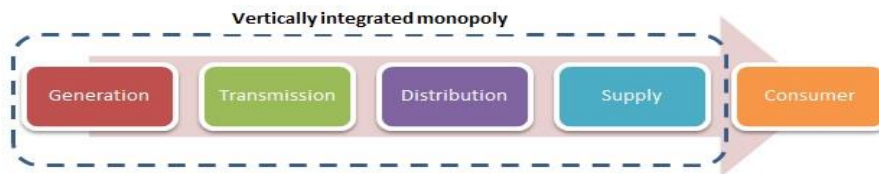


Figure 7. The European Electricity System pre liberalisation

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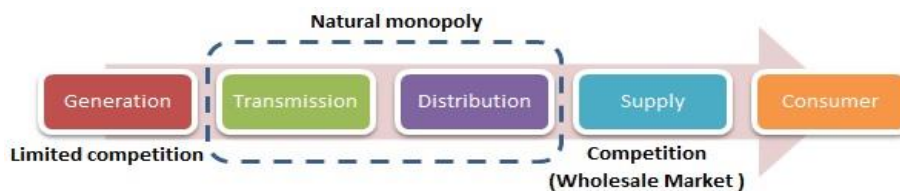


Figure 8. The European Electricity System post the First Directive

As European electricity vertically integrated firms commonly owned all the four areas of activity, the EC introduced some measures to prevent the risk that these companies would use their ownership of the network to unfairly give advantage to their generation and/or retail supply business, including:

- ✓ **Introduction of independent entities group, transmission and distribution system operators** (TSO and DSO, respectively), which would determine and control the access to the networks. Moreover, the firms which owned the transmission and/or distribution systems would be responsible for operating, ensuring the maintenance of the network in a non-discriminatory way, and, if necessary, work as a public utility (*Article 7 to 12*);
- ✓ **Vertical unbundling:** Obligation for vertically integrated firms to keep, in their internal accounting and management systems, the activities of generation, transmission, distribution and retail supply as separated and independent sectors (*Articles 13 and 14*).

With regard to transmission and distribution networks, and to enable generators and suppliers to get their power to final consumers there were measures to ensure all competitors would be able to get non-discriminatory access to the network. Thus, the First Directive introduced the concept of *Third-Party Access* (TPA), in which each EU member can choose the access to the network system among three options (*Articles 17 to 19*):

- ✓ **Negotiated TPA:** Generators and suppliers had to negotiate with the TSO and DSO for the access to the networks;
- ✓ **Regulated TPA:** Basically, the access to the network has fixed tariffs. The tariffs are published by the relevant authorities, and applied to all users of the network;
- ✓ **Single buyer:** It is defined as the legal entity that gathers all the responsibility regarding to the network, including the single administration and running of transmission and distribution networks and/or for the centralised purchase and sale of electricity.

Moreover, the access to the network systems can only be refused when there is not enough capacity to transport the electricity or when transport would make it impossible to carry out public services obligations.

Concerning generation, the document, from *Article 4 to 6*, stated that EU members must follow between two procedures regarding the construction of new power plants:

- ✓ **Authorisation:** With this procedure, anyone can build a power plant whenever and wherever they wanted, provided it complied with planning law and its features, including the safety and security of the electricity system, protection of the environment, energy efficiency, among others;
- ✓ **Tendering:** The electricity system would continue to be centrally planned. Therefore, an official body would set the amount of capacity that need to be built and replaced in the country, and the specifications tenders bidders would need to meet.

Regarding to the supply activity, there was changes too. Thus, the First Directive, through *Article 19*, required the EU members to gradually open up their electricity markets. Thus, it was introduced, firstly, competition in the wholesale markets (the large consumers), through three stages:

- ✓ By February 1999, about 26% (40 GWh/year) of the market had to be open;
- ✓ By February 2000, about 28% (20 GWh/year) of the market had to be open;
- ✓ By February 2003, about 1/3 (9 GWG) of the market had to be open.

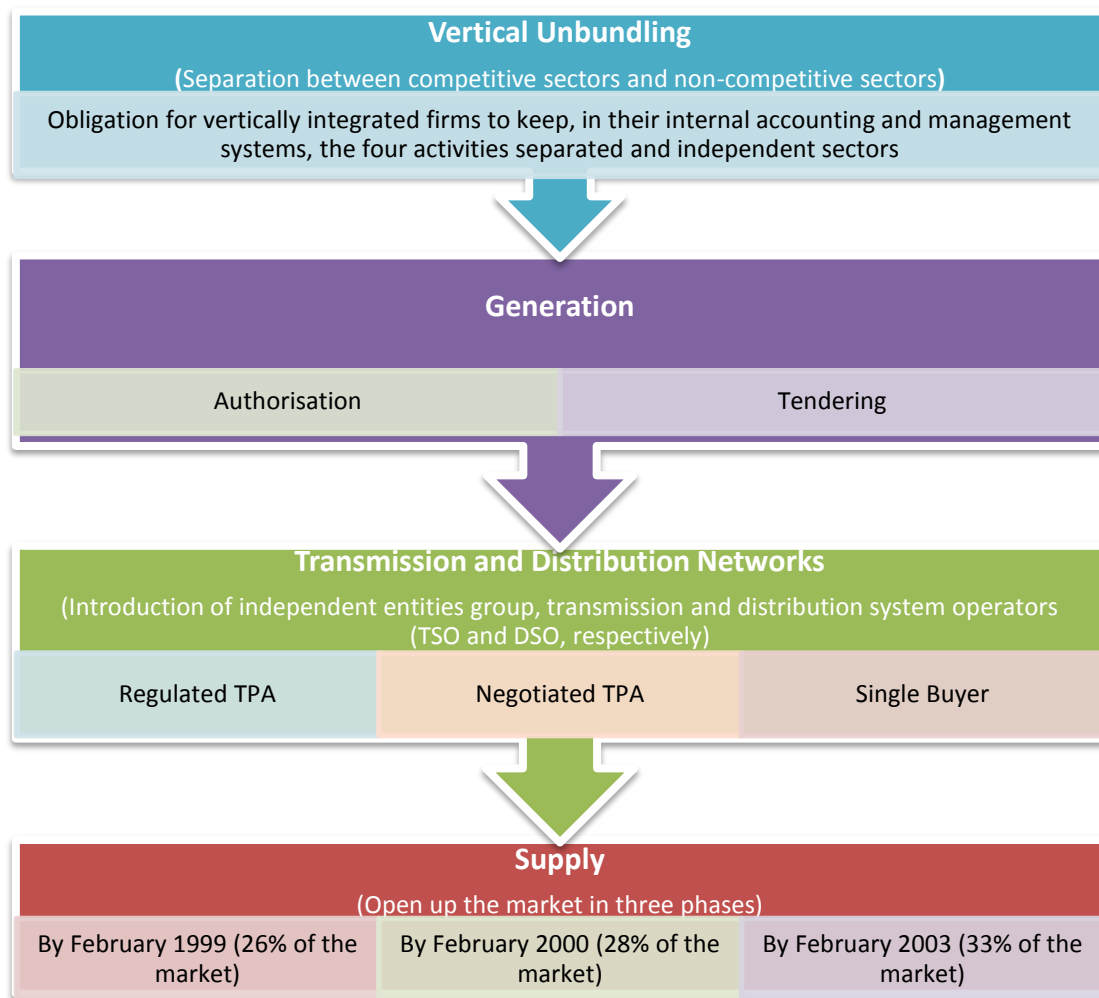


Figure 9. Main features of the First Directive

Finally, concerning regulation, the document did not provided any appointment regarding, for instance, an independent authority, which should be responsible to resolve disputes between companies in each sector, nor the verification of the tariffs established by the TSO and DSO. Moreover, the document notwithstanding the reduction of monopoly to the network operation, did not provided also any jurisdiction over ownership rights.

Although the document established basic rules (Figure 9), which the EU members have to incorporate in their legislation,

“Member States shall ensure (...) that (...) electricity undertakings are operated in accordance with the principles of this Directive, with a view to achieving a competitive market in electricity, and shall not discriminate between these undertakings as regards either rights or obligations.”

Article 3, Chapter II

it also gave a certain degree of freedom for EU members to apply the guidelines since the different choices led to equivalent economic results, as well as similar level of opening and access to the electricity markets. The First Directive does not impose a single rigid new market structure but sets out the minimum conditions under which sector can be developed.

Thereby, as a result, instead of having an harmonised IEM, as desired by the EEC Treaty, the EU members pursued different liberalisation and regulatory strategies, leading then to the development of many individual liberalised markets.

Moreover, as expected, over time it became obvious that the introduction of competition and its measures (general obligation not to discriminate, to preserve the confidentiality of commercially sensitive information, to negotiate in good faith, among others) was not enough to address the lack of regulation.

Adding to the technical and regulatory issues arising from the idea of cross-border trade in an European IEM, that simply was not approached, the need for a new framework was evident (Figure 10), and in 2003 came out the first amendment to the document.

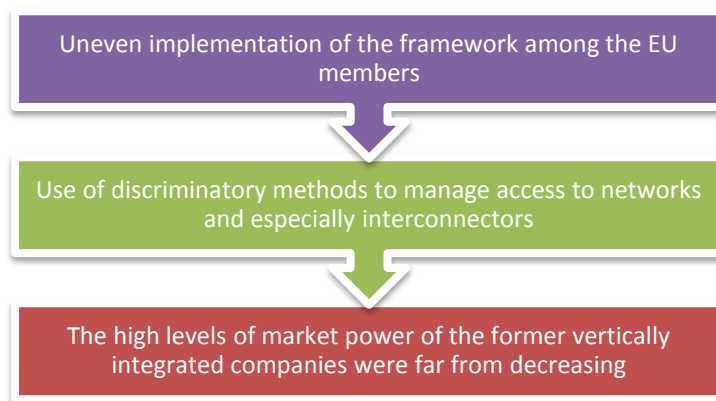


Figure 10. Main issues deriving from the First Directive

2.4.2. The Second Directive

Due to the circumstances previously stated, the EC was forced to bring forward new legislative measures aiming not only to accelerate the market opening, evening then the liberalisation among the EU members, but it also reply to the criticisms on network access and regulation, and took away the less liberal options presented in the First Directive.

Thereby, the new framework (*Directive 2003/54/EC*) established more common rules for the four areas of activity (Figure 12), and included some extra contents such as safeguard measures or provisions on regulation [20].

Basically, all of the measures stated in this document were intended to provide a framework for cross-border trading. In fact, international energy trade assumed a much more important role in the Second Directive and promoting construction of interconnectors between national systems seemed to become an end in itself, rather than a means, for instance, to enhance security or to promote competition (*Article 23*).

At the end, with the adoption of this new framework, it was expected the European electricity system evolved to (Figure 11):

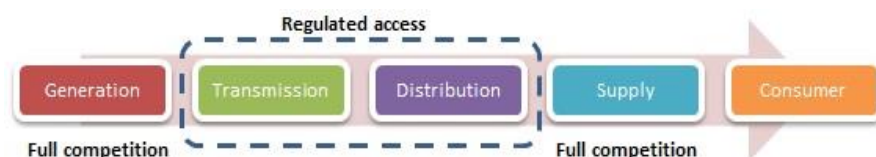


Figure 11. The European Electricity System post the Second Directive

Thus, and starting by generation activity, under the new Directive, the authorisation procedure was defined as the standard procedure for new generating capacity (*Article 6*), even though tendering procedure is allowed for certain special cases, like environmental interests, promotion of infant new technologies or when it will be necessary to ensure the security of supply (*Article 7*).

Essentially, EU members were required to publish a list of criteria, identified in the previous Directive, for the grant of authorisations for the construction of generating capacity in their territory.

With regard to transmission and distribution networks, particularly to TPA, the *Article 20* of the Second Directive withdrew the Negotiated TPA and the Single Buyer options, remaining then the Regulated TPA as the only option available for the future. In addition, the tariffs or at least the methodologies underlying their calculations had to be approved by a regulatory authority.

Closely related to the previous point, in the Second Directive the vertical unbundling requirements were substantially strengthened. Thus, despite the maintenance of accounting and management unbundling measures, the new framework, through *Articles 10 and 15*, stated that TSO and DSO, when part of a vertically integrated undertaking, must be independent at least in terms of their legal form, organisation, and decision making from other activities not relating to transmission.

According to the same Articles, the document also said that is not required to separate the ownership of assets of the transmission system from the vertically integrated undertaking. This meant that, although an integrated company could still own a TSO or DSO firm as well as, a generation or a retail supply firm, the TSO and the DSO activities had to be carried out by legally separate firms.

At this point, it is possible to conclude that, like the last document, the Second Directive remained silent regarding ownership rights. In fact, the EC retains its neutral position. Thus, in spite of providing for legal unbundling, it does outline that such separation does not imply the transferral of assets from the TSO and DSO.

Regarding to the supply activity, and comparing to the First Directive, which progressively opened the market on the basis of the consumption of the final costumers, the new Directive, through *Article 21*, provided a new market opening system:

- ✓ Until 1st July 2004, the eligible customers specified in the First Directive;
- ✓ From 1st July 2004, at the latest, all non-household customers should be allowed to choose their retail suppliers;
- ✓ From 1st July 2007, residential customers should be eligible to access retail supply competition.

One of the highlights of the Second Directive concerns to regulation. Aware that a framework in line with cross-border energy trading requires the effective regulation of the transmission and distribution networks for reasons such as preventing discrimination, excessive pricing or cross-subsidies, the document, through *Article 23*, stated that EU members shall designate one or more competent bodies with the function of regulatory authorities, which will be wholly independent from the interests of the electricity industry.

These sector regulators were obliged to have a minimum set of standard competences which included, among others:

- ✓ Ensuring non-discrimination, effective competition and the efficient functioning of the market;
- ✓ Monitoring the rules on the management and allocation of interconnection capacity;
- ✓ Setting of mechanisms to deal with congested capacity;
- ✓ The publication of appropriate information by TSOs and DSOs concerning interconnectors, grid usage and capacity allocation to interested parties;
- ✓ The effective unbundling of accounts to avoid cross-subsidies between the different activities;
- ✓ Monitoring the terms, conditions and tariffs for connecting new producers of electricity to guarantee that these are objective, transparent and non-discriminatory;
- ✓ Overall compliance of the TSOs and DSOs with the directive.

Moreover, the document approached the possibility of national regulatory bodies cooperate not only with regulatory authorities from other EU country but also with the EC, whether for the development of the IEM or to break up dominant companies:

“National regulatory authorities shall contribute to the development of the internal market and of a level playing field by cooperating with each other and with the Commission in a transparent manner”

Article 23, Chapter VII

“Member States shall create appropriate and efficient mechanisms for regulation, control and transparency so as to avoid any abuse of a dominant position, in particular to the detriment of consumers, and any predatory behaviour.”

Article 23, Chapter VII

With regard to this last quote, the EU members shall provide, by 31st July of each year, the EC with a report on market dominance, predatory and anti-competitive behaviour. This report shall,

in addition, review the changing ownership patterns and any practical measures taken at national level to ensure a sufficient variety of market actors or practical measures taken to enhance interconnection and competition.

Concerning to the security of supply, the Second Directive went further, and brought some safeguard measures, including the introduction of a security plan in case of a sudden crisis in the energy market (*Article 24*). Besides, the document also made reference to monitoring of security of supply and the establishment of technical rules:

“EU members shall ensure the monitoring of security of supply issues covering, in particular, the supply/demand balance on the national market, the level of expected future demand and envisaged additional capacity being planned or under construction, and the quality and level of maintenance of the networks, as well as measures to cover peak demand and to deal with shortfalls of one or more suppliers.”

Article 4, Chapter II

The competent authorities shall publish every two years, by 31st July at the latest, a report outlining the findings resulting from the monitoring of these issues, as well as any measures taken or envisaged to address them and shall forward this report to the EC instantly.

“Member States shall ensure that technical safety criteria are defined and that technical rules establishing the minimum technical design and operational requirements for the connection to the system of generating installations, distribution systems, directly connected consumers' equipment, interconnector circuits and direct lines are developed and made public.”

Article 5, Chapter II

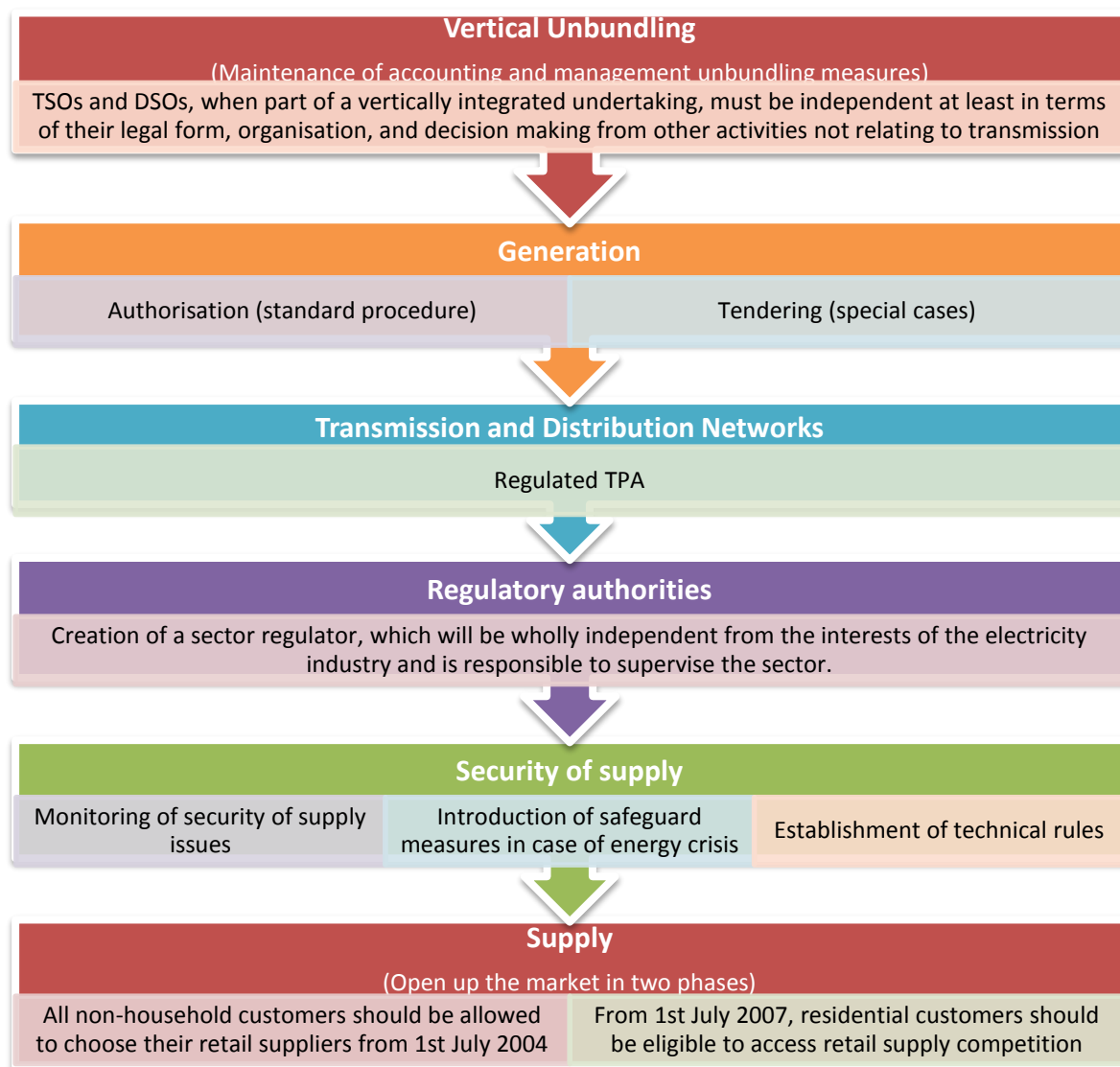


Figure 12. Main features of the Second Directive

According to the *Article 27*, the Directive also required the EC to play an important role towards the creation of the IEM. Thus, the EC must address and report to the European Parliament and Council (EPC) outlining the experience gained and progress made in creating the IEM. Basically, it should cover the existence of non-discriminatory network access, how effective is the regulation, the development of interconnection infrastructure and the security of supply situation in the EC, market dominance, concentration in the market and predatory or anti-competitive behaviour.

Besides that, the Second Directive, through the *Article 3*, established general rules for the organisation of the sector regarding public service obligations and customer protection (Figure 13). With the following guidelines, the EC expected to ensure that issues such as social exclusion, universal service, security of supply and environmental considerations were taken into account by private companies operating in a liberalised market:

- ✓ **To be in line with EU objectives:** EU members must ensure that electricity undertakings operate with a view to achieve a competitive, secure, and environmentally sustainable market in electricity;
- ✓ **Public service obligations:** EU members may impose public service obligations on electricity undertakings, but such mandate must be clearly defined, transparent, non-discriminatory, verifiable and shall guarantee equality of access for EU electricity companies to national consumers.
In order to carry on these public service obligations, EU members may introduce the implementation of long-term planning, taking into account at all times the possibility of TPA to the system;
- ✓ **Universal service:** EU members must ensure that all household customers enjoy universal service. By other words, it is the right to be supplied with electricity of a specified quality within their territory at reasonable, easily and clearly comparable, and transparent prices.
To ensure the provision of universal service, EU members may appoint a supplier of last resort;
- ✓ **State aid:** To achieve the goals of social and economic cohesion, as well as those of security of supply and environmental protection, economic incentives can be granted by the EU members, in a non-discriminatory and transparent way, for the maintenance and construction of the necessary network infrastructure;
- ✓ **Consumer protection:** In order to protect final customers and, in particular to ensure that there are adequate safeguards to protect vulnerable customers, the Directive contains specific measures aiming to allow such customers with the possibility of switching suppliers easily while at the same time being protected from disconnection;
- ✓ **Potential abuse of public service obligation:** EU members may decide not to apply the rules on generation or on TPA if the application of those provisions would obstruct the performance, in law or in fact, of public service obligations, but only insofar as the development of trade is not adversely affected to an extent contrary to the interest of the community;
- ✓ **Electricity labelling:** EU members shall ensure that electricity suppliers specify in or with the bills, the contribution of each energy source to the overall fuel mix of the supplier over the preceding year, and information on the environmental impact, in terms of at least emissions of CO₂;
- ✓ **Report the EC:** EU members must, upon implementation of this Directive, inform the EC of all measures adopted, whether or not such measures require derogation from this Directive.



Figure 13. General rules for the organisation of the sector

Undoubtedly, the Second Directive was a relevant mark towards the creation of the IEM. However, the document is not perfect and itself presented some major structural problems.

For instance, as stated before, it remained silent regarding the issue of granting monopoly rights. Moreover, on breaking up the dominant companies and introduce competition in the markets, it was still not explicit.

It is hard to understand how far the Directive required the EC and the national regulatory authorities to break up dominant companies and how far it just asked them to take measures that mitigate the effects of their dominance.

In order to achieve a fully operational and competitive internal market, there are some main obstacles, such as issues of access to the network, tariffication issues and different degrees of liberalisation between EU members.

Regarding the retail market opening, no mention is made on pricing policy. For instance, there is no requirement that tariffs should reflect costs or that firms should not discriminate between classes of consumer (e.g. by offering large consumers disproportionately better terms than small consumers). The Directive assumes that the operation of the market will prevent such abuses.

Other issue, related to the execution of the Second Directive, is the cross-border trading in electricity, which in terms of flow exchanges between EU members, remained organisationally and economically difficult, due to:

- ✓ The differences in the structure of tariffication systems applied in EU members;
- ✓ There was a risk of ‘pancaking of tariffs’ if all operators of the transit systems charged a tariff;
- ✓ Congestion on some borders often led to allocate the interconnection capacity to market operators upon unclear and discriminatory rules.

Thus, to overcome such problems (Figure 14), a harmonised EC framework in tariffs for cross-border energy trades and on the allocation of available interconnection capacities was felt necessary.

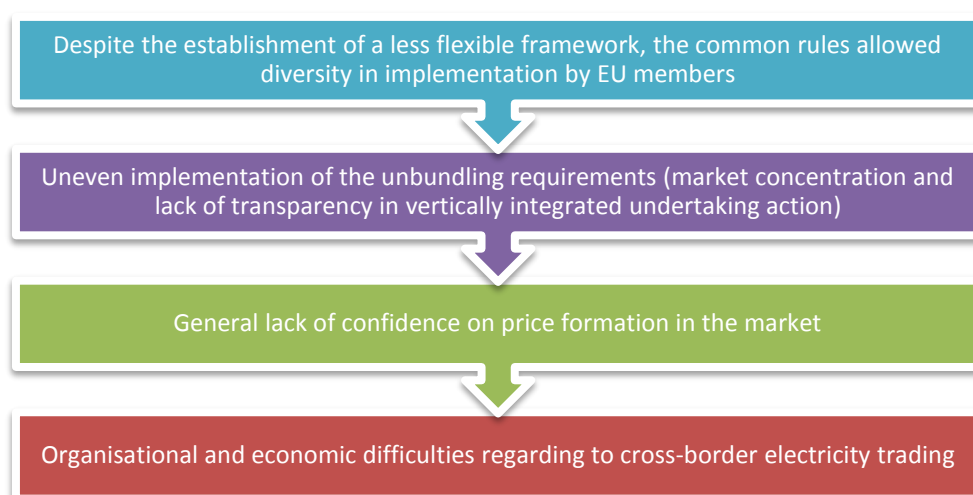


Figure 14. Main issues deriving from the Second Directive [21]

2.4.3. A new framework: The Third Directive

Once again, the measures and policies introduced by the EC, through the Second Directive, were insufficient to address the full operation and competitive of the IEM. Thus, after intense negotiations among EU members and the EC, the latest set of EU laws on energy markets was adopted in 2009 [22].

The provisions of this new framework (*Directive 2009/72/EC*), known as the Third Directive or the Third Package, marked the latest regulatory stage so far in the EU's efforts to complete the IEM, particularly through the set of new measures regarding to security and sustainable of the European electricity sector, as well as consumers' right.

Each Directive had its most significant features, and the Third Directive is no different (Figure 15). In this case, one of the highlights concerns the unbundling of transmission network systems.

Although the only option available so far was the legal unbundling, with this new Directive the EU members could choose between three different models:

- ✓ **Full ownership unbundling (FOU):** This model consists in the full separation between the operation of electricity transmission networks from generation and supply activities. Under this regime, TSO can no longer be affiliated or be part of a company which is also active in those activities.
According with *Article 9*, the TSO must have full control of the network. However, in this regard, it can also be understood that a person or a company may still be able to hold shares in both a network and a supply or generation undertaking as long as these shares represent a non-controlling minority interest.
- ✓ **The Independent System Operator (ISO):** According with the *Article 13*, in the ISO model when the transmission system belongs to a vertically integrated undertaking, EU members may decide not to choose the first model and designate then an ISO, which must be subject to approval by the EC. Once appointed, the ISO has to commit to complying with a ten year network investment plan agreed upon by a regulatory authority.
The ISO has to be an entity full separated from the vertically integrated undertaking, that may not hold any interest in a supply or generation company, and must perform all functions of a TSO.
- ✓ **The Independent Transmission Operator (ITO):** This last model is only applicable in EU members where TSO belongs to a vertically integrated undertaking. EU members that have already introduced the ISO model or full ownership unbundling models will not be able to revert to an ITO model.
According to *Articles 18 and 19*, the ITO model preserves integrated supply and transmission companies in exchange for obliging such companies to comply with additional rules to ensure that the two activities are operated independently, including for instance, the managers of TSO cannot have positions of responsibility, interest or business relationships, directly or indirectly, with the relevant vertically integrated undertaking or the network development and investment decisions taken by an ITO will be examined to ensure that they are consistent with relevant EC-wide plans.
This model can be considered the lowest threshold for network unbundling.

At the end, with this Third Directive the EC wanted to make sure that any system model for unbundling should be effective in removing any conflict of interests between generators, suppliers and TSO, in order to create incentives for the necessary investments and guarantee the access of new market entrants under a transparent and efficient regulatory regime and should not create an overly onerous regulatory regime for national regulatory authorities.

Concerning generation, no new measures are introduced regarding the introduction of competition in the electricity generation phase. According to *Article 7*, the only innovations introduced concern the utilisation of RES. Thus, the EU members must take into account the contribution of the corresponding generating capacity to meeting the overall EC target of at least a 20% share of energy from RES in the EC's gross final consumption of energy in 2020.

As far as distribution activity is concerned, by the *Article 25* a EU member may require the DSO, when dispatching generating installations, to give priority to generating installations using RES or waste or producing combined heat and power.

Unlike the transmission network system, the unbundling of the distribution network system remained without any modification (legal unbundling). However, the persons responsible for the management of the DSO must not participate in company structures of the integrated electricity undertaking responsible, directly or indirectly, for the day-to-day operation of the generation, transmission or supply of electricity.

Moreover, if the DSO is part of a vertically integrated undertaking, the EU members shall ensure that the activities of the DSO are monitored by regulatory authorities so that it cannot take advantage of its vertical integration to distort competition. In particular, vertically integrated DSO shall not, in their communication and branding, create confusion in respect of the separate identity of the supply branch of the vertically integrated undertaking.

Regarding the supply activity, there is no further restructuring with exception for *Article 33*, which referred to the prevention of a disruption in supply.

Keeping in the track of the Second Directive, the regulation was also subject of attention in this new framework.

Whereas the Second Directive acknowledged that the creation of a internal electricity market requires the effective regulation of the transmission and distribution networks, it failed to separate national regulatory authorities from public entities. Although regulatory authorities were required to be complete independent from the interests of the electricity industry, political independence was forgotten.

Concerned about this situation, the Third Directive, through *Article 35*, required national regulatory authorities to be legally distinct and functionally independent from any other public or private entity. Besides that, the EU members shall ensure that its staff and the persons responsible for its management do not seek or take direct instructions from any government or other public or private entity when carrying out the regulatory tasks. For that purpose, regulatory authorities shall be granted budgetary autonomy, legal personality and appropriate human and financial resources.

According to *Article 37*, regulatory authorities as regard to market regulation powers and duties, they are responsible for monitoring and intervening in the allocation of interconnection

capacity, setting of mechanisms to deal with congested capacity, ensuring compliance of TSO and DSO with the rules set forth in the Directive, among others.

Besides that, and concerning about international energy trading, the framework also provided a regulatory regime for cross-border issues (*Article 38*).

Thereby, regulatory authorities shall closely consult and cooperate with each other, to foster the creation of operational arrangements in order to enable an optimal management of the network, promote joint electricity exchanges and the allocation of cross-border capacity.

Moreover they must also coordinate the development of all network codes for the relevant TSOs and other market actors, and coordinate the development of the rules governing the management of congestion.

At the same the Third Directive was adopted, another document was also accepted by the EU members: *Regulation(EC) 713/2009* [23]. The main goal of this document was the establishment of ACER.

Since the adoption of the First Directive, the lack of coordination at high level has constantly undermined the establishment of a truly IEM. Aware of this, in an attempt to reinforce the position of regulators at the European level, with the Second Directive it was created an independent advisory group, called the *European Regulators Group for Electricity and Gas* (ERGEG), to facilitate consultation, coordination and cooperation between the regulatory bodies in EU members and the EC. Despite the good work provided by this entity, the reality showed that it was insufficient.

Thus, a new entity with clear competences and with power to adopt individual regulatory decisions in a number of cases, including the extinction of barriers to cross-border exchanges of electricity with a view to achieving the objectives of EC energy policies, was required and the response came with the entry of ACER.

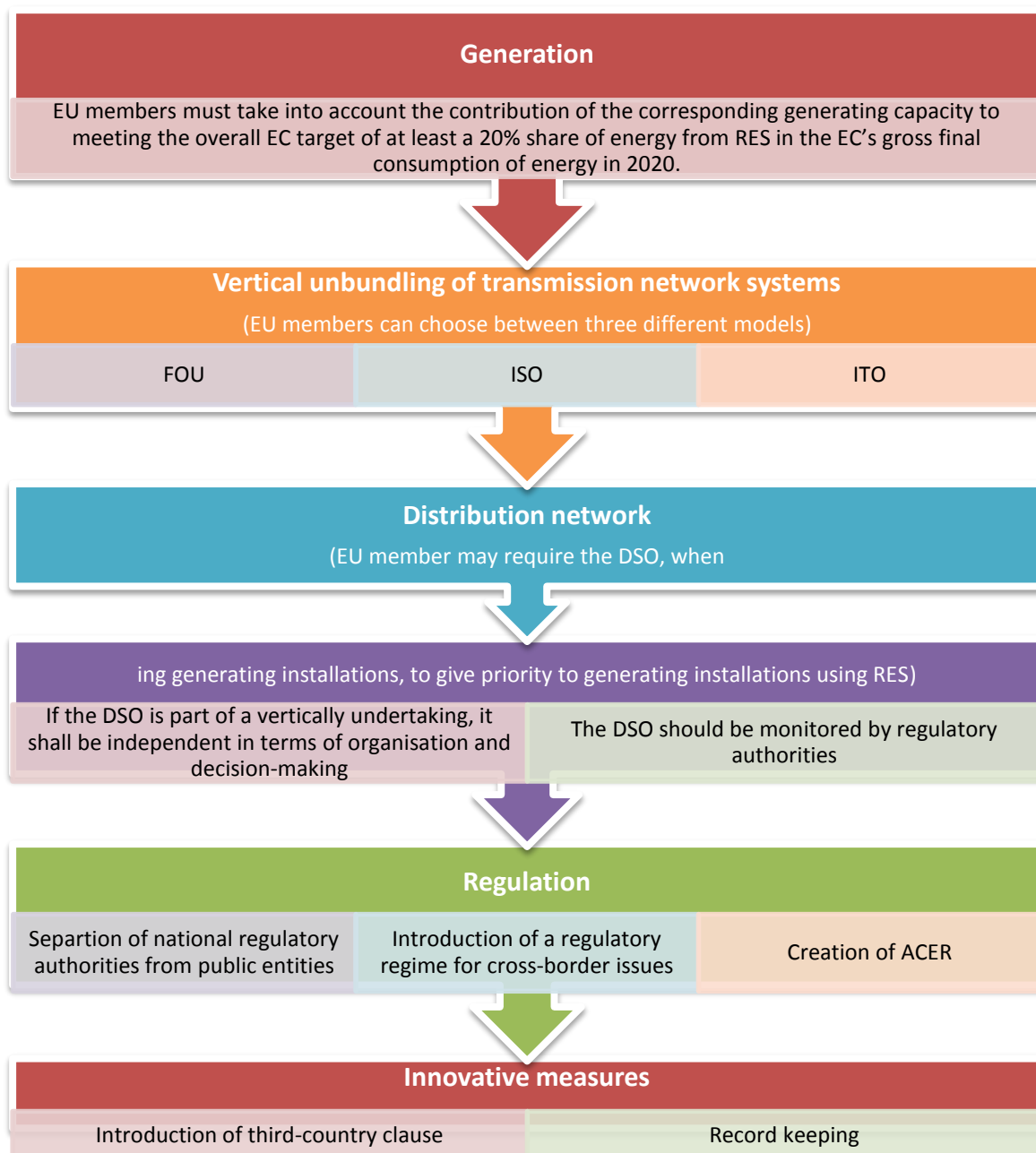


Figure 15. Main features of the Third Directive

Trying to anticipate the future, the Third Directive also included some innovative measures in relation to third countries stated in the *Article 11*.

Fundamentally, the framework requires non-EU companies to be in line with the EU laws in case they wish to acquire a significant share of an EU transmission network. In such acquisitions, national regulatory authorities can refuse the certification of a TSO if the relevant company does not comply with the unbundling requirements of Article 9, its market entry would will not put at risk the security of supply of the EU members and the EC.

This assessment must be carried out by the very same authority, with the only limitation of having to take into account the international agreements between the EU and the respective third country.

The record keeping was another of the innovations of this Third Directive. Thus, and according to *Article 40*, the EU members shall require generator and supply undertakings to keep at the disposal of the national authorities, including the national regulatory authority, the national competition authorities and the EC, for the fulfilment of their tasks, all data relating to operational decisions and trades. The idea behind this Article, is the hope that such requirements enable regulators to better assess allegations of market abuse and to study past behaviour of market players.

As well as the last Directive, the new framework set general rules for the organisation of the sector with a view to achieve a competitive, secure and environmentally sustainable electricity market (Figure 16). Thus, in order to further consolidate consumer protection, innovation, and makes an attempt to merge national systems into one European electricity market, the *Article 3* considered:

- ✓ **Entrance of foreign electricity suppliers:** EU members shall ensure that all customers may have their electricity provided by a supplier regardless of the Member State in which the supplier is registered. In this regard, EU members shall take all measures necessary to ensure that administrative procedures do not discriminate the entrance of foreign electricity suppliers.
- ✓ **Consumer switching:** EU members shall ensure that when a customer wishes to change supplier, the change is effected, in a non-discriminatory manner as regards cost, effort or time, within three weeks.
- ✓ **Definition the concept of vulnerable customer:** EU members shall take appropriate measures to protect final customers, and shall, in particular, ensure that there are adequate safeguards to protect economically vulnerable customers.
- ✓ **Promotion of sustainable development:** EU members shall implement measures to achieve the objectives of social and economic cohesion and environmental protection.
- ✓ **Promoting energy efficiency:** EU members shall strongly recommend that electricity undertakings optimise the use of electricity, for example by providing energy management services, developing innovative pricing formulas, or introducing intelligent metering systems or smart grids.
- ✓ **Providing information to customers:** EU members shall ensure the provision of single points of contact to provide consumers with all necessary information concerning their rights, current legislation and the means of dispute settlement available to them in the event of a dispute.
- ✓ **Creation of a consumer body:** MS shall ensure that an independent mechanism such as an energy ombudsman or a consumer body is in place in order to ensure efficient treatment of complaints and out of court dispute settlements.



Figure 16. General rules for the organisation of the sector

Although the Third Directive set the full ownership separation between the TSO and the generation and supply activities for the first time, the framework still allow EU members, through the ITO model, to maintain system arrangements where TSOs belong to a vertically integrated undertaking, so uneven implementation of the Directive is expected.

Nevertheless, reviewing the three European Directives (Figure 17), it is safe to say the implementation of the successive frameworks has been almost a success towards the creation of a fully operational and competitive IEM.

Obviously, it is hard to get it right the first time. However, looking back, it is possible to note that, for instance, the competitive activities have been opened to all customers before finishing the restructuring of the electricity industry. Moreover, the institutionalisation of the cooperation of national regulatory authorities and the TSOs and DSOs were achieved too in an earlier stage.

			Prior to 1996	First Directive	Second Directive	Third Directive
Competitive Sectors	Generation		Monopoly	Authorisation Tendering	Authorisation	Authorisation
	Supply	Wholesale	No choice	1/3 of the market opened	Open market by 2004	Open competition
		Retail	No choice	No choice	Open market by 2007	Open competition
Non-competitive Sectors	Transmission and Distribution		Monopoly	Negotiated TPA Regulated TPA Single Buyer	Regulated TPA	Regulated TPA

Figure 17. Evolution of the Electricity Sector over the years

2.5. European Energy Mix Outlook

According to EC reports [24], in 2010 Europe represented 6.5% of the world energy production (Table 1). Not a significant value when compared to China (17.5%), USA (13.4%), Middle East (12.7%) or even Russia (10.1%), but considerable.

Table 1. Evolution of the world energy production, by region [24]

Mtoe	1995	2000	2005	2009	2010	2010 (%)
EU-27	961	946	901	817	835	6.5
China	1 066	1 064	1 623	2 085	2 2253	17.5
United States	1 659	1 667	1 631	1 686	1 725	13.4
Middle East	1 140	1 329	1 530	1 561	1 636	12.7
Asia*	826	934	1 121	1 303	1 360	10.6
Russia	968	978	1 203	1 186	1 293	10.1
Africa	767	883	1 081	1 135	1 174	9.1
Rest of the World	1 884	2 178	2 441	2 499	2 564	20.0
World	9 271	9 980	11 532	12 273	12 840	100

Although the worldwide mix of primary energy production has been changing significantly over the past four decades, there is something that remains the same: coal and petroleum continue to be the energy sources most widely used in 2010 with 28.4 % and 31.7 %, respectively (Table 2).

Table 2. Evolution of the world energy production, by energy source (in Mtoe) [24]

Mtoe	1995	2000	2005	2009	2010	2010 (%)
Petroleum and Products	3 395	3 701	4 057	3 994	4 077	31.7
Solid Fuels	2 234	2 229	2 937	3 436	3 641	28.4
Gas	1 815	2 063	2 373	2 529	2 719	21.2
Renewables	1 202	1 290	1 422	1 585	1 652	12.9
Nuclear	608	676	722	703	719	5.6
Other	17	22	21	26	32	0.3
Total	9 271	9 980	11 532	12 273	12 840	100

Another important feature regarding worldwide energy is the gross inland consumption (Table 73). By region, it is notable that the biggest economies, such as China or USA, are the ones with greatest needs reaching in 2010 a share of 19.3 % and 17.4 %, respectively. Europe, is third of the list, with a 13.4 % share.

Table 3. Evolution of the world gross inland consumption, by region (in Mtoe) [24]

Mtoe	1995	2000	2005	2009	2010	2010 (%)
EU-27	1 637	1 685	1 780	1 654	1 714	13.4
China	1 058	1 108	1 709	2 301	2 469	19.3
United States	2 067	2 273	2 319	2 165	2 216	17.4
Asia*	880	1 052	1 259	1 461	1 524	11.9
Russia	637	619	652	647	702	5.5
Africa	438	496	596	676	682	5.3
Middle East	309	358	488	584	614	4.8

Rest of the World	2 209	2 418	2 649	2 684	2 844	22.3
World	9 235	10 009	11 452	12 172	12 765	100

As expected, looking to the final worldwide energy consumption (Figure 18), the variable has been also increasing and the responsables are the world’s fastest growing economies for the past two decades, China and India [25]. From 1990 to 2010, China’s economy grew by an average of 10.4 % per year and India’s by 6.4 % per year.

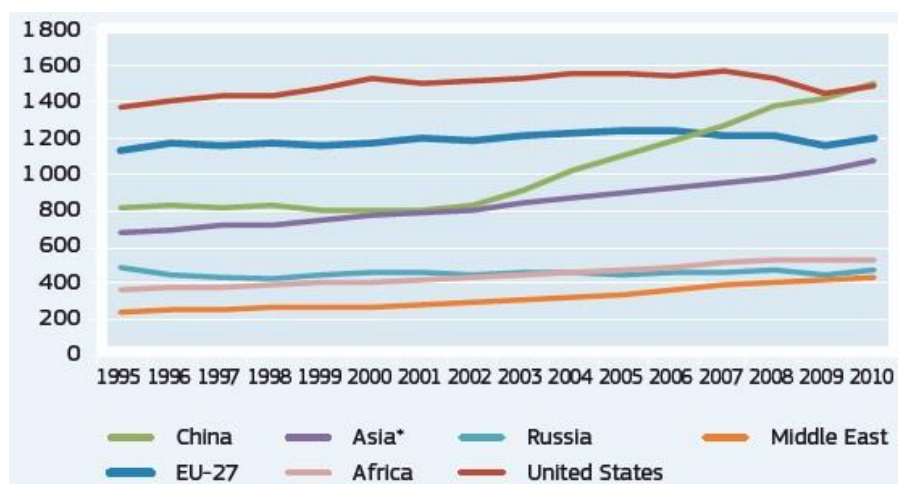


Figure 18. Evolution of the world energy consumption, by region (in Mtoe) [24]

Europe, as others mature economies, including the USA or Russia, shows an evident slow pace of growth in comparison with the emerging economies. Thus, in 2010 the final energy consumption can be translated in figure 19.

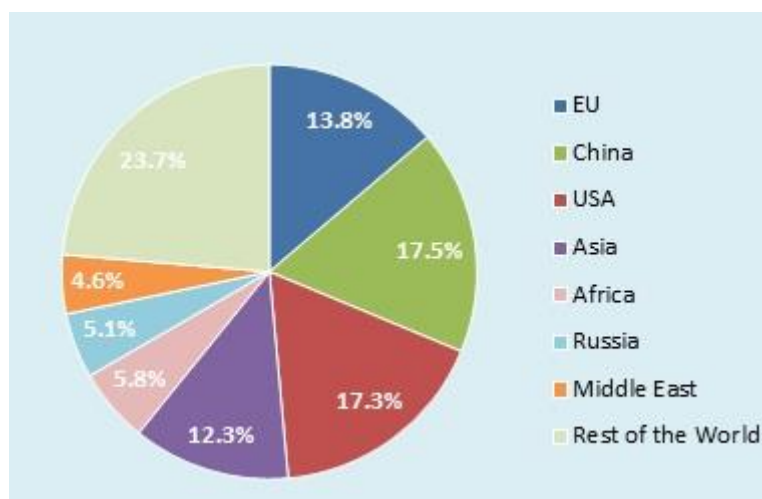


Figure 19. World final energy consumption in 2010

Regarding the world’s electricity generation (Table 4), coal is the predominant energy source used. In 2010, coal-fired generation accounted for 40.5 % and natural gas 22 % of overall

worldwide electricity generation, followed closely by RES and Nuclear with 19.4 % and 12.9 %, respectively.

Table 4. Evolution of the world electricity generation, by energy source (in TWh) [24]

Mtoe	1995	2000	2005	2009	2010	2010 (%)
Solid Fuels	4 994	6 001	7 333	8 110	8 663	40.5
Gas	2 002	2 732	3 665	4 371	4 768	22.3
Renewables	2 638	2 842	3 291	3 868	4 160	19.4
Nuclear	2 332	2 591	2 768	2 696	2 756	12.9
Petroleum and Products	1 238	1 207	1 145	996	989	4.6
Other	25	37	46	47	60	0.3
Total	13 230	15 410	18 248	20 087	21 397	100

Although RES have positive environmental and energy security features, most RES technologies other than hydroelectricity do not compete economically with fossil fuels, except in a few regions or in niche markets. Photovoltaics (PV), for instance, is currently a niche of RES, but it can be competitive where electricity prices are especially high, where peak load pricing occurs, where government incentives are available, or where infrastructure interconnection issues pose large costs. Government policies or incentives often provide support for construction of renewable generation facilities [25].

Overviewed the energetic situation worldwide, it is time to focus in EU between 1900 and 2011. Thus, starting by the energy production, it is visible the decreases of energy production in Europe over the years (Figure 20). Total primary energy production in the EU has declined continuously between 2001 and 2011 by 15 % [26].

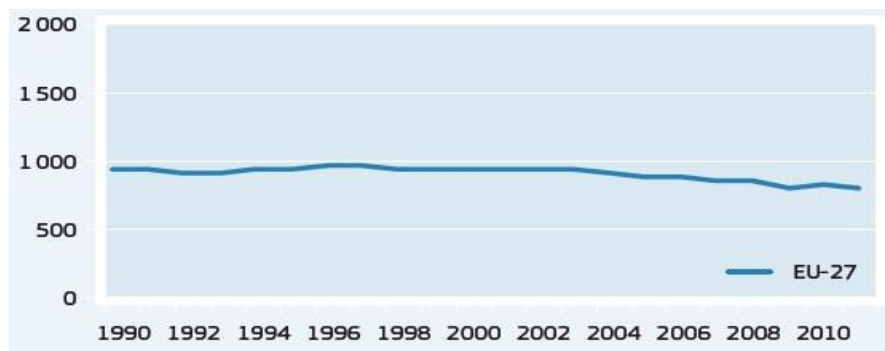


Figure 20. Evolution of the energy production in EU (in Mtoe) [24]

Historically, the European mix of primary energy production was dominated by fossil solutions, such as coal or natural gas. Not even with the seventies oil crisis the scenario changed, when generation from nuclear power increased rapidly. In fact, the situation remained unchanged until very recently with the adoption of the *Maastricht Treaty* in the beginning of the nineties, and the subsequent amendments to the treaty (Amsterdam, Nice and Lisbon). The objectives were clear, the principle of sustainable development supported by the use of RES, while protecting the environment.

Thus, with these guidelines behind, in 2011 the RES (20.1 %) reached a share similar to coal (20.7 %), while the natural gas, despite its falls from year to year, accounted a share of 17.4 %. However, the leading place is occupied by nuclear power since the turn of the century, registering in 2011 a share of 29 % (Figure 21).

In the last decade, RES production grew by 63 %, while reductions were recorded in the production of all other fuels [26].

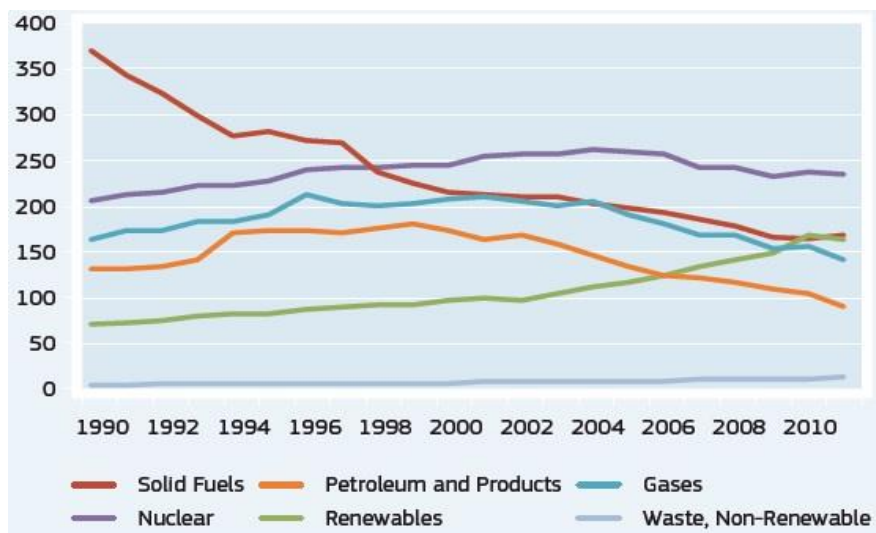


Figure 21. Evolution of the EU energy production, by energy source (in Mtoe) [24]

Gross inland consumption, or total energy demand, represents the quantity of energy necessary to satisfy inland consumption of a geographical region. Europe, in 2011, the main energy source was petroleum with a share of 35.2 % (Figure 22). More distant of this mark were natural gas, coal, nuclear and RES with shares of 23.4 %, 16.8 %, 13.8 % and 10 %, respectively.

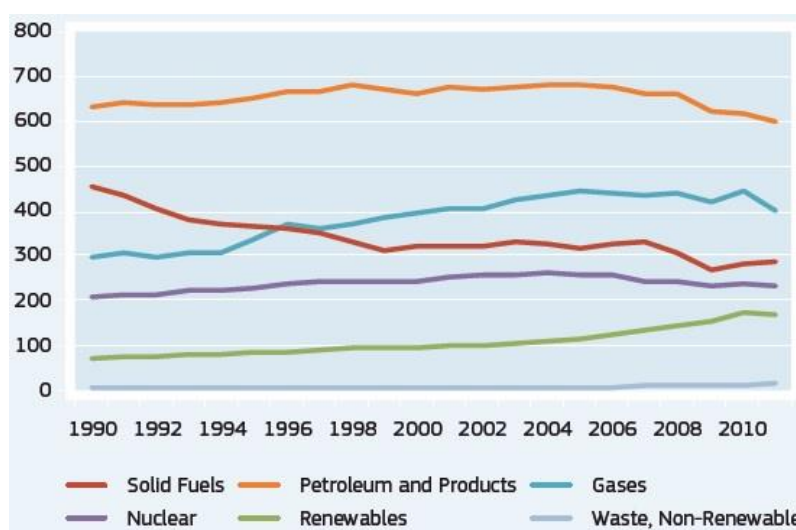


Figure 22. Evolution of the EU gross inland consumption, by energy source (in Mtoe) [24]

Exploring the RES share (Figure 23), biomass and renewable wastes take an distinguished position with 6.8 % share, followed far behind by hydro, wind power with a share of 1.6 % and 0.9%, respectively. At the end, comes geothermal and PV power with a share of 0.4 % each.

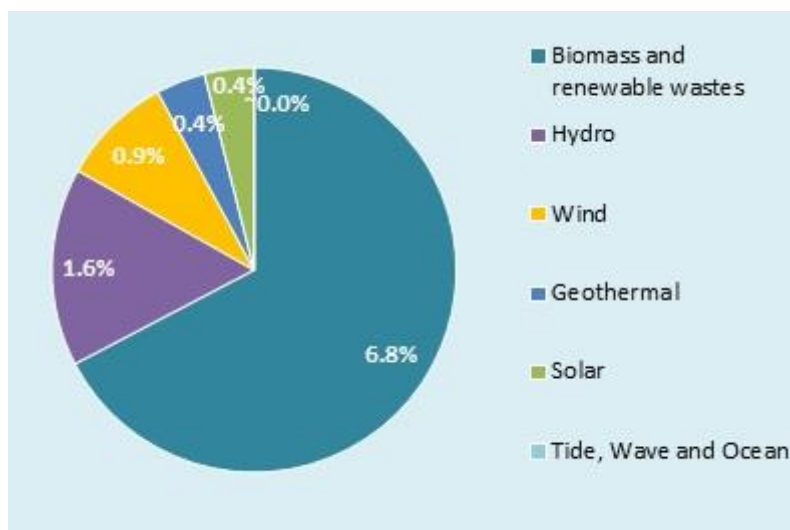


Figure 23. Gross energy consumption, by RES (in 2011)

As shown before, Europe is presenting a slow pace of growth in comparison with the emerging economies (Figure 24). In 2011 the oil was ranked in first place (40.3 %) among the EU final energy consumption, followed by natural gas (21.9 %), electricity (21.6 %) and RES (7 %).

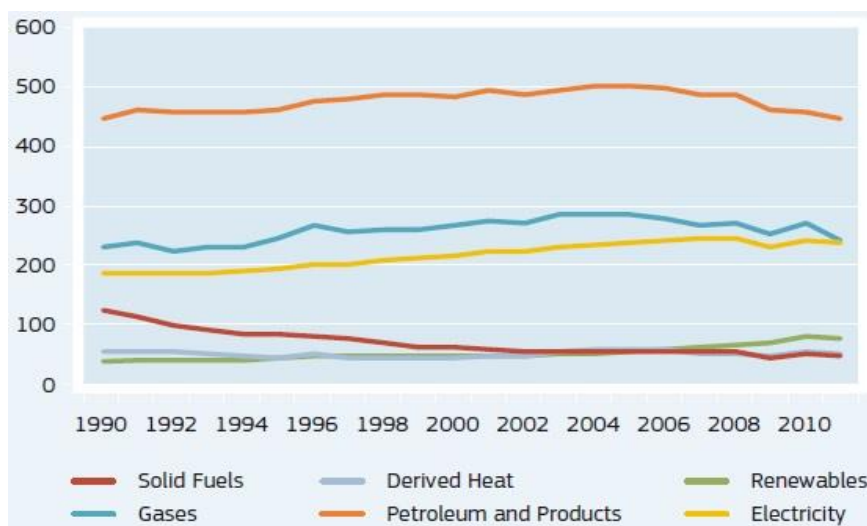


Figure 24. Evolution of the EU final energy consumption, by fuel (in Mtoe) [24]

Further analysis of the final energy consumption in Europe lead to a conclusion: there was a fall of 4 % between 2001 and 2011 [26], mainly due to the decrease in the consumption by industry (-13 %) and households (-9 %). On the other hand increases were recorded in services (10 %) and the transport sector (6 %). These trends reflect a shift from an economy based on the industry towards a economy based on services as well as an decrease in energy intensity due to energy efficiency gains.



Figure 25. Evolution of the EU final energy consumption, by sector (in Mtoe) [24]

In 2011, EU final energy consumption reached 1 109 Mtoe (Figure 25). A third of this amount was consumed by the transport sector (33 %), followed by the industrial sector (26 %), households (24.7 %) and services (13 %).

According to Eurostat report, there are several sectors which contribute to the final energy consumption in Europe [26]. The most relevant are: Industry, Transport and Residential. With regard to the analysis, the study period is the last decade (2001-2011).

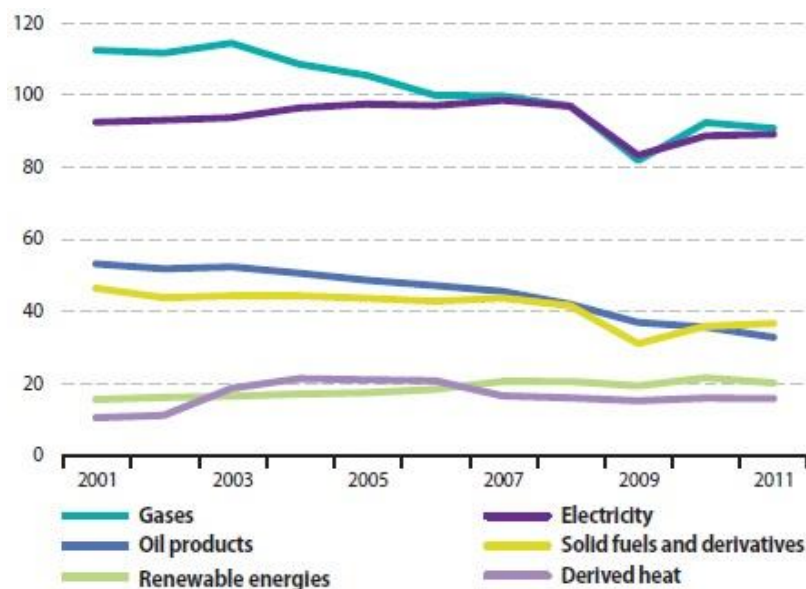


Figure 26. Evolution of the EU final energy consumption in Industry (in Mtoe) [26]

Thus, in relation to industry (Figure 26), between 2001 and 2011 the sector recorded reductions in the consumption of oil (-39 %), coal (-21 %), natural gas (-19 %) and electricity (-4 %). In

contrast, over the same period the consumption of derived heat and RES grew by 53 % and 31 % correspondingly.

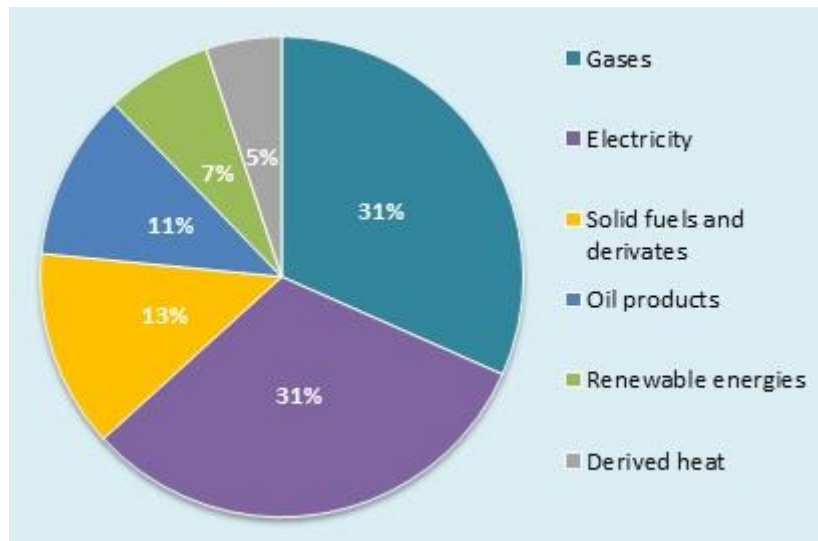


Figure 27. Final energy consumption in EU Industry, by energy source (2011)

In 2011, natural gas and electricity each covered 31 % of the energy requirements of EU industry, followed by coal (13 %) and oil (11 %). The contribution of RES and derived heat were smaller with 7 % and 5 %, respectively (Figure 27).

There are several types of transportations in EU, including by road, air or rail. Within the transport sector of the EU, road transport was the most energy consuming mode since there are record keeping.

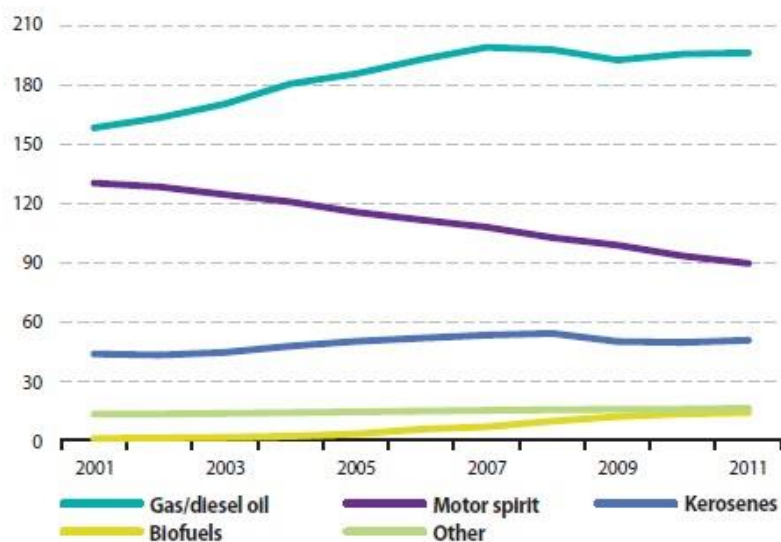


Figure 28. Evolution of the EU final energy consumption in Transport (in Mtoe) [26]

In the last decade, significant changes were observed in the fuel mix consumed by the transport sector in the EU (Figure 28). From 2001 to 2011, the consumption of motor spirit decreased by 31 %, while the consumption of all other fuels grew.

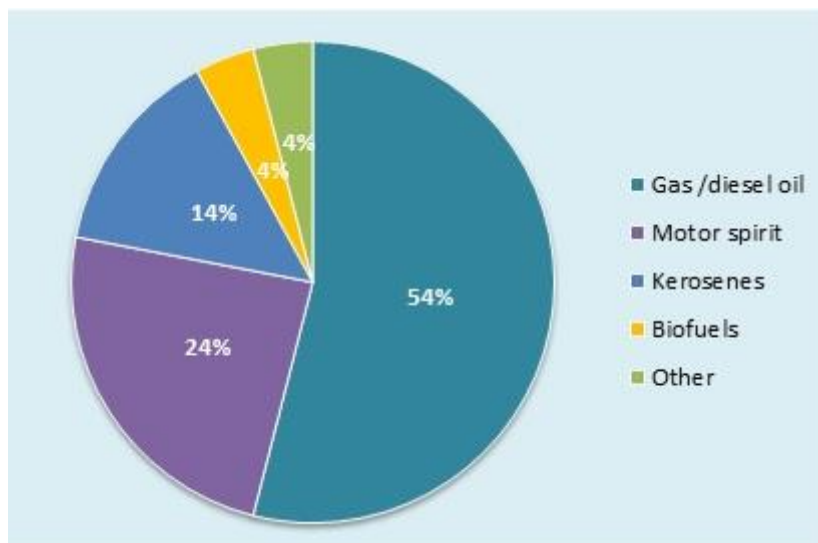


Figure 29. Final energy consumption in EU Transportation, by energy source (2011)

For instance, gas/diesel oil accounted for 54 % of the total in 2011 compared to 46 % in 2001. In contrast, the share of motor spirits dropped to 24 % in 2011 from 38 % in 2001 (Figure 29). Kerosenes maintained a share of approximately 14 % in 2011, while biofuels made up 4 % of total transport consumption.

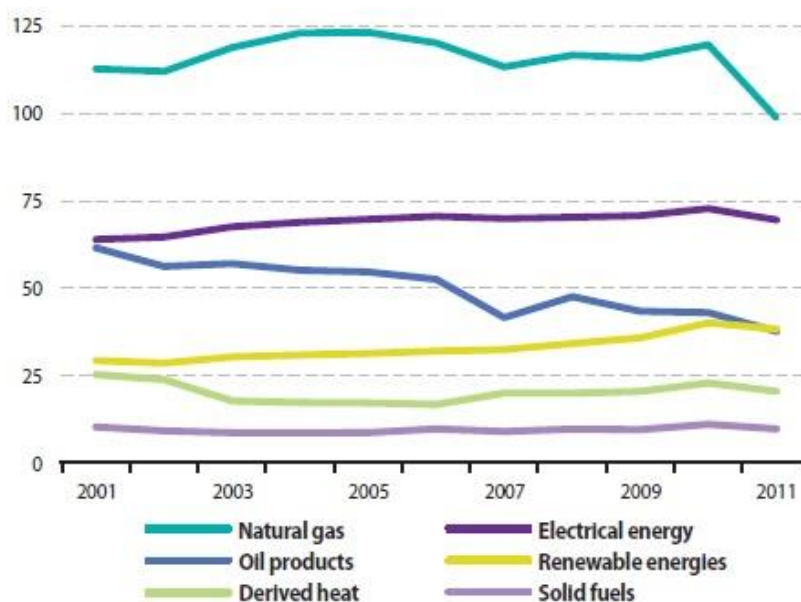


Figure 30. Evolution of the EU final energy consumption in Households (in Mtoe) [26]

Between 2001 and 2011 total energy consumption by EU households dropped by 9 %. According to Figure 30, the energy source with the highest decrease over this period was oil (-

39 %), followed by derived heat (-19 %), natural gas (-12 %) and coal (-5 %). In contrast, increases were recorded in the consumption of RES (31 %) and electricity (9 %).

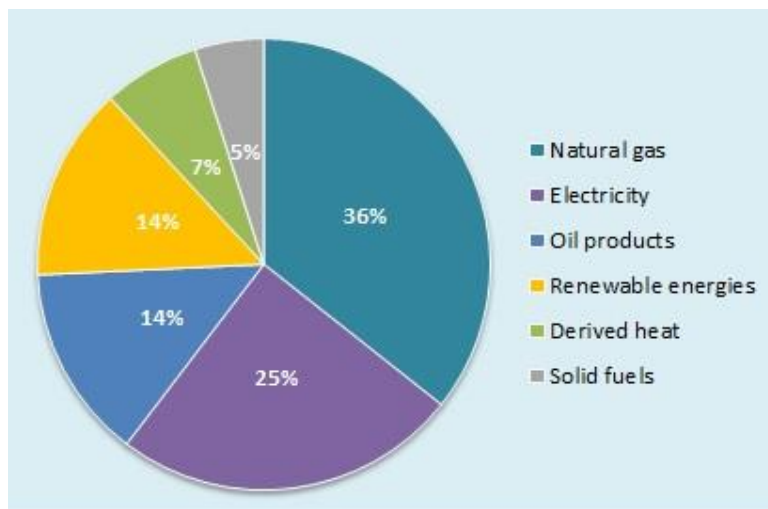


Figure 31. Final energy consumption in EU Households, by energy source (2011)

In 2011 (Figure 31), natural gas made up 36 % of the total energy consumption by EU households, followed by electricity (25 %), RES with the same share as oil (14 %), derived heat (7 %) and coal (4 %).

Since the nineties, the installed capacity of EU electricity power plants have been growing continuously and in 2011 reached the overall amount of 920 GW. Considering the last decade, it is possible to draw the graph shown in Figure 32.

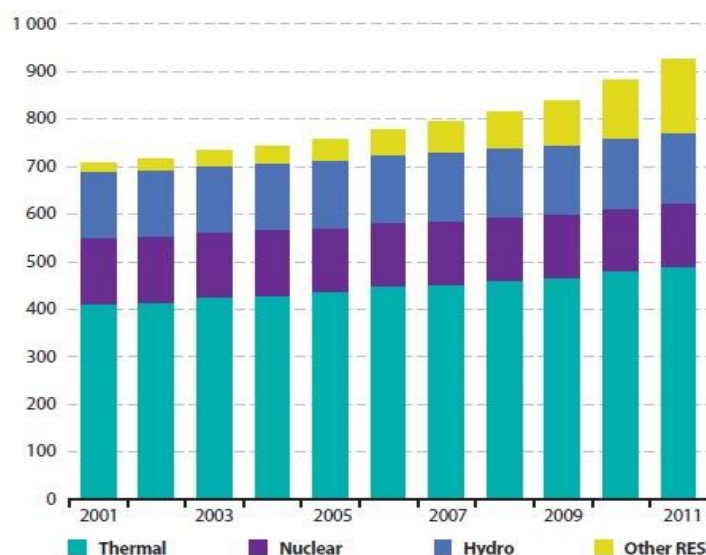


Figure 32. Installed capacity of EU electricity power plants, by type (in MW) [26]

According to Figure 32, in 2011 the thermal capacity reached 53% of the total installed capacity, much higher than nuclear (14 %), hydro (16 %) or other type of RES (17 %) capacity.

Not counting with hydropower, looking in detail to the RES type it is possible to conclude that wind power is responsible for the largest amount of RES share, followed by PV power and biomass [24].

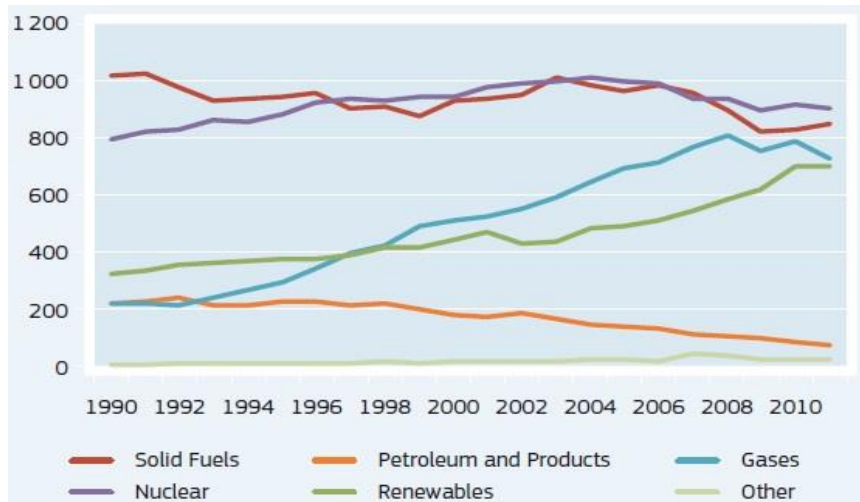


Figure 33. EU gross electricity generation, by type (in TWh) [24]

With regard to the generation of electricity produced by an electric power plant, in 2011 the EU gross electricity generation was 3 268 TWh, a 6 % increase when compared to 2001. It is also worth mentioning, that over this period, generation from hydro and other RES grew by 50 % and thermal generation by 1 %. On the opposite, nuclear generation dropped by 7 % [26].

According to Figure 33, in 2011 the electricity was generated primarily by nuclear power plants with a share of 27.6 %, followed by thermal plants (coal, natural gas and petroleum with a share of 25.9 %, 22 % and 2.2 %, respectively). Backing up the EU electricity generation, was the RES with a global share of 21.3 %.

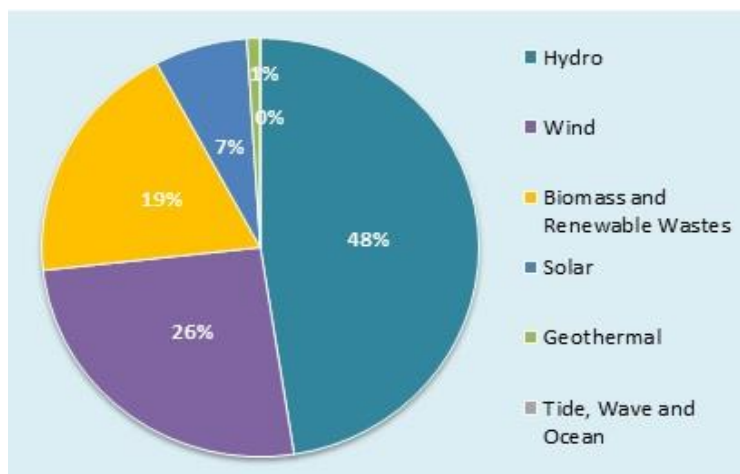


Figure 34. EU gross electricity generation, by RES (2011)

Focusing on the RES share (Figure 34), almost half of the gross electricity was generated by hydropower (48 %). The other half was constituted by wind power (26 %), PV power plants (7 %), biomass and renewable wastes (19 %), and finally, geothermal (1 %).

One of the most famous measures introduced by the EU regarding to environmental protection and promotion of RES, was the 2020 climate and energy package. Basically, this package is a set of binding legislation which aims to ensure the EU meets its ambitious climate and energy targets for 2020. Shortly, these targets, known as the "20-20-20" targets, set three key objectives for 2020:

- ✓ A 20% reduction in EU greenhouse gas emissions (GHG) from 1990 levels;
- ✓ Raising the share of EU energy consumption produced from RES to 20%;
- ✓ A 20% improvement in the EU's energy efficiency.

Focusing on the first two goals, at the moment the results are promising and let a positive signal that these targets will be achieved possibly in a couple of years before the established deadline (Table 5). For instance, in 2011 EU registered a total share of 13 % in the use of RES [26].

Table 5. Share of RES in gross final energy consumption (%)

	2007	2008	2009	2010	2011	2020 target
EU-28	9.2	9.6	10.6	12.1	13.0	20.0

Moreover, regarding to GHG, the following table represents the significant reduction over the years [24].

Table 6. Evolution of the GHG reduction over the years

Index 100=1990	1990	2000	2005	2008	2009	2010
EU-27	100	93	91	92	89	83

Analysing all the data presented before, it is possible to come up with some conclusions. For instance, according to Figure 33, the picture for different electricity generation technologies is one of contrasts: the EU appears to have shifted from the recent trend of “RES plus gas” to “RES plus coal”. This might be explained by the failure of the CO2 emission market, which was expected to ‘tax’ the use of coal for electricity generation purposes.

Table 7. Evolution of the GHGs emissions in Europe

Million ton CO ₂ or equiv.	1995	2000	2005	2009	2010
EU-27	5 412	5 330	5 448	4 903	5 006
Index 1995	100%	98%	101%	91%	93%

In line with this conclusion, and supported by energy and environmental indicators (Table 7), it is also rational to come up with the fact that although final energy consumption stagnated, the low-carbon generation increased, due to the increase in coal-fired generation. The reason?

It’s simple, and it is mainly due to the policy choices adopted by major EU economies. Exploring this idea, it is the result of insignificant carbon price signal, cheap coal, expensive gas and reduced demand, combined with low wholesale prices and subsidised RES that has been pushing gas out of the market [27]. Moreover, the EU comeback for coal can also be seen as a forced escape of the natural gas coming from Russia, due to the latest events in international relations between Ukraine and Russia.

Thus, since its qualities as back-up generation are as uncontested, as is its climate advantage compared to coal, natural gas-fired power plants play a central role in the future agenda on strategic reserve and capacity remuneration mechanisms not only in EU, but worldwide [27].

Helping the situation, there is another interesting aspect related to RES. The RES support schemes, introduced in order to achieve the EU’s 20% RES target, are undercutting the CO2 price (Figure 35). Such an effect increases the costs of the transition to low-carbon electricity, while having no impact on the reduction of the emissions. Historic data shows that, increasing RES generation was closely accompanied by increase in coal-fired generation [27].



Figure 35. Evolution of the carbon prices between 2008 and 2012 [27]

Closely related to the last sentence is the installed capacity, which in the case of RES power plants has been growing continuously. A common characteristic of added RES capacities throughout the whole period is that they are subsidy driven. However, it is important to prevent a possible slowdown of RES growth due to a change in national RES support policies or other upcoming event [27].

3. A call for energy Cooperatives

3.1. Introduction

Since ancient times people from different backgrounds join to community solutions, in response to social and economic disadvantage and in the interest of the weak social layers, particularly the working poor. Basically, what unites them is a shared belief that people, not money, should and have to be the key for transformation and progress. Thereby, it doesn't take very long to this common expectations and basis for cooperation that goes beyond individual interests, evolve to a cooperative community movement that spreads practically throughout the sectors of our society.

The community Cooperatives that are popping up today across the world are the last stage of an evolutionary process which has seen the progressive shift of Cooperatives' aims from specific social and professional groups to society as a whole.

Looking back into the history of the Cooperatives, the early steps of the movement have started in the 19th century, when the first Cooperatives emerged within the working class in order to offer better opportunities to the workers. Besides its economic role, Cooperatives were also part of a broader social movement with political aims of transforming society. At that time, Cooperatives were related to special-interest groups. That means, they usually served purposes which were not transversal to all society members but specific to a restricted group of people [28].

However, at some point, a new cooperative trend has started to arise. Despite inspired by the same ideals and having the same legal forms, they had a different nature in the way they provided essential services of interest to all members of a community, not just a part of it [28]. Among the first Cooperatives that met the needs of a whole community, the energy Cooperatives, which will be subject of analysis ahead, are some of the clearest and most significant examples of this trend.

Cooperatives have been addressing the community issues for over 150 years, and the last development relevant to the evolution of cooperative movement occurred towards the end of the last century with the enlargement of Cooperatives' aims to embrace society's benefit. Though early Cooperatives were only concerned in granting benefits to their members, the pursuit of the public interest was not their objective. In other words, their explicit aim was to benefit members through trade with them and the community's well-being was an unintended consequence. However, in the last few decades of the 20th century the well-being of society as a whole made its first appearance as an explicit goal for the Cooperative firm. In the new community Cooperatives arising today these evolutionary paths intertwine to give birth to a highly complex and diversified category of Cooperative organisations [28]. But before proceeding, how can we explain to someone what is a Cooperative?

By the International Labour Organisation (ILO) *Recommendation No. 193 on the Promotion of Cooperatives 2002* a Cooperative is defined as [29]:

“An autonomous association of persons united voluntarily to meet their common economic, social and cultural needs and aspirations through a jointly owned and democratically controlled enterprise.”

ILO Recommendation 193, paragraph 2

This definition has been adopted from the International Cooperative Alliance Statement on *Cooperative Identity 1995*, and nowadays is accepted worldwide. The same document states the seven principles to which Cooperatives must comply (Figure 36):

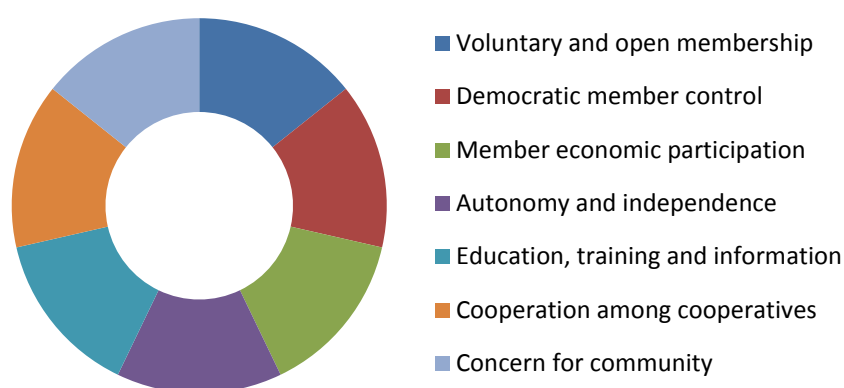


Figure 36. The seven Cooperative principles

In relation to economic terms, Cooperatives are a distinct kind of business organisation because they have a different model of ownership. This means, Cooperatives are enterprises that are owned by their users rather than by their investors (as is the case of capitalist corporations) so they are simultaneously members and users of the firm and their ownership rights take a very specific configuration. Therefore, as democratic and participatory organisations, Cooperatives' net earnings are usually divided equity and equality among the members according to the volume of transactions they have realised with the firm, and all voting rights are shared among the members according to their relative amount of transactions, or, more simply, on a “one member, one vote” basis [30].

Nowadays, as mentioned above, there are a new community Cooperatives slowly arising. These highly complex and diversified model of Cooperative organisations, identified as “social enterprises” are emerging where some different types of stakeholders have a strong appeal in becoming owners whilst share mutual interests and visions. Among their interests are a sustainable development, social inclusion and poverty reduction, and the access to energy as a critical issue for development processes, including for eradicating poverty and helping to provide basic human needs [31]. In these cases, Cooperatives may enjoy competitive advantages through a privileged “win-win” relationship with the key stakeholder groups. Such win-win relationship is likely to ensure loyalty of the members and attract other members over time [32].

However, despite the many good Cooperatives examples observed in various fields and regions, one may wonder why this joint organisational model is not more widespread? In fact, there are some barriers that help to explain why Cooperatives face an unequal and sometimes difficult development across Europe (Figure 37).

The most evident is that, as no organisational model is universal, it's only in a number of situations depending on each context that these models seem adequate, but let's forget for now this topic once it will be explored further ahead in relation to RES Cooperatives. Second, as all organisational models, Cooperatives also suffer from economic barriers. These weaknesses are often reinforced by “barriers to entry” that disable Cooperatives to take advantage of their valences to survive and develop. Third, the development of Cooperatives may be hindered by the way in which they are perceived and understood by a number of stakeholders – this refers to legitimacy issues [32].



Figure 37. Reasons that prevent the Cooperatives' development

One of the most challenging obstacles faced by Cooperatives is definitely how hard is to gather enough funds particularly in capital-intensive markets, such as the RES industry. Commonly, non-investor-owned firms are less attractive to investors seeking to maximise the return of their investments. Moreover, members can deny the entry of such non-member investors (external investors) because they want to protect their common ideals from traditional profit-maximisation behaviours. For those two reasons, cooperative capital is usually limited to the amount raised from the members. This often leads to under-capitalisation, which prevents the firm from entering a market that requires a large capital base.

Nevertheless, two solutions may be found, but both have their cons. First, gathering a very large number of members may enable to obtain a sufficient amount of capital. In this case, the Cooperative organisation becomes much more difficult to run in a democratic way and can lose the ground for its trust-related assets. Second, despite their reluctance, members can eventually open the capital to external investors. But in this case, under the pressure of external shareholders expecting returns on their investment and decision-making power equal to it, the Cooperative may gradually transform and resemble a for-profit firm, thereby invalidating certain of its assets [32]. According to studies, the limited access to capital is hindered by some factors which industrial economists call “barriers to entry” (Figure 38).



Figure 38. The biggest challenges that all Cooperatives face

All these obstacles may prevent a new player from entering a market, despite its potential competitive advantages. In other words, Cooperatives may be the most efficient solutions in a number of cases, but if they do not have access to the market for instance because of the existence of a monopoly, due to large economies of scale, or because of an unfavourable legislation, such efficiency will remain theoretical and not be converted into market shares [32].

When a Cooperative decide to gather capital whether through fresh members and external investors, a new issue usually comes up...people do not know what a Cooperative is. When someone thinks business and economic activity, they spontaneously see the traditional for-profit business model. On the other side, when people think about enterprises that have the social or environmental needs on the baseline, they see a non-profit or NGO model. Definitely, Cooperatives enjoy little legitimacy simply because people, stakeholders, decision-makers do not know them. Hence, much of the Cooperatives' efforts in scaling up their model, or even in only surviving, lies in gaining cognitive legitimacy [32].

3.2. Emergence of energy Cooperatives

The environmental and economic trends of the last decades are begging the world to urgently rethink the current energy systems. Thereby, due to the ever rising concerns over ecological sustainability, market volatility, increasing energy prices as well as security of energy supply, the world over the last years have been trying to transform the energy system of the past towards a more sustainable system of energy supply and production. Slowly the classical regime, characterised by highly centralised energy infrastructures, is switching for a different and decentralised energy model, and at the grassroots level this has included the establishment of “new” types of socio-economic organisations as the revival of energy Cooperatives and other forms of local or community based ownership of RE technologies (Figure 39).

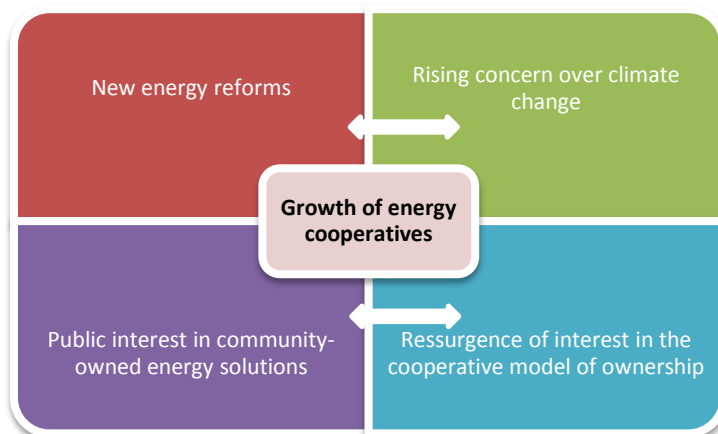


Figure 39. Reasons behind the revival of energy cooperatives [31]

Supported by the raising awareness on climate changes and the introduction of RES policies, this new generation of energy Cooperatives, commonly known as RES Cooperatives, are democratising the energy sector through producing, selling, consuming and, in the particular case of this work, energy providing. These organisations can be considered a serious solution to overcome the lack of institutions and policy, and the lack of enterprises, organisation and human capacity.

Let's see the several reasons why RES Cooperatives are an alternative solution to the traditional and big energy providers (Figure 40). The energy supply at a reasonable price is one of the issues of particular concern to most RES Cooperatives. Moreover, through this firms consumers can reduce their environmental impact (by relying on RES), strengthen the market for cleaner energy and encourage the building of more RES power plants. By becoming a member, the citizen is encouraged to active participate in local and national energy policy discussions and thus can easily see the implications of their efforts as a contribution to a better environment and energy future. Beside that, RES Cooperatives can also promote local development by creating green jobs or offering additional services such as microfinance, better infrastructure or technical training and assistance on innovative and productive end uses. [31]. Finally they distinguished themselves from other market players, in the way mainstream electricity undertakings have no incentive in reducing the consumption of their customers, because this would simultaneously induce costs and reduce their turnover. RES Cooperatives, on the contrary, are much more legitimate in promoting the reduction of consumption, as this is in line with the interests of the consumers who are controlling the organisation [32].



Figure 40. RES Cooperatives pros in relation to traditional energy providers

Since the boom of alternative energies in the seventies, that big companies control the RES market practically in every single countries. However, thanks to recent European liberalisation of the electricity market an increasing number of RES Cooperative's movements have emerged all over Europe after a historical state monopoly, supported by the dissatisfaction of consumers and their desire to have a word to say about their energy's costs and the origin of their energy. Among the pioneers there were EWS in Germany and Ecopower in Belgium [32].

Although RES Cooperatives offer numerous advantages in terms of both economic efficiency and citizen involvement, the truth is that they still represent a small share within the European RES market. Basically, the RES market could be divided in two parts (Figure 41):



Figure 41. The two parts of the RES market

According to the Eurostat energy reports (Figure 42), in terms of production the share of RES (biomass, hydropower, geothermal energy, wind and solar energy) in the total production of energy in the EU has evolved from 9 to 14% between 2005 and 2012, and from 15 to 24% if we only consider electricity (Figure 43).

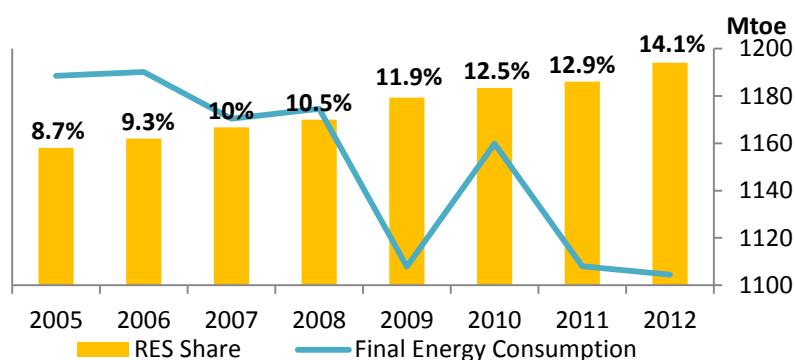


Figure 42. Share of RES in the EU (2005-2012)

A side note for the fact that, for instance, from 2005 to 2009 the proportion of this energy produced by RES Cooperatives, however, remains weak although growing: from 1 or 2% in Southern and Eastern Europe, to 6% in Belgium and France and an estimate of 15% in Scandinavian countries [32].

Besides production of renewable energy, a related market is that of the supply of the produced energy, particularly in the form of electricity. This market is even more difficult to enter for RES Cooperatives, as it has only recently been liberalised and is still controlled by a small number of powerful energy companies. Plus, the electricity grid is often owned by the historical electricity provider in each country. Nevertheless, several RES Cooperatives have started

supplying electricity based on RES, with the goal of increasing their membership and controlling a significant part of the supply chain [32].

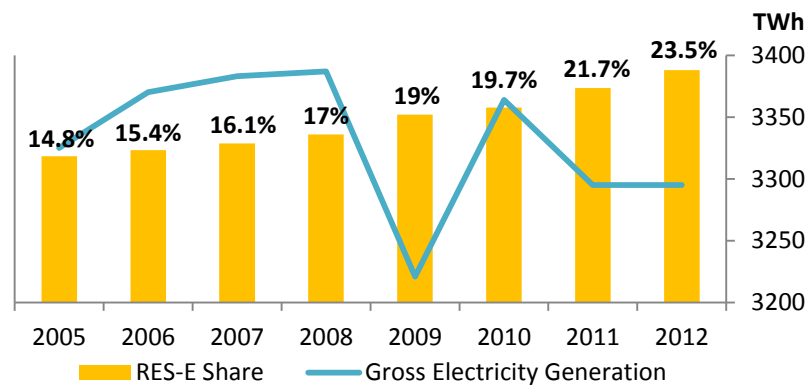


Figure 43. Share of RES-E in the EU (2005-2012)

It is evident the rising concerns over ecological sustainability and the adoption and promotion of the use of “green power” led to an increase of RES share in the total production of energy in the EU. Looking to data (Figure 43), particularly between 2009 and 2010, we may guess the falling energy consumption of 2009 is also related to a strong policy measures to improve energy efficiency. But if we analyse carefully and remind the news of that time, it is visible on the graph the financial and economic crisis effects in the year 2009 pulling down consumption to its lowest level. The same way that the increase one year later was due to a combination of severe weather conditions, which strongly pushed up demand from the residential sector, and economic recovery effects [33]. However, other elements have to be taken into consideration such as a growing population. At the same time EU members have set energy efficiency targets for buildings and took measures to increase the rate of deep renovations to effectively reduce energy demand and create new jobs. The consequences of such acts are visible in the following years.

At this moment there are several questions that can be asked:

- ✓ Why the visible benefits of these firms are not the springboard for scaling up the energy Cooperative movements?
- ✓ Why RES Cooperatives still represent a small share within the European RES market?

Despite the common advantages of the RES Cooperative model in response to consumer concerns, as mentioned before there is no universal organisational model. Each country has their own national particularities and even if there are some general principles, there certainly are no standard patterns among countries. Thus, it is quite reasonable to say that the development of the model depends on each context that a cooperative is fixed.

However there are generic barriers transversal to all of them (Figure 44). The first one is the limited access to capital, at least in the start-up phase. For instance, the high costs of RES power plants can be an huge obstacle for setting up new RES projects. Second, for producing energy based on RES, another critical limitation is the access to locations for new infrastructures. This, combined with the amounts of capital required for the development of the projects, clearly

favoured big players and led to the emergence of an oligopoly. This was clearly confirmed in all European countries, both for the production and the distribution of RE.

A third barrier concerns to RES-E distribution. In some countries, such distribution is not possible for RES Cooperatives and even where it is allowed, private consumers and municipalities remained rather passive when dealing with these organisations. In these cases, this enables the firms to exploit their information advantage concerning the profitability of RES projects, at the expense of consumers and municipalities, who generally accepted what the big companies offered them without realising the more favourable deal they could obtain. In fact, there would be many reasons for consumers and municipalities to support the emergence of RES Cooperatives but given the low awareness of the current energy situation, the level of dissatisfaction was low.

Intimately related with the previous obstacle, a fourth barrier is the lack of transparent information enabling the public authority to compare among different offers. Sometimes the RES projects are too small to fall even under the public procurement scheme. Moreover, as most municipalities are involved in “inter-municipal partnerships” for the management of energy and many other issues, decisions are taken according to the governance mechanisms of these partnerships [32].

Behind the previously mentioned barriers to entry, the lack of support for this model also seemed to result from a lack of awareness of RES as public goods with a high potential of involvement of and return to the community.



Figure 44. Generic barriers that RES Cooperatives have to face

According to studies and their own experience (Figure 45), there are four strategies used by some RES Cooperatives to establish their model [32]:

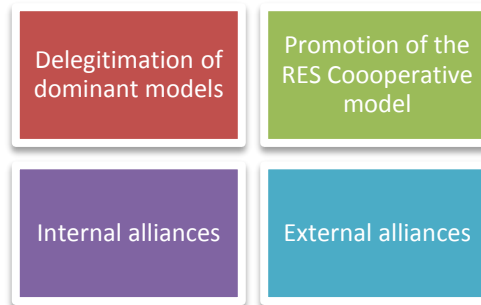


Figure 45. Strategies adopted by RES Cooperatives to overcome these barriers

About the first two strategies, statements “throwing down” the big companies and promoting the economic assets of RES Cooperatives are surprisingly scarce, and away of public debates. In fact, these firms are mainly focused in promoting on their normative legitimation (better environmental and democratic solutions) rather than their pragmatic legitimation (advantages comparing to the different stakeholder groups). Fundamentally, the most intensive process observed in RES Cooperatives is a quest for cognitive legitimation through the definition of their common identity (internal networking) and the establishment of alliances with other partners, as governments. Hence, RES Cooperatives tried to have their model known and recognised by politicians at different levels. For instance, Ecopower use an individual commitment of politicians and other resource-rich stakeholders as cooperative members to increase the recognition of the model. RES Cooperatives also enjoyed their role of allies of environmental NGOs and simultaneously tried to build a reputation of trustworthy economic partners [32].

While everything does not depend of RES Cooperatives themselves, the diffusion of their model will depend very much on their ability to gather different stakeholders around their project. As the power relationships with mainstream businesses seem unfavourable to RES Cooperatives, maybe a more dynamic strategy of selective alliances with some of these businesses will be necessary to reach a significant share of the market. In any case, the success of the diffusion of RES Cooperatives will be a key element to assess to what extent the cooperative model is indeed experiencing a renewal in addressing new social and environmental challenges [32].

In summary, in the field of RES, Cooperatives appear as a solution to the problem of excessive power market, provide social and environmental guarantees in a context of asymmetric information and seem more committed to encourage the reduction of energy consumption. However, RSE Cooperatives also have their limitations, in the context of the energy market, which explain their still limited market shares and their difficult development in certain contexts.

3.3. The Cooperatives in European Union law

As energy and sustainable development are likely to be included as two of the main goals in the near future of European development agenda, the role of these organisations are set to become even more intensive and important in the future of energy markets.

With the expected growth of RES Cooperatives’ popularity, a natural consequence seems to be that they will require some protection through appropriate legislative framework, policy environment and enabling conditions, including support measures. These include loan, grant and subsidy programmes (including special feed-in tariff rates that encourage community-based or cooperatively owned energy development), technical assistance and capacity-building, including

partnership programmes with government agencies that help public authorities at all levels to work towards their commitment to “energy for all” [31]. This is in line with the ILO *Recommendation No. 193 on the Promotion of Cooperatives 2002*, which specifically notes:

“Cooperatives should be treated in accordance with national law and practice and on terms no less favourable than those accorded to other forms of enterprise and social organisation. Governments should introduce support measures, where appropriate, for the activities of cooperatives that meet specific social and public policy outcomes, such as employment promotion or the development of activities benefiting disadvantaged groups or regions. Such measures could include, among others and in so far as possible, tax benefits, loans, grants, access to public works programmes, and special procurement provisions. “

ILO Recommendation 193, paragraph 7

Thereby, a flexible regulatory environment is essential to promote Cooperatives and in this particular case, RSE Cooperatives. Regarding to RES Cooperatives, their promotion can be split into three different parts (Figure 46):



Figure 46. The three ways to promote RES Cooperatives

Since 2003, time that EC adopted the Regulation on the Statute for the European Cooperative Society, which sets the rules for Cooperatives willing to extend their action beyond national borders, much have been done but there remain much still to do, starting by the most important thing: the release of a standard law that may protect RES Cooperatives.

With the economic crisis of 2009, consumer confidence and levels of trust in business drastically fell down, and thus with public attention focused more and more on social and ethical performances of enterprises. After years of debates, the EC published in 2011 its long awaited new communication: “*A renewed EU strategy 2011-2014 for Corporate Social Responsibility*“. By adopting this communication, the EU officially recognised Cooperatives as one the various ways of doing business.

Soon, their role was empowered when the social entrepreneurship was selected as one of the twelve measures announced by the EU to achieve the IEM, as well as the introduction of a short term action plan to support the development of social enterprises in its 2011 communications “*Towards a Single Market Act - twelve levers to boost growth and strengthen confidence*” and “*Creating a favourable climate for social enterprises, key stakeholders in the social economy and innovation*”.

Aware that these enterprises are active and could be a competitive player, the United Nations proclaimed 2012 as the *International Year of Cooperatives* and launched several efforts, including the *2012 International Year of Cooperatives Conference* in Cyprus, to set the cooperative movement in the political agenda. Among the discussed topics, the dialogue between cooperatives experts and EU policy makers, the overview of national cooperative legislations in Europe and the potential for revision of the European Cooperative Society regulation, and how Cooperatives could answer to the current economic crisis stand out.

It was also organised another important conference to discuss the cooperative contributions to the EU 2020 strategy. Basically, EU 2020 aims for a “*sustainable economy, putting people and responsibility first with a sustained fight against exclusion and a transition to a green economy*”. As they already act in accordance with these principles, Cooperatives could bring specific answers and innovative solutions that aim at contributing to the EU 2020 strategy [34].

Meanwhile, and realising that Cooperatives and the cooperative movement should be consulted and included in drafting new energy policies or implementing existing ones, Cooperatives Europe (CE) had raised, as part of an EU project on RES Cooperatives, to give voice to the cooperative business model at European level. The key objectives of this working group are to [34]:

- ✓ Promote Cooperatives in the European energy agenda and support a decentralised energy strategy in the EU;
- ✓ Strengthen visibility at EU level as a respectable agent in the energy and environment area and develop a European cooperative energy advocacy strategy with clear targets for policy makers;
- ✓ Feed cooperation through joint actions and targeted cooperative networks and events.

For instance, in 2012 the energy working group hosted two big events, both titled “*Power to the People*”. The first was within the EU sustainable energy week and the second was at Cooperatives United in Manchester. With these two events, it was pretended to outline the benefits of community energy and how community ownership can be increased [34].

Supported by the previous year recognition, the year 2013 started with good news for the cooperative movement when it was announced the EC proposal to integrate sustainability into companies’ strategies and activities. After all, this is something that Cooperatives have been doing for many years, informing members, citizens and consumers of the impact of their activities.

On 26 June 2013, CE and Rescoop.EU, a project which is seeking to identify all the RE projects in Europe and promote RES Cooperatives as the next step forward in the energy transition, organised an event in the framework of the EU sustainable energy week entitled “*Big energy: small energy? The role of cooperation for EU’s energy transition*”. This event took place at the EC and the programme had included discussion about overcoming key challenges for introducing RE, the cooperative way of achieving the EU energy transition, local and regional RE partnerships, effects of EU policy on local/regional RE initiatives and the learns from the EU’s liberalisation approaches [34].

Maybe influenced by this conference, the history says some days after it was made another step in the right direction towards a “real recognition” that in Europe there are different ways of doing business, particularly Cooperatives enterprises, which equally deserve special attention of policy makers, when the EPC adopted by vote a report on the contribution of cooperative model during the economic and social crisis, which Europe is still facing today, and a motion for resolution on the Entrepreneurship 2020 Action Plan [34]. This motion complies with the plurality of business forms, a principle recognised in the funding treaties of the EU, but which was barely mentioned in the EC’s texts since the publication of “*A renewed EU strategy 2011-2014 for Corporate Social Responsibility*“, two years before.

So far, the year 2014 has been a mix of feelings for RES Cooperatives in particular. Despite the EC's announcement that a group of experts would be created to build up clear recommendations on cooperative training and education, financing of Cooperatives, and business development support services, they also released the EU 2030 framework for climate and energy policies, which at the moment despite the slightly improved guidelines still does not support local efforts towards decentralised energy production. This framework pretends to define the EU's climate and energy policies beyond 2020, building on the experience and lessons learnt from the EU 2020 strategy, and according to the first package draft, the national targets have been eliminated and, as expected, the energy savings target will not be taking into account until the EC review the effects of the energy efficiency directive [34].

In response to the document, CE asked for three ambitious binding targets at the EU level on:

- ✓ Energy efficiency;
- ✓ RE share;
- ✓ Reduction for greenhouse gas emissions (GHG).

CE believes these binding targets need to be broken down into 28 individual national level targets ensuring then an equal approach among EU members, once national binding targets drive to policy decisions, give investment signals and clarity on the pathways that need to be taken by national industries (Figure 47). Only then it is possible to have a stable long-term framework, which promotes new investments into the energy transition, particularly in RES Cooperatives, in order to reach Europe's energy autonomy and affirm its leadership in a competitive, green economy.



Figure 47. Framework proposed by Cooperatives Europe that may promote new investments into the energy transition, particularly in RES Cooperatives

Ideally, a market system can only work when all actors (small, medium and big companies) are included and are treated equally. However, the new guidelines keep overlooking the impact that RES Cooperatives are having in the energy transition, but also helping to better organise the energy demand, stabilise the IEM and reinforce indigenous supply sources. It is then expected that these guidelines are interfering with existing national and European laws, such as the renewable energy *Directive 2009/28/EC*, which takes into consideration the interests of local and regional RES generators, but it will be too late to Europe recognise and amend the mistakes of their recent energy guidelines?

2014 was a year of parliamentary elections in Europe and it has been argued that the EU ought to listen its citizens' discontentment and depending on the results, it could provide, or not, a crucial platform for building a stronger parliamentary network of cooperative supporters.

Despite the result shows the ever increasing euroscepticism, the leadership is still in the hands of the two biggest political families (EPP and PES/S&D) followed by ALDE and the Greens, respectively (Figure 48). Elected the new EPC it is time to select the new EC president by an absolute majority, instead of merely approving her/him, as the previous Treaty stated. The choice fell on Jean-Claude Juncker (EPP).

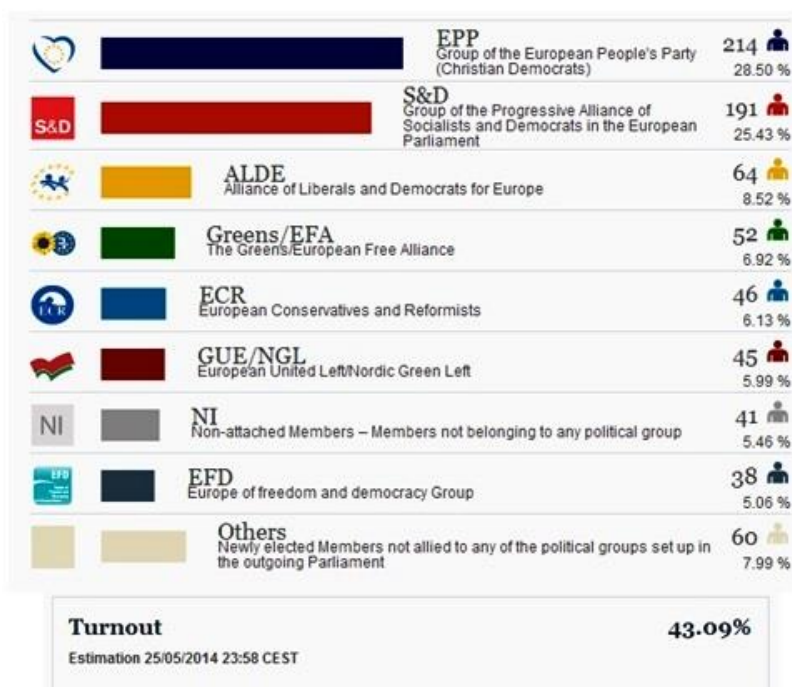


Figure 48. 2014 European election results [35]

Despite the recent Jean-Claude Juncker nomination for EC president, it is important to understand the impacts that this leadership will bring in the law making and definition of EU's priorities for the next five years.

In the end, Europe needs a new energy vision based on increased energy autonomy through RES, diversity of energy players through Cooperatives and citizens as drivers of change. Maybe the current Ukraine crisis and the linked energy security issue would encourage EC to ensure a more balanced policy framework, which includes all types of existing players, particularly RES Cooperatives.

In parallel to the promotion made by international organisms, must be also developed efforts by the states of each country and the cooperative movement operating there.

In general, at this moment it is possible to say the governmental promotional measures can be divided into direct promotion of energy Cooperatives and a more general promotion of RES, which may indirectly encourage and support the establishment of RES Cooperatives. Nevertheless, it is of maximum importance that these promotional measures must provide the conditions under which potential members of Cooperatives will be able to give birth to new Cooperatives, whose autonomy and democratic nature will be respected according to the cooperative principles and values [31].

In relation to the promotion by the cooperative movement, strengthening the vertical structure is fundamental in enabling RES Cooperatives to reach their full potential in producing sustainable energy and creating green jobs [31].

By forming national or regional networks of RES Cooperatives is half way to reach the individual success. This is important with regard not only to capacity-building and knowledge transfer, but also to engage in policy and legislative dialogue and conduct public awareness campaigns, protecting thus the interests of each RES Cooperative. Financing for energy initiatives is also provided by the cooperative movement. Many savings and credit Cooperatives

provide specific loans to improve energy efficiency or to small and medium-sized enterprises involved in the energy sector, including RSE Cooperatives. This is an important role, as energy generation or distribution can require considerable amounts of investment, and access to finance is often a major challenge for RES Cooperatives [31]. However, and despite the advantages of such organism, in almost European countries no national federation of Cooperatives exists.

4. Case studies analysis

4.1. Introduction and Methodology

In spite of the EU's efforts in the recent years, the establishment of an IEM is far from being concluded. At the moment, across Europe the path through the full liberalisation has reached different levels as each MS approached the process in its own way, in accordance to their national particularities. However, this long and evolutionary process of market liberalisation has opened a door for new visions, opportunities and, consequently, new independent energy players, in a number of European countries.

RES Cooperatives are one of the natural outcomes of this transition and, today more than yesterday, have the potential to play a big role in response to the 21st century energy challenges of energy security and supply, as well as promoting RES. Right now they are shaping a new future for the energy market in Europe, giving the chance to the ordinary citizen to own, control and benefit from their own power and energy efficiency schemes. This last statement is going to be the gateway of this work.

Thus, and inspired by the success of several RES Cooperatives across Europe and with the motivation to transform Coopérnico as the first green electricity supplier in Portugal, the main goals of this work are to understand the potential role that RES Cooperatives may have in the future of the liberalised energy sector not only across Europe, but particularly in Portugal, and be a successful guide for any RES Cooperative that aims to get in the national electricity retail market.

Therefore, the first step of this work consists in the characterisation of four different European electricity markets (UK, ES, DE, BE), followed by the analysis of the role and experiences that each one of the selected case studies has faced in their own electricity supply market:

- ✓ **The Co-operative Energy, in United Kingdom (UK):** The UK has one of the most powerful energy markets in Europe. Regarding to the domestic energy supply market, the UK has six major energy companies (British Gas, EDF, Eon, Npower, Scottish Power and SSE) who supply over 98% of domestic customers. Therefore, The Co-operative Energy was selected with the aim to understand how a RES Cooperative can be an alternative in such a competitive market and how did they manage to do it.
- ✓ **Som energia, in Spain (ES):** Comparing the two energy sectors, it is possible to say the Spanish electricity market is quite similar to the Portuguese one, including the legislation in force. Moreover, both countries share an organised energy market, MIBEL. Because of these reasons is recommended to study the most reputable RES Cooperative in the Iberian Peninsula.
- ✓ **EWS, in Germany (DE):** It is possible to say the EWS is probably one of the most respectable entities within the cooperative movement. EWS became an electricity supplier even before the liberalisation of the energy markets. Because of its story, motivations, business model and structure, as well as the European system where the

RES Cooperative operates, is natural that this RES Cooperative was chosen as a case study.

- ✓ **Ecopower, in Belgium (BE):** A work in which the central theme are the RES Cooperatives, it is inevitable not to mention the EcoPower. In fact, this RES Cooperative is one of the pioneers of the movement and probably the best example to study regarding to electricity supply activity. Moreover, the RES Cooperative is one of the founders of the European group RESCoop.

With this study, it is expected a real assessment regarding the possible positive and negative effects not only for Coopérnico, but for a RES Cooperative that aims to operate in the Portuguese electricity market.

The second step of the work is related to the comparison between the four selected markets with the Portuguese case. Moreover, the current situation of the liberalisation in the national electricity system, as well as the legislation to which it is adjacent, plus a brief description of the current electricity suppliers companies operating in Portugal will be studied.

Furthermore, all the steps and necessary requirements for a energy cooperative to become a new electricity supplier in Portugal will be compiled.

4.2. Electricity Sector in the United Kingdom

4.2.1. An Overview of the British Liberalised Market



Figure 49. United Kingdom and its countries

The British electricity market has four distinct geographical territories (Figure 49): the main island divided by Wales in the South, Scotland in the North with England between, plus the Northern Ireland in the West of the main island.

As introduced above in chapter one, the UK was the first European country to launch concrete and innovative measures that led to the deregulation and liberalisation of its electricity market.

The success of the initiative was so evident that shortly after it inspired the neighbouring European electricity markets to follow and adopt the same line of policies.

It is hard to define the British energy model; however there are some main features that characterised the British liberalisation process [36]:

- ✓ The creation of a wholesale spot market, as the main price-setting arena for wholesale electricity sales;
- ✓ The creation of retail competition, so that all consumers can freely choose their electricity supplier;
- ✓ The separation between competitive sectors and non-competitive sectors, including the clear corporate separation between the four activities.

Before the nineties' liberalisation, the generation and transmission in England and Wales were responsibility of the *Central Electricity Generating Board* (CEGB)⁴, whilst in Scotland and Northern Ireland the task was carried out by *North of Scotland Hydro-Electric Board* (NSHEB), *South of Scotland Electricity Board* (SSEB) and *Northern Ireland Electricity Board* (NIEB), respectively. All these companies were nationalised [37].

Regarding the distribution and supply, whilst in Scotland and Northern Ireland these activities were also under control of NSHEB, SSEB and NIEB, in England and Wales they were provided by twelve regional *Area Electricity Boards* (AEB).

Besides the CEGB, the *Electricity Act 1957* established also an Electricity Council, which was the policy-making body for the *Electricity Supply Industry* [38]. In England and Wales the Electricity Council, established in 1957, played an important coordinating role in the electricity system, bringing together directors from the CEGB and AEB.

Before the liberalisation, and concerning the transmission network, there were four electricity transmission grids operated independently, by each one of the companies previously enumerated: CEGB, NSHEB, SSEB and NIEB [37].

⁴ CEGB' responsibilities were to develop and maintain an efficient, coordinated and economical system of electricity supply in entire England and Wales, including the production or acquisition of electricity and to provide that energy for the AEB's distribution. It also had power to provide electricity to the Scottish Boards or electricity undertakings outside UK [38].

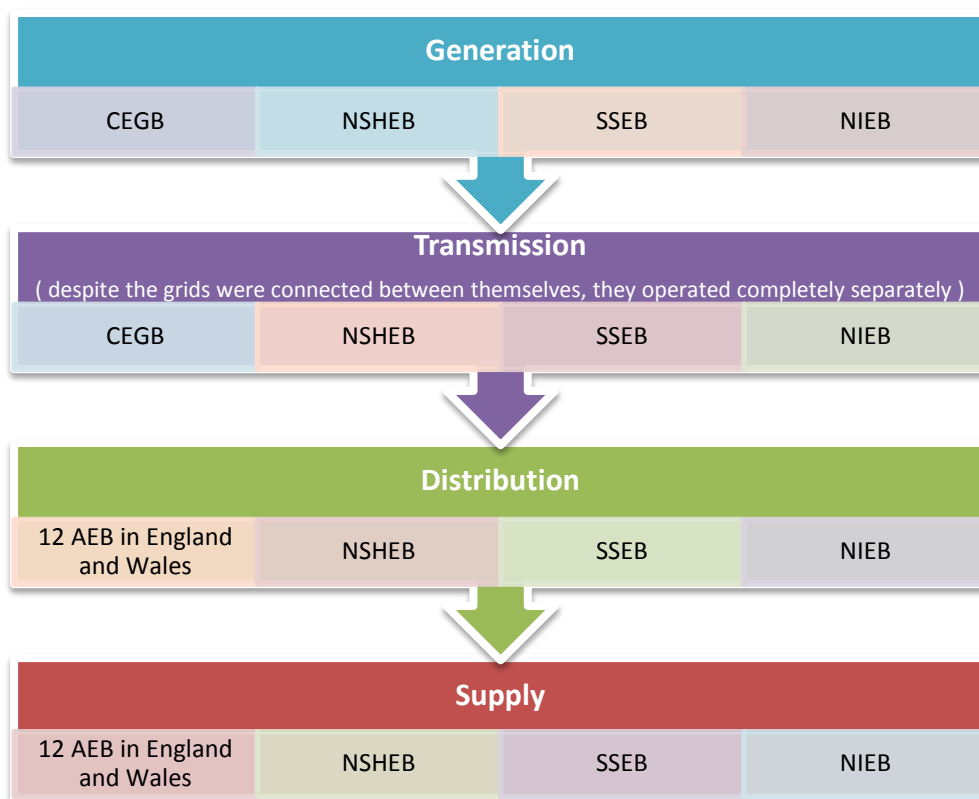


Figure 50. Main features of the pre British liberalisation

Until the late eighties, these nationalised companies fully dominated the British electricity sector (Figure 50). Nevertheless, the scenario changed when the British government, led on that period by Margaret Thatcher, introduced for the first time some liberalisation, followed by reorganisation and privatisation measures, into the electricity system. Basically, it was the kick starter for the construction of the British electricity market as it's known today, and that inspired the creation of the European IEM.

Thereby, the first step towards the post British electricity system liberalisation were made still in the early eighties, by the *1983 Energy Act*, that removed the requirement that only AEB could supply electricity [39].

The document imposed on the AEB the duty to buy electricity on “fair terms” from a private generator or supplier and allow it to use the transmission and distribution system. However, the *1983 Energy Act* had a very limited impact with only a small number of private companies entering the market, because of excessive costs of third party access to the CEGB’s national grid [40].

The second wave of new polities came with privatisation measures, whose main challenge was to reorganise the sector in order to introduce a real competition among the players. On that time, there were some constraints to competition in transmission and distribution networks, once these activities were natural monopolies. Thus, it has only been possible to attempt to create real market competition in generation and supply activities.

As a result, in the late eighties the preparation for privatisation begun (*Electricity Act 1989*⁵), and between 1990 and 1993, the generating and AEB companies in England and Wales, plus the NSHEB, SSEB and NIEB were all sold off [37].

For instance, the CEGB's breakup led to three new generating companies, called *Powergen*, *National Power* and *Nuclear Electric*, and a transmission company entitled *National Grid*. Despite all the companies were down as private, with exception of *Nuclear Electric* that remained publicly owned until 1996, they were initially protected from unwanted takeover bids by the British government's Golden Shares scheme. This meant that investors could acquire significant shareholdings in electricity companies but would not be able to gain a controlling interest [37].

Regarding the Scottish companies, both were privatised as two vertically integrated regulated utilities in 1991, free to sell electricity into the English and Welsh market: The *Scottish Hydro-Electric* (SHE), which later became *Scottish and Southern Energy* (SSE), and the *Scottish Power* (SP) [36].

Once there was a strong political opposition in Scotland to the Thatcher privatisation programme and the break-up process of the existing companies, SHE and SP remained responsible not only for the generation activity, but also for transmission and distribution networks. As Scotland was, and is today, characterised by sparsely-populated areas, the British government accepted that these companies were also charged of the supply of electricity [36].

Finally, in respect to Northern Ireland, it was followed the same model as in Scotland. That means, NIEB's privatisation led also to a new fully vertically integrated company: *Northern Ireland Electricity* (NIE).

Regarding the 12 AEB, they were also privatised and converted into 12 *Regional Electricity Companies* (REC): 1- East Midlands Electricity; 2- Eastern Electricity; 3- London Electricity; 4- Merseyside and North Wales Electricity Board (Manweb); 5- Midlands Electricity; 6- Northern Electricity; 7- North Western Electricity Board; 8- South Eastern Electricity Board; 9- South Wales Electricity; 10- South Western Electricity; 11- Southern Electric and 12- Yorkshire Electricity (Figure 51).

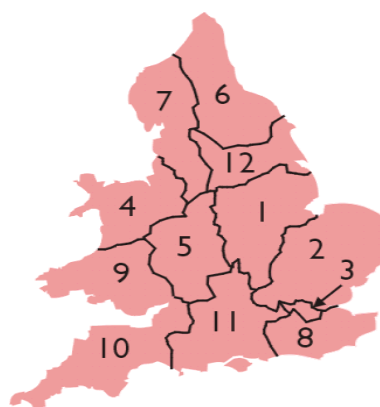


Figure 51. Regional Electricity Companies

⁵ Among the several objectives published in *The Electricity Act 1989*, the document laid down the foundations for the government's privatisation plans. For instance, the Act introduced a competitive market into electricity generation and supply, and a system of independent regulation responsible for ensuring an efficient and competitive electricity market and for protecting customer interests [41].

Just like the new generation companies, the 12 REC were protected by the Golden Shares scheme [37].

Trying to bring competition into the industry, the two biggest generation companies (*National Power* and *Powergen*) were allowed to supply electricity directly to larger consumers while the RECs were allowed to invest in generating capacity until a certain amount of power [37].

Thus, by 1996, *National Power* and *Powergen* were required to sell off some of their generating capacity. The purchaser was the largest REC, *Eastern Electric*, despite the company exceeded the previous limit of only obtaining 15% of its power from its own generating capacity, and this breach of the retail/generating limit was then followed by SP when it acquired the REC *Manweb* [37].

In order to promote this requirement and to allow a much greater degree of integration across the whole industry, in 1998 the Labour government, that had been elected the previous year, decided to allow the generators to buy retail providers as long as they sold off more of their generating capacity [37].

At the same time, in 1995, the Golden Shares protection system scheme ran out, and the consequence was the immediately take-over of the private companies, especially seven of REC, by outside players, particularly American undertakings [36].

Two years later, in 1997, and taking into account the industry regulator's concern that REC were using their effective regional monopolies on distribution to subsidise their retail activities, the companies were required to legally separate their distribution and retail activities, although they could still continue to own both operations.

This decision, and the rising competitive environment in the sector, led that most of the American companies sold their interests in Britain, and a new set of European owners took control of the electricity sector in UK.

As one of the four elements that characterise the price of electricity charged to the end-user customer is the wholesale price charged by the generators, another innovation of the British model in order to introduce more competition was the creation of a wholesale spot market in 1990, *Electricity Pool of England and Wales*, where the generating companies could sell their output energy at changing prices in response to the demands of the REC and any new entrants on the supply side [37].

Simple economic theory dictates that a reduction in supply will force up price and many observers suggested that the electricity pool was open to manipulation by the large generators [37]. By other words, they could together set the system marginal price for the bulk of the time through limiting available generating capacity. In addition, the electricity pool was more than often bypassed in favour of longer term bilateral contracts, known as *Contract for Differences*, that hedged the risk of the volatile pool prices.

A review of the *Electricity Pool of England and Wales* led to its replacement in March 2001 by the *New Electricity Trading Arrangements* (NETA) and four years later, in 2005, due to more restructuring of the electricity system, followed with further integration of generating and supply, NETA evolved to the *British Electricity Transmission and Trading Arrangements* (BETTA), when Scotland joined into the market for the first time [37].

Since end of 2007, there is a wholesale electricity market operating in Ireland and Northern Ireland on an All-Island basis, called *Single Electricity Market (SEM)*. Basically, the SEM was designed to provide for the least cost source of electricity generation to meet customer demand at any one time across the island, while also maximising long-term sustainability and reliability [42].

The British wholesale market have been evolving, and today, besides BETTA, there are three different organised energy markets operating in the country: the first independent power exchange created in the UK, at the same time than NETA, called *APX Power UK*, the *Intercontinental Exchange* [43], and in 2010 it was launched the latest market for UK energy contracts, *Nasdaq OMX N2EX*. From the three organised energy markets, *APX Power UK*, formerly *The United Kingdom Power Exchanges -UKPX*, is the cornerstone of the UK spot market and is used by members on a 24/7 basis for the majority of their within day balancing requirements.

Now that is overviewed the main lines of the liberalisation process in the UK to the present, it will be also interesting to understand what such measures brought and caused in the industry (Figure 52). As any other electricity system, the British one is composed by four sectors (Figure 53): Generation, Transmission, Distribution and Supply.

Starting by the last activity, the British retail market was opened up in three stages. Firstly, on privatisation of the electricity sector in 1990, only industrial customers with consumption greater than 1 MW a year were allowed to choose their electricity supplier. Four years later, in 1994, the open market was extended to customers with a 100 kW annual demand and since 1999 the British retail market is fully opened to competition, when domestic customers were allowed to switch its electricity supplier whenever they want [37].

As result, the number of electricity supply companies has increased significantly with new companies entering the retail market. The only thing they need to operate is a license to supply electricity. Nevertheless, as it will be discussed next, the market is completely dominated by six companies, with many of the licensed operators acting as simply agents for these companies.

All of the leading six supply companies are also established in the generation sector, through subsidiaries, with significant shares. At the same time, more than 50 new generating companies had entered the generation market, through a license agreement.

Whilst in England and Wales, the transmission network system is still responsibility of *National Grid*, due to vertical unbundling in Scotland the transmission network is responsibility of the subsidiaries of SP (*SP Transmission*) and SSE (*SSE Transmission*). In Northern Ireland the TSO is *EirGrid*, company which purchased *SONI* (the previous TSO) to NIE [44].

The TSOs' statutory duties, provided under The *Electricity Act 1989*, The *Utilities Act 2000*⁶ and their transmission licenses, are among others the developing and maintaining of an efficient,

⁶ *The Utilities Act 2000* was fundamental in amending the industry structure and regulatory framework. The purpose of the document was to advocate market development through integrated regulation of the gas and electricity markets, the separation of electricity supply and distribution, and the creation of the necessary framework to underpin the introduction of NETA. Moreover, the document also provided guidelines to protect the interests of consumers, wherever possible through the promotion of competition.

coordinated and economic transmission system, which facilitate competition in electricity generation and supply and protect the environment [41].

In respect to the distribution sector, in the beginning seven of the 12 REC were acquired by American companies, which later sold their shares to European firms. Nevertheless, they were always in control of the local monopoly distribution networks in their franchise areas. At the moment, there are 15 licensed DSO in the UK, held by 8 companies that will be identified right after. Besides the 15 licensed DSO, there are also 7 *Independent DSO* (IDSO) licenses.

The REC' licenses set out a number of public service and other obligations such as ensuring continuity and supply, non-discrimination, prohibition of cross-subsidies, price controls and the obligation to contract for a specific amount of capacity from non-fossil fuels each year [41].

There is another license, referred as *second tier licenses*, required for those suppliers who wish to sell to any customer attached to the distribution networks. RECs can also obtain *second tier licenses* to enable them to compete in distribution networks other than their own.

SP Energy Networks and SSE Power Distribution hold *second tier licenses* and can supply customers across the UK electricity market, likewise any *second tier license* holders can supply customers in Scotland [41].

The *Electricity Act 1989* also introduced a regulatory system headed by a *Director General of Supply* (DGS), responsible for ensuring an efficient and competitive electricity market and for protecting customer interests.

In 1999, the regulatory offices for electricity and gas were merged to create the *Office for Gas and Electricity Markets* (Ofgem).

Ofgem is governed by the *Gas and Electricity Markets Authority* (GAEMA) and its powers are provided under The *Gas Act 1986*, The *Electricity Act 1989* and The *Utilities Act 2000*. Ofgem, through advocating competition, is focussed on promoting and protecting the interests of gas and electricity customers and licensing and monitoring the gas and electricity companies, taking action where necessary to ensure compliance [41].

Northern Ireland has its own regulatory body: *The Northern Ireland Authority for Utility Regulation* (UREGNI), previously known as Ofreg. UREGNI' duties are similar to Ofgem', and includes the promotion of competition in the electricity industry, the protection of electricity and gas consumers, and the arbitrary in disputes between consumer and supplier [45].

Regarding the monopoly of transmission and distribution networks, they were subject to independent regulation.

A number of the provisions within the Act seek improved regulation through transparency, consistency and predictability [41].

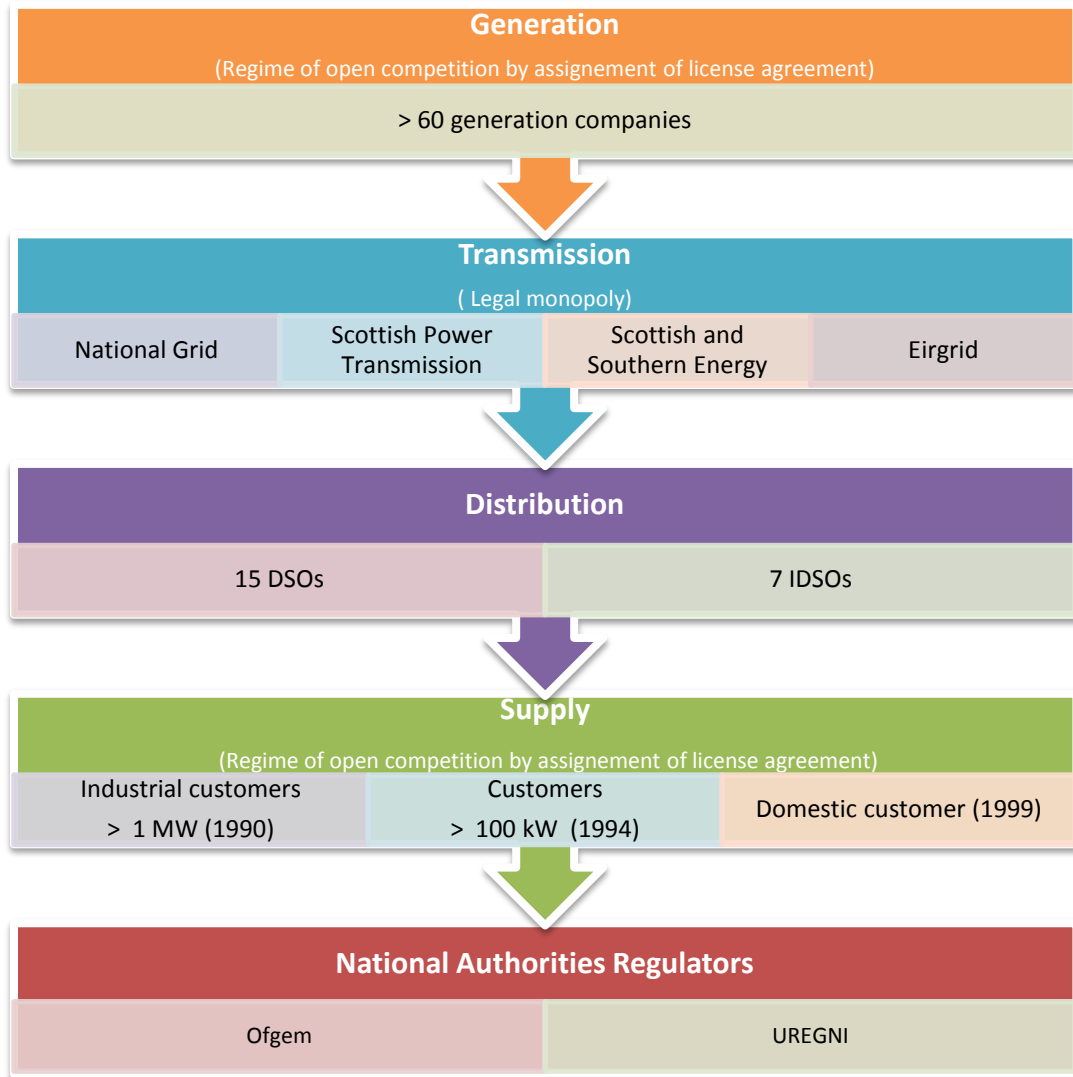


Figure 52. Main features of the post British liberalisation

4.2.2. Electricity Suppliers Operating in the British Open Market

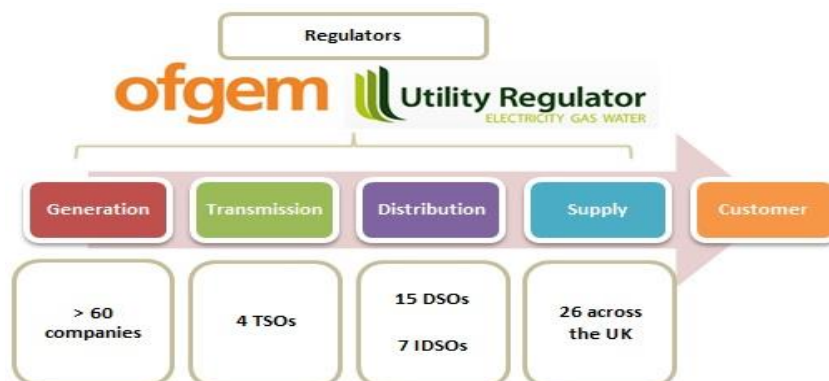


Figure 53. British Electricity System

Comparing to 1999, the number of generating companies more than duplicated. Despite, more than 60 companies own nowadays power stations across the UK, many of these are small power producers with relatively low capacity [37]. In fact, the 10 biggest generating companies (RWE Npower, E.ON Powergen, SSE, SP, Centrica, British Energy, International Power, Drax Power, AES and EDF Energy) own more than 80% of the total UK power capacity.

The other 20% is responsibility of companies such as Amegni Renewables, Dong Energy, Community Windpower, Ecogen, Ecotricity, Eneco, Energy 4-All Cooperative, Enertrag, Exxon, among others.

In Great Britain, there are four TSOs: National Grid operating in England and Wales, SSE and SP Energy Networks in Scotland and finally, Eirgrid in Northern Ireland. Their job is to maintain the flow of generated electricity through to the regional distribution networks, which are controlled by eight companies (Figure 54): Electricity North West, Northern Ireland Electricity, Northern Powergrid, Scottish and Southern Energy Power Distribution, Scottish Power Energy Networks, UK Power Networks and Western Power Distribution [44].

Besides the 15 licensed DSO, there are 7 *Independent DSO* (IDSO) licenses: Energetics Electricity Limited, EP Electricity Limited, Harlaxton Energy Networks Limited, Independent Power Networks Limited, The Electricity Network Company Limited, UK Power Networks (IDNO) Ltd and Utility Assets Limited [44].

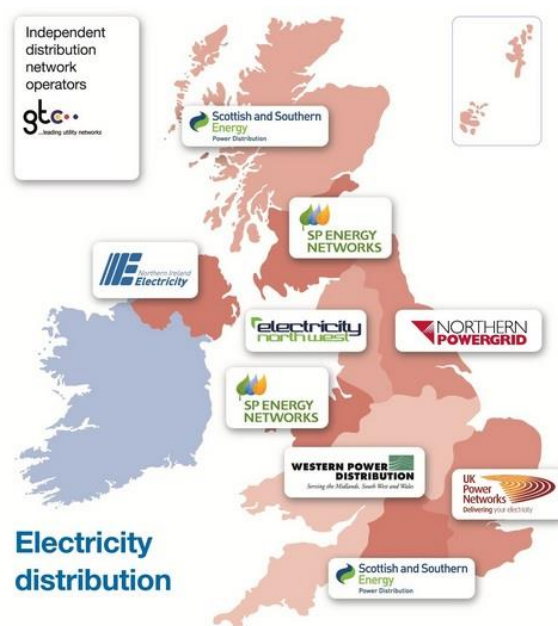


Figure 54. DSOs operating in the UK

These transmission and distribution networks are used by the electricity suppliers, which supply and sell electricity to customers. Nowadays, there are more than 70 licensed electricity companies operating in the British domestic sector [44].

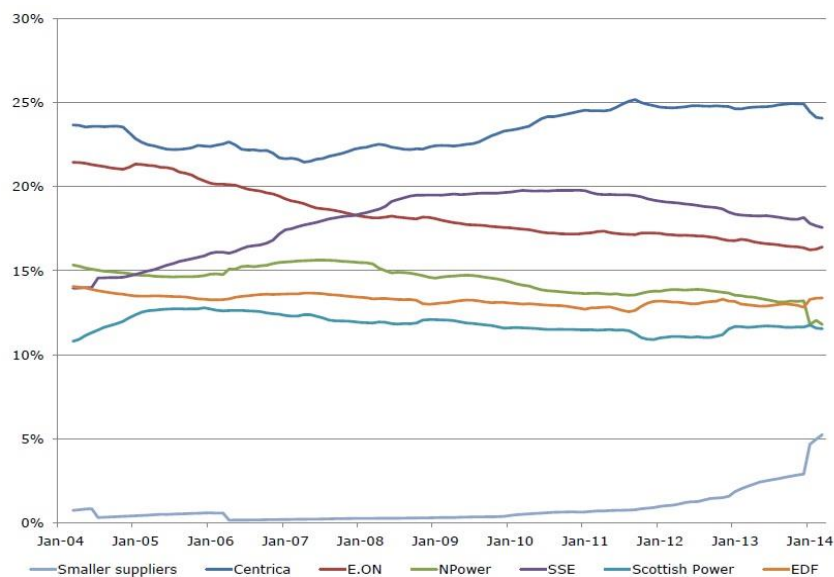


Figure 55. Domestic electricity supply market shares, by company [46]

The market is dominated by 6 big companies, Centrica/British Energy, EDF Energy, RWE Npower, E.ON Powergen, SP and Scottish and Southern Energy. Besides the Big 6, there are 18 smaller suppliers, making a total of 24 electricity suppliers operating in the UK.

According to Ofgem’s report [46], in January 2014 the Big 6 market share was between 11% and 25% (Figure 55). It is important to highlight the solid growth that smaller suppliers are registering. The reasons are several, and include the low level of trust in the bigger companies, dissatisfaction by the service provided, easy access to information and rising awareness for a new energetic paradigm, besides the obviously monetary savings. Other interpretation may be related to the fact that the big 6 energy companies are not competing as hard as they did in the past to win customers from each other.

In the category of smaller suppliers, stands out companies as The Co-operative Energy, Ecotricity, Good Energy, Utilita, First Utility, Spark Energy, Ovo Energy, Green Energy, Flow Energy, Utility Warehouse, among others, which besides collecting a market share around 1% are slowly increasing in the number of customers. Of the 18 smaller suppliers currently in the domestic market, only four have expanded to around 1/4 million customers, including The Co-operative Energy.

The path for these companies, as the following one, is long and tortuous, because there are significant barriers that prevent their expansion.

4.2.3. The Co-operative Energy



One of the smaller suppliers that are becoming an alternative to the big 6 energy, is The Co-operative Energy. Born in 2010, is the only Cooperative supplier in the electricity market, and because of its values and mission has been awarded with a couple prizes, including the *Consumer Action Award* at the *Which? Award 2011* and the *Best Energy Provider Award* at the *Consumer Moneyfacts Awards 2012* [47].

The Co-operative Energy is part of *The Midcounties Co-operative*, the largest independent co-operative in the UK with more than 430 000 members [47]. The number of members is updated every three years, when the members who don't trade see their membership canceled.

Result of the cooperative movement that was established in the beginning of the nineteenth century, *The Midcounties Co-operative's* history began in the middle of the same century, when some people realised that they could achieve far more by acting collectively than they ever would alone.

Thus, inspired by the first successful retail cooperative society that was brought to life by the Rochdale Pioneers, in 1844, many people decided to copy the model and values of success (, that today are followed by every Cooperative), and set up their own local Cooperative stores in towns and villages across the UK.

Years later, some of the Cooperatives combined with others to eventually form *The Midcounties Co-operative*. Among them, are the Swindon in 1853, Gloucester in 1860, Walsall and Chipping Norton both in 1866, Oxford in 1872 and Cinderford in 1874. The reasons why they merged are simple: partly to increase their purchasing power and partly to compete more effectively against the conventional retailers. At the end of the twentieth century, more mergers led to two big societies in the Midcounties region:

- ✓ Oxford, Swindon and Gloucester Cooperative Society (OSG);
- ✓ West Midlands Cooperative Society (WMCS).

In 2005, the members of these two Cooperatives decided to do one last merge, and the result was *The Midcounties Co-operative*. Nowadays, this powerful Cooperative has several business groups, including Food, Funeralcare, Travel, Pharmacy, Post Office or Child Care, among others. However, only in 2010, the society entered in the Energy business, through the creation of The Co-operative Energy [47].

Focusing in the case study, at the moment The Co-operative Energy covers England, Wales and Scotland, i.e., the entire UK. Moreover, they are committed to providing low carbon energy with simple tariffs with clear billing. Bu how they will achieve that?

With no shareholders to please, but its members, The Co-operative Energy aims to be Britain's most trusted energy supplier, through [47]:

- ✓ **Trusted on price:** the Cooperative ensures to keep the prices consistently competitive. Moreover they aims to keep their tariffs as simple and transparent as possible, made up of a monthly fixed charge and a single unit price for energy consumed;

- ✓ **Trusted on fairness:** Like all Cooperatives, The Co-operative Energy is ethical in its dealing with people and businesses. That means, new customers won't be favoured over existing ones and there will be periodical reports regarding the energy costs, how much money the Cooperative make and how that profit is shared between members and reinvested in new projects.
- ✓ **Trusted on service:** It is Cooperative's intentions to keep all their operations in Britain.
- ✓ **Trusted on environment:** Besides supporting new RES projects across the country, the Cooperative aims to keep the carbon content of its electricity below half the national average.

Based on these guidelines, two years after its formation and granted the license by the energy regulator, in 2013 the Cooperative achieved the mark of 150 000 customers, becoming then an seriously alternative to the big 6 energy suppliers. Currently, The Co-operative Energy is the electricity supplier of nearly 250 000 customers in the entire country [48].

This is the result of the creation of a wider range of products to its customers. For instance, the Cooperative launched a new version of its competitively priced Pioneer variable tariff. Moreover, The Co-operative Energy also now offers a range of fixed-term tariffs to new and existing customers, which guarantee prices for one, two and three years.

It is not mandatory to become a member, when a customer chooses The Co-operative Energy as its electricity supplier. However, it's quite easy and cheap to become a member, around € 1, and once a member the citizen in return will receive 1 point. Obviously, the member will get more points the more he invests in the Cooperative. Then, twice a year it will distributed a profit share, based on how many points the member have accumulated [47].



Figure 56. The Midcounties Co-operative membership card

A fairly good idea is that, customers of Co-operative Energy become members of *The Midcounties Co-operative*, alongside customers of Midcounties' other businesses (Figure 56). Thus, the member can accumulate points when shop in the cooperative stores or online [47].

4.3. Electricity Sector in Spain

4.3.1. An Overview of the Spanish Liberalised Market



Figure 57. Spain and its autonomous communities

The Kingdom of Spain is a Constitutional monarchy located on the Iberian Peninsula in south-western Europe, and is composed by 17 autonomous communities and 2 autonomous cities with varying degrees of autonomy thanks to its Constitution (Figure 57).

Despite Spain is organisationally structured, once all autonomous communities have their own elected parliaments, governments, public administrations, budgets and resources, the Spanish Constitution states the indivisible unity of the Spanish nation.

Going straight to the point, Spain was one of the first European countries to transpose the First Directive. In fact, the Spanish electricity liberalisation process started in late November 1997 [49]. As the liberalisation progress across Europe was presenting low results, the EU members were forced to adopt a new demanding framework (Second Directive), which Spain transposed to its legislation in 2007 [50]. In 2012, it was transposed into Spanish national law the last document regarding the adoption of the Third Directive [51].

The pre liberalisation period, focusing between 1983 and 1996, was characterised by *The National Energy Plans* (PENs). After the global oil crisis, the Spanish government came up with large investments programmes in an attempt to regulate the sector's financial problems. Therefore, in 1983 an agreement was signed between the main companies and the government and one year later, the regulation and legal ordering of the Spanish electricity sector was set by *Law 49/1984*. Thus, in 1985, Spain became the first European country to adopt an independent system operator when it was formed a state-owned company, *Red Electrica de España* (REE), responsible for the high-voltage transmission assets of all firms in the sector. REE also directed the central dispatch of the system [52].

Before the liberalisation, the generation and distribution sectors were linked, by ownership, to UNESA⁷ (a group of companies composed mainly by Endesa (on that period a government-owned generation company), Iberdrola, Unión Fenosa and Hidrocantábrico). In the nineties a process of concentration occurred leading thus to Endesa's dominant position with the acquisition of *Compañía Sevillana de Electricidad* and other subsequent asset consolidations. As a result, Endesa achieved half of the Spanish generation share and 40% of the distribution market. The second group, Iberdrola held a generation quota of 29% and 38% for distribution. The third and fourth generators, Unión Fenosa and Hidrocantábrico, had 13% and 6% in generation and 15% and 5% in distribution [52].

On that time, a new phenomenon arose: Self generation. It was facilitated by generous pricing provisions for excess power sold to the network. Obviously, there were legal limits to the size of self-generation facilities, which qualify for these pricing terms [53].

In relation to regulation, in 1987 the regime has been organised around The Stable Legal Framework, or *Marco Legal y Estable* (MLE) law. Fundamentally, the MLE worked like price cap regulation, establishing then standard costs for all factors of generation that later were used to produce tariffs, that generated revenues collected by distribution companies [53].

This regulatory regime encouraged efficiency. Since the companies knew what their revenues will be under the MLE, they knew that cost reduction will increased profits.

The final phase was in the early nineties, when in end of 1994 the Spanish government enacted a new electricity law, known as *Law Ordering the National Electricity Sector* (LOSEN), which intended to increase competition and transparency in the sector, but keeping the positive elements of the MLE. The three principal features of LOSEN were the creation of a regulatory authority, *The National Commission for the Electricity System* (CNSE), requiring competitive bidding for all new generation and allowing for an “independent system” for those parties who seek to bypass the existing national system [53].

Therefore, it is possible to conclude that the Spanish electricity sector before the liberalisation operated as an integrated system (Figure 58). The transmission network and the short term management of the capacity for generation were in the hands of an independent entity, REE. The power generation needs for the entire network were defined by the PENs. Distribution, for the most part, was the responsibility of the four large vertically integrated companies. These companies were also responsible for the supply within certain geographic regions and had the exclusive right to do so. These companies were integrated into the sector's managerial group UNESA. Furthermore, there were some small distribution companies that acquired electricity by UNESA companies and resold it to the consumers.

⁷ UNESA is a utility association that has traditionally played a substantial role in coordinating the activities of the utilities, including coordinated planning, negotiation of fuel purchases with suppliers, analysis of economic and financial issues, and research and development. It has represented the utilities before national bodies such as the CNSE. Liberalisation of the electricity market required the utilities to undertake commercial activities such as fuel purchasing separately. Due to such changes UNESA has been required to redefine its activities and change from a corporation to a non-profit association with the potential for much broader membership [54].

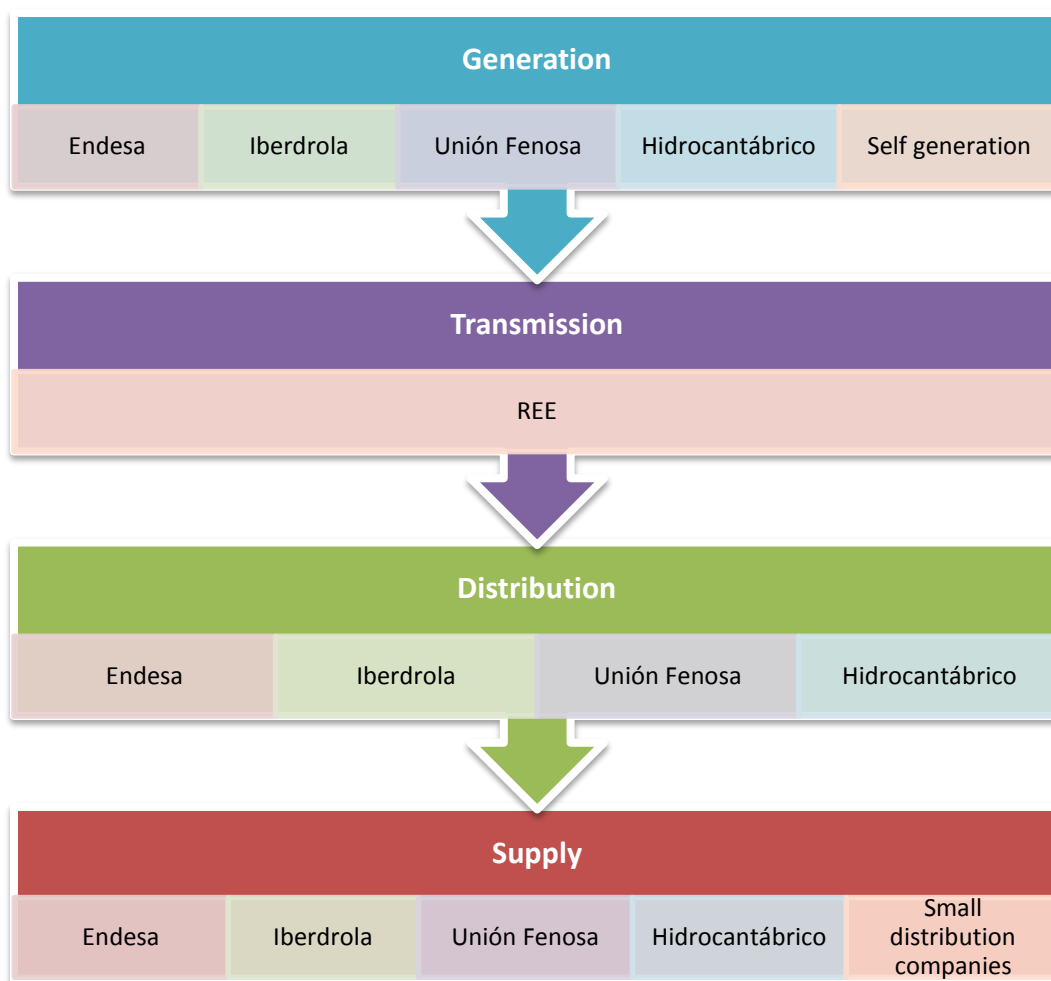


Figure 58. Main features of the pre Spanish liberalisation

The first step towards the liberalisation of the Spanish electricity market was made in 1997 with the approval of the *Spanish Electric Power Act 54/1997*⁸ [55]. After a decade of reforms, this first document provided the basis for the creation of an open wholesale market, the choice of suppliers to the largest electricity customers and mandated price decreases to those remaining under regulated tariffs.

During the two following years, further legislation amendments and Royal Decrees have widened the choice more quickly to medium-sized consumers, cut regulated prices more deeply than originally planned, and encourage greater activity in the wholesale market by lowering access tariffs [54].

Despite the *Act 54/1997* established the legal separation between the regulated activities (transmission and distribution) and the liberalised activities (generation and supply), given the fact that they are natural monopolies, the document kept the possibility to integrate these activities in the same group enterprise [54].

⁸ The Act 54/1997 establishes the basic legal framework for generation, transmission, distribution, and sale of electricity. It left behind the public service system approach and provided the basis for the liberalisation or privatisation of the Spanish electricity sector [54].

Through this new framework, the regulated activities allowed the regulated TPA to the networks, under the conditions established in the regulation and through the payment of an access tariff.

Royal Decree-Law 17/2007 modified the previous Act to the stipulations of Second Directive on common rules for the IEM. For instance, the document introduced the functional and accounting separation of regulated activities.

Two years later, through the *Royal Decree-Law 485/2009*, it was introduced measures regarding the protection of vulnerable customers, protection of consumers' fundamental rights and promotion of economic and social cohesion, such as the last resort supply concept and the additive calculation mechanism used to set last resort tariffs based on the cost of energy, the access tariff and an additional cost for commercial management [51].

The latest significant amendment to the original document was done two years ago, through the *Royal Decree-Law 13/2012*. With this new framework, it was granted new powers and reinforced duties to CNE on unbundling, consumers' protection and the approval of methodologies concerning transmission and distribution access tariffs in order to create a single regulatory authority at national level. Moreover, the document introduced new measures regarding the supply activity (vulnerable consumer concept and requirements), appointment and certification of TSO and effective separation of the four activities (FOU) [51].

Since 1998, Spain has a fully competitive generation market. Although in the beginning the four largest generation companies represented more than 85% of the total Spanish production, with entry of new competitors this share has reduced gradually.

Iberdrola, Unión Fenosa and Hidrocarbónico were originally privately owned companies. Endesa become also private, when in 1998 the government's remaining shares were sold. However, the government retained Golden Shares until 2005.

All generators are entitled to have access to transmission and distribution networks through an authorisation procedure [54]. However, there is another type of generation regime: the special one, which is also granted, through an authorisation, to generators with production of equal or less than 50 MW, self-generators using cogeneration or other forms of electricity generation associated to RES.

In order to provide more competition to the sector, at the same time it was also created an wholesale electricity market: MIBEL (formerly OMEL). Basically, this organised market, that will be later discussed, allowed generating companies to compete and sell their electricity in a centralised pool and/or through bilateral contracts with buyers.

Regarding the transmission activity, in early 1999 the government controlled 60% of REE and each of the four main companies held 10%, the maximum permissible share of total capital per individual owner. Some months after, the government announced its plan to sell a share of 35% to small shareholders and institutional and foreign investors.

In 2007, the *Royal Decree-Law 17/2007* established the single-carrier model with REE as the owner of entire transmission network, including the technical and financial management of the system [56].

Distribution activity occurs through the utilities operating under a concession granted by the autonomous regional authorities or the national government, in the case of distributors serving more than one autonomous community.

The Cooperative model is well disseminated across Spain. Thus, besides the main companies, currently there are also a number of independent small DSO across the country. Until 2009, they also sold electricity to customers.

The Spanish supply activity took almost 10 years to become fully open to competition. It all started in 1998 with largest customers and was extended to domestic customers in 2003. Despite the several timetables, at the end all high-voltage consumers (using supply above 1 kW) were eligible to choose supplier from 1 July 2000. All other customers were scheduled to be able to choose suppliers in 2003 [54].

Nowadays, new companies can also enter the retail supply of electricity to liberalised customers under authorisation from the appropriate level of government. Approval of the autonomous community government is required for regional/local retailing.

Besides CNSE, the independent regulatory commission established in 1994, whose main functions are advisory and dispute-related resolution, approval of mergers and acquisition into transmission and distribution companies, two new entity were created [56]:

- ✓ **The Ministry of Industry, Energy and Tourism (MIET):** assumes policy responsibilities for the reforms and it also has the most significant regulatory functions. In particular, it is responsible for setting regulated retail tariffs, network access tariffs and various charges. Moreover, it authorises new generators and approves transmission projects.
- ✓ **The National Commission for Energy (CNE):** took over the responsibilities for the energy sector and the hydrocarbon fuels. Nowadays, the role and functions of this regulatory authority were transferred to *National Commission for Markets and Competition* (CNMC), a new entity that was established in 2013. The new authority merges the competition body with several sectorial regulators (energy, telecommunications, audio-visual, transport and postal), with the aim of guaranteeing, preserving and fostering the correct operation, transparency and effective competition in all sectors and markets.

Moreover, autonomous communities have competencies in several areas, including the approval of

distribution facilities and other electric facilities “when their use does not affect other regions” (for instance, small generation facilities), the concession rights for electricity distribution, and development of regulations with respect to connection of supply, and the enforcement of regulations with respect to quality of service.

The autonomous communities also play an important role in supporting the development of independent generation, and have the right to put additional charges on the bills of electricity customers in their region to recover the costs of such support.

All the previous information can be summarised in Figure 59. As a consequence of such measures, nowadays the Spanish electricity system can be represented through Figure 60.

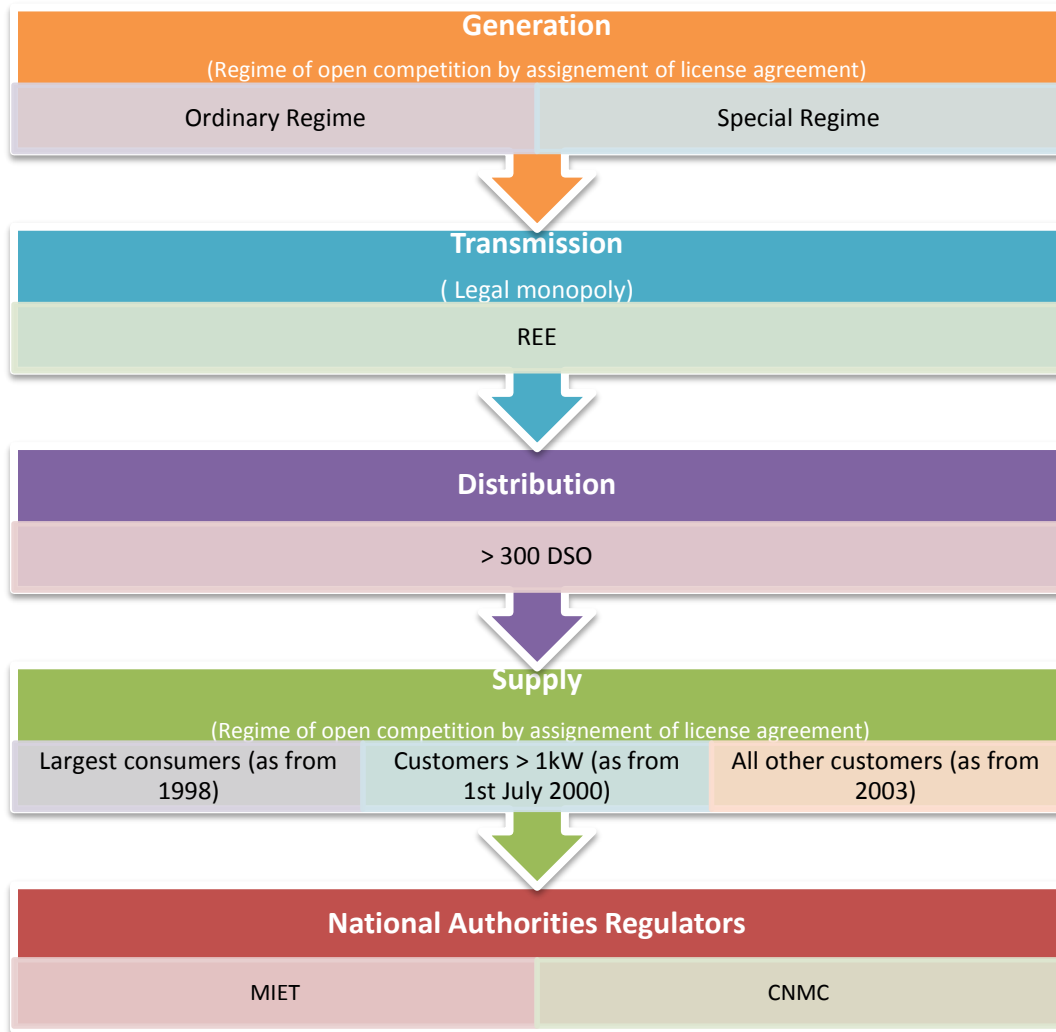


Figure 59. Main features of the post Spanish liberalisation

4.3.2. Electricity Suppliers Operating in the Spanish Open Market



Figure 60. Spanish Electricity System

Spanish electricity generation is still dominated by the historical players, Endesa, Iberdrola, Gas Natural Fenosa (formerly Unión Fenosa), EDP/Hidrocarbónico and E.ON. Nevertheless, there are some other companies, whose market share is registering a significant growing. Companies such as Fersa, Zabalgarbi, Alpic Energía España, Gorona de Viento, GDF Suez, ENEL Green Power España, Torresol Energy, Eolia, Anselmo León, Barbo Energías Renovables, Acciona or Cooperatives, as Som Energía, Enercoop and GoiEner, are taking advantage of the European Directives and recent RES policies to increase their significance in the Spanish energy market [57].

Whilst there is only one TSO in Spain, REE, the DSOs are usually commercial companies or Cooperatives. Currently, there are more than 300 distribution companies operating in Spain, including for instance the 5 largest energy companies in Spain, Agri-Energia, Aguas de Barbastro Energía, Bassols Energia, Berreruza, Central Electrica Mitjans, Compañía de Electricidad del Condado, Dielenor, Dielesur, Alarcon Navarro Empresa Electrica, Alset Electrica, Anselmo Leon Distribucion, among many others [57].

Although Spain has more than 160 active electricity suppliers at present, the most important are those that are obliged to supply the vulnerable customers: Endesa, Iberdrola, Gas Natural Fenosa, EDP/Hidrocarbónico Energía and E.ON.

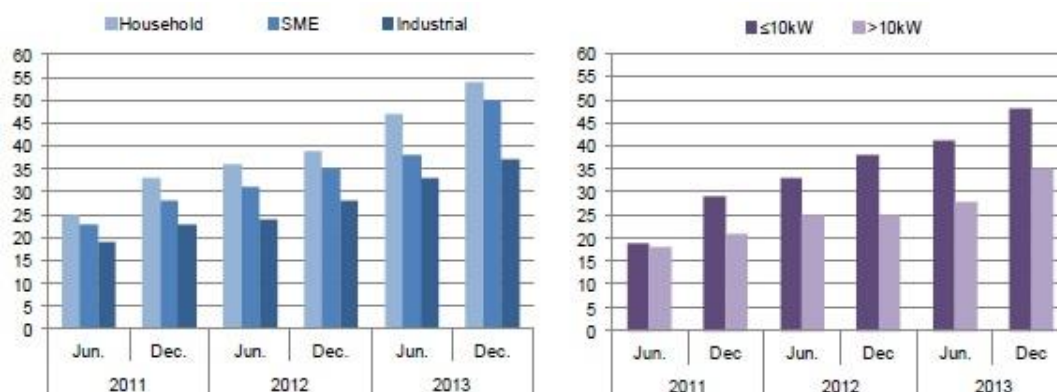


Figure 61. Evolution of the number of suppliers with a significant volume of customers in the distribution areas of the five largest players [58]

As shown in the Figure 61, the suppliers that are not related to the 5 traditional energy companies are progressively increasing their share in the free market. According to CNMC's report [58], in 2013, the companies with the highest growth in relative terms in the domestic segment were Fenie Energía, Som Energía, Audax Energía, Watium, HolaLuz and Gesternova, which are suppliers with no links to any distribution areas.

In the end of 2013, the retail market had a switching rate of 12%, one of the highest in Europe, which means the Spanish customer is more aware than in the past of the options available in the market. There are several reasons that may be linked to this high switching rate and the slowly increase of small companies' influence, as the prices billed, consumer dissatisfaction and the rising awareness for a new energetic paradigm. Other possible reason is the fact that the regulated tariffs are coming to the end, forcing then the consumer to move to the liberalised market and choose one of the several suppliers operating in the country.

In spite of this advances, in December 2013 the 5 largest supplier companies still registered almost 80% of the total volume of energy supplied in the free market (Figure 62), 97% if consider only the domestic sector.

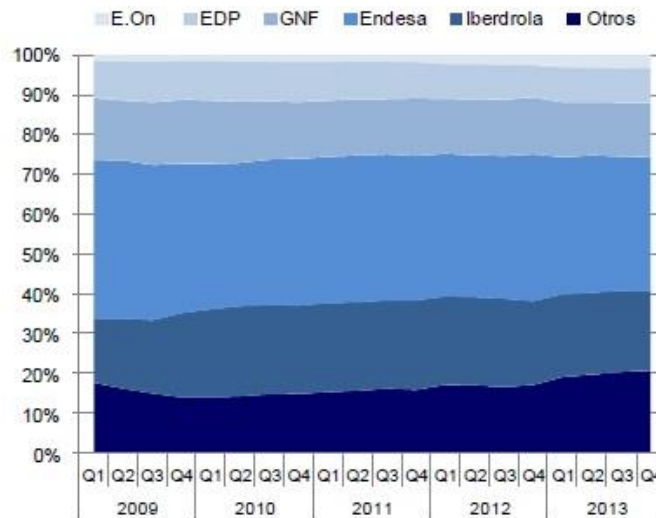


Figure 62. Evolution of the market share, by company [58]

Besides Som Energia, there are others Cooperatives actives in the retail market, such as GoiEner, Nosa Enerxía S.C.G or Zencer, which also provides green electricity to domestic end-users, trying then to push the world into a better energetic paradigm.

4.3.3. Som Energia



In Spain, the object of study chosen for this work is the Som Energia, which have been operating in the country for exactly four years. Looking back at the history of Som Energia, or “We are Energy” translated to English, the idea of creating a company that promotes the RES and the sustainable development just came up in 2010, when a group of people linked to the University of Girona decided to reproduce the formula of success established in other European countries, in promoting a new electricity model more citizen-friendly. Under this concept was born the Som Energia, the first renewable energy cooperative in Catalonia and the reality has been showing the positive impact that this movement is operating, not only in the region, but in the whole Spain [59].

Although the idea was created in the beginning of 2010, only in the end of the same year the project is extended to a cooperative model. Right after this event, in September of 2011, they

started to provide electricity, based on green energy, and one month later it was built the construction of its first RES power plants.

Besides the main activities (production and supply), it is also Som Energia's intentions to fight the unemployment, through the promotion of green jobs in the local communities where the future projects will be installed, and to disseminate a new energy culture in Spain. Nowadays, Som Energia also promotes measures for energy saving among their members.

Moreover, and under the promoting of a new energy paradigm, the Cooperative aims to introduce an educational and mentality shift [60].

Thus, Som Energia does not want to be just a provider or producer of green energy. The ambition of this cooperative is above all, to build a wide social movement supporting RES and the public participation. According to its mission, the human component is very important for the success of this project and at the moment, the huge level of commitment of its members has been helping to build a community's awareness for real alternatives.

Resuming the four years of activities, the first year was, mainly, focused on the launch of the Cooperative. When this period was overcome, it was second year's intention to start selling green electricity to all partners and producing its own energy. Since last year (2013), the expectations are:

- ✓ To consolidate the Cooperative's growth in terms of the evolution within the Spanish electricity market;
- ✓ To consolidate the Som Energia electricity price;
- ✓ To reduce the production costs for continuous technological improvements;
- ✓ Development of policies to reduce emissions taxes.

Regarding to its members, since its foundation the number of members of the Cooperative has grown from year to year. The journey of Som Energia started with 350 members and one year later, end of 2011, the number surpassed the mark of 1000 members. The growth of Som Energia has been remarkable, and at the moment, past two years, the Cooperative has nearly 16 000 members mainly due to the ability of its members to be supplied by 100% renewable electricity, at a similar price to last resort electricity supplier, regardless of their place of residence.

Unlike The Co-operative Energy, until very recently in Som Energia it was mandatory a customer be also a member of the Cooperative. Nevertheless, a person who wants to become a member shall pay a one-off returnable deposit of € 100 in the Cooperative's social capital.

In some countries, the Cooperative's activities are subsidised by the government, lottery funds or other private foundations. However, in Spain, this kind of incentive is not available, and does not seem to be in the near future, especially because of the current climate of crisis and austerity budgets that the country is facing [61]. That's why it is so important for Som Energia, that each customer be a member as well, and understands the concept behind the Cooperative.

Another difference, comparing to The Co-operative Energy, is that Som Energia does not follow the traditional advertising. It is all based on social networks (Twitter or Facebook), instead of the British Cooperative, that besides these platforms, already used for the first time the radio as a way to spread its campaigns. Nevertheless, the mouth to mouth dissemination is used by all Cooperatives.

Once a member, the citizen can invest in new RES projects (investors can get a return of between 3-5% annually and can take out their investment whenever they wish). These projects are mainly small-scale projects (owned by all members) to produce energy in the biogas, PV, wind and biomass sectors. With these projects, it is Som Energia objective to be able to cover fully the energy demands of its members.

Moreover, in Som Energia, all members can take part in the cooperative working groups (commercialisation, diffusion, projects, education, among others) and also be active in the several volunteer regional centres distributed all around the country [62].

Another way to call for its member participation, are through the conferences, debates and regular meetings around the country that the Cooperative organises, to engage and raise awareness about sustainable energy.

As all other Cooperatives, here the cooperative system is also meant to let all members participate and it functions under the principle of one person, one vote.

4.4. Electricity Sector in Germany

4.4.1. An Overview of the German Liberalised Market



Figure 63. Germany and its States

Germany is a federal parliamentary republic consisting of 16 constituent states (*Bundesländer*), identified in the Figure 63, which retain limited sovereignty. Because of differences in size and population the states are divided as city states (*Stadtstaaten*), for instance Hamburg, Bremen and the capital Berlin, or states with larger territories (*Flächenländer*).

From the 16 states, 5 are responsible for regional administrative purposes on federal state level, namely *Baden-Württemberg*, *Bavaria*, *Hesse*, *North Rhine-Westphalia* and *Saxony*. Currently, they are divided in a total of 22 Government Districts (*Regierungsbezirke*):

- ✓ **Baden-Württemberg:** Freiburg, Karlsruhe, Stuttgart and Tübingen;
- ✓ **Bavaria:** Oberbayern, Niederbayern, Oberpfalz, Oberfranken, Mittelfranken, Unterfranken and Schwaben;
- ✓ **Hesse:** Darmstadt, Gießen and Kassel;
- ✓ **North Rhine-Westphalia:** Arnsberg, Cologne, Detmold, Düsseldorf and Münster;
- ✓ **Saxony:** Chemnitz, Dresden and Leipzig.

Within the federal state authority, *Regierungsbezirke* act as a mid-level agency mostly concerned with administrative decisions on a regional level for the 403 affiliated districts (*Kreise*), which are divided between rural districts (*Landkreise*) and urban districts (*Stadtkreise*). Basically, the district can be seen as an intermediate level of administration between the *Bundesländer* and the municipal governments (*Gemeinden*), which are the lowest level of official territorial division in Germany.

At this point, and without further details, it is possible to see that Germany has a quite complicated organisational system. However, despite the constitutional system complexity, the country has always adopted the internal European electricity market directives on time.

Thus, the beginning of the German liberalisation process was given in end of the last century, with the ratification of *The National Energy Act of 1998*. Basically, this document transposed the First Directive at the federal level. When the Second Directive came up, in 2003, all the EU members were obligated to adopt the guidelines published in the document. Germany was no different, and in 2005 it was enacted a new *National Energy Act*, that was later amended in 2011 with the release of the Third Directive two years before [63].

Before the liberalisation, the electricity sector in Germany was organised by a coexistence of public,

private and mixed-economy enterprises, which means there was never a broad government monopoly in the sector as practised, for instance, in the UK with the former CEGB. Here, instead, the regulation framework as a natural monopoly hence competition was not tolerated [63]. But how is that?

To understand how the German electricity sector used to work on that period, it is necessary to go back to the time of the *First World War*. When the war ended it was adopted a system of territorial monopolies. Distribution areas were established by demarcation contracts between energy supply companies. In this way, the energy supply companies can only operate inside their own contractual territories. Later, the system was strengthened when energy supply companies started cooperation with municipal utilities [63].

Municipal utilities in ownership of the municipals received electricity, from that one produced by the energy supply company in which they were involved and in doing so, assured the marketing of the electricity producing energy supply company. In the meantime the municipalities participated via the profits of the larger energy supply companies. Generally

speaking this system, ensured security of supply and profits for energy supply companies and municipal utilities [63].

One year before the liberalisation was set in march, energy supply companies were active at municipal, regional or supra-regional level, and classified as “*Network Energy Supply Company (NESC)*”, “*Regional Energy Supply Company (RESC)*” or “*Municipal Utility (MU)*” [63]:

- ✓ **The supra-regional level:** In 1997 there were 8 NESCOs, which produced almost 80% of the country electricity. Moreover, they had been active only in the framework of their territorial monopoly. However, whilst some companies (*PreussenElektra AG*, *Bayerwerk AG*, *VEAG*) were only active in production and transmission, others NESCOs, such as *RWE*, *VEW*, *EnBW*, *BEWAG* and *HEW* had been active in all the four electricity sectors.
- ✓ **The regional level:** At this level, there were around 80 RESCOs with a production share of 10%, total took over the electricity from the large NESCOs. The RESCOs distributed electricity whether to end-users or *to* MUs.
- ✓ **The municipal level:** There were around 900 MUs supplied end-users in their municipalities with electricity, gas, water or district heat. They produced an electricity share similar to RESCOs.

All energy supply companies were linked via long-term contracts, typically for 20 years. Additionally, as a result of capital investments large NESCOs financed their subsidiary RESCOs. In contrast to the RESCOs, MUs remained autonomous and were minority capital owners of the large NESCOs [63].

Thereby, before the liberalisation, and in the framework of the territorial monopoly concept, all the four activities were clearly in the hands of the large NESCOs (Figure 64). The MUs participated in the profits of the NESCOs by capital shares. Indeed, the supply to the customers was organised mainly by MUs, but the electricity sold to them came from NESCOs, delivered from the RESCOs, and MUs in approximately equal quantities [63].

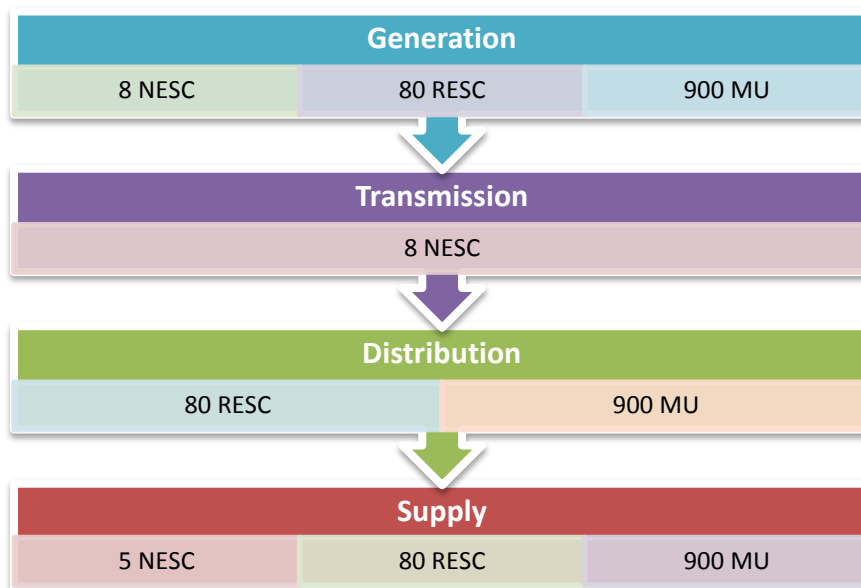


Figure 64. Main features of the pre German liberalisation

The post liberalisation of the German electricity sector started with the adoption of *The National Energy Act of 1998*⁹ (“*Energiewirtschaftsgesetz von 1998*”). According to the document, legal competition became possible, which means territorial monopolies were abolished. It was only enacted the separation of accounts between the transmission activities and production and supply. Moreover, it was guaranteed a negotiated TPA to the electricity transport system for electricity producers and industrial consumers (Germany was the only EU member to adopt this option, instead of regulated access), without any regulatory agency supervision. In fact, the regulation of the electricity networks was given over to the NESCs.

However, the complete and seamless liberalisation process did not lead to competition, but to proceedings and market concentration due to mergers and acquisitions [63].

While the document expected to be approved and adopted, the large NESCs reacted with a massive wave of mergers, in order to keep market power, profits and electricity prices as they wanted. Thus, the merger process started in 1997 with the merger between *Badenwerk* and *Energieversorgung Schwaben* (EVS) to the new NESC, called *Energie Baden-Württemberg AG* (EnBW) and continued later at national and European level.

Fundamentally, this very early merger process and in particular the seamless liberalisation in Germany, due to *The National Energy Act of 1998*, are indications of the influence of large German NESCs within German legislation in accordance with their own expansive market strategies [63].

In 2005, the negotiated TPA was transformed to a regulatory TPA with the release of the new *National Energy Act*. It was also stated in the document, that regulatory entities shall be created

⁹ According to *Energiewirtschaftsgesetz von 1998*, the purpose of the Act was to ensure the safe, affordable and environmentally acceptable wireline supply of electricity and gas in the public interest. Basically, the document approached topics, such as abolition of antitrust exemptions for the energy sector, control of prices and conditions, grid access and power transmission and the promotion of RES, in order to deal with a new general structure of the German electricity market [64].

and responsible for the legal unbundling of non-competitive areas (transmission and distribution) from competitive areas (production and supply) [63].

With the publishing of the Third Directive in 2009, EU members were invited to adopt more common rules. Thus, until March 2011 Germany had to apply effective unbundling of energy production and supply interests from the network, through three basic models, increase the transparency of retail markets and introduce more effective regulatory oversight, among others. The main features of the post German liberalisation are represented in Figure 65.

In the generation activity, in 2005 there was a reduction of the number of NESC's from 8 to 4 (REW, E.ON, EnBW and Vanttenfall). Despite, on that period, their electricity market share increased, the scenario has been changing with the decommissioning of several nuclear power plants, owned by these companies, and the significant expansion of capacity from RES [65].

The electricity generation market is no longer controlled by the big 4 companies. Nowadays, apart from a few other large-generating companies, the electricity generating market consists of a large number of independent companies, most importantly public utility companies, that have been taking advantage of the RES' government support schemes to slowly enter in the market [66]. All players need an authorisation to build new electricity generation power plants.

Since 2005, the 4 big generating companies are responsible for the transmission networks and all are generally obligated to connect power plants on an economically reasonable, non-discriminatory and transparent basis. When the Third Directive was transposed at a federal level, they had to choose among three main unbundling models: FOU, ITO and ISO [67].

They opted for different models of unbundling. For instance, E.ON and Vanttenfall opted for a FOU model. As a consequence, these companies would have to sell their electricity networks, leading then to two new TSOs: *TenneT* (ex-E.ON) and *50Hertz Transmission* (formerly Vanttenfal). On the opposite, *Amprion* (RWE) and *TransnetBW* (EnBW) opted for a ITO model. That means, that under this model the management of the transmission network is done by a subsidiary of the parent company.

Finally, an operating permit by the state regulatory authority and certification by BNetzA are required to operate a transmission network.

Characterising the distribution sector, since 2005 the electricity distribution activity are fully regulated. While the big 4 companies have managed to acquire shares in many DSOs, whether RESCs or MUs, through privatisation efforts in the past, the German distribution market has seen a reverse trend in recent years [66].

In order to provide competition and to ensure the success of the German liberalisation process, the BKartA prevented new acquisitions by the 4 NESC's. Nevertheless, the most significant "measure" that have been shifting the sector is the will of the local people, which through social movements such as Cooperatives are attempting to regain sole control over the DSOs. The most famous case is EWS, a small Cooperative that besides producing energy based on RES, also distributes the energy produced through the networks it owns.

Thus, currently the German DSOs are mainly small local entities, largely owned by municipalities [68]. The requirements to operate distribution systems in Germany are equivalent to those for transmission systems with the exception that DSOs do not need to be certified by the BNetzA.

With the introduction of *The National Energy Act of 1998*, the supply activity was straight away opened up to competition. Thus, from then on the German customer was able to switch from electricity supplier, despite electricity end-user prices for households were regulated until 1 July 2007.

At the moment, any company which aims to be also an electricity supplier, must comply with the guidelines on business processes for the supply of electricity to customers (*Geschäftsprozesse zur Kundenbelieferung mit Elektrizität* (GPKE)) published in 2006.

Since the beginning of the liberalisation efforts in 1998, at least one-third of customers had changed electricity supplier. In 2014 this ratio is expected to rise to some 40% or 50%. Renewable energy suppliers are particularly benefiting from this trend [66].

Concerning the regulation, the amendment of 2005 separated the regulation of the transport segment and the competition segments (retail and supply of electricity).

Thus, in order to ensure the correct functioning of the German electricity system, there were created several regulatory agencies [63][66]:

- ✓ **The Federal Network Agency (*Bundesnetzagentur* (BNetzA))**. This regulatory authority is the system responsible for the transport segment, including TSOs, and to create the conditions for fair and effective competition on the upstream and downstream markets for the supply of electricity. Moreover, until 2007 *Bundesnetzagentur* was also responsible to regulate the authorisations concerning net entering and the cost based of net prices, plus unbundlings.
- ✓ **State Regulatory Authorities (*Landesregulierungsbehörden*)**. This new entities were responsible in the same way as the BNetzA concerning electricity transport companies with less than 100 000 customers and if their network is within the borders of the respective federal state.

Fundamentally, these are the two institutions responsible for the regulation of the electricity grids.

Furthermore, there were created some other entities such as the *Federal Cartel Office* (*Bundeskartellamt* (BKartA)) responsible for merger control and protection of competition. Moreover, it is responsible for the operation of another regulatory authority, *Market Transparency Authority for Electricity and Gas* (*Markttransparenzstelle Strom und Gas* (MTS)), in cooperation with the BNetzA. Then, there are the *Federal Environment Agency* (*Umweltbundesamt* (UBA)), competent for environmental issues and it includes the *German Emission Trading Authority* (*Deutsche Emissionshandelsstelle* (DEHSt)), which governs the trading of emission certificates under the Kyoto Protocol [66].

Finally, and to help the liberalisation process, it was established two electricity exchanges markets in 2000: *Leipzig Power Exchange* - LPX and *European Power Exchange* - EPX. In 2002, LPX and EPX merged and founded a new organised energy market called *European Energy Exchange* (EEX) covering the spot market, the futures market and the clearing of OTC dealings (bilateral contracts). With EEX it was introduced more prices transparency, as well as market competition.

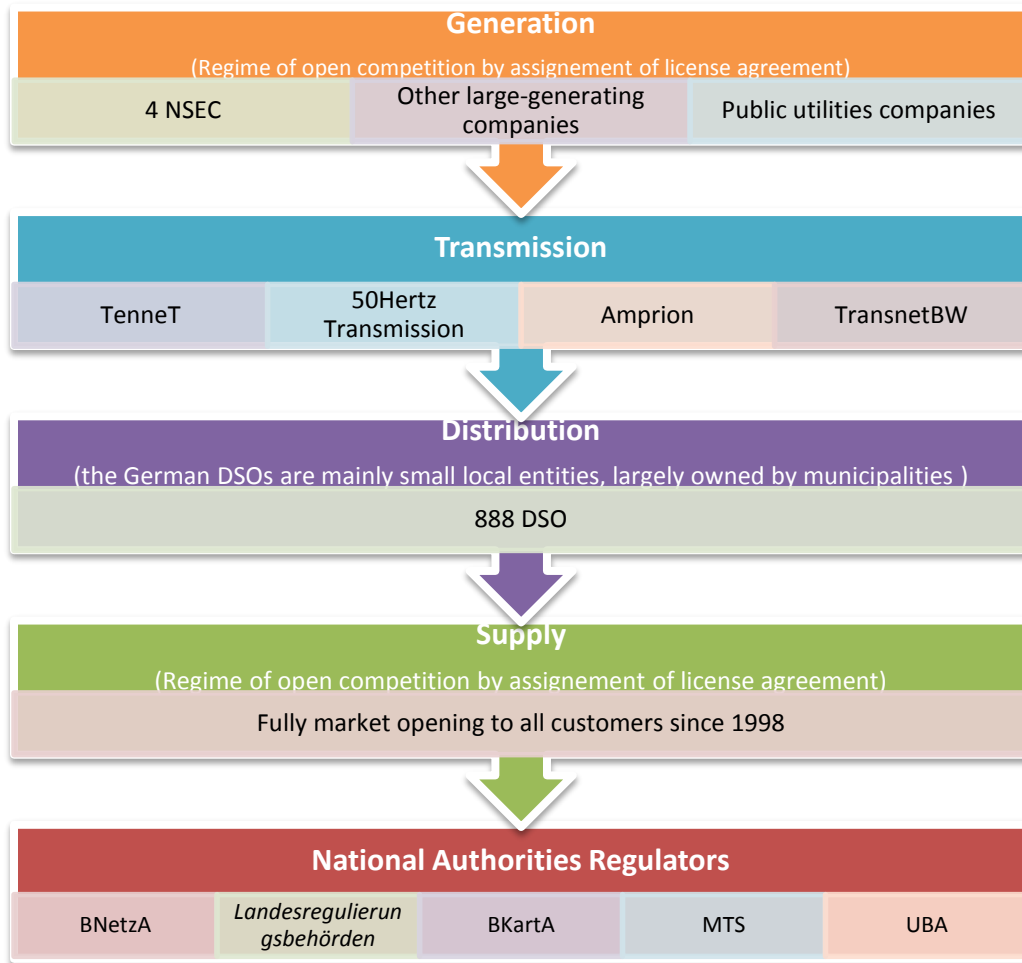


Figure 65. Main features of the post German liberalisation

4.4.2. Electricity Suppliers Operating in the German Open Market

The resume of the German electricity system can be seen in Figure 66.

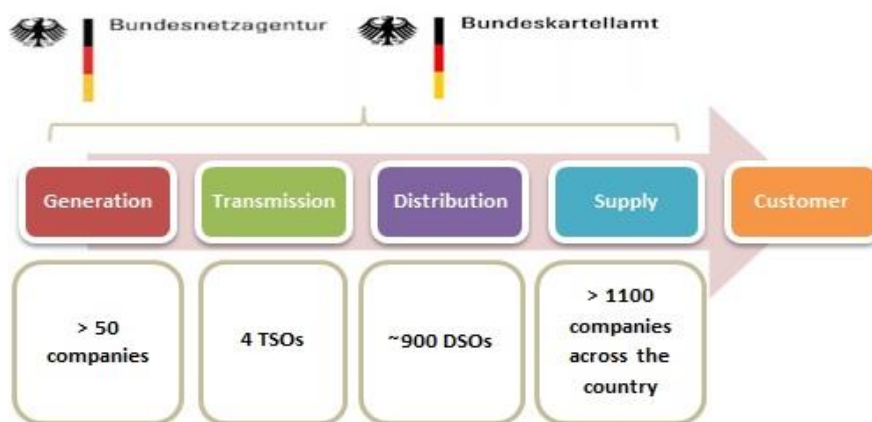


Figure 66. German electricity system

Germany is one of the largest European electricity producers. Despite the historical powerful companies such as RWE, E.ON, EnBW and Vanttenfal, there are several other firms that are taking advantage of the RES to increase their generation market share, such as Enercon, Enertrag, GDF Suez, swb AG, Breeze Two Energy, EEW Energy from Waste, MVV Energie, Energiekontor, Prokon, ENERTRAG, Société Electrique de l'Our, Enviva Therm, EWE AG, RheinEnergie, STEAG and Mainova, among others. Besides these large generating companies, there are the public utility companies (Stadtwerke Bochum Holding GmbH, Stadtwerke Brandenburg an der Havel GmbH, Stadtwerke Düsseldorf AG, Stadtwerke München GmbH, Stadtwerke Hannover AG, Stadtwerke Leipzig GmbH or Stadtwerke Flensburg GmbH). All these companies, and many others, have power plants with over 10 MW of installed capacity [69].



Figure 67. TSOs operating in Germany [70]

At the moment, there are 4 TSOs operating in the country (Figure 67): *50Hertz Transmission*, *Amprion*, *TenneT* and *TransnetBW*, each of them responsible for one of the four German control areas. Fundamentally, their task is to keep control power available to maintain stable and reliable supply.

In the distribution activity, currently there are almost 900 electricity distribution companies active in the market. The majority are small regional DSOs, called *Stadtwerke*, with fewer than 100 000 customers [69]. Three quarters of all DSOs in Germany supply fewer than 30 000 households, which means that they all have a small market share.

There is in Germany an innovative partnerships between communities, public and private organisations, which have enabled localities to take ownership of or participate in the governance of their local energy systems and utilities - a phenomenon that has grown significantly in recent years. Thus, driven by the success history of EWS in the past, by the end of 2012, 190 German communities had been successful in bidding to run their local electricity distribution grid, with at least nine of these being fully owned by EWS.

Finally, in relation to supply, at the moment there are more than 1100 electricity suppliers operating in Germany, mostly *Stadtwerke* due to their public service obligation of electricity supply. These utilities have long or medium term delivery contracts with the major electricity producers.

By other words, it is possible to say the *Stadtwerke* are traditionally responsible for operating the local grid networks and distributing energy to local consumers, and therefore have a greater and more central role in the governance of their local energy market. Nevertheless, it is to be noted that the share of public utilities in overall supply in the electricity sector has continuously decreased since 1998 due to the incoming of new suppliers and contract switching.

These new electricity suppliers can be divided in two types: those, whose energy comes fully from RES, and those who use conventional energy sources.

Slowly, the supply companies are spreading their business across the country. Whilst, in 2008, the majority of suppliers operated only within one network area, or in maximally four additional network areas, nowadays new electricity suppliers operate, on average, within 200 network areas, leading then to a number of approximately 72 suppliers for household customers within each network. On the opposite, established public utilities are active, on average, within 31 network areas [65].

While in 2008 the share of the four largest electricity suppliers (E.ON, RWE, EnBW and Vattenfall) in the overall household customer segment was still at 50.1%, in 2010, the year under review, this share was at 43.8%, and the tendency in the near future is the rate to keep falling. It is clear to say, the *Stadtwerke* and other independent suppliers represent more than 50% of the domestic market. The reasons are transversal to other European energy markets. Among the main causes, it is possible to highlight the environmental concerns, the will of change for a new “green” world, the lack of trust in the big energy companies and the prices billed.

However, the people’s desire for a decentralised power is the main reason. Since the early nineties, there have been in Germany, a clear movement towards a much more constructive, locally-governed infrastructure in which communities may secure their participation and ensure transparency, efficiency and the betterment of their neighbourhoods, which soon led to the creation of new community companies, as Cooperatives.

Nowadays, the influence of these social companies is rising over the years, once they serve and support the local community and economy. Therefore, it is possible to conclude that the retail market in the German electricity sector is characterised by a strongly regional structure.

4.4.3. EWS



The number of RES Cooperatives in Germany has been growing significantly in recent years, registering 100 new cases each year. For instance, at the end of 2013, there were 888 registered RES Cooperatives in the country.

Among the almost 900 social enterprises, it is possible to find one of the pioneers of RES movement: *ElektrizitätsWerke Schönau* (EWS). Its roots are traced in the eighties, right after the Chernobyl disaster in 1986, when in the small town of Schönau, a small group' initiative emerged to protest against nuclear energy and promoting alternative ways of energy supply. Thus, after many years of protests and debates with the local grid operators and the town council, the EWS in 1997 succeeded in buying the grid from the former electricity supplier for 4.7 million *Deutsche Mark* [61]. The financing of such high amount of money was only possible by a spectacular country wide appeal for funds, which did not only made the purchase possible but also showed that when the citizens join together it is possible to achieve good things.

The process was intense and slow, but after many years of struggle EWS could then legally run the electricity network of Schönau, and reorganise it in an ecological manner.

Initially, EWS started to supply Schönau's community's, through local RES sources, however when the energy market was liberalised, the Cooperative spread its services to households across Germany [71].

Regarding its creation, EWS was formed in 1994, as a natural evolution of *Netzkauf GbR*, a citizen group established in 1991, whose plan was to buy the electricity grid themselves. Nowadays, EWS is one of the largest eco-electricity providers in Europe, and the largest run by citizens. Its aim is simple: to decentralise and democratise the energy supply, putting it at the nucleus of a continuously expanding national network of independent power generators utilising a range of RES technologies (PV, hydropower, wind power, biomass and cogeneration).

After this first success, EWS expanded and during the following years, grids in nine neighbouring villages were bought as well. It allowed EWS to increase the number of customers, reaching in the moment to around 150 000 households, commercial establishments and industrial firms with green electricity, comparing to the 1 700 customers in the beginning.

Since the beginning, the EWS's business model and work has repeatedly garnered prizes. It has been leading to a satisfaction not only among members and workers of EWS, but the customers are also happy to see that they are contributing to EWS's vision of sustainable and fair power production [72].

Regarding membership, EWS Cooperative gathers 3 400 members. To become a member, a person must purchase at least five shares, with the value of € 100 each, and the money will be used for the expansion of its grid networks and the establishment of independent RES power plants, through EWS Energie GmbH. A side note to say that, it is not mandatory a new customer become a member too.

In this moment a pertinent question may arise: Why the number of members is smaller when compared to customers? Well, despite its longevity, EWS is only registered as a Cooperative since end of 2009 [72]: EWS Netzkauf eG.

As a Cooperative, EWS must face new problems regarding to energy market. In Germany there are more than 900 grid operators, also very small ones, like EWS Netze GmbH. For years EU has been telling Germany to minimize the number of grid operators, and what it possible to see today is a closing in on grid operators more and more by the German regulation agency, the BNetzA.

As a consequence, many small grid operators are giving up, because from a financial perspective they are unable to fulfil these requirements [61].

Will EWS survive to this change in the energy market? Only time may tell.

4.5. Electricity Sector in Belgium

4.5.1. An Overview of the Belgian Liberalised Market



Figure 68. Belgium and its Regions

Before any further development about the Belgian liberalisation, it is important to clarify that the Kingdom of Belgium is a federation of three Regions with three national languages, of which Dutch and French are predominant (Figure 68):

- ✓ The Flanders, in the north of the country, is subdivided into five provinces and include many medieval art cities such as Antwerp, Bruges or Ghent;
- ✓ The Wallonia, in the south, whose main cities are Liege, Namur and Charleroi, is also subdivided into five provinces;
- ✓ And the Brussels-Capital Region, which does not contain any province. Basically, is only the capital.

Among the five countries that will be object of study in this work, the Belgian government was the one that took more time to liberalise the electricity sector, maybe because of such a complex political power, with competencies regarding energy policy, divided between the federal level and the three Regions.

In fact, the start sign for the liberalisation process was given in 1999, one year after the deadline set by EC, with the transposition of First Directive at the federal level, but only two years later, in 2001, the law of 1999 was further completed and amended by all the Regions between 2000 and 2004 [73].

Regarding the remaining two European Directives, just like the first one, they were transposed to federal law out of time. For instance, while the Second Directive was transposed into Belgian

law in middle of 2005 [74], the Third Directive has taken place at federal level by 2012, despite the deadline of March 2011 [75].

With the timeline of the Belgian liberalisation done, it is time to give the big picture of pre liberalisation of the Belgian electricity system (Figure 69).

Thus, before 1999 the Belgian generation sector was dominated by Electrabel and the SPE with market shares of 91% and 6.5%, respectively. The rest of the market share was divided over a number of small autonomous producers and industrial auto producers.

Both companies also operated the transmission networks through a joint cooperation, called CPTE. Through this entity, created in 1995, Electrabel and SPE coordinated and managed their activities in both the segment of generation and transmission [73].

Regarding to the distribution activity, the networks were, initially, propriety of the municipalities, which meant they had a legal monopoly for the distribution of electricity. However, most municipalities transferred the distribution of energy to inter-municipal companies, set up by groups of municipalities (, or *intercommunales*). There were two types of *intercommunales*:

- ✓ Pure *intercommunales*, this means pure public ownership;
- ✓ Mixed *intercommunales*, in which municipalities joined forces with a private company to organise distribution management and investment activities.

The private company working in association with the municipalities was Electrabel, which participated for approximately 60%. By other words, the inter-municipal companies were tied by agreements to purchase electricity from Electrabel for a period of 15 years. This meant that Electrabel was not only the big player in generation and transmission activities, but also had a dominant position in the distribution sector [73].

Just like distribution, the supply activity was also in hands of municipal and pure *intercommunales* companies with shares of 1 % and 12 %, respectively. Concerning the mixed *intercommunales* companies the share was of 49 %. Nevertheless, Electrabel and SPE, through CPTE, were responsible for the electricity supply to clients directly connected to the transmission network (38 %) [73].

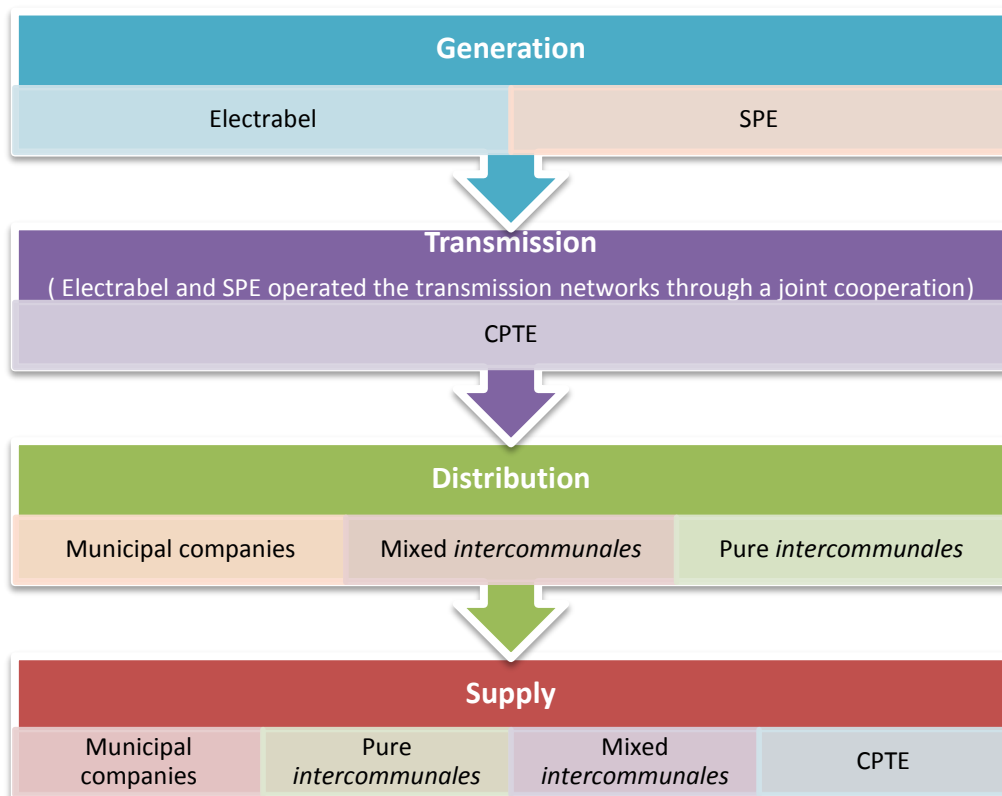


Figure 69. Main features of the pre Belgian liberalisation

The post liberalisation era brought some changes in the four sectors (Figure 70). For instance, starting by generation, it was established that electricity generators need to have an authorisation before they can start their activities. Nowadays, the generation sector is full liberalised which means, besides the two historical major players, Electrabel (GdF-Suez) and SPE-Luminus, a few new companies entered in the generation activity, like REW, E.ON, EDF, Enoco, Eni and Essent, or some smaller companies such as Aspiravi, Ecopower, Electrabel Green Projects Flanders and Electrawinds [73][74].

Moreover, the authorisation must be federal for installations with a capacity of 25 MW or higher. Below this limit, no generation authorisation is required. Nevertheless, an environmental and building permission has to be applied in accordance with regional legislation [75].

As a response to the opening up of the European electricity markets, an organised electricity market in Belgium was introduced in the end of 2006: *Belgian electricity power exchange* (Belpex), responsible for the spot market with daily transactions and intraday adjustments, plus the Green Certificates Exchange. The Belpex's daily market is coupled with its neighbours, APX in the Netherlands, EPEX Spot in France and Germany, and Nord Pool Spot in the Nordic region, while the intraday market is linked only with APX and Nord Pool Spot.

Belpex, via APX, counts on a strong shareholder structure being composed, among others, by two electricity TSOs: ELIA in Belgium and TenneT in the Netherlands.

Regarding derivatives market, the Belgian power exchanges are provided by *ICE-European Energy Derivates Exchange* (ICE-ENDEX). ICE ENDEX was established in March 2013, shortly after the split of energy exchange APX-ENDEX into APX and ENDEX.

According to the Directives, the transmission and distribution networks became a legal monopoly. It was also demanded a legal separation and independency between the generation and supply activities, and a consequence was the establishment by CPTÉ of *Elia System Operator* (ELIA) for its network activities, in 2001. Right after, in 2002 ELIA has been chosen by the Belgian government as the TSO for the next 20 years.

However, ELIA has also the license as DSO in the Flanders for networks with voltage between 26 kV and 70 kV, and is a local TSO in regions of Walonia and Brussels. Right now, in terms of ownership, the company is fully unbundled since Electrabel sold its 24% share, partially to a cooperative company representing the Belgian municipalities (Publi-T), and partially to the market [73].

Regarding distribution networks under 30 kV, the grid is mostly operated by inter-municipal companies (mixed *intercommunales*). Moreover, in line with the European legislation, the municipal and inter-municipal companies had to stop their supply.

Concerning the supply activity, four different supply licenses are available in Belgium since there are four different authorities governing relationships between supplier and consumer, being the competent authority determined by the location and voltage at which the customer is connected to the electricity grid [74]:

- ✓ License submitted to the federal regulator, for trading electricity and supplying it to end-users connected to the transmission grid.
- ✓ License submitted to the regional regulator, depending on the location, for supply electricity to end users connected to distribution networks.

Continuing in the supply sector, all companies connected to the federal transmission network are free to choose their supplier since a period between 2000 and 2002. Regarding to domestic sector, users who are connected to the distribution networks, the Belgian energy market was gradually opened [73][76]:

- ✓ **Flanders:** as from 1st January 2003;
- ✓ **Wallonia and Brussels:** as from 1st January 2007.

Due the liberalisation some changes did occurred in this sector, with the entry of dozens of new electricity suppliers and the ending of the municipalities' role in the supply activity. Thus, the eligible customers who were previously operated by the mixed *intercommunales* and who did not select a new supplier were from then on supplied by Electrabel, while the pure *intercommunales* transferred their retail activities to a new company called Luminus [73].

Regarding national regulatory authorities, the federal regulator is the *Commission for the Regulation of Electricity and Gas* (CREG). It was created in 2000, and its function is to advice the Belgian authorities on the structure and operation of the liberalised electricity and gas markets, monitors the application and efficiency of relevant laws and regulations, including the approval of the tariff proposals submitted by the TSO and DSOs. Nevertheless, with the introduction of the federal laws of 2005, CREG's mission became somewhat reduced in favour

of the *Belgian Federal Energy Administration Ministry*. Moreover, there are three regional energy regulators [74]:

- ✓ *The Flemish Regulator of the Electricity and Gas market (VREG)*, responsible for regulate the region of Flanders;
- ✓ *The Walloon Commission for Energy (CWaPE)*, responsible for regulate the region of Wallonia;
- ✓ *The Brussels Regulator for Energy (BRUGEL)*, responsible for regulate the Brussels-Capital Region.

In addition to supervising the operation of the electricity market, these institutions also play a central role in issuing supply licenses, authorising new power plants, including renewable energy, and issuing and managing green power certificates.

The regulators' competencies in the electricity sector are allocated according to the tension of the relevant grids. Thus, for networks with a tension above 70 kV, the CREG regulates the entire Belgian territory, while for grids with tension below 70 kV, the regional regulators are competent for Flanders, Wallonia and Brussels-Capital, respectively.

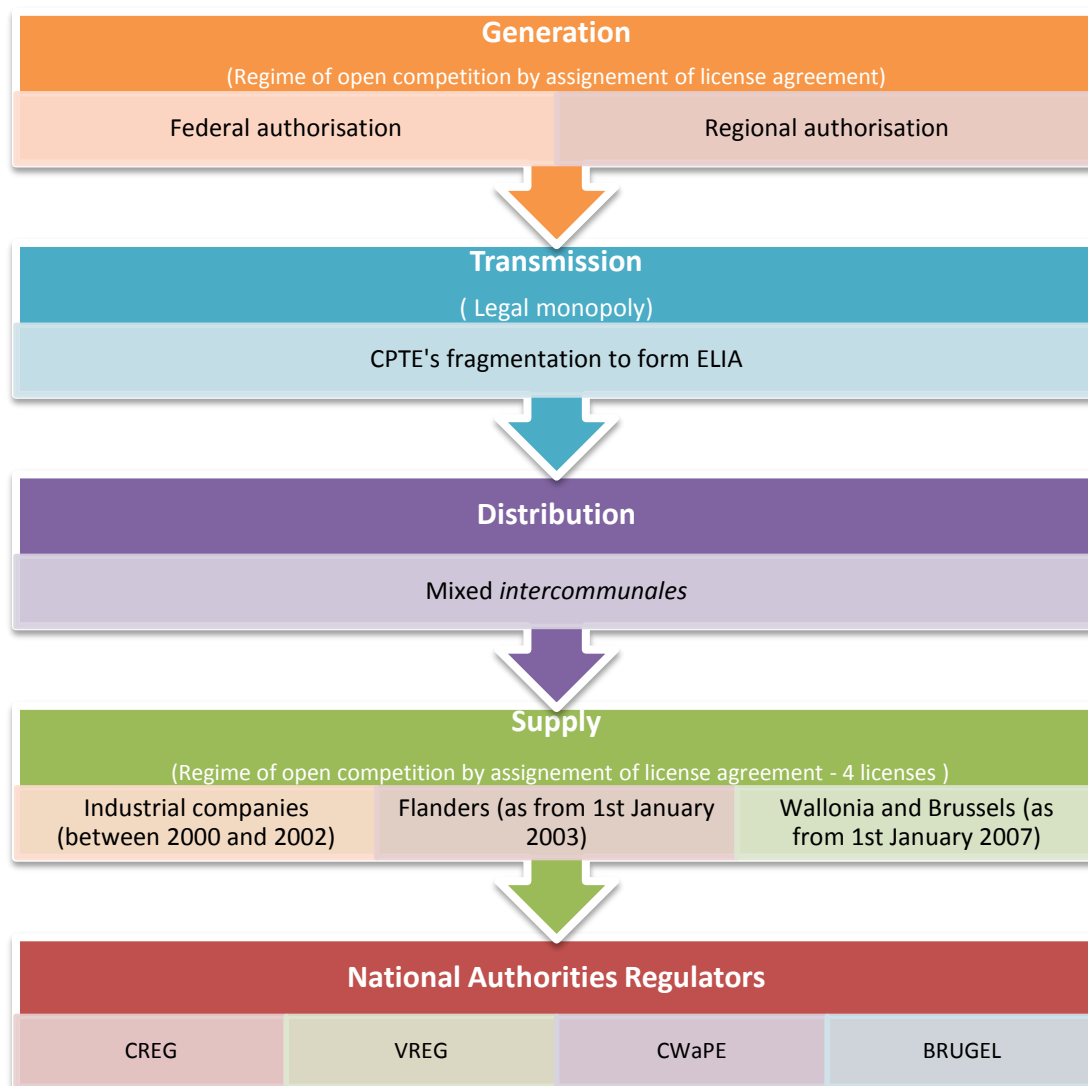


Figure 70. Main features of the post Belgian liberalisation

4.5.2. Electricity Suppliers Operating in the Belgian Open Market

Therefore, at the moment the Belgian electricity system can be represented by four big sectors, plus the regulators (Figure 71).

Electricity generators are the first players in the chain, and at the moment there are several players operating in Belgium, including Electrabel, SPE-Luminus, REW, E.ON, EDF, Enoco, Eni and Essent, or some smaller companies such as Aspiravi, Ecopower, Electrabel Green Projects Flanders and Electrawinds.

While Belgium has a single TSO, Elia Transmission, in the distribution sector, the case is quite different with several DSOs. As there are three Regions, each one has its DSOs. Thus, in Belgium, DSOs are ORES, Tecteo (Resa), Régie de Wavre, AIESH, AIEG, IEH, INTEREST, INTERMOSANE and PBE in Wallonia, Sibelga in the Brussels-Capital Region and finally, Eandis, ELIA and Infrax in Flanders [77].

The customers can be anyone from individuals to major industrial players. Industrial users are often directly connected to the high-voltage grid, whereas individual users or SMEs, for example, are connected to the distribution system.

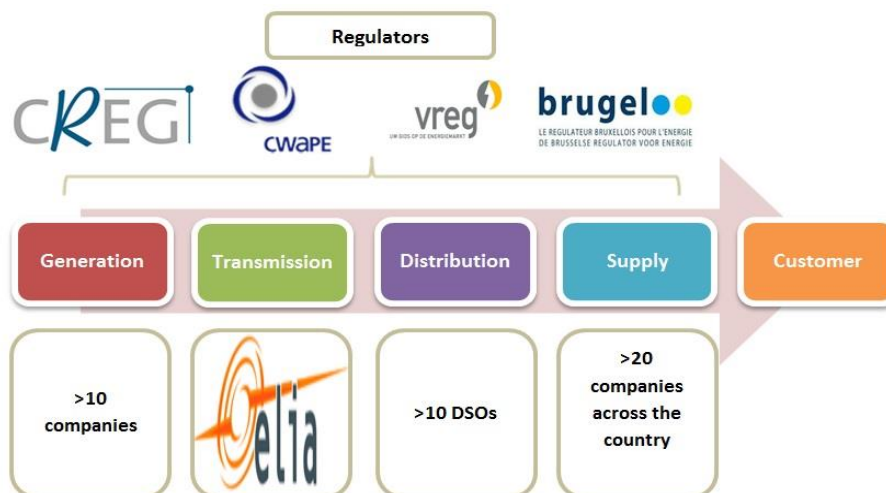


Figure 71. Belgian Electricity System

With regards to the supply activity, nowadays, the Belgian customers may choose from a range of companies. Considering the three Regions, there are more than 20 electricity suppliers in the country.

According to VREG [78], there are in the Flanders territory 35 electricity suppliers. Focusing on those who have got a market share, they are 29: Electrabel Customer Solutions, EDF Luminus, Eni Gas & Power, Essent Belgium, Lampiris, Eneco Belgie, Netbeheerder, Octa+ Energie, Ecopower, Elegant, Elektriciteitsbedrijf Merksplas, Belpower International, Watz, Elexys, E.ON Belgium, Wase Wind, Elindus, WE Power, Scholt Energy Control, Trevion, Belgian Eco Energy, Electrabel, Energie 2030, Powerhouse, Enovos Luxembourg, Axpo Benelux, Delta Energy Belgium, Energie der Nederlanden, E.ON Global Commodities.

In June 2014, the market shares based on the total number of end-users was led by Electrabel with 44.40%, followed by EDF Luminus and Eni Gas & Power with shares of 20.18% and 11.84%, respectively (Figure 72).

Then, there is a group of companies, including Essent (7.63%), Lampiris (5.03%) and Eneco (4.34%), with a respectable share in the Flanders market, followed by a third group composed by Netbeheerder (2.50%), Octa+ Energie (1.53%), Ecopower (1.23%), Elegant (0.41%), Elektriciteitsbedrijf Merksplas (0.30%), Belpower International (0.23%) and Watz (0.14 %).

All other players had shares below 0.10%.

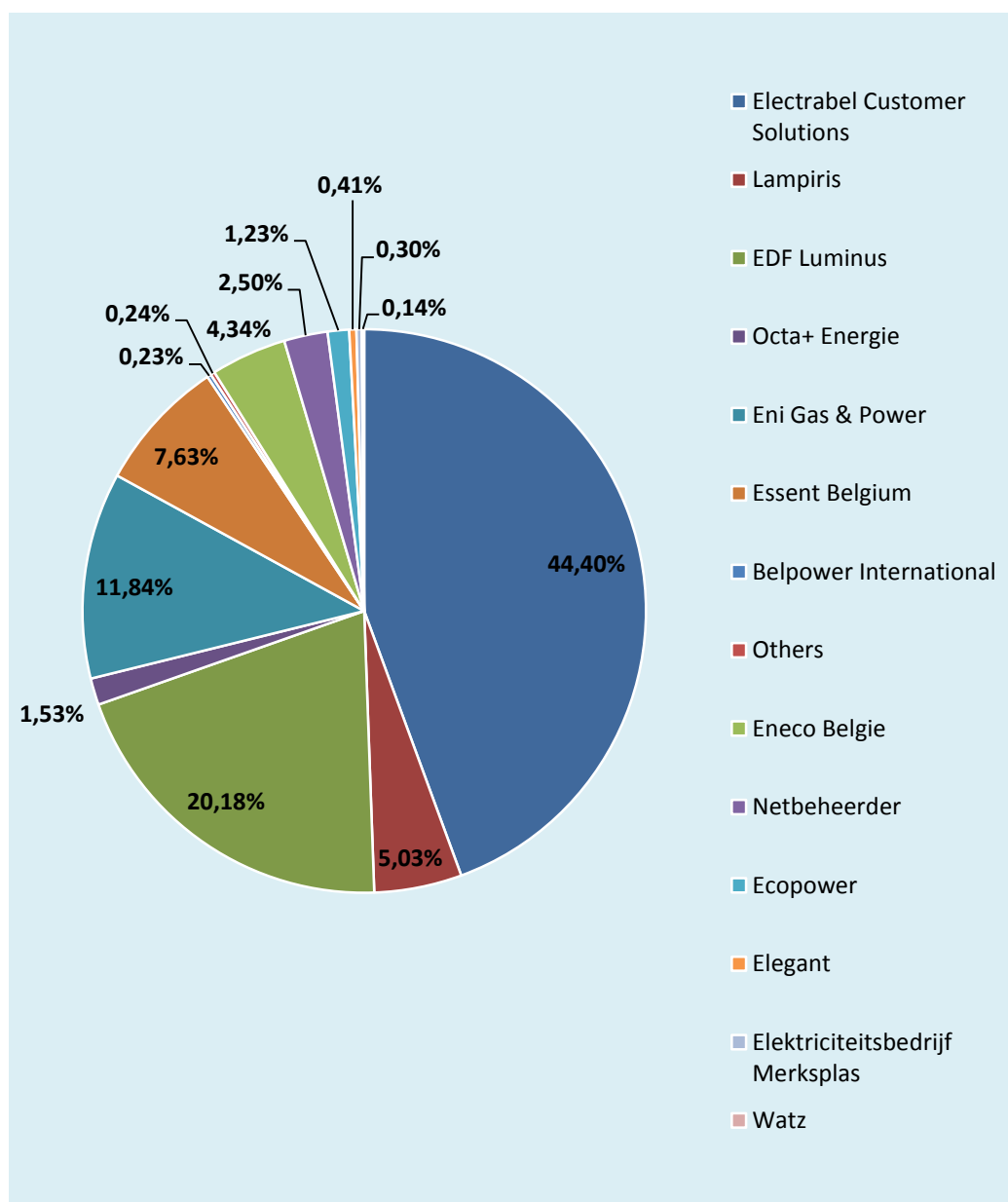


Figure 72. Flanders Region’s market share, by electricity supplier (in June 2014)

In relation to Brussels-Capital Region, according to BRUGEL the total number of electricity suppliers is 16 [79]: Belgian Eco Energy, Belpower International, E.ON Belgium, Electrabel, Electrabel Customer Solutions, Elexys, Eneco Belgie, Energie 2030, Lampiris, EDF Luminus, Octa+ Energie, Eni Gas & Power, Essent Belgium and Sibelga.

Here the case is no difference, which means that by the end of 2013, based on the total number of end-user, Electrabel Customer Solutions was the number one company with a market share of 75.10%. Concerning the others players, Lampiris had a market share of 15.11%, while EDF Luminus, Eni Gas & Power and Octa+ Energie ended the year with shares of 5.26%, 1.76% and 1.66%, respectively (Figure 73).

A side note, to Sibelga (0.54%), Belpower International (0.23%) and Essent Belgium (0.22%), all companies that ended 2013 with interesting market shares. The others represent a share of 0.12%.

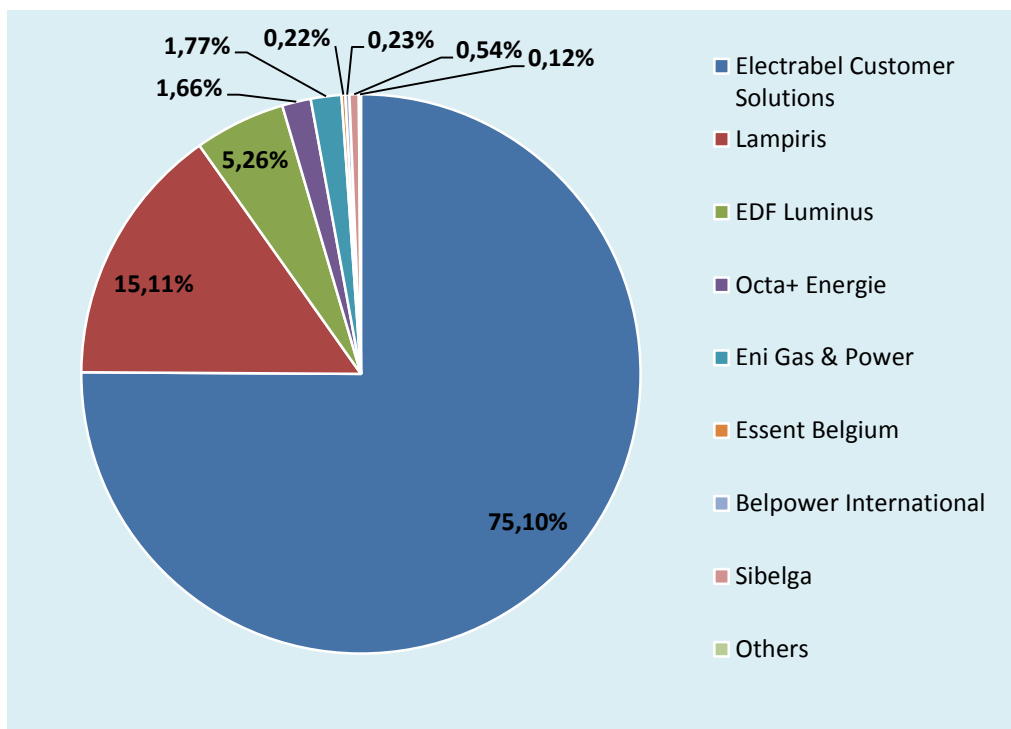


Figure 73. Brussels-Capital Region's market share, by electricity supplier (in the end of 2013)

Finally, according to CWaPE [80], in the end of 2013 there were 10 electricity suppliers operating in the Wallonia Region: Belpower international, Electrabel Customer Solutions, EDF Luminus, Elexis, Eneco Belgie, Energie 2030, Eni Gas & Power, Essent Belgium, Lampiris and Octa+ Energie.

Looking closely to the market shares (Figure 74), once again Electrabel Customer Solutions stood as the electricity supplier with the largest share (51.80%). With half of Electrabel's share (24.90%) was EDF Luminus, while the third place belonged to Lampiris with 11.2%. Right after, came Eni Gas & Power and Essent Belgium, each one with a share of 5.4%.

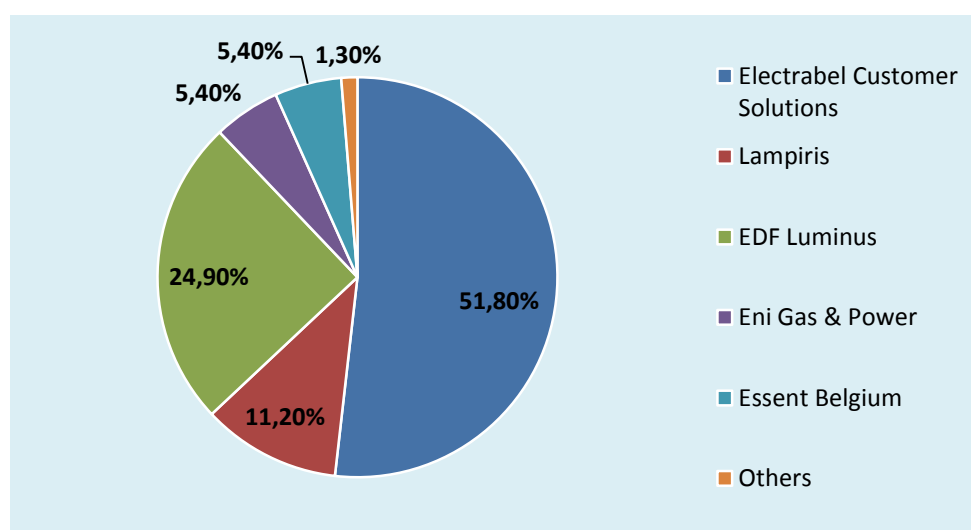


Figure 74. Wallonia Region's market share, by electricity supplier (in the end of 2013)

Considering the number of electricity suppliers, the market in Flanders is more developed than the others. Indeed, the region was the first to open up its market in the segment of the supply back in 2003. However, this does not explain everything. For instance, Flanders have been leading not only in innovative measures, as the *Flemish Green Power Support Scheme* and the *Flemish Energy Company* or even the installation of smart meters, but also in adapting the European Directives to the Regional legislation, as the full ownership unbundling on distribution level that must be achieved until 2018 [75].

Despite the insufficient data, concerning the Wallonia and Brussels-Capital markets, which lead to a problem for a correct access and analyse of the Belgian electricity market, it is possible to come up with a conclusion: there are three big players in the country, wherein two of them (Electrabel and EDF-Luminus, previously SPE) were operating in the market even before of the liberalisation. The third one is Eni Gas & Power.

Nevertheless, paying attention to the most vibrant market (Flanders), there are some “green” companies, including Lampiris or Ecopower, which will be studied in the next section, whose market shares are having a sustainable growth over the time, due to a mix of reasons, such as their visions of an electricity system based on RES, regional support schemes for smaller RES companies or the public awareness and debates for a new energy paradigm.

4.5.3. Ecopower



Unlike Lampiris, Ecopower is a social company owned by its members. Founded 23 years ago in Belgium, Ecopower is one of the most known RES Cooperatives operating in Europe. As one of the first of the new wave of energy Cooperatives, Ecopower is an example for most of the Cooperatives all over Europe, due not only for the introduction of several innovative practices and an exemplar management of its resources, that have led to a sustainable growth of the Cooperative, but for being one of the founders of REScoop, an European Federation of groups and Cooperatives of citizens that was legally established under Belgian national law with an European scope [61]. The aim of REScoop is to set the bases for a stronger European renewable energy cooperative alliance. Thus, this European Federation aims to support and develop RES Cooperatives promoting education, information and experience exchange, supporting research and the creation of new Cooperatives and helping to overcome financial and banking barriers. By other words, REScoop represents its members at the national, regional and, particularly, at the European level to create a level playing field for energy Cooperatives [61].

Among its members, besides Ecopower, are for instance two of the case studies: EWS and Som Energia.

Presentations made, it is time to look more closely at Ecopower’s history. It all began in 1991 when a group of 30 people, from ecological and social movements, came up with the idea of

citizen energy production and sometime after, the project was officially recognised as Cooperative by the Belgian government.

The years passed and at the turn of the century, something happened. In 1999, the city council of Eeklo, a small city near Ghent, decided to start a project for sustainable development. It soon became clear that a focus on energy was desirable and the decision was made to build windmills. The city's environmental officer drew up a plan subject to several criteria: the windmills should be built at least 250 metres from residential areas and they should not have a negative impact on the ecological context of important nature conservation areas. At the end, three sites were selected on which windmills could be installed according to the environmental and social criteria. As the city owned land on two of the sites, those places were put up for rent. Thus, seven companies competed for the right to build and operate the windmills and at the end, Ecopower came out as the winner [81]. But how was that possible, to beat private and consolidated companies?

In fact, it was a result of an explicit information strategy and campaign – a shared initiative of Ecopower and the city – the people of Eeklo were well informed and very supportive of the project. Moreover, they were convinced of the windmills' potential and many have purchased shares in Ecopower, shares in what are now 'their' windmills.

This event had such a big impact in Belgium, that the number of members increased, from 47 members that the Cooperative had in 1999, to around 700 in 2002 and almost 3 000 in the end of 2003 [61].

Since then, Ecopower have been invested in more RES projects, including wind power, PV, hydropower or biomass across the country.

For instance, during this year (2014), Ecopower aims to invest in a factory for wood pellets to be used for residential heating. Also, a wind power project with 4 large wind turbines is being built in Asse and preparations are made for a few more projects in Beersel (2 wind turbines), Bilzen (1 wind turbine), Ghent (1 wind turbine) and Sint-Truiden (3 wind turbines), respectively [81].

However the boom of members happened in 2003, year in which the liberalisation of the Belgian energy market occurred. Thus, taking advantage of this event, Ecopower started a new activity in its organisational structure: become a green electricity supplier [61].

Thanks to this new activity, at the end of 2013 Ecopower reached the 40 000 customers. The keys for success are simple: fairest and greenest electricity, and best customer service on the market. Moreover Ecopower, unlike the other energy suppliers, besides providing electricity also intends to reduce the electricity bill of their customers, through energy efficiency policies.

Besides investing in its own projects, Ecopower also gives every kind of support in projects developed by third parties: local groups of citizens, local co-ops, city councils or private companies. Actively supporting other RES Cooperatives is an important element of Ecopower's philosophy. At the same time Ecopower wants to make people aware about RES energy and rational energy use in particular.

Regarding members, at the moment the Cooperative has more than 50 000 members. In the Ecopower's scheme, interested citizens and organisations can buy one or more shares at a price of € 250 each. This gives them the right to one vote in the Cooperative's General Assembly, irrespective of the amount of shares that they have.

Having been granted recognition as a Cooperative, Ecopower is obliged to limit yields on shareholders' investments to a maximum of 6%. This is not necessarily an obstacle, however, as it creates some interesting possibilities given that the Cooperative can also pursue less profitable projects. The financial surplus will be used for this purpose. In any case, 6% is quite a good rate – considering current interests on saving accounts [81].

4.6. Cooperatives' background and experience in electricity retailing supply process

Coopérnico's electricity retailing supply process

1 Name of the Cooperative:

Type a sentence

250 characters remaining

2 Which were the reasons that pushed up the Cooperative into the electricity retail market, competing then in a clearly way with the large energy players?

Type a paragraph

1500 characters remaining

3 From 1 to 5, how hard do you describe all the electricity retailing supply process? (1- hard ; 5- easy)

Just like all the other social enterprises, the Cooperative started its activity as an electricity producer based on RES, and just then spreaded its domain into the electricity retailing.

★ ★ ★ ★ ★

0/5

4 Going deeper into the process, how long did it take? *

- < 3 months
- between 3 and 6 months
- between 6 and 9 months
- between 9 and 12 months
- > 1 year

5 Which were the main barriers the Cooperative had to face during the entire process? (Order the list according to the relevance) *

- 1. Financial issues
- 2. Legislative complexity
- 3. Not easy to find all the necessary information and someone to clarify some doubts
- 4. Lack of qualified human resources
- 5. Lack of technology resources (for instance ERP software)
- 6. Buying electricity in the organised market
- 7. Other *Type your answer*

100 characters remaining

6 How did you overcome these obstacles? *

1500 characters remaining

7 Counting the transmission and distribution network access, the requirement for trading electricity in the organised market and the retailing supply register itself, how many licenses did you have to fulfill to operate in the national electricity retail market? *

- 1
- 2
- 3
- 4
- 5
- >5

8 When the Cooperative started the retailing supply activity, how did you purchase electricity in the organised energy market?

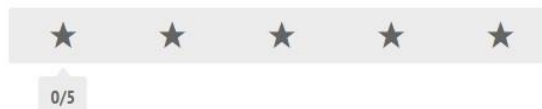
- Directly (The Cooperative itself)
 - Indirectly (Via Broker)
 - Indirectly (Via BPO)
 - Through an intermediate company: The billing is made by the Cooperative (Option when the Cooperative do not participate in the organised energy market)
 - Other
- Type your answer

100 characters remaining

9 What was the total amount of financial warranties the Cooperative had to provide in the end of the process?

- < € 50,000
- between € 50,000 and € 100,000
- between € 100,000 and € 150,000
- between € 150,000 and € 200,000
- > € 200,000

10 From 1 to 5, how good was the market receptivity, especially consumers, to the Cooperative entry? (1- bad ; 5- good)



11 Considering the statement below, what measures did the Cooperative take to settle down in such a competitive market? (Order the list according to the relevance)

Despite the rising global awareness for a new energetic paradigm, the ordinary people are not familiar with these social companies yet.

- 1. National advertising campaigns (TV, radio, flyers)
- 2. Local promotion (talking face-to-face with people)
- 3. Low price billed
- 4. Partnerships with other social movements and public organisations
- 5. Partnerships with private entities and research institutes
- 6. Extra-services (energy saver guide)
- 7. Green electricity
- 8. Other *Type your answer*

100 characters remaining

12 Is it mandatory to a customer become a member of the Cooperative?

(May use the "Other" option, to give extra details about the answer)

Yes

No

Other

Type your answer

100 characters remaining

13 According to your experience what makes people join the Cooperative and participate in this green revolution? (Order the list according to the relevance)

- 1. Pro-RES approach
- 2. Anti-oligopoly
- 3. The possibility to participate in the governance of their local energy systems and utilities
- 4. Low level of trust in the big energy companies
- 5. Good service provided
- 6. Concentrated market economy and decentralised model of power production and supply (Development of the local community and economy)
- 7. Monetary interests (People just see RES projects as a better investment than banks)
- 8. Other *Type your answer*

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Figure 75. Example of the form given to RES Cooperatives

Besides the four case studies (The Co-operative Energy, Som Energia, EWS and Ecopower), completed the form eight more RES Cooperatives: Enercoop from France, GoiEner S. Coop., Nosa Enerxía S. Coop., Zencer S. Coop. and EnerPlus all from Spain, Greenpeace Energy eG from Germany and NLD Energie and DE Unie from Netherlands.

Looking to all the answers in question 2, there are two main causes behind the entry of the RES Cooperatives in the electricity retail market: market opportunity and the non-existence of an environmentally friendly option.

All the RES Cooperatives share both causes, Ecopower, Som Energia and Greenpeace Energy being perhaps the best examples; however there are some that are more inclined to each option, than others.

In relation to the first reason, whilst for instance Enercoop took advantage of the liberalisation of the French energy market to bring forth the idea of a decentralised model of power production and supply, where consumer is closer to the production, the case of the Co-operative Energy is different, despite being also related with market opportunity. As part of the Midcounties Co-operative, a social enterprise that was already operating in several markets such as the food, funeralcare, pharmacy or post office for instance, the Co-operative Energy was the missing piece in the Micounties Co-operative puzzle. Thus, the Co-operative Energy was created in 2010 as a result of a market opportunity in the British energy business, based on the lack of trust among consumers in the Big 6 energy suppliers.

Leading the second reason, there is EWS, which became an electricity supplier before the liberalisation of the energy markets. The decision of EWS to start supplying electricity was a natural consequence of a protest against nuclear power. As the renounce of the use of nuclear energy itself was not enough to build up a new energetic paradigm, the people of Schönau decided to demonstrate that a green electricity supply in the village was possible, including a new tariff structure, and the only option available at the time was the buy of the electricity grid.

Relative to NLD Energie and DE Unie, there were a couple of reasons put forward, but the most important was the possibility to introduce a truly local company that promoted local sustainability.

Concerning RES Cooperatives, whose entry in the electricity retail market is a declared mix of both reasons, starting by Greenpeace Energy the liberalisation of the German energy market in 1998 opened up the possibility to supply customers with green electricity. As at the time there was any supplier capable to provide high quality green electricity, Greenpeace e.V. took matters and created in autumn 1999 the Greenpeace Energy, a RES Cooperative legally and financially independent of the environmental protection organisation. In the next year, Greenpeace Energy started supplying customers with clean electricity according to the Greenpeace early idea.

The Ecopower history is similar to Greenpeace Energy, although the decision to start supplying electricity was initiated by its members at the General Assembly in 2003 after the liberalisation of the electricity market for private households in Flanders.

Relative to Som Energia, the Cooperative started in 2010, and shortly after, and in accordance with its mission (a new energetic paradigm), the Cooperative identified an opportunity in the Spanish electricity market: the promoting of an electricity model based on RES. Thus, it didn't take too long to Som Energia to start supplying green electricity to its members, as well as the construction of RES power plants.

The Som Energia's ideology is shared with four more Spanish Cooperatives: Zencer, Nosa Enerxía, EnerPlus and GoiEner. In their own way they all have the will to provide consumers

the democratic access to liberalised electricity, supported by 100% green electricity and the chance the customer taking control of its own power company, fighting thus the low level of trust in the energy companies and the corruption in the Spanish energy business.

Moreover, in relation to GoiEner, just like several other RES Cooperatives, the Cooperative aimed to start its activity as an electricity producer based on RES, and just then spread its domains into the electricity retailing. However, due to cut of the feed-in tariffs introduced by the Spanish legislation in early 2012, the GoiEner was forced to turn its focus for the electricity retailing market.

Although currently all these RES Cooperatives are supplying electricity in their own market, it does not mean it was an easy process for them. Besides Ecopower, DE Unie, NLD Energie Som Energia, which ranked their process as 5 and 4, respectively, the majority of the RES Cooperatives assessed their electricity retailing supply process as hard or very hard.

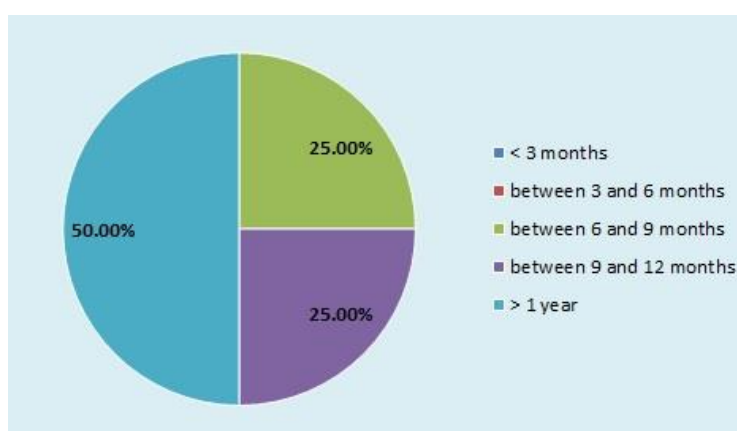


Figure 76. Result of the question 4: “How long did the whole process take?”

No doubt the national legislation, which differs among EU members, matters to the time it takes to fulfil the electricity retailing supply process. However, it is not the main factor. Based on the experience provided by the RES Cooperatives, the minimum period to start supplying electricity is 6 months and may exceed one year depending on the method chosen to operate on the organised energy market (Figure 76).

A side note to the EWS case, which took several years to be concluded. As they started supplying electricity before the liberalisation of the German energy market, at that time it was required to run the distribution grid in order to supply electricity. The licenses to run the grid are still given by the municipalities. In most of the cases the concession is for periods above 15 years and has to be announced at least 1 year in advance, so at this point it is possible to realise the complexity of the EWS’s electricity retailing supply process. Moreover, besides the license to run the grid a license to supply was also required.

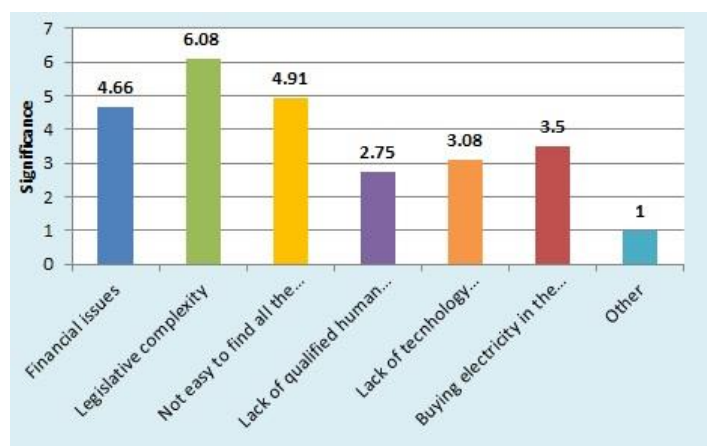


Figure 77. Result of the question 5: “What was the main barriers the RES Cooperatives had to face during the entire process?”

Independently of the time it takes to complete the electricity retailing supply process, there are several barriers that the RES Cooperatives had to face during the entire process (Figure 77). According to their feedback, it is possible to highlight the legislative complexity, including the difficulty to clarify any doubts, as well as the financial issues as the main obstacles to become an electricity supplier.

Nevertheless, for Enercoop and Som Energia the biggest issue was the access to the organised energy market. Besides that, for Enercoop the problem number one was the market context.

Based on the RES Cooperatives’ response, a national RES Cooperative shall overcome these barriers through several ways. Thus, the best advice that the Cooperative may have at this point is to be fully committed to the project, studying and analysing the current national regulations of the electricity sector. Moreover, the RES Cooperative shall seek for outside collaborations. Working together with different partners (other Cooperatives, social economy organisations, public institutions or energy experts) may help overcoming the lack of knowledge and experience in the business, as well as any financial issue.

Finally, it is important to be patient and to have perseverance during the development of the electricity retailing supply process.

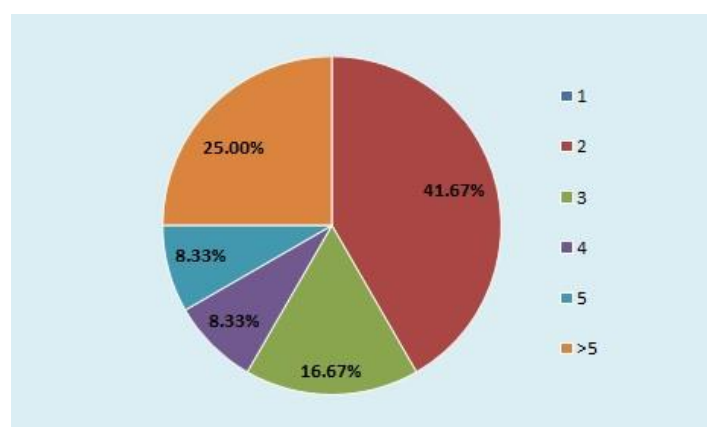


Figure 78. Result of the question 7: “ How many licenses did the RES Cooperatives have to fulfil to operate in the national electricity retail market?”

As shown in Figure 78, the number of licenses varies from country, as well as the strategy chosen by the RES Cooperative to supply electricity in their national electricity retail market.

Before the liberalisation of the energy market, the EWS just needed two permissions to start supplying electricity: one for running the grid and another one for the supply itself. Still in Germany, Greenpeace Energy has a comparable number, three licenses, even though the Cooperative started supplying after the liberalisation of the German electricity market.

In relation to the Spanish RES Cooperatives, the number goes from two to more than five. The explanation is maybe related to the method chosen to purchase electricity in the MIBEL, as it will be seen right away.

Looking to the Benelux's RES Cooperatives, the NLD Energie and DE Unie needed two permissions given by the Dutch Authority for Consumers & Market, to operate as an energy supplier. For Ecopower, the number of licenses reaches five, and the reason may be related to the fact that Belgium is divided in three regions, each one with its own regional energy regulator.

Finally, the Co-operative required to fulfil more than five licenses to start supplying electricity in the UK.

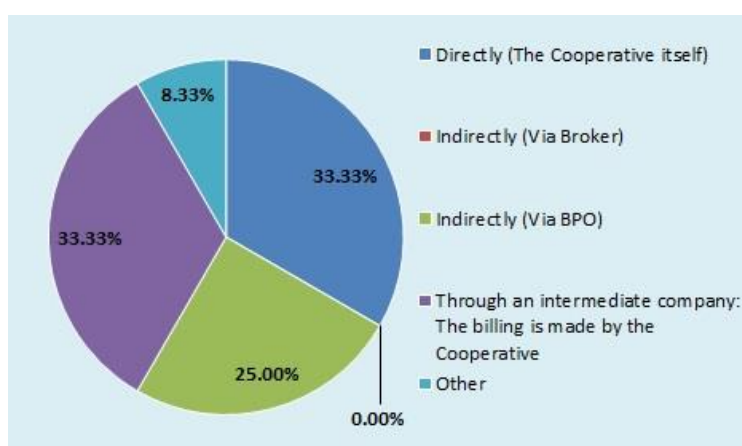


Figure 79. Result of the question 8: “ When the RES Cooperative started the retailing supply activity, what was the method chosen to purchase electricity in the organised electricity market?”

Analysing the 12 RES Cooperatives, from the several options to operate on the organised electricity market the chosen method was (Figure 79): To purchase electricity directly on the market (Enercoop, Greenpeace Energy, The Co-operative Energy and Zencer).

Nevertheless, there are also RES Cooperatives, such as DE Unie, Ecopower, EnerPlus and Nosa Enerxía, which in the beginning of the supply activity opted for not participate in the energy market. Basically, their strategy is to operate as an intermediate company but the billing is made by the RES Cooperative.

Moreover, there are also RES Cooperatives which access the market through a Representative Agent, via a BPO agreement (GoiEner, Som Energia and NLD Energie).

Relative to EWS, the RES Cooperative buys electricity directly from RES producers. This method is also used as a complement by the Co-operative Energy.



Figure 80. Result of the question 9: “ What was the total amount of financial warranties the RES Cooperative had to provide in the end of the process?”

As the financial issue is one of the biggest barriers a RES Cooperative faces during the process, it is worth a closer look (Figure 80). Based on the RES Cooperatives’ feedback, it is possible to get the permission for energy retailing and start supplying with less than € 50,000.

Just focusing on the Spanish RES Cooperatives, as their national legislation is quite similar to the Portuguese and it also shares the same organised energy market, it is possible to come up with the certainty that a RES Cooperative, that aims to operate in Portugal, just needs € 50,000 to start offering electricity to Portuguese customers.

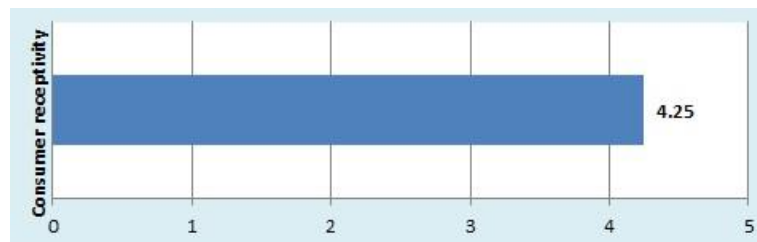


Figure 81. Result of the question 10: “ What was the consumers’ receptivity to the RES Cooperative entry in the electricity market?”

Notwithstanding it is a lengthy and complex process, the rewards do not take too long to occur. According to the RES Cooperatives experience, from the moment that the Cooperative enters in the electricity retail market, its offers are seen with good eyes by the consumer (Figure 81). Despite Zencer, which ranked the consumer’s receptivity to its offer as three, all the other RES Cooperatives rate as four and five the consumer’s acceptance to their entry in the electricity retail market.

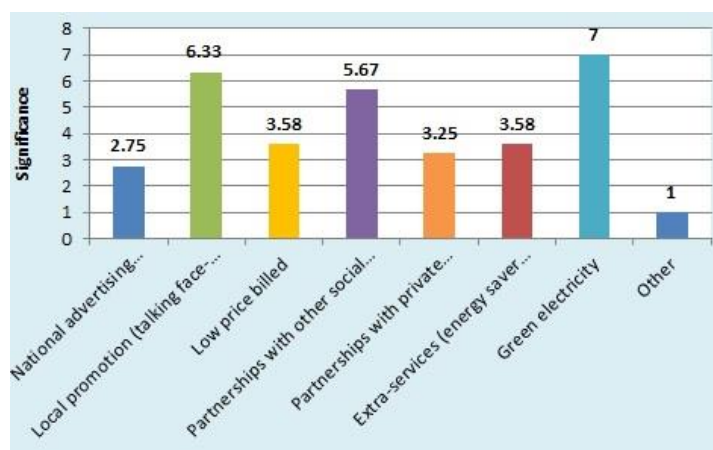


Figure 82. Result of the question 11: “ What measures did the RES Cooperative take to settle down in such a competitive market?”

As any other business, in order to succeed it is important for a new competitor to study and analyse the energy market before deciding to operate. However, when the RES Cooperative get the permission for electricity retailing, it will be equally important to come up with some measures that will allow its offer to be chosen by the consumers. Thus, according to the RES Cooperatives experience, the most relevant aspect that stands out is the green and clean electricity (Figure 82). Besides this competitive advantage, as the Cooperative does not have the same tools as the big energy companies (TV ads and newspapers ads), the local promotion through talking face-to-face and the participation in public events, as well as the collaboration with other public organisations, such as Cooperatives or social movements, are definitely other measures Coopérnico may takes to settle down in the energy market.

For instance, the NLD Energie has partnerships with other local RES Cooperatives, which act as NLD Energie's resellers.

Moreover, another big advantage introduced by the RES Cooperatives is related to the reduction of the electricity consumption of their customers, through energy saving measures. The RES Cooperatives have the real concern to reduce the electricity bill of the national consumers, on the opposite of the big energy companies.

In relation to question 12, the number of RES Cooperatives for which it is mandatory to a customer become a member of the Cooperative is practically equal to those which is not required.

Taking the example of two RES Cooperatives that complemented their answers: GoiEner and Som Energia. While in the first case the “YES” is related to a financial support that the RES Cooperative needs due to operation in the energy market (deviations), in relation to Som Energia it was mandatory a customer to be a member as well in the beginning of the electricity retailing. However, nowadays the answer is “NO”, once each member can bring into the Cooperative five electricity contracts of friends and/or family.

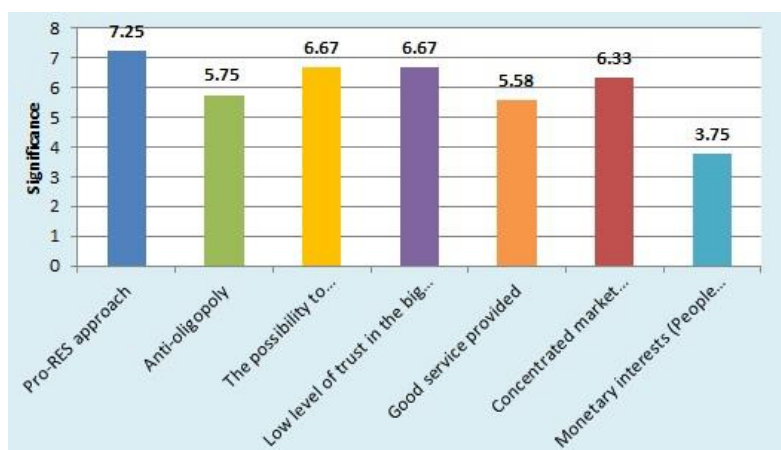
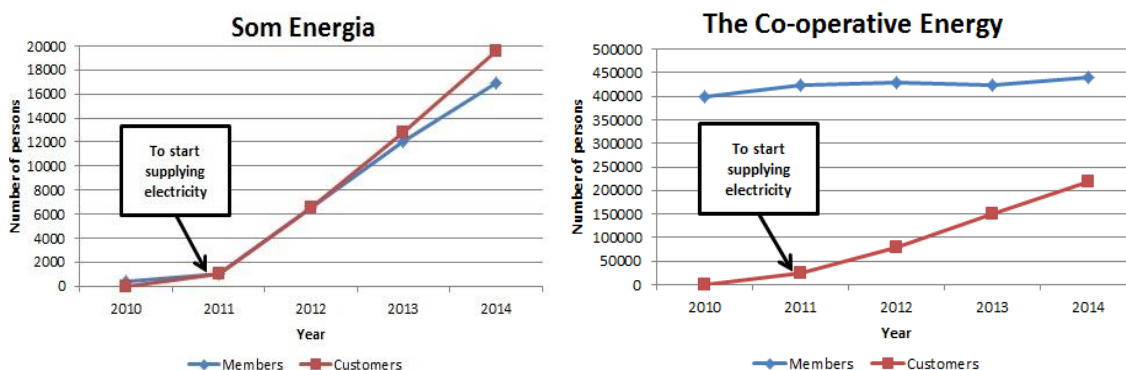


Figure 83. Result of the question 13: “What makes the people join the RES Cooperative and participate in the green revolution?”

Finally, as important as the measures defined by the Cooperative to strike the electricity market, is to understand what leads the consumer to become a member and/or a customer of the RES Cooperative. Despite cultural differences between Europeans, considering that the RES Cooperatives which participated in this survey are from three different European regions, Southern Europe (Portugal and Spain), Central Europe (Germany) and Western Europe (Netherlands, Belgium and UK), the motivations that make people join to such green revolution are basically the same regardless of the place of origin or traditional culture.

Thus, as shown in Figure 83, the biggest motivation for the consumer is the Pro-RES approach. People are increasingly more aware about what is going on in the world and believe that the use of RES is the only possible way out for a new global energetic paradigm. Moreover, the consumer believes that this new energetic paradigm should be built on a decentralised model of power production and supply, which contributes for the development of the local community and economy, and interestingly wants to participate and conduct itself this "green revolution", through the governance of their local energy systems and utilities.

However, there are customers who do not know anything about the mission and vision of the RES Cooperative when they choose a new electricity supplier; they just switch due to the lack of trust in the big energy companies and the perceived corruption in the energy business. Basically, they just switch because there is a new offer in the market and hope to have a good service provided with this new entity.



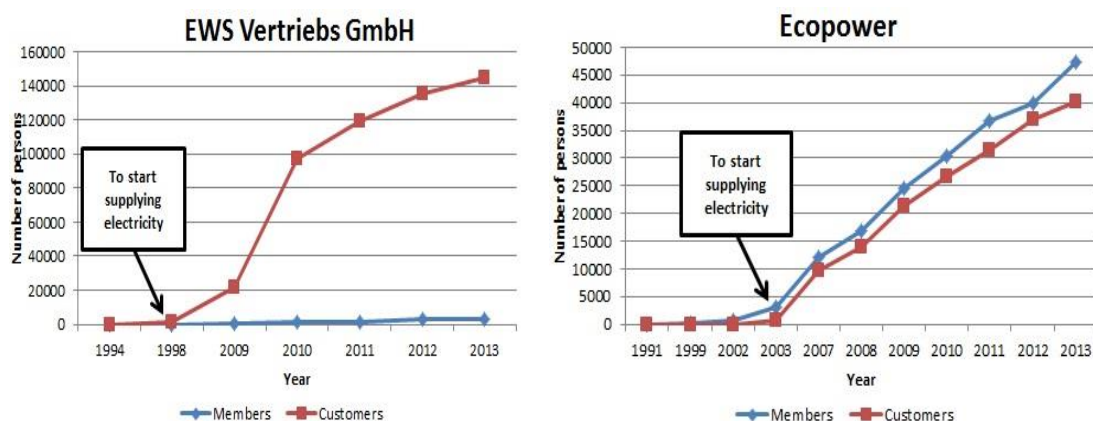


Figure 84. Relation between the number of members and customers, since the RES Cooperative started the electricity retailing activity

It was plotted on a graph the evolution of the number of members and customers since the beginning of the electricity retailing supply activity of the four case studies. As shown in Figure 84, the possibility to offer electricity has definitely contributed for the prosperity and growth of all the four RES Cooperatives which means that, the probability of happening the same with Coopérnico is real and is within reach of us all. Therefore, it is possible to confirm that the ability to retail electricity can increase the number of members of the Cooperative, and thus sharing with more people the RES Cooperative's vision for a new energetic paradigm that benefits the society as well as the environment.

5. Portuguese Electricity Market

5.1. An Overview of the Portuguese Liberalised Market

Looking back into the evolution of the Portuguese electricity system it all started right after the Portuguese revolution, when key Portuguese power companies were nationalised. Aiming to have a single undertaking responsible for power generation, transmission and distribution of electricity throughout the territory, in 1976 a vertically-integrated monopoly company called *Electricidade de Portugal* (EDP) was created.

Meanwhile, in 1981 *Decree-Law 20/81* referred for the first time the possibility of self-generation, for entities accessorially producing electricity from RES or using technologies that would lead to the reduction of primary energy consumption. In 1986, *Decree-Law 149/86* extended the idea to plants exclusively producing electricity and two years later, the *Decree-Law 189/88* recognised that a faster process was needed and the creation of conditions allowing for the economic viability of the small plants. This Decree-Law replaced the previous documents and established the rules for independent power production, allowing this production from RES and cogeneration [83].

Therefore, the Portuguese electricity system before the liberalisation may be represented through the figure 85:

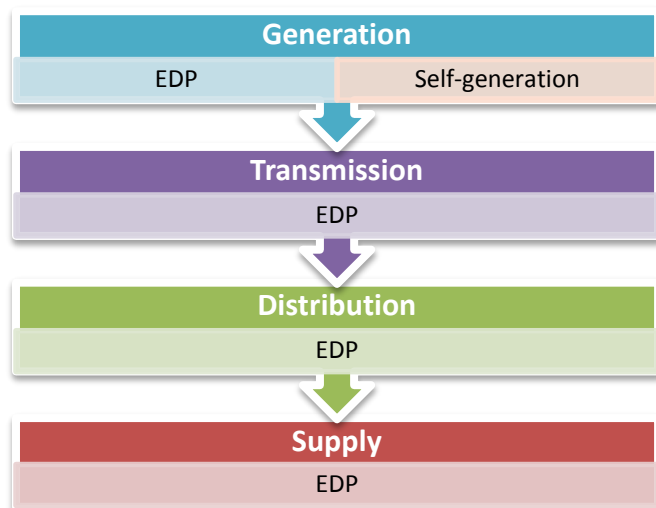


Figure 85. Main features of the Portuguese pre liberalisation

Briefly, as it will be discussed in the next section, the liberalisation of the Portuguese electricity market started in 1995, through a series of decree laws that anticipated the main principles of the First Directive.

From that moment on, and in line with what was happening elsewhere in the Europe, the current Portuguese electricity system is the natural consequence of the successive transposition of the European Directives at the national level (Figure 86 and Figure 87).

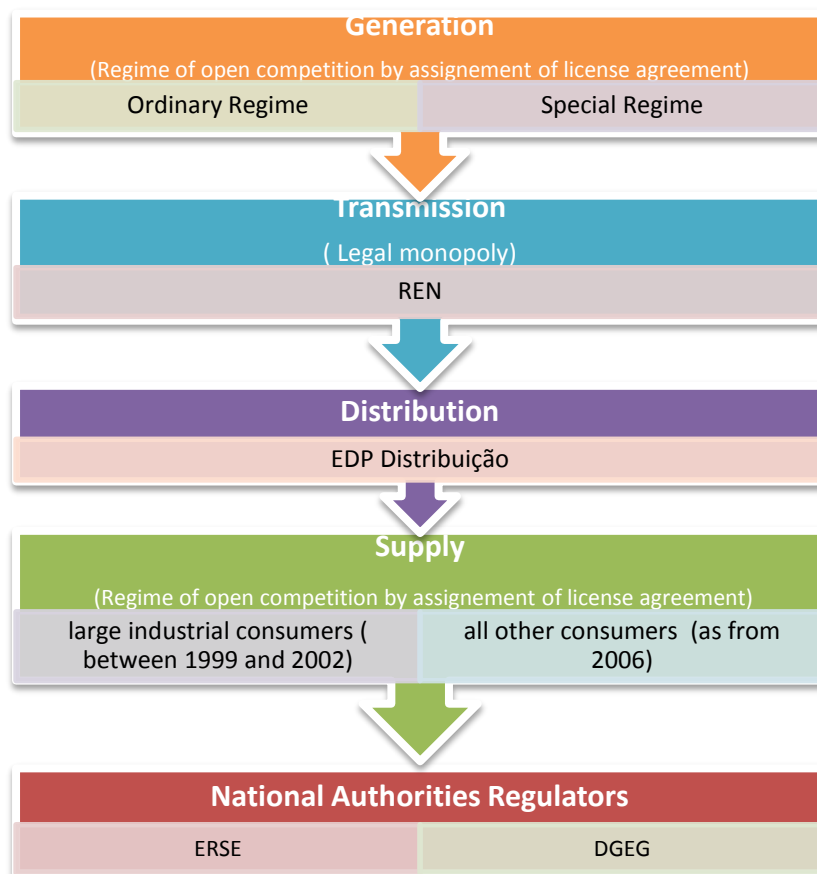


Figure 86. Main features of the pos Portuguese liberalisation

Thus, and regarding the generation activity, companies may choose between two types of authorisations: Ordinary and Special Regime. The main players operating in Portugal are basically the same as in Spain: EDP, Iberdrola, Endesa and Galp.

Aware that Portugal is a country full of natural resources, in the beginning of the century the Portuguese government led by José Socrates, introduced aggressive national policies to accelerate RES use. Such measures allowed the entry and growth of companies such as Acciona, Martifer Solar, dst Renováveis, Generg, Enercon, GE and GDF-Suez or the flowering of SMEs, such as Boa Energia, Ikaros-Hemera, Solar Project, FFSolar, Eurosolar, SunEnergy, Arménio Carreira Energias Renováveis, PluriEnergia, Enforce, SmartWatt or Catavento, for instance.

In Portugal there is only one TSO and DSO: *Rede Eléctrica Nacional* (REN) and EDP Distribuição, respectively. Despite the legal unbundling of the electric transmission network in 1996, since 2000 the high-voltage grid is owned by REN.

Concerning the supply activity, the industrial sector was the first to be open up to competition, between 1999 and 2002. However, the eligibility of the household consumers was only effective in 2006, one year ahead the Second Directive's framework.

In relation to national regulatory authorities, currently there are two entities responsible for proper functioning of the Portuguese electricity system: ERSE and DGEG.

Also, Portugal shares with Spain an organised market, MIBEL, that include a day ahead market, located in Spain and managed by OMIE, and a forward and derivatives market, located in Portugal and managed by OMIP.



Figure 87. Portuguese electricity system

5.2. Evolution of the Legislative Framework behind the Portuguese Liberalised Market

The organisational framework of the *National Electricity System* (SEN¹⁰) was approved in 1995 (*Decree-Law 182/95 to 185/95*) and established the coexistence of an *Electricity Public Service System* (EPSS) and an *Independent Electricity System* (IES), organised according to a market logic. This framework was changed in 1997, in order to fully incorporate the principles of the First Directive of the EPC of 19th December [84][85].

Six years later, the *Directive 96/92/EC* was amended by a new document, *Directive 2003/54/EC* of the EPC of 26th June. As a consequence of these new guidelines to the establishment of the IEM, the framework set up in 1995 and then in 1997, was replaced by some transitional frameworks. It took almost three years for the government to approve a new national strategy contemplating the liberalisation process and promote competition in the energy market in accordance with the Second Directive guidelines.

The signing of the *Decree-Law n° 29/2006* [84], from 15th February, sets an electricity sector legislative framework articulated and coherent with the EU lines, including the key strategic goals approved by the European document released three years before. Thereby, the Decree-Law established the new organisational and operational principles of the SEN as well as the general laws applicable to the exercise of generation, transmission, distribution and supply activities, in order to promote an open and competitive market.

Going deep inside the document, in contrast with the previous regime, the new framework established an integrated SEN where the generation and supply activities fall under the regime of open competition by assignment of license agreement, and the transmission and distribution

¹⁰ National Electricity System (SEN): Group of principles, organisations, agents and electricity infrastructures related with all the activities stated by the Decree-Law, in the national territory [84][85].

activities are performed by assigning of public service concessions (Figure 88). According to the Decree-Law these activities are supposed to be performed taking into account the correct use of the resources available and environment protection, including energy efficiency and the promotion of RES, plus the no damage to the obligations of public services [84][85].

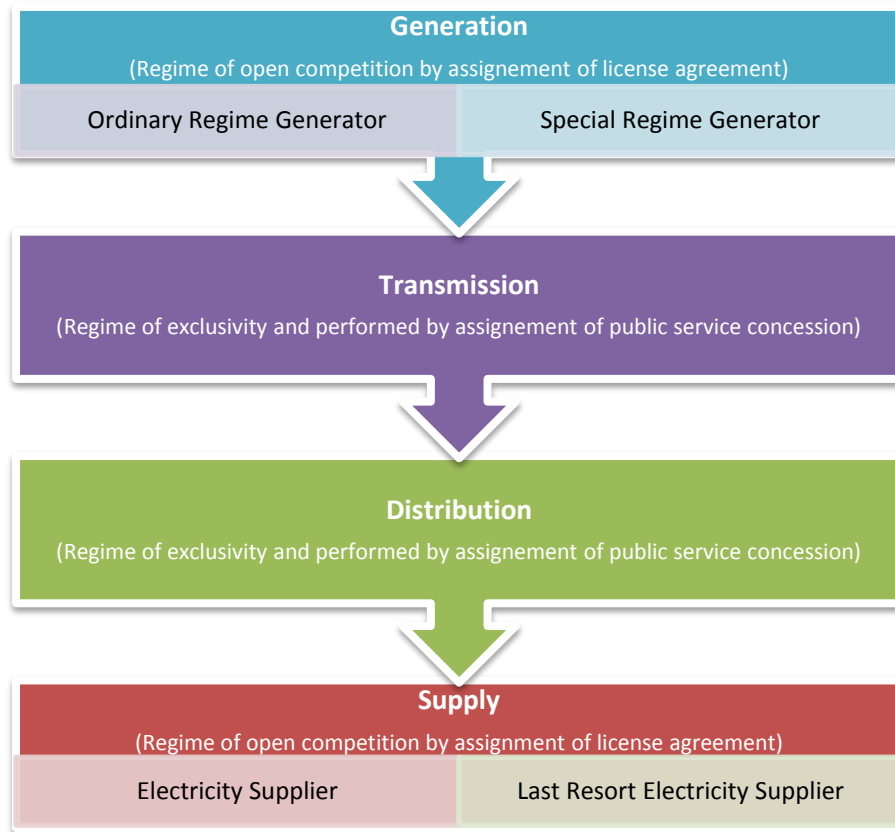


Figure 88. General features about the four sectors of SEN

Regarding the generation activity, there are two types of generators. According to the *Articles 17 and 18* of the *Decree-Law n° 29/2006*, they are defined as:

- ✓ **Ordinary Regime Generator (ORG):** It is considered all the generation activity that is not covered by a special legislation regime for electricity generation (e.g incentives for using RES or combined-cycle power plants);
- ✓ **Special Regime Generator (SRG):** It is considered all the generation activity under a special legislation regime in the scope of adopting policies to encourage the generation of electricity, including the use of RES or combined-cycle power plants.

There are also differences regarding to commercial relation. While the ORG can sell their electricity through the celebration of bilateral contracts both to end-users consumers and electricity suppliers, or through the participation in the organised markets, the SRG has privileged access regarding the commercialisation of the electricity to the last resort electricity supplier, under the conditions laid down in specific legislation. However, both have the right to ensure the supply in accordance with the liberalised market.

According to the document, the electricity transmission activity is carried out by exploiting the *National Transmission Grid* (RNT), and must be performed through a regime of exclusivity and by assignment of public service concession. This activity is considered legal and patrimonially separated from the other activities carried out under the SEN, and hence must ensure the independence and transparency of the activity exercise and its relationship with the others players acting in the SEN. As the RNT plays a vital role in the SEN, its operation integrates the overall technical management of the system ensuring then a good symbioses between the generation plants and the distribution activity. Essentially, its role is to ensure the security of supply and an integrated and efficient system operation.

There is also another important activity in the SEN: the distribution of electricity. This activity is carried out through the operation of the *National Distribution Grid* (RND), which corresponds to the Medium and High-Voltage grid and the Low-Voltage grid. Such as the transmission activity, the Medium and High-Voltage grid is also operated through an exclusive concession granted by the Portuguese government. In respect to the Low-Voltage grid continues to be exploited by municipal concession, and there will be no loss for them if they directly explore their networks.

Once again, this activity is legally separated from the transmission and the other activities not related to distribution. However this legal independence is not mandatory when a Low-Voltage distributors serves less than 100 000 customers.

Regarding the supply activity, the *Decree-Law n° 29/2006* sets the electricity supply activity open to competition, subject only to a licensing agreement regime. The electricity supply activity involves the buying and selling of electricity to end-user consumers or other agents under acquisition modalities that will be reviewed in the following section. For that, they have the right of access to the transmission and distribution grids on payment of regulated tariffs. According to the same document, similar to the generation, in this activity there are two types of suppliers:

- ✓ **Ordinary Electricity Supplier;**
- ✓ **Last Resort Electricity Supplier (LRES).**

Basically, by the *Article 46* the difference between both is that the last one is subject to universal service obligations, ensuring to all consumers who request the meet of their electricity needs and are in compliance with applicable legislation for the effect. Also, it is an entity that is expected to act while the open market does not operate with full effectiveness and efficiency. Meanwhile, the role of LRES is, provisionally, allocated to electricity distributors for the duration of their concession.

In the context of consumer protection, the same document defines “universal service” by the security of supply in terms of quality and continuity of service and protection regarding to tariffs as well as prices, and access to clear information.

Therefore, the consumers may choose, without restrictions, their electricity supplier, not being the switch of supplier charged under the contractual point of view. Moreover, in order to simplify and make the switch of electricity supplier effective, it was also anticipated the creation

of an independent entity in a legal, organisational and decision-making sense, from the other entities in the SEN, called *Logistic Operator for Switching Suppliers* (OLMC).

Also according to the Decree-Law, the activities of transmission, distribution, LRES and OLMC are subject of regulation, without prejudice for the competences of other administrative bodies, by the *Energy Services Regulatory Authority* (ERSE). Besides ERSE, there is another regulator called *Directorate General for Energy and Geology* (DGEG), which responsibility is to monitoring the security of supply in collaboration with the concessionaire of the RNT. Both regulators have the responsibility to release an annual report concerning the development of the electricity sector, to the Portuguese government and EC.

The *Decree-Law n° 29/2006*, from 15th February, which laid the baselines of the organisation and operation of the new electricity sector, refers to complementary legislation a set of conclusive norms, namely the procedural legal regimes of the activities of generation, transmission, distribution and supply of electricity, as well as the laws governing the activities of the logistics operation of switching supplier of electricity.

Thereby, in the development and implementation of the principles said in the document, the *Decree-Law n° 172/2006*, from 23th August, establish the procedures of license agreement assignment for generators (ORG and SRG), as well as public service concession assignment for the RNT and RND [84][85].

With regard to the electricity supply activity, in 2009 was released the *Dispatch n° 9244/2009* regulating the content of the *Article 50* of the amended document (*Decree-Law n° 172/2006*) [84][85]. The dispatch established all electricity supplier had the obligation to publish their pricing, using for this purpose the modalities of service and information to customers provided in the regulations for *Quality of Service of the Electricity Sector*, reinforcing thus the necessity of electricity suppliers to send to ERSE the following pricing information, as stated in the above *Article 50*:

- ✓ The reference table charged or planning to charge, whenever a change occurs concerning prices;
- ✓ The prices actually charged (quarterly and annual) with quarterly basis.

The electricity sector is not static and since 2006 it has been in constantly development, influenced whether by the recently conditions created through the establishment of the current legislative framework and new dynamics caused by the creation of the MIBEL, in the same year.

To this observed development in the electricity market, adding the needs for configurations of the LRES concept in accordance with the requirements stated by the *Directive 2003/54/EC*, as well as the several agreements signed between the Portuguese government and the Spanish government regarding to MIBEL, it was established through the *Decree-Law n° 104/2010*, from 29th September, a timetable predicting the extinction of regulated tariffs to end-users customers with consumption in VHV¹¹ and HV¹², MV¹³ and SpLV¹⁴, from the 1st January 2011 [84][85].

¹¹ Very High-Voltage (VHV): Voltage between phases whose effective value is greater than 110 kV.

¹² High-Voltage (HV): Voltage between phases whose effective value is greater than 45 kV and less than or equal to 110 kV.

According to the Decree-Law, until the end of 31st December 2011, all the costumers should now be supplied under the liberalised market. During this period, customers who maintain their contracts supply with a LRES will be applied a transitional rate.

At the same year this Decree-Law was released, a complementary document was also published focusing in the consumer protection policies. Being the MIBEL's construction a top priority in the political agenda of the region, in order to take a step forward towards the liberalisation of the SEN, the *Decree-Law n° 138-A/2010*, from 28th December, had as the main objective the creation of social tariffs for end-users economically vulnerable ensuring then to every customer the access to the SEN [84][85].

In tune with the *Directive 2009/72/EC*, in 20th June 2011 it was made the second amendment of the *Decree-Law n°29/2006* with the introduction of a new organisational framework of the SEN: The *Decree-Law n° 78/2011* (Figure 89) [84][85].

¹³ Medium-Voltage (MV): Voltage between phases whose effective value is greater than 1 kV and less than or equal to 45 kV.

¹⁴ Special Low-Voltage (SpLV): LV supply or delivery where contracted power is (i) Mainland Portugal - greater than 41.4 kW, (ii) Autonomous Region of the Azores – equal to or greater than 20.7 kW and is achieved by way of maximum power at 15 minute intervals, (iii) Autonomous Region of Madeira greater 62.1 kW).

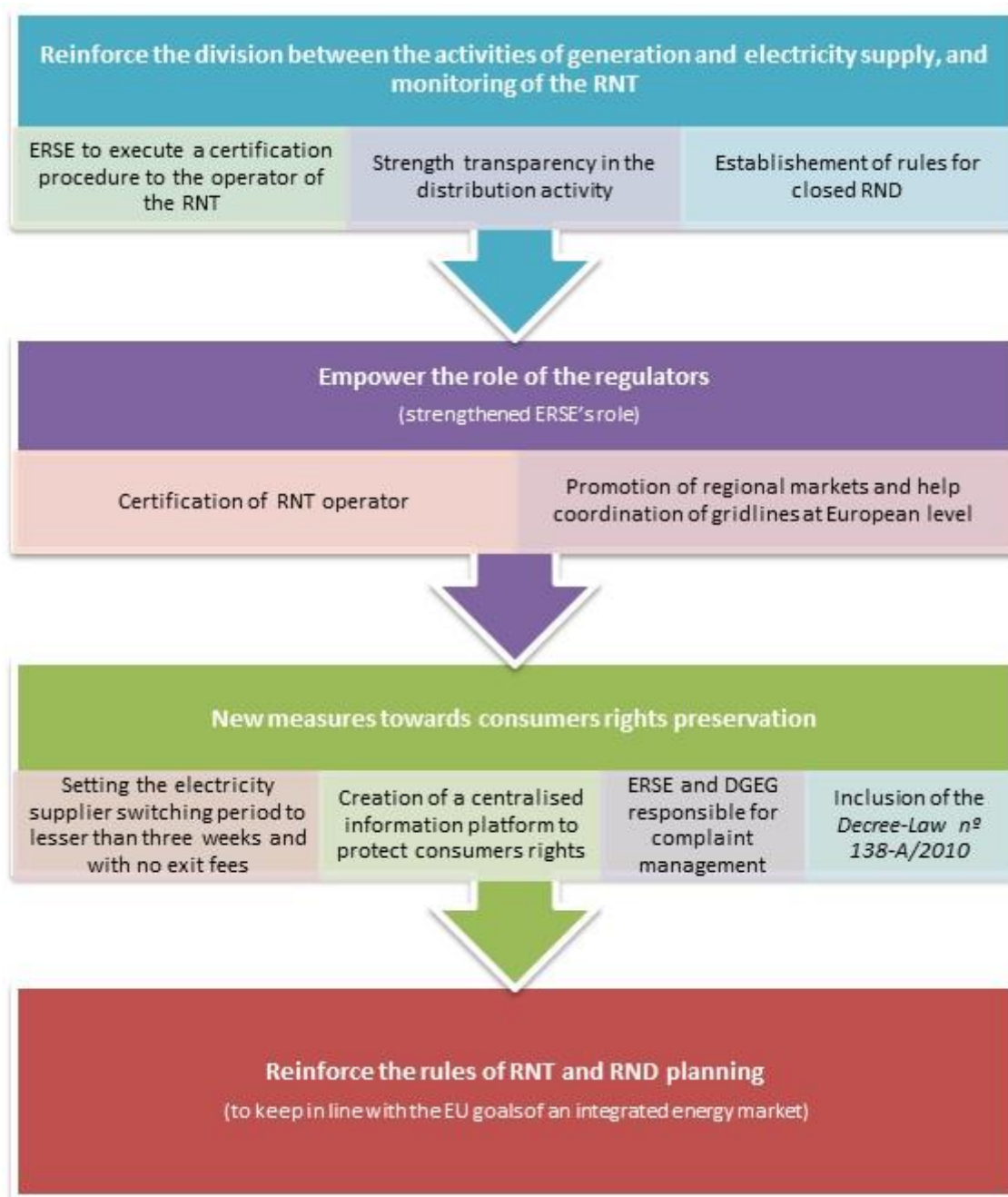


Figure 89. General features introduced by the Decree-Law n° 78/2011

This document is the Portuguese interpretation of the *Third Package* and therefore aims to reinforce the division between the activities of generation and electricity supply, as well as the operation of the transmission gridlines as a way to achieve the establishment of an integrated IEM in the EU that allows the implementation of a more effective market competition. Thus, the Decree-Law n° 78/2011 suggests [84][85]:

- ✓ ERSE to execute a certification procedure to the operator of the RNT, in order to assess the conditions of separation of activities;
- ✓ Regarding to distribution activity, it is expected the strengthen of the transparency in the legal separation of activities, since the operator of the RND belonging to vertically

integrated company and serve a number of customers exceeding 100 000 shall need to develop a compliance program that includes measures taken to exclude discriminatory conduct. Moreover, it is established the rules for closed-grids which contemplates the possibility of intervention by the ERSE in the analysis and assessment of access tariffs, in cases of lack of transparency or fairness.

The *Decree-Law n° 78/2011* also empower the role of the regulators, ensuring more independence in the exercise of their regulatory functions, including supervision and certification. For instance:

- ✓ It is strengthened ERSE's role, namely in the certification of the operator of the RNT, promotion of regional markets and coordination of gridlines at European level through a cooperation with other regulatory entities, in accordance with the EU legislations.

With regard to consumer protection, the Decree-Law aims to extend its policies relating to this field. It is expected the consumers rights are preserved by the introduction of new mechanisms, including:

- ✓ The reduction of the electricity supplier switching period to lesser than three weeks. The consumers are able to achieve the switch without having to pay any termination fees;
- ✓ Complaint management is responsibility of the regulator authorities, namely ERSE and DGEG.
- ✓ Creation of a centralised information platform which offers relevant information, including the legislation on the protection of electricity consumers and dispute resolution mechanisms to protect their rights.
- ✓ Inclusion of the consumer protection policies, in particular the “end-user economically vulnerable” concept and its features, stated in the *Decree-Law n° 138-A/2010*.

Finally, it is expected from the *Decree-Law n° 78/2011* to reinforce the rules of RNT and RND planning, so Portugal can keep in line with the EU goals of an IEM.

Trying to face the economic crisis that Portugal has been going through, *Decree-Law n° 102/2011*, from 30th September, was released with additional measures respecting the consumer protection. Thereby, in order to help guaranteeing all consumers the access to basic needs, including electricity, it was created the *Extraordinary Social Support to the Energy Consumer (ASECE)*.

At the same time this Decree-Law was published, two more documents were announced [84][85]:

- ✓ Ordinance n° 275-A/2011, from 30th September;
- ✓ Ordinance n° 275-B/2011, from 30th September.

In execution to the previous Decree- Law, the *Ordinance n° 275-A/2011* and the *Ordinance n° 275-B/2011* set the discount of the ASECE to be applied to electricity bills of end-users

economically vulnerable and establish all the necessary procedures and conditions to the assignment, application, conservation and monitoring of the ASECE, respectively.

Continuing the process initiated two years before by the *Decree-Law n° 104/2010*, the *Decree-Law n° 75/2012*, from 26th March, established a timetable predicting the extinction of regulated tariffs to end-users customers with consumption in StLV¹⁵. Regarding to this third amend of the *Decree-Law n° 29/2006*, it will be object of further analysis in the following section.

Right after, it was published in 23th May 2012 the fourth amend (*Decree-Law n° 112/2012*) aiming the participation restriction in the share capital of the RNT and RND operators [84][85].

The fifth and sixth amend to the previous *Decree-Law n° 29/2006*, arrived in 2012. With the *Decree-Law n° 215-A/2012* and the *Decree-Law n° 215-B/2012*, from 8th September, as it was expected a new adjustment in the organisational framework of the SEN towards the promotion of competitiveness, price transparency, as well as the correct functioning and full liberalisation of the electricity market (Figure 90) [84][85].

¹⁵ Standard Low-Voltage (StLV): LV supply or delivery where contracted power is (i) Mainland Portugal - 41.4 kW or lower, (ii) Autonomous Region of the Azores – 215 kW or lower and is not achieved by way of maximum power at 15 minute intervals, (iii) Autonomous Region of Madeira 62.1 kVA or lower.

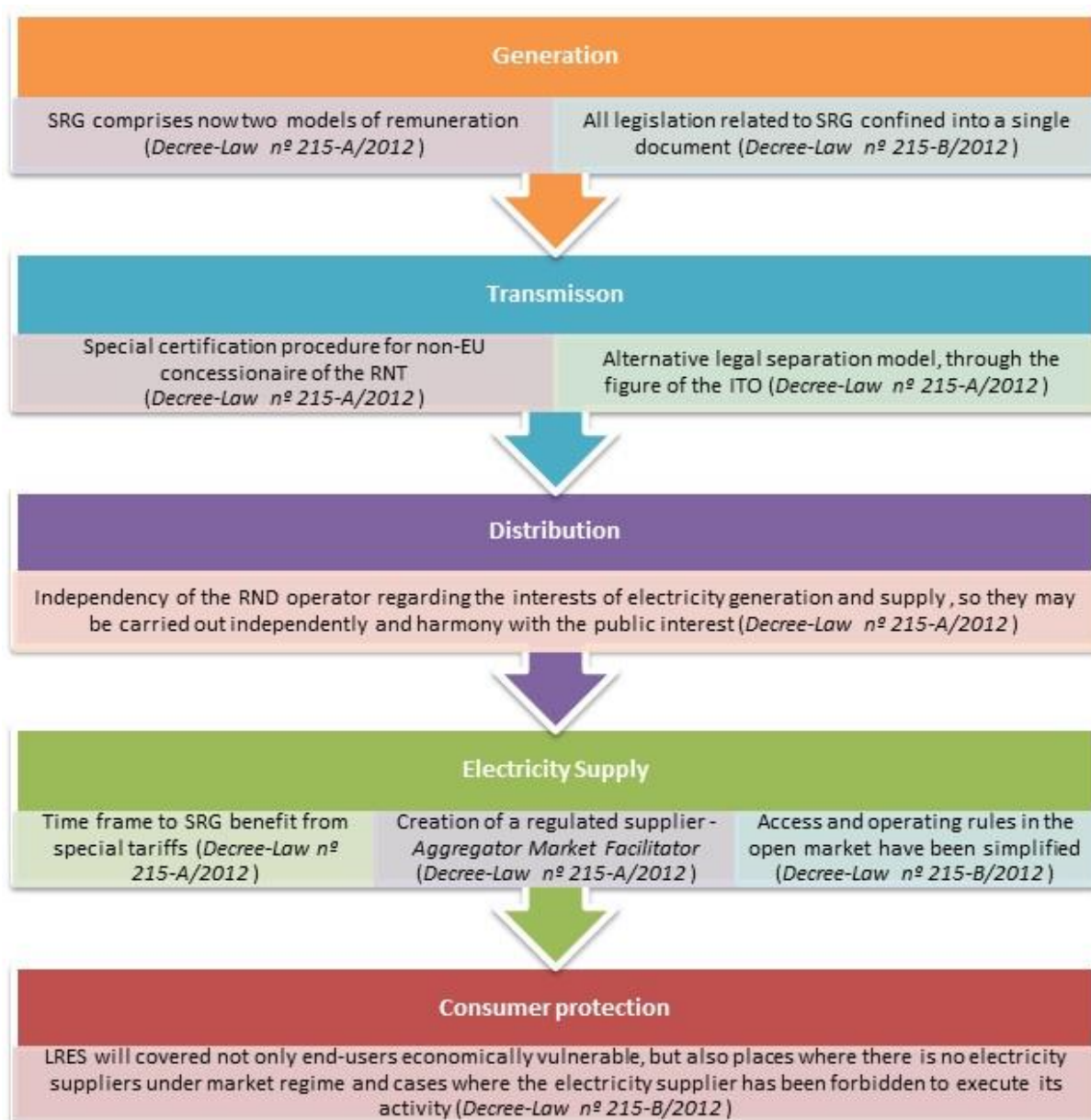


Figure 90. General features introduced by the Decree-Law n° 215-A/2012 and Decree-Law n° 215-B/2012

In order to complete the full integration of the *Directive 2009/72/EC*, the first sector of the SEN to be modified was the generation activity.

The *Decree-Law n° 215-A/2012* revealed changes regarding to the types of generators. That means, the SRG shall now comprise two models of remuneration:

- ✓ The market remuneration regime (subject to market conditions);
- ✓ And the previous special legislation regime.

With respect to the transmission activity, the *Decree-Law n° 215-A/2012* lay down new rules concerning the RNT operator. For this purpose, in addition to the revision of the accreditation and review of the certification procedure if the concessionaire of the RNT is controlled by an

entity belonging to EU, it is also expected now the same procedure if the operator is owned by some entity from countries outside the EU.

Still in the transmission activity, the same document clarify and reinforce the requirements on independence, and legal separation concerning the RNT operator (full ownership unbundling), stated by the *Decree-Law n° 112/2012*. Therefore, it was suggested an alternative legal separation model to the current one provided by the *Directive 2009/72/EC*, through the figure of the ITO whose practicability depends on the application of the concessionaire RNT and approval by the Portuguese government. These measures are expected to give ERSE free access in decision and conclusion of such procedures.

Also, it set up mechanisms that allow the Portuguese government to monitor and supervise the activities of the RNT operator, that are not directly related to the RNT or the technical management of the system, in order to ensure that such activities are carried out independently and in harmony with the public interest.

In relation to the RND, the *Decree-Law n° 215-A/2012* wants to guarantee the independency of the RND operator regarding the interests of electricity generation and supply. Thereby, it is expected the removal of the risk of discrimination in access to the gridlines and the prevention concerning the share of confidential information.

As for the electricity supply activity, the obligation to purchase electricity generated under a special regime imposed on the LRES, passes now to be limited as long as the SRG benefit from special tariffs or other guaranteed compensation.

After this period, the SRG will be able to sell their electricity on organized markets or through bilateral contracts as the ORG already do, or may sell it to a new regulated supplier called *Aggregator Market Facilitator* (AMF). This new entity, which will be assigned under license agreement, will purchase the electricity generated to open market prices, and will act as an aggregator of generation. In other words, the AMF has the obligation to purchase electricity for generators that wish it.

Focusing on the most significant changes of the *Decree-Law n° 215-B/2012*, in the present Decree-Law was gathered all the legislation related to the SRG, that before was spreaded by several documents.

With regard to electricity supply, with the *Decree-Law n° 215-B/2012* access and operating rules in the open market have been simplified. That means, apart from the LRES and the AMF, the electricity supply activity is now open to competition, only subject to prior registration.

Finally, in relation to consumer protection, the *Decree-Law n° 215-B/2012* sets the electricity supply by LRES, not only to end-users economically vulnerable but also in places where there is no electricity suppliers under market regime, as well as in situations where the electricity supplier has been forbidden to execute its activity. Besides that, the document also expects ERSE to come up with a new centralised platform where consumers can have access to information beyond the one demanded in the *Decree-Law n° 78/2011*, including for instance latest legislations and the reference prices of all electricity suppliers.

In the light of the commitments and objectives behind the *Decree-Law n° 75/2012*, *Decree-Law n° 256/2012* adopted a set of measures aiming to prevent the rising trend of the various costs which affect, in the medium to long term, the final electricity bill, as well as the continuing exponential growth of the tariff deficit.

Among the several measures aiming the stability of the tariff system, the *Decree-Law n° 256/2012*, from 29th November, determines the extension of the extinction period of regulated tariffs to end-users customers with consumption in VHV and HV, MV and SpLV, in order to guarantee the correct transition to the liberalised market. Therefore, and despite the *Decree-Law n° 104/2010* predicted all the costumers should now be supplied under the liberalised market, until the end of 31st December 2011, the *Statement of Correction n° 78/2012* declared that LRES must continue to supply electricity to end-users customers with consumption in VHV and HV, MV and SpLV, until 31st December 2013.

Furthermore, in the end of 2012, it was released on 21st December the *Dispatch n° 16298/2012* (Figure 91) [84][85]. This document introduced the three fundamental guidelines for DGEG to promote the electricity market, without prejudice to the role of ERSE in the transmission of information to consumers, including:

- ✓ Promotion of all mechanisms and instruments available to consumers, regarding the protection of their rights;
- ✓ Adequacy of how information will be spread throughout the different types of consumers, with a particular emphasis on communication to economically vulnerable end-users;
- ✓ To promote active participation of the citizens during the transition period to the liberalised market, in order to exploit every opportunity to reduce electricity bills.

Thereby, it is also important that the promotion contains information related to:

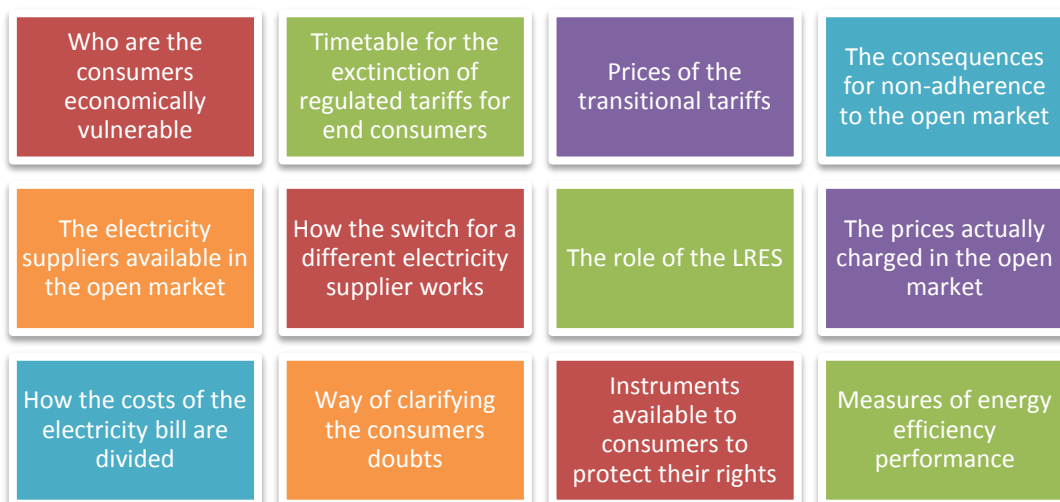


Figure 91. General features regarding the information introduced by the *Dispatch n° 16298/2012*

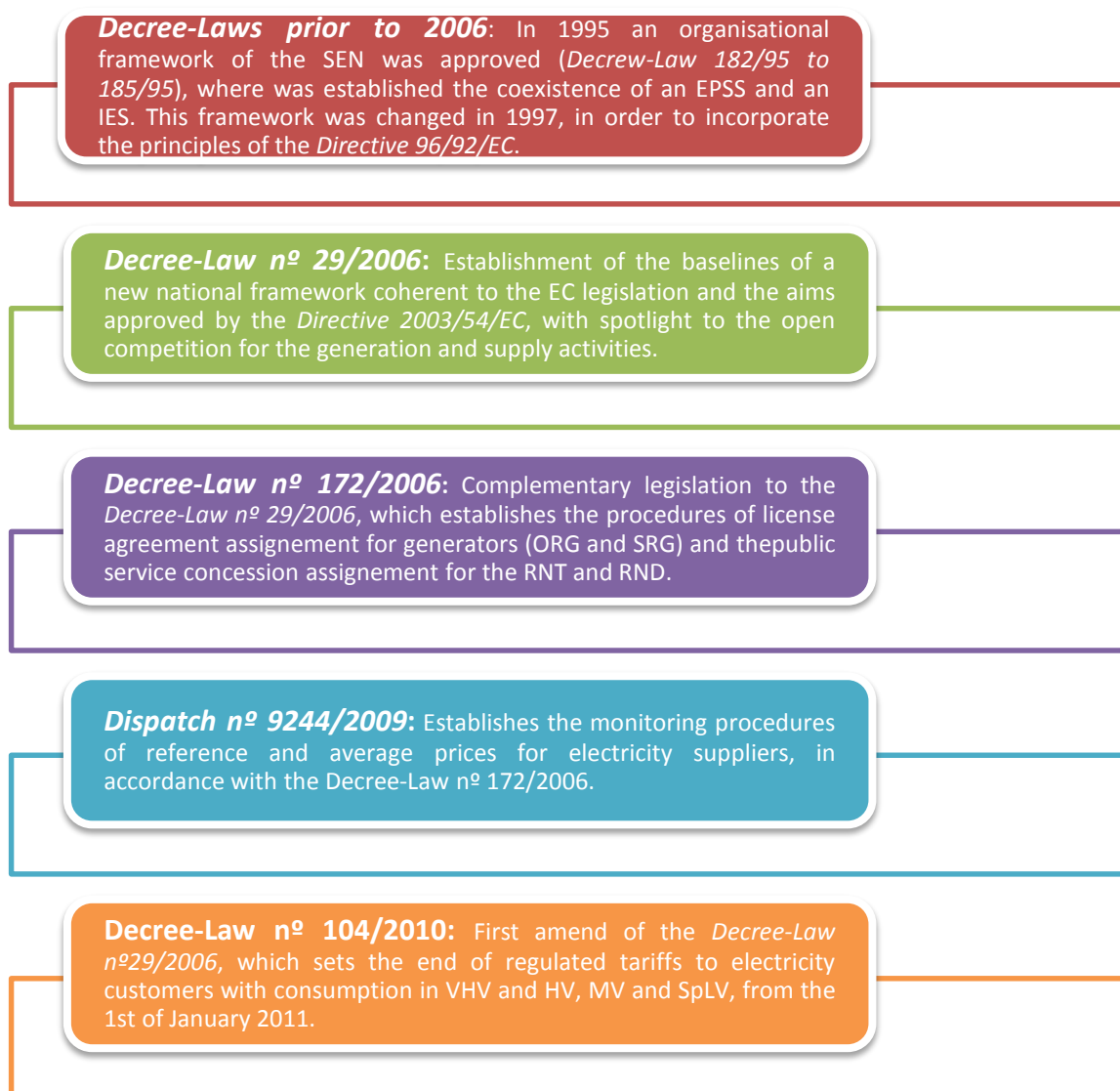
The *Decree-Law n° 215-B/2012* sets the access to the open market, including the registration process. The same document states that the assessment of the application and the effectiveness

of registration for the practice of electricity supply activity, involves a fee that must be paid to the DGEG.

Therefore, by the *Ordinance n° 83/2013*, from 26th February, is established the fee to be paid as well as the procedure for the respective payment.

This document and the *Decree-Law n° 215-B/2012* will be developed further ahead regarding to Coopérnico registration process.

Figure 92 summarises the Portuguese legislation regarding to liberalisation of the SEN.



Decree-Law nº 138-A/2010: In line with the liberalisation of the SEN, the present document main objective is the creation of social tariffs for end-users economically vulnerable, ensuring then to every customer the access to the SEN.

Decree-Law nº 78/2011: Second amend of *Decree-Law nº29/2006*, coherent to the EC's *Directive 2009/72/EC*. Therefore, it was introduced a new organisational framework of the SEN focusing on empower the role of regulators and consumer rights, as well as RNT and RND planning.

Decree-Law nº 102/2011: Yet in the field of consumer protection it was created the ASECE, in order to help guaranteeing all consumer the access to electricity.

Ordinance nº 275-A/2011: In execution with the *Decree-Law nº 102/2011*, this Ordinance sets the discount of the ASECE to be applied to electricity bills of end-users economically vulnerable.

Ordinance nº 275-B/2011: In execution with the *Decree-Law nº 102/2011*, this Ordinance establishes all the necessary procedures and conditions to the assignment, application, conservation and monitoring of the ASECE.

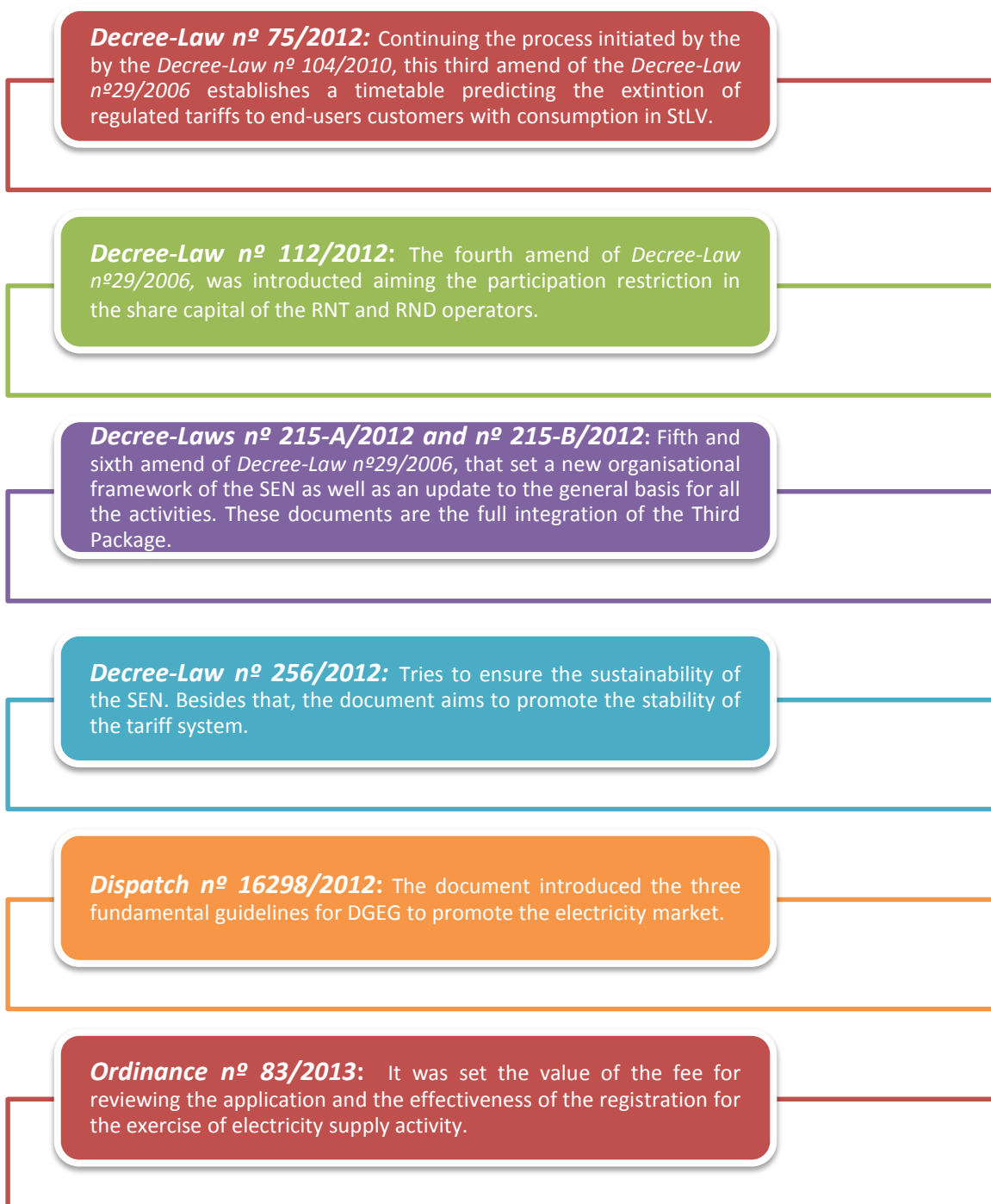


Figure 92. Resume of the Portuguese energy legislation

5.3. Electricity Suppliers Operating in the Portuguese Open Market

The process of liberalisation of the electricity sector in most of the European states was done progressively, and started by including customers with higher consumptions and higher voltage levels (VHV and HV). Portugal was no exception, and its electricity market has been progressively opened since the adoption of the First Directive framework, in 1996. Ten years

later, in 6th of September 2006, the aims of Second Directive¹⁶ of the EPC were anticipated in one year, and all consumers in the continental territory of Portugal have been able to choose freely their electricity supplier based on the following acquisition modalities:

- ✓ Celebration of electricity supply contract with electricity suppliers in the liberalised market;
- ✓ Electric power contracting in organised markets or through bilateral contracts, in the case of customers with status of a market agent;
- ✓ Celebration of electricity supply contract with last resort electricity suppliers, according to legal conditions and established regulatory laws.

With these measures it was expected to increase the competition within the Portuguese electricity sector, reflecting in the level of prices and the improvement in the quality of the service, which should lead to greater satisfaction on the part of electricity consumers.

The options available for the consumers are vast and different covering whether large consumers, industries or small and medium enterprises (SMEs), but in regard to the issue of this thesis and topic, the focus will be the domestic market segment.

- ✓ **Large consumers:** Group of clients whose power plants are connected to VHV and HV electric networks;
- ✓ **Industries:** Group of clients whose power plants are connected to medium-Voltage (MV) electric networks;
- ✓ **SMEs:** Group of clients whose facilities are connected to low-voltage (LV) electric networks, and the contracted power is higher to 41.4 kW (Special Low Voltage, SpLV);
- ✓ **Residential:** Group of clients whose facilities are connected to LV electric networks, and the contracted power is less or equal to 41,4 kW (Standard Low Voltage, StLV).

Introduced the big picture regarding the liberalisation process towards the Portuguese open market, it is time to go into detail and understand the steps made until this moment, pointing also the legislative initiatives behind it.

In the context of the realisation of the IEM, the adoption of the Third Directive framework (*Directive 2009/72/EC*) has brought more changes to Energy Portuguese law including the amendment of the regulatory legislation of the sector. This directive was also supported by the *Memorandum of Economic and Financial Policies* (MEFP), which celebrates the agreement between the Portuguese government, the *European Central Bank* (ECB), the EC and the *International Monetary Fund* (IMF) and states the extinction, for all customers, of regulated end-user electricity tariffs charged to Portuguese consumers of electricity until the 1st of January 2013.

¹⁶ *Directive 2003/54/EC*, which established the 1st of July 2007 for all electricity customers to be able to freely choose their supplier.

Thereby, in order to satisfy the above mentioned documents, a timetable was defined by the Portuguese government for the progressive extinction of regulated tariffs for end consumers. The *Decree-Law n° 75/2012*, from 26 of March, establish the framework that allowed the gradually extinction, by contracted power, of all the regulated tariffs charged to electricity customers with consumption in StLV [84][85]. It also introduced transitional regulatory mechanisms, that promote for existing customers with regulated tariffs the access to liberalised market, and protection measures for end-users economically vulnerable.

The transitional period starts after the day chosen for the extinction of the regulated tariffs, and there will be two transitional periods (Figure 93).

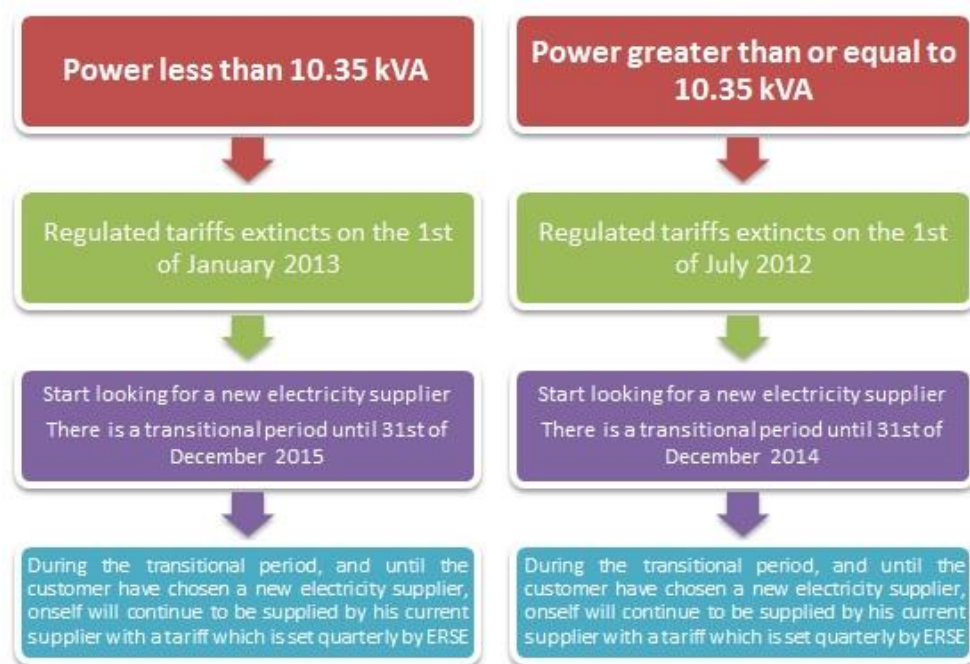


Figure 93. Transitional period for the extinction of the regulated tariffs

During this transitional period, applicable to consumers who continue to be supplied by the LRES, ERSE will continue to set transitional rates every three months. After this period, all the new electricity contracts must follow the laws of the free market. To help consumers on their change, the transitional regulatory mechanisms includes also the access to all kind of information on the liberalisation process applied to electricity supply, as the different phases of extinction of regulated rates and corresponding transitional periods or steps to change electricity supplier.

Concerning the second point, among the protection mechanisms stand out the commercial relations, the social tariffs, regulated by ERSE, and lower prices for customers economically vulnerable. In order to take advantages of these conditions, this type of customer must have a deal with last resort electricity suppliers rather than one of the electricity supplier playing in the free market. According to *Decree-Law n.º 138-A/2010*, from 28th of December, economically vulnerable consumers are considered to be all those who receive one of the following social benefits [84][85]:

- ✓ Income support for the elderly;

- ✓ Social insertion income;
- ✓ Unemployment benefit;
- ✓ 1st tier of family allowance;
- ✓ Disability living allowance.

Basically, the document is the final update of the previous *Decree-Law n° 104/2010*, from 29th of September, which established the end of regulated tariffs to electricity customers with consumption in VHV and HV, MV and finally, SpLV¹⁷ from the 1st of January 2011[84][85] .

As the Portuguese electricity sector is now a open market and the regulated tariffs will gradually come to an end, associated with these changes is the customer's responsibility for actively seeks for information, regarding to further development of the sector or electricity suppliers' offers. This allows them to understand exactly what these changes imply before changing to a different supplier or tariff. But which are the options available in the market?

At present, there are seven players competing in the electricity residential market (Figure 94).

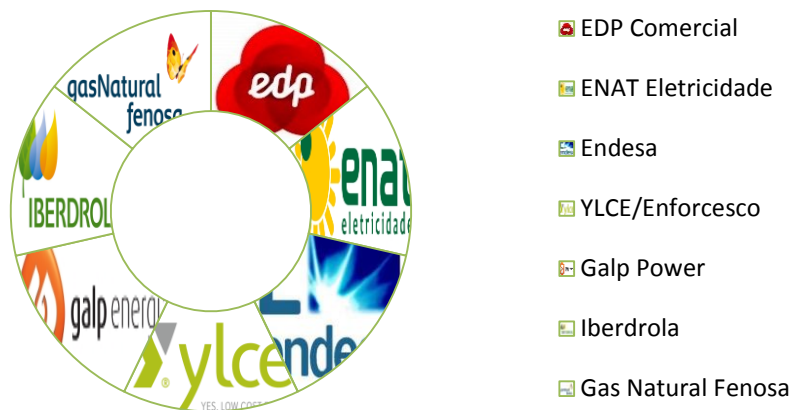


Figure 94. Currently electricity supplier companies operating in Portugal

According to ERSE's last review [86], published on July 2014, the number of customers in the open market in June grew by approximately 63% comparing to same month a year ago, corresponding thus to 2 904 130 costumers (Figure 95).

¹⁷ Special Low-Voltage (SpLV): LV supply or delivery where contracted power is (i) Mainland Portugal - greater than 41.4 kW, (ii) Autonomous Region of the Azores – equal to or greater than 20.7 kW and is achieved by way of maximum power at 15 minute intervals, (iii) Autonomous Region of Madeira greater 62.1 kW).

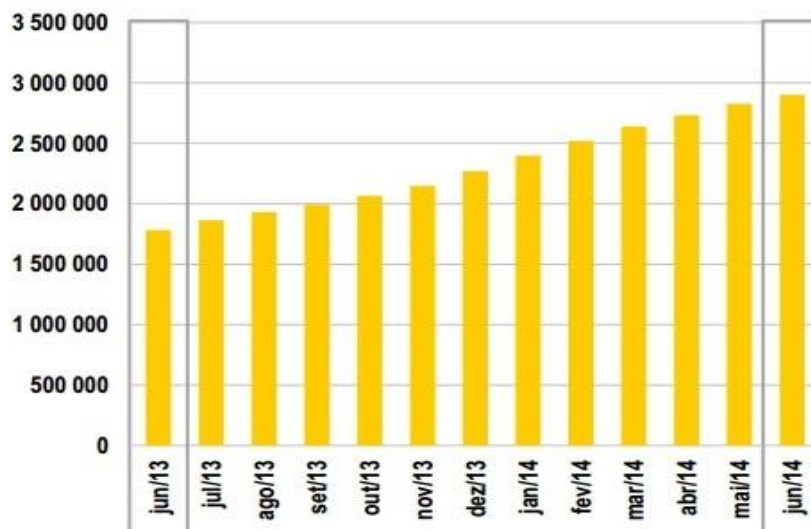


Figure 95. Total number of customers in the Portuguese open market [86]

Characterising the liberalised market, is not hard to conclude that the number of customers come exclusively from the domestic sector, which represent in June 98% of the total of customers (Figure 96).

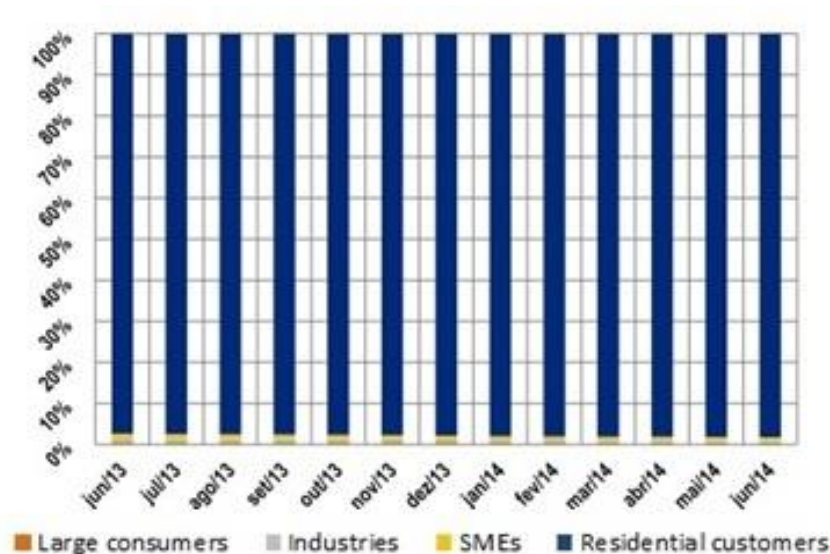


Figure 96. Liberalised market characterisation (number of consumers) [86]

Looking to the different types of consumers in the open market, almost all the large consumers (97%), industries (91%) and SMEs (86%) are already in the liberalised market (Figure 97). Nevertheless, from the 7 038 customers which remains in the regulated market, 4 793 customers are a SME, 2 235 customers are industries and 10 are HV large consumers, represent 14%, 9% and 3% of the number of consumers, respectively.

Regarding residential customers, the sector has been growing substantially since 2012 and at the moment 47% of the customers are in the liberalised market.

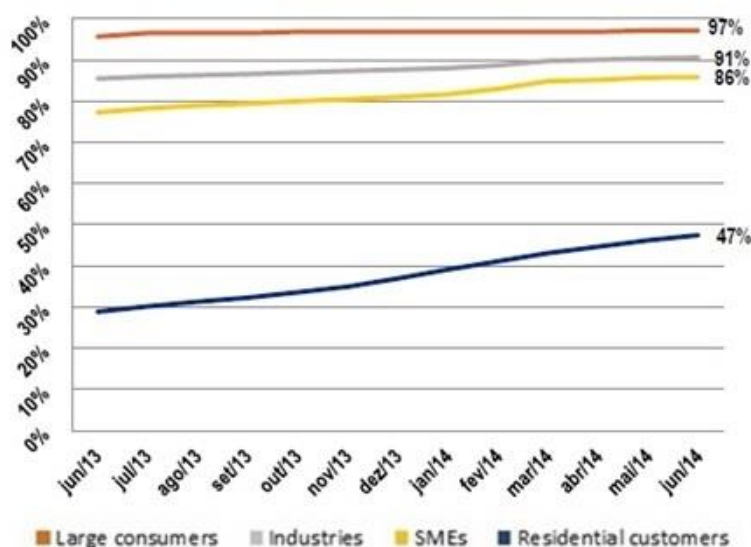


Figure 97. Share in the liberalised market by sector (number of consumers) [86]

The Portuguese liberalised market has been reporting a considerable increase in the number of customers, average monthly rate of 4.2%, representing now an annual consumption of 34 806 GWh (average monthly rate of 1.4%) as shown in Figure 98.

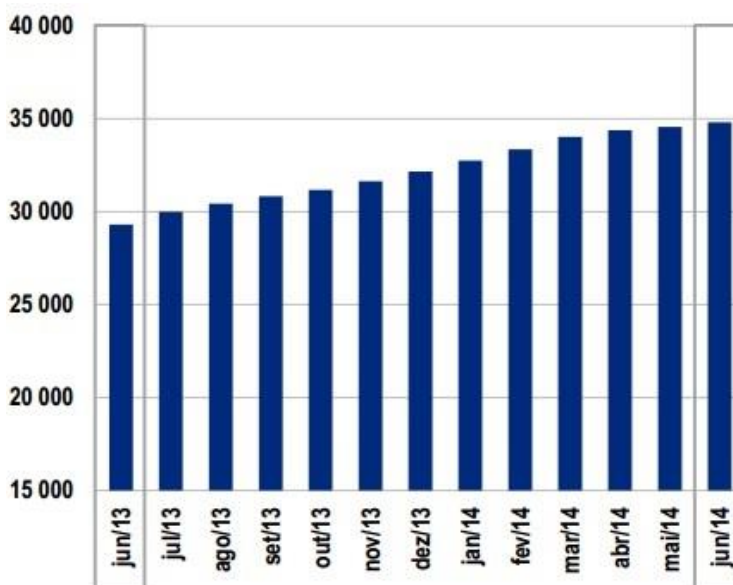


Figure 98. Annual consumption (GWh) in the Portuguese open market [86]

Globally, the liberalised market represents almost 79% of the total consumption in the Portuguese continental territory in June (Figure 99).

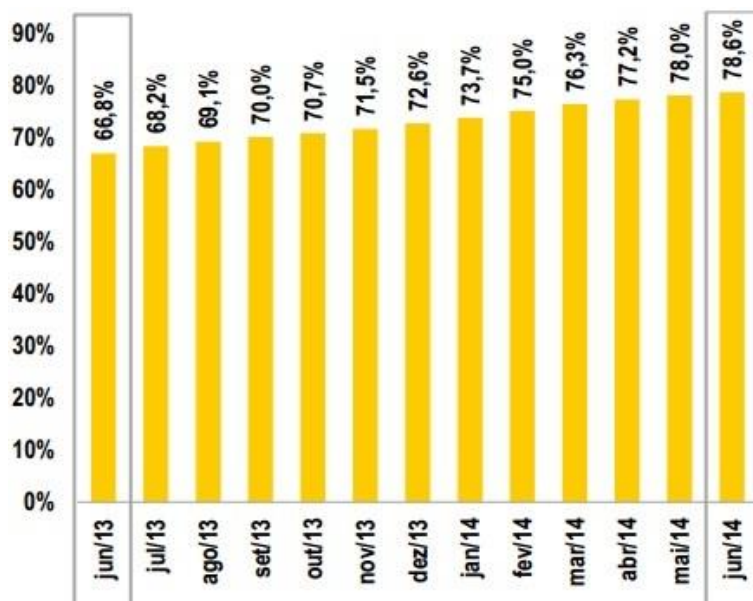


Figure 99. Share of the liberalised market in the total consumption of Continental Portugal [86]

Looking again to the different types of consumers in the open market, the share of large consumers, industries, SMEs and residential customers represent 100%, 97%, 89% and 52% of the sector consumption, respectively (Figure 100).

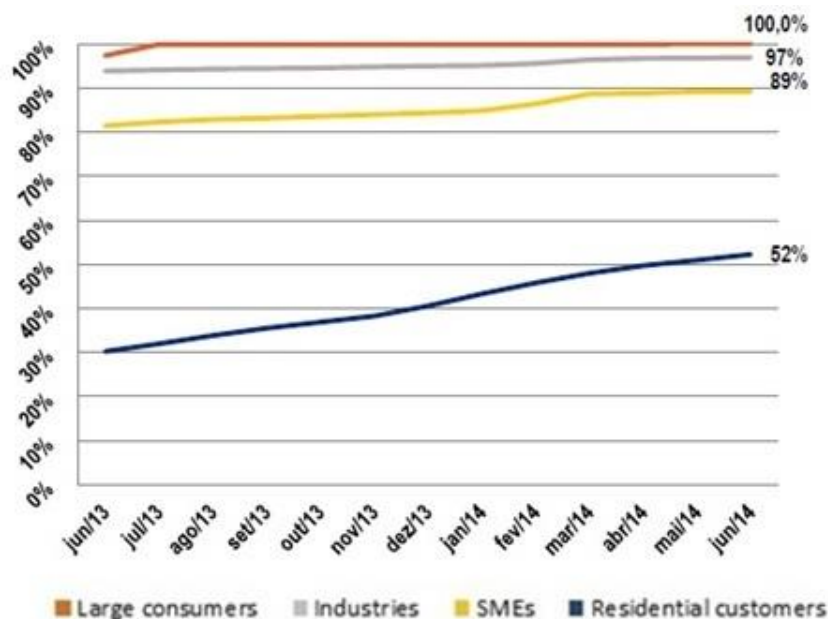


Figure 100. Share in the liberalised market by sector (consumption) [86]

Despite the domestic sector representing almost 100% of the number of clients in the Portuguese open market (Figure 96), the industrial customer still represents the biggest share regarding to consumption with 39%, followed by the domestic sector (27%), which is growing faster (70% comparing to June 2013), and the large consumers (25%). The last place belongs to SMEs with 8% of the total consumption in the liberalised market (Figure 101).

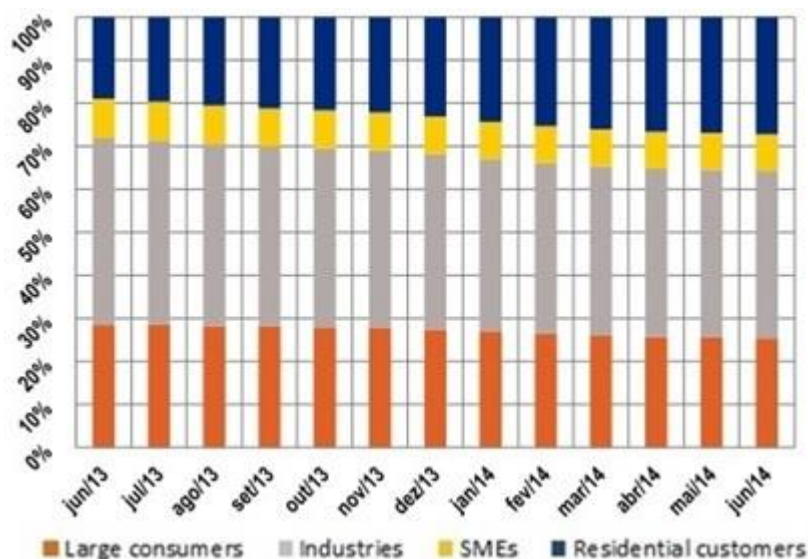


Figure 101. Liberalised market characterisation (consumption) [86]

In order to better understand the liberalised market, as well as the process regarding the extinction of the regulated tariffs, it is also important to make an brief characterisation of the LRES activity. At the moment the number of clients supplied by a LRES are localised in the residential sector, with 98% of the total of customers (Figure 102).

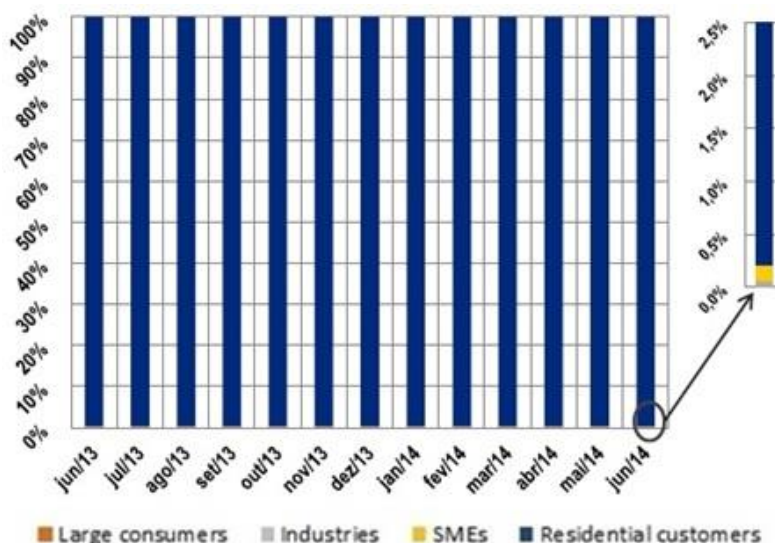


Figure 102. LRES activity characterisation (number of consumers) [86]

In relation to the others 0.2%, it is expected to get closer and closer to zero as the consequences regarding to extinction of regulated tariffs to each sector become gradually effective. Thus, as a consequence of this dominant position in the LRES activity, the share of consumption about the residential customers is, naturally, above the 90% (Figure 103).

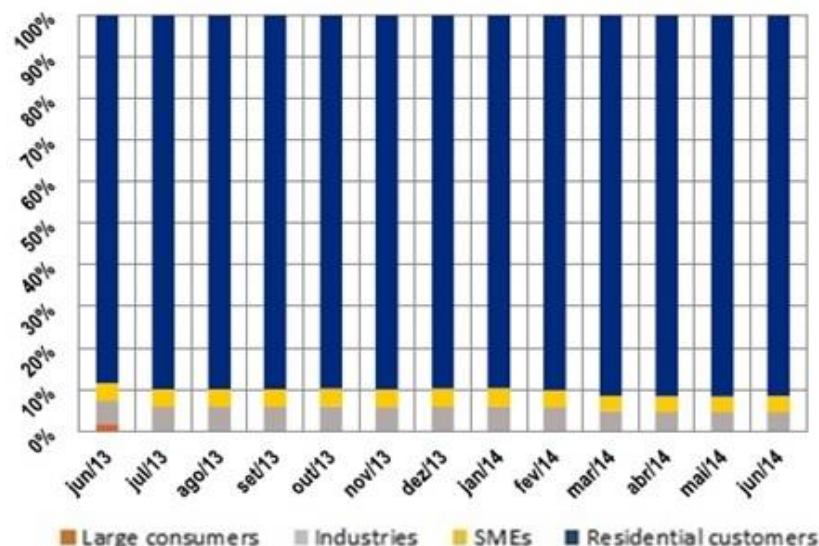


Figure 103. LRES activity characterisation (consumption) [86]

Looking closely to the residential sector (Figure 104), customers with power greater than or equal to 10.35 kVA, the date scheduled for the end of the transitional period is 31st December 2014, and in June, these consumers represent about 12% of total customers still supplied by a LRES. The others 88% concern to customers with power less than 10.35 kVA, which transitory period ends in 31st December 2015.

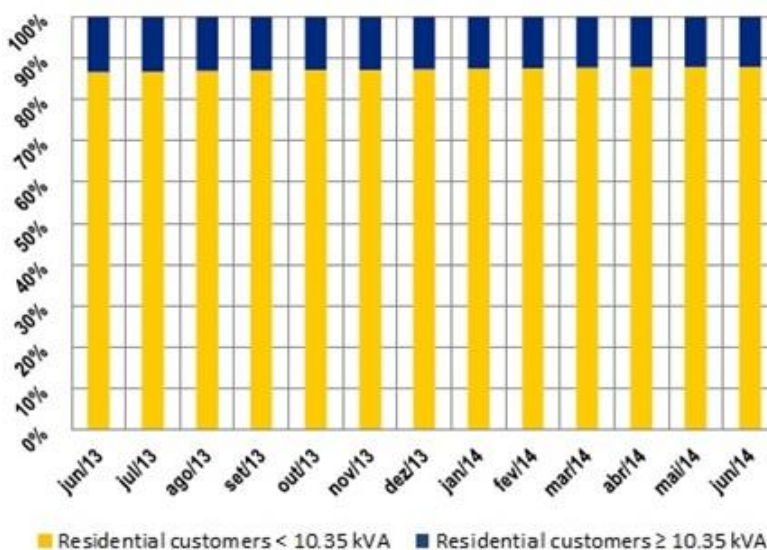


Figure 104. Characterisation of the residential sector in the LRES activity [86]

Focusing now in the options available for customers (Figures 105 and 106), at the moment, EDP is the number one electricity supplier operating in the Portuguese liberalised market in respect whether to number of consumers (86%) or consumption (46%).

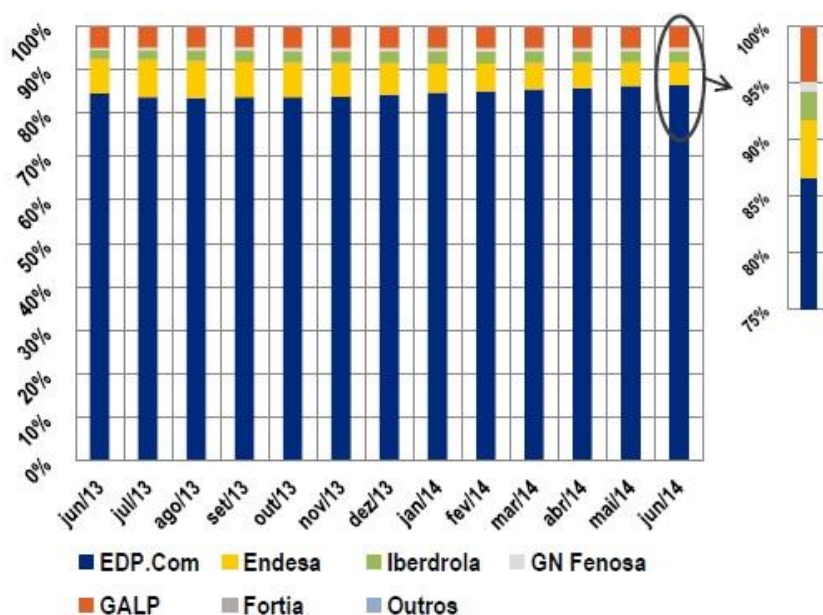


Figure 105. Share of each electricity supplier in the liberalised market (number of clients) [86]

The designation “Outros” includes electricity suppliers as ENAT, Enforcesco, Audax or Axpo, even though these last two do not operate in the residential sector.

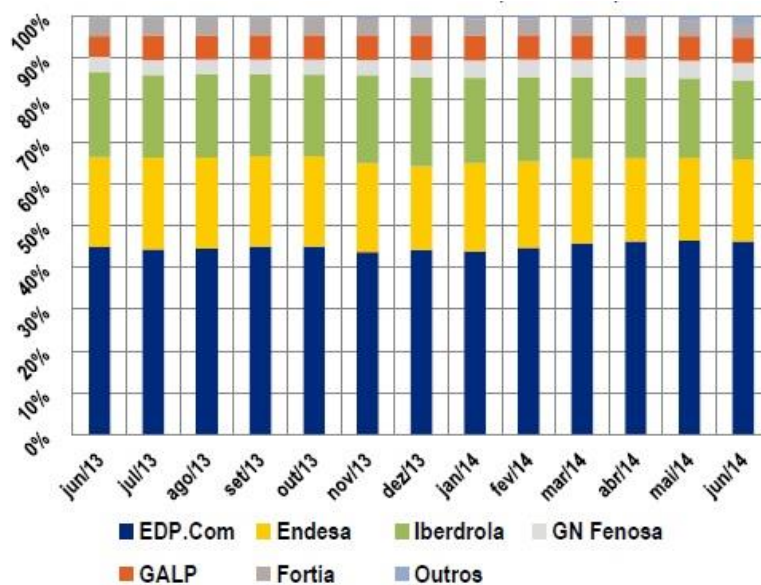


Figure 106. Share of each electricity supplier in the liberalised market (consumption) [86]

The open market expression of the three major electricity suppliers (EDP Comercial, Endesa and Iberdrola) in June represents almost 85% of the electricity supply and about 94% in relation to the number of customers.

Analysing each sector, the Large consumers sector’s consumption is led by EDP Comercial (30%), followed by Endesa (25%), Iberdrola (17%) and Fortia (14%) as shown in Figure 107.

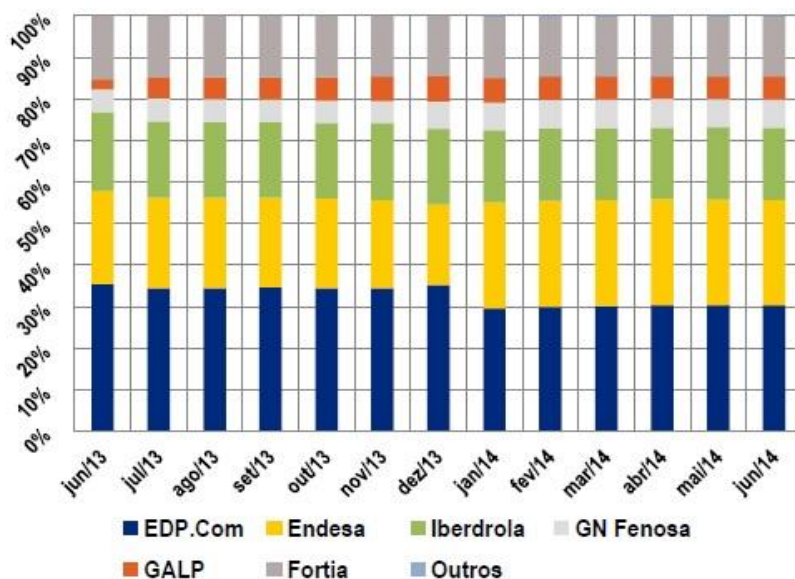


Figure 107. Share of each electricity supplier in the Large consumer sector (consumption) [86]

EDP is also leading the consumption in the Industries sector with a share of 30%, followed closely by Iberdrola (29%) and Endesa (27%), making this sector the most competitive of the four (Figure 108).

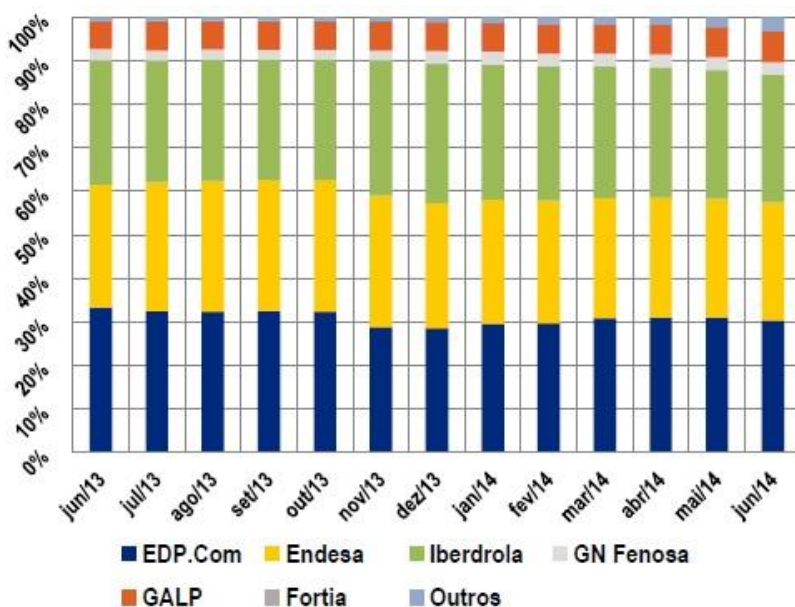


Figure 108. Share of each electricity supplier in the Industries sector (consumption) [86]

In the SMEs sector (Figure 109), EDP is once again the leader with a share of 48%. The next electricity supplier is Iberdrola with a share of 19%, followed by Endesa (16%) and, Galp Gas and Natural Fenosa with 7% each.

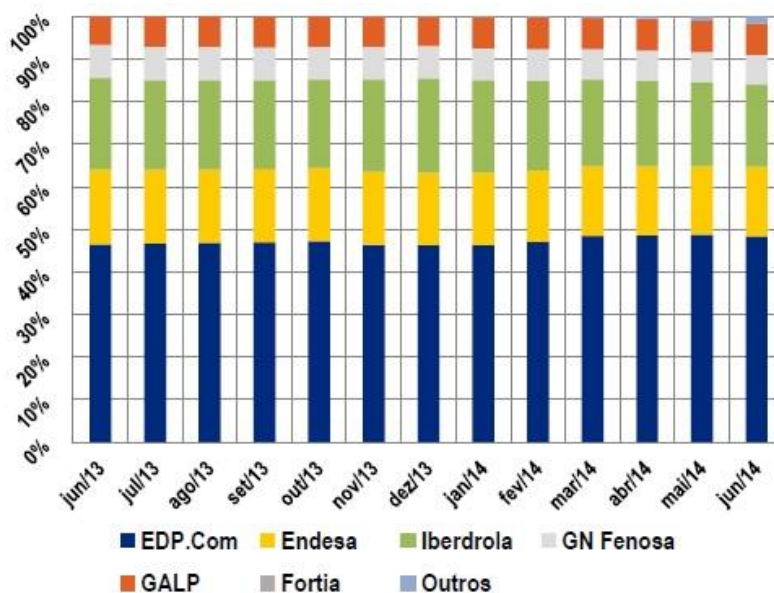


Figure 109. Share of each electricity supplier in the SMEs sector (consumption) [86]

As the residential sector is the most important to the issue of this thesis, it is relevant to point that the residential customer sector, besides having the greater business concentration, it is the one with the smallest share in the liberalised market (only 47% of the customers in the liberalised market). Because of that, the sector offers more opportunities to electricity suppliers to capture customers who are still in the regulated market.

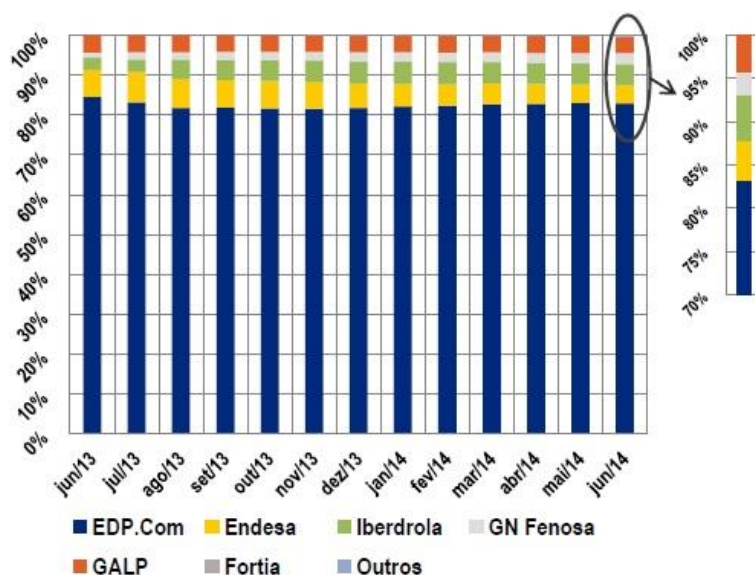


Figure 110. Share of each electricity supplier in the residential sector (consumption) [86]

Analysing the sector (Figure 110), EDP is the current leading electricity supplier, position mostly achieved thanks to its historical background as the sole electricity supplier when the Portuguese electricity market was regulated. Therefore, it is not strange EDP's unquestionable share of 83%. That means the space for the others competitors is narrow, making thus the

competition between them tight as the numbers suggest: Iberdrola (5.3%), Endesa (4.5%), Galp Energia (4.2%), Gas Natural Fenosa (3%) and the others (0.3%).

With the Portuguese liberalised market characterisation done, it is now time to take a closer look to the companies which are operating in the electricity market.

5.3.1. EDP Comercial



The EDP Group is among the most powerful and influential European companies acting nowadays in the electricity sector and can also be considered one of the largest Portuguese economic entities, probably as consequence of its historical background.

Taking this last note, its roots are traced to the period right after the Portuguese Revolution, when the Portuguese government decided to merge all the Portuguese continental companies regarding to generation, transmission, distribution and electricity supply into a single one. From this nationalisation process, and according to the *Decree-Law n° 502/76 EDP – Electricidade de Portugal, Empresa Pública* was created in 30th July 1976. Three fundamental challenges were expected of this new entity, including:

- ✓ The electrification of the country;
- ✓ The modernisation and extension of the RNT and RND as well as the planning, development and edification of the SEN;
- ✓ Establishment of an unique tariff transversal to all customers;

With these guidelines behind, in the mid-eighties the EDP's RND covered 97% of the continental territory of Portugal and guaranteed around 80% of the LV electricity supply [87].

In 1986, Portugal joined to EU and since then the country politics are in hands with the EU legislation. Therefore, the 1989 revision of the constitution eliminated much of the remaining Marxist rhetoric of the original document, abolished the communist-inspired "agrarian reform", and laid the groundwork for privatisation of nationalised firms.

EDP is one of these examples, and in 1991 was transformed in a anonymous company (S.A) under the Decree-Law n° 7/91, from 8th January, and in 1994 it was formed the EDP Group after a deep restructuring process [87].

Just focusing on the electricity supply activity, the firm is considered the largest electricity supplier in the Portuguese open market and on the other side of the border, is among the top five players.

Regarding to the Portuguese sector, EDP operates through the name of EDP Comercial while in Spain the electricity supply activity is performed by EDP-HC Energía (ex-Hidrocantabrico Energia) [87].

Besides its role as EDP Comercial in the open market, the firm also operates as a LRES. Thereby, in Portugal EDP, through EDP Serviço Universal, is delegated to supply all customers who choose to stay in the regulated market and the electricity needed to ensure the supply of these customers is acquired in the market or to SRG¹⁸ [87].

5.3.2. Iberdrola



Iberdrola is a Spanish multinational electricity company based in Bilbao, Basque Country, and is placed right behind Endesa, as the second largest electricity utility company in Spain. The firm was formed in April 1991, as a result of the merge between two major private utilities, *Hidroeléctrica España S.A.* and *Iberduero*. The intention behind this joint was to create an entity that would be able to hold its own in the coming liberalisation of the EU's power industry [88].

Iberdrola's roots are traced in the beginning of the twenty century, when in July 1901 the mining engineer Juan Urrutia led a group of entrepreneurs in forming *Hidroeléctrica Ibérica* in Bilbao. Meanwhile, civil engineer José Orbegozo, at the head of another group of Bilbao-based entrepreneurs, set up the *Sociedad General de Transportes Eléctricos* (SGTE) with the intention of developing power installations along the international stretch of the river Duero [88].

Right after, in 1907 a third company, *Hidroeléctrica Española* (Hidroela), was founded with the purpose to electrify the cities of Madrid and Valencia.

After some years, SGTE went through a name change, became *Salto de Duero*, and five years after the end of the Spanish Civil War, in 1944, STGE and *Salto de Duero* merged to form *Iberduero*.

In the early 1990s, the state utility ENDESA, created by the Franco regime in the 1940s, drew attention to itself with a series of acquisitions. The Spanish government, worried that the Spanish's smaller private utilities would be unable to compete in the coming Europe-wide market, encouraged ENDESA to swallow one small utility after another. To counterbalance ENDESA's growing influence, *Hidroela* and *Iberduero* made the decision to merge and the result was the creation of Iberdrola [88].

¹⁸ According to *Decree-Law n° 215-A/2012* the last resort electricity supplier, EDP obligated to purchase electricity generated under the Portuguese special regime.

In 1992, the firm started its internationalisation process when established a presence in Latin America, including for instance Argentina, Bolivia, Chile or Brazil. Moreover, in this new century the firm integrated *ScottishPower* and *Energy East*, currently known as Iberdrola USA, in its group and become a major multinational company, one the five largest electricity companies in the world [88].

Regarding to Portugal, the first contact was in 1998 when Iberdrola acquired 80% of *Empresa Eléctrica de Guatemala S.A.*, in alliance with EDP. Some years after, the two firms partnered with the italian group Eni, in a deal to acquire a share in Galp Energia [88]. In relation to electricity market, Iberdrola is active in the sector since 2002.

5.3.3. ENAT Electricidade



ENAT – Energias Naturais, through ENAT Eletricidade, is also another national firm acting in the Portuguese liberalised market.

Looking back at the history of ENAT, the company was born in the interior of Portugal, more exactly in Castelo Branco, and started its activity in the renewable energy market in 2004. At the moment, ENAT services are spread all over the national territory, with offices in Lisbon, Oporto, Castelo Branco, Viseu, Beja, Algarve, among others regions [89].

However, pointing to more ambitious goals, in 2012 ENAT saw a window of opportunity in the electricity open market, and since November 2013 the firm included in its portfolio the electricity supply activity being thus from that moment, one more option to all residential customers who are in the electricity liberalised market [89].

The first customer to sign ENAT services came right after, in Castro Verde, followed by others in Castelo Branco and then all over the country. At the present, ENAT provides its services to approximately 2000 customers [90].

Regarding to ENAT offers, they do not have a retention period, which means the customer may quit its deal anytime, without penalty fee. Besides that, and according to its directors, the firm differs from the large companies by having a closer customer service and prices more accessible [89].

5.3.4. Endesa



If EDP is leading the Portuguese electricity market, it is also reasonable to say the largest operator in Spain is Endesa. Actually, these firms are fighting for the supremacy of the Iberian electricity market.

Endesa's history is quite similar to EDP once the firm, since the time of its foundation in 1944, was linked to the Spanish government. In fact, the firm on that time was 98% owned by *Instituto Nacional de Industria* (INI). INI was the state parent company, which owned all the power firms controlled by the Spanish government, including *Empresa Nacional Hidro-Eléctrica del Ribagorzana* (ENHER), *General Europea S.A.* (GESA), *Union Eléctrica de Canarias S.A.* (UNELCO), *Empresa Nacional Eléctrica de Córdoba* (ENECO) and ENDESA. However, the things changed and in 1983, as part of the government general plan to make INI more efficient and modernise the country's institutions in order to prepare the Spanish entry in the EC, all the companies under INI control were transferred to ENDESA's authority. Since this reorganisation the firm has enjoyed a phenomenal growth and became the country's largest electricity producer. As a result of a couple more deregulations and changes over the eighties and nineties, the company achieved the full privatisation in 1998 [91][92].

Out of majority government control for the first time, the company continued with its restructuring plan, which had started in 1999, so that it could compete effectively in a deregulated market [91].

Under this restructuring plan, ENDESA created ENDESA Servicios, ENDESA Generación, and ENDESA Distribución to oversee its internal needs, electricity production, and electricity distribution, respectively [92].

In Portugal, the Endesa Energia was the first electricity supplier in the Portuguese open market in April 2000. Two years later, ENDESA created Sodesa - Energy Trading SA, an even shared joint venture with the Portuguese group Sonae, with the aim of supply electricity and marketing services for Portuguese electricity customers in the liberalised market. However, the firm abandoned the open market in 2007 due to the unfavourable regulatory framework, and decided to come back when ERSE have set new rates for 2009, which the company considered attractive.

Therefore, in January 2009, Endesa began a new step in the Portuguese electricity market when they come up with its own electricity supply company: Endesa Energia.

5.3.5. YLCE/Enforresco



Founded as a spin-off of Enforce, Enforresco S.A. is the most recent electricity supplier in the Portuguese electricity market. With its headquarters in Castelo Branco, more specifically in Covilhã, Enforresco came up one year ago with the brand YLCE - *Yes, Low-Cost Energy*, to

materialize this new company business framework. Therefore, according to João Nuno Serra, Enforcesco's CEO, through YLCE it is Enforcesco's main intention to operate, gradually, in the European energy market after 2015, period in which the firm plans to have already a solid role in the Portuguese open market [93][94].

Right now the firm has more than 1000 customers, independently of the size and type, and this is possible thanks to some advantages intrinsic to a low-cost company, including the low operational costs and the use of information and communication technologies optimising then all the business and relation process with customer. According to Enforcesco's CEO, summing all elements it results in a lower and attractive price to the final user, comparing to the competition [93][94].

5.3.6. Galp Power



With three centuries of existence, Galp Energia, through the name of Galp Electricidade, is another agent operating in the electricity liberalised market. Despite in 2007, the firm's efforts were the business and industrial customers, particularly those who were already customers, in 2012 there was an extension of electricity supply to residential customers [95].

The first historical data of the company is from 26th August 1846. It is on this date that Queen Maria II authorised the opening of a competition to lighting the Lisbon by means of hydrogen gas, an event that would lead to the establishment of *Companhia Lisbonense de Iluminação e Gás* (CLIG). Two years after, it was lightened the firsts gas-fired lamps in Lisbon and that moment can be remembered as the birth of Galp Energia. From that event, it was a click to petroleum and natural gas technologies [95].

Galp Energia was established on 22 April 1999 under the name of *GALP - Petróleos e Gás de Portugal, SGPS, S.A.*, resulting of a merger between *Petrogal*, Portugal's sole refiner and the main distributor of oil products, and *GDP - Gás de Portugal*, the company importing natural gas into Portugal and transporting and distributing it domestically [95].

Exploring these companies, *Petrogal* was formed in 1976 from the merger of four Portuguese oil companies: *Sonap*, *Sacor*, *Cidla* and *Petrosur*, while *GDP* is the former *Sociedade Portuguesa de Petroquímicos* created in 1957 by *Sacor* and and CRGE, which are the merger between CLIG and *Companhia Gaz de Lisboa* [95].

Currently Galp Energia is the leading integrated company of petroleum products and natural gas in Portugal and aims, through Galp Power, to be a solid option in the Portuguese electricity market as well.

5.3.7. Gas Natural Fenosa



Operating at the moment in 25 countries, Gas Natural Fenosa is the last but not least multinational company with activity in the Portuguese liberalised electricity market.

With a background history similar to Galp Energia, under the name of *Sociedad Catalana para el Alumbrado por Gas* (SCAG), Gas Natural Fenosa was the first company to bring light to streets and public spaces in Barcelona, thus offering the first public service implemented in the city, in 1843 [96].

From 1866, SCAG made a leap beyond the Catalonian territory and began geographical expansion throughout Spain with the purchase of some gas factories, as well as beginning to build factories of its own. At the end of the century, SCAG also entered into the business of thermal electricity and in 1911, hydroelectric power and one year later, the company changed its name to *Catalana de Gas y Electricidad, S.A.* (CGE), in order to incorporate the electricity activity in the company strategy [96].

1963 is the period that one of the greatest milestones in the firm was achieved, when CGE introduced petrol in the Spanish energy market, using it as a raw material to replace coal. At the end of the decade, *Gas Natural S.A.*, a joint venture between CGE and *Exxon*, began the era of natural gas in Spain, mainly through the establishment of natural gas supply contracts with countries of Maghreb, among others events [96].

In 1987, CGE changed its name to *Catalana de Gas S.A* (CdG) and sold its conventional electricity shares. Five years later, in 1991, CdG merged with *Gas Madrid, S.A.* and absorbed different gas pipeline shares from *Repsol*, thus integrating the gas sector in Spain. The merger led to a new change of company name, becoming *Gas Natural SDG* [96].

In 1992, *Gas Natural SDG* started its international expansion with the acquisition of assets in Argentina, and the incorporation of *Gas Natural BAN*. Five years later, it continued advancing throughout the South American territory to begin new activities in Brazil, Colombia and Mexico.

The group's solidity continued to consolidate when in 2002 it expanded into the Italian energy market. From then, and with the beginning of activities in Puerto Rico and France, the company's international expansion process has been unstoppable up to the point of reaching more than 25 countries worldwide, including Australia, South Africa, Oman, the Dominican Republic, Guatemala, Belgium and Germany [96].

One of the great turning points that transformed the group's history was the merger by absorption with *Unión Fenosa* and *Unión Fenosa Generación*, in 2008, which resulted in the first integrated gas and electricity company in Spain, as well as in Latin America: Gas Natural Fenosa.

With the integration of the two companies, the group became even stronger, more efficient and more competitive and it is today one of the top 10 leading European firms in the energy business [96].

In Portugal, Gas Natural Fenosa operates in the liberalised electricity market through Unión Fenosa Comercial. Basically, Gas Natural Fenosa only took advantage of Unión Fenosa's consolidated deployment in the Portuguese market previously to the company's acquisition, once the firm had been operating as an electricity supplier in the Portuguese market since 2004 [96].

There are different aspects a consumer must be aware in the time to choose its electricity supplier in order to reduce the electricity bill, like the current household energy consumption, reliability and the rating of customer service provided by the electricity supplier, or even the terms of a contract. However, there are also two important parameters:

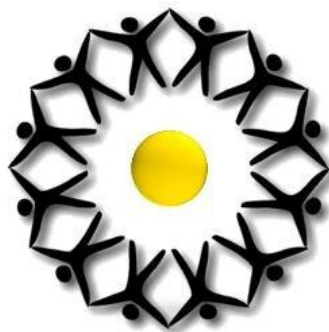
- ✓ **The cost of electricity:** tariff rates of each electricity supplier;
- ✓ **Environmental impact:** the percentage of electricity each electricity supplier generates from RES;

Despite the possible advantage of being a social company, these are the two aspects a RES Cooperative, as Coopérnico, can use to make the difference in the electricity retailing business.

But what is Coopérnico, its roots and how can a social company enter in this competitive world?

Thus, with a general description of the Portuguese liberalised market, as well as the main players operating in the residential market, it is time to answer to these questions right away.

5.3.8. The incoming of a new player: Coopérnico



Inspired by the success model of several European RES Cooperatives, Coopérnico is the first RES Cooperative in Portugal and it was founded in late 2013, by a group of 16 people from different areas and with different professional backgrounds sharing the vision of a fair and responsible renewable energy model that may contribute to a social, environmental and sustainable energy future (Figure 111).

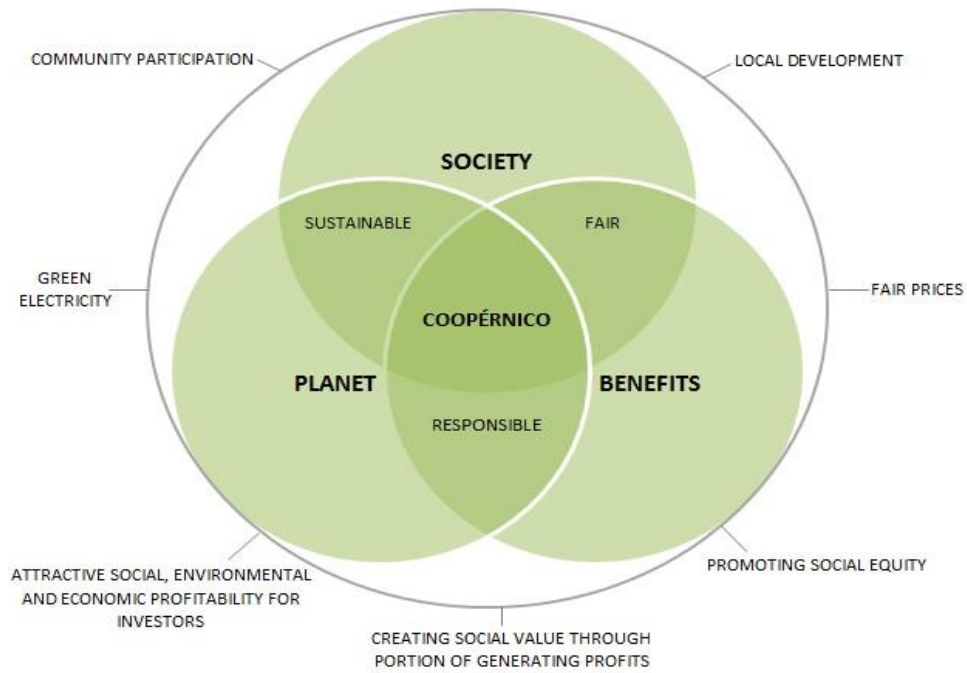


Figure 111. Relation between Coopérnico’s commitments, vision and mission

With the clear objective to grow whether in membership and citizen involvement in initiatives that promote the sustainable development, the Coopérnico’s business plan, approved in December 2013, established a realistic goals for the next five years, including, for instance, the expectation to have more than 1500 members by the end of 2017 (Figure 112).

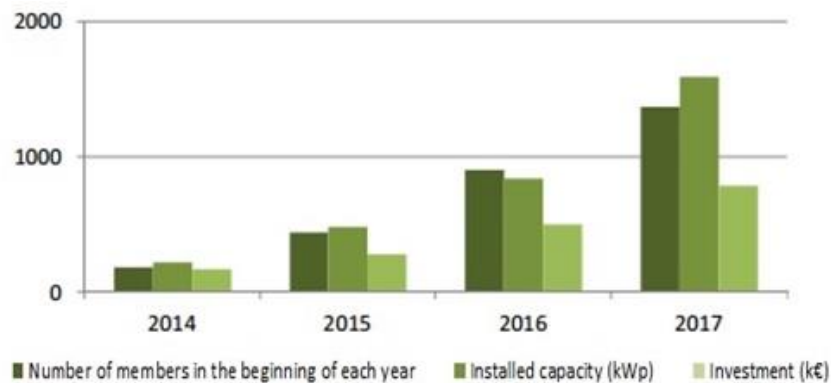


Figure 112. Coopérnico objectives for the beginning of each year

Thus, in the context of the process towards the full liberalisation of the Portuguese electricity market, Coopérnico aims to be the hub for people and organisations wishing to create a new energetic paradigm, mainly through (Figure 113):

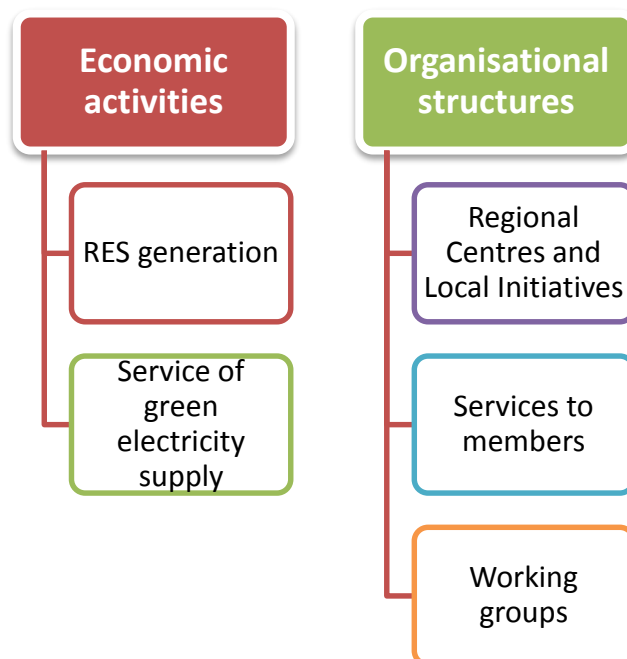


Figure 113. Economic activities and organisational structures of Coopérnico

Regarding to the first economic activity, Coopérnico invests through equity interest in solutions for decentralised RES generation. These societies may be related, or not, to the Cooperative. At present, there are four projects already in activity and two more in development.

Still in the same branch, Coopérnico also offers services of consulting and advising to potential stakeholders in this activity.

In respect to the electricity supply activity, the Cooperative proposes to be able to provide the 100% electricity supply based on RES to all LV customers (citizens, businesses firms and other stakeholders).

Linked to its global strategy, and in addition to their economic activities, Coopérnico has also an organisational structure comprised in three pillars.

Therefore, aiming to promote the Cooperative in the national territory, as well as the progressive environmental and energy awareness among its citizens, Coopérnico wants to invest in the creation and propagation of Regional Centres throughout the country. All these poles will be overseen by a central organ, whose functions will be the definition of the requirements needed to create new Regional Centres, the monitoring of its creation and development, as well as the coordination of all activities executed by Coopérnico's Regional Centres. Currently is already in activity the Regional Centre of Oporto and being in launch phase the Regional Centre of Braga.

Moreover, Coopérnico also proposes to support the use of RES and the promotion of energy efficiency tips to the Cooperative members, as well as the development of guidelines regarding energy saving measures to be applied for all the establishments where there are or will be installed projects.



Figure 114. Five different thematic Working Groups

Finally, Coopérnico intends to create several Working Groups (Figure 114), which may help to define action plans and strategies for the success of the Cooperative. These groups will work, and be made, with the voluntary participation of Cooperative members.

Thus, in order to follow the developments in the energy sector, identify areas of potential interest to Coopérnico and evaluate the respective interest, it is proposed to create a working group called “Scouting, Areas of Activity, Innovation” to address these issues. This working group will also focus on the establishment of partnerships with industry or academic institutions, to study and developing new RES generation projects.

Adopted a model that combines economic and environmental benefits to social solidarity, Coopérnico also assumes the commitment to promote social or educational activities, ensuring then the involvement of its own members and partners in these activities, as well as the commitment to invest in local development, whenever the Cooperative intends to implement a given project.

In order to meet its members and the Portuguese society in general, it is also essential to establish a group that manages the Coopérnico’s image, as well as the organisation of the Cooperative events, such as General Meeting, newsletters, communications to members or promotional campaigns relating to the Cooperative.

It is also expected that another group can be responsible for the development of a manual that summarises all the rules of conduct and management of Coopérnico’s activities, such as hiring, working members’ remuneration and rules for the holding of General Meeting, among others.

Regarding to “Retailing” working group, it is proposed that this group be responsible for monitoring the MIBEL, in order to anticipate future changes in the market development. Thus, based on this monitoring, Coopérnico intends to come up with innovative strategic solutions that can not only consolidate Coopérnico’s evolution within the MIBEL, but also to protect the interests of its members.

All those who purchase at least three titles in capital in the amount of € 60 are accepted as members by the board of directors. At the moment, Coopérnico has four different types of membership (Figure 115):

- ✓ **Founders:** Members who helped to create the Cooperative.
- ✓ **Effective:** Members whose age are over eighteen years old and collective persons, that share the same objectives of the Cooperative. They must be admitted by the board of directors.
- ✓ **Benefactor:** All of those who make valuable contributions for the purposes of the Cooperative, and be proclaimed as such by the General Meeting.
- ✓ **Honorary:** All of those who contributed significantly to the reputation or objectives of the Cooperative, and be proclaimed as such by the General Meeting, with a vote of not less than 2/3 of the effective members.

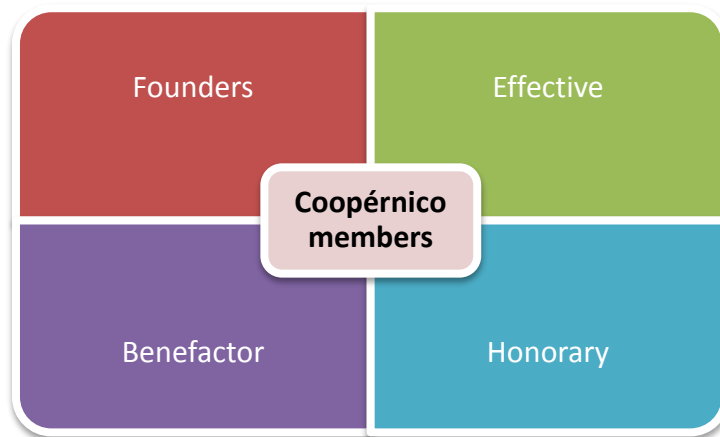


Figure 115. Types of membership in Coopérnico

In relation to the Coopérnico's governing organs they are divided as (Figure 116):

- ✓ **General Meeting of Shareholders:** Is the maximum organ of the Cooperative, with powers to decide on all matters relating to its activities and to elect and remove the mandatory statutory bodies.
- ✓ **Board of Shareholders' General Meeting:** Consists in a Chairman of the Board of the Shareholders' Meeting and a Vice-Chairman, whose function is to convoke and coordinate the work of the General Meeting.
- ✓ **Board of Directors:** Consists in a CEO and two members of the Board, whose function is to drive the Cooperative, and ensure the continuing of its commitments.
- ✓ **Board of Trustees:** Formed by nine members (five founder members, two benefactor or honorary members and two effective members). They are responsible to make sure Coopérnico's activity complies with its mission.
- ✓ **Board of Auditors:** Have the job to control and supervise the exercise of the Board of Directors and the business plan proposed by it, in accordance with Coopérnico's laws and statutes.

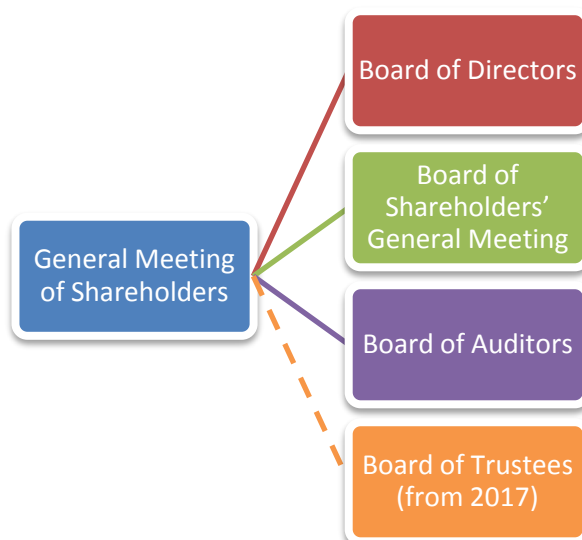


Figure 116. Coopérnico’s organisational chart

Like all others competitors, a RES Cooperative must follow a set of well-defined steps in order to become an electricity supplier. Thus, the first step a RES Cooperative must fulfil is the development of a standard request demanded by the legal framework for the Portuguese electricity sector.

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Figure 117. Print screen of Coopérnico’s application index

According to *Decree-Law nº 215-B/2012, Article 46*, the registration shall contain the following elements:

- ✓ The identification of the applicant;
- ✓ The date and the number of registration.

By the *Article 47* of the same document, it is stated the procedures for a correct application. Thus, the application shall be made electronically through the electronic one-stop-shop, referred to in *Article 6* of *Decree-Law N° 92/2010*, from 26 July, and addressed to DGEG. The application shall include (Figure 117):

- ✓ The full name of the applicant, stating the name or business name;
- ✓ NIF number;
- ✓ Office location;
- ✓ Phone number;
- ✓ Email address.

Moreover, the application shall be submitted to DGEG:

- ✓ Accompanied by a simple copy of an identification document or, if the person concerned is a collective person, the access code to the permanent certificate of business registration, or a copy of the respective statutes when the seat is outside the national territory;
- ✓ Statement of qualification and no impediment to the exercise of retailing activity, in accordance with *Annex VI* of the *Decree-Law n° 215-B/2012*;
- ✓ Statement of the applicant confirming the aware of the obligations within the *Decree-Law n° 29/2006*, from 15 February, the *Decree-Law n° 215-B/2012* and other applicable legislations and regulations identified in the information available at the electronic one-stop-shop, referred to in *Article 6* of *Decree-Law N° 92/2010*, from 26 July, and that fully respects;
- ✓ Authorisation of access to application information;
- ✓ Document containing the identification of the means used to fulfill the obligations to consumers, particularly with regard to communication and interface with customers and quality of service.

The statements required must be signed under oath by the legal representative.

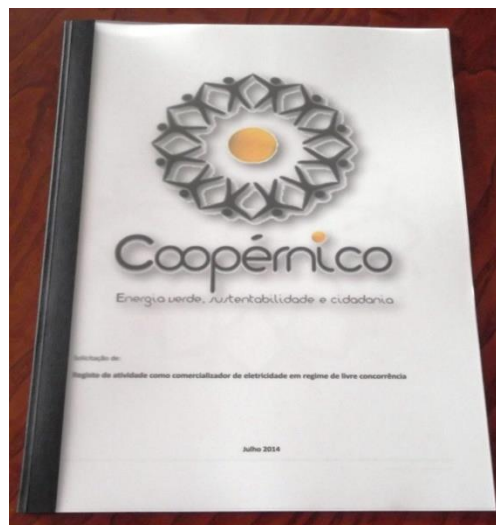


Figure 118. Coopernico's application

Upon submission of the application (Figure 118), the document is analysed by DGEG and automatically accepted, if will not be released any comment within 30 days from the date of submission. In case of approval, the elements referred to in *Article 46* are automatically enrolled in the register of electricity suppliers.

For the assessment and effectiveness of the registration, the RES Cooperative shall pay a fee to DGEG, which is defined by the *Ordinance n° 83/2013*, from 26th February. Thus, by the *Article 2*, it is established a fee of € 1,000 and according to the following article the payment shall be made within 5 days after the generation of the reference payment, under penalty of application be outright rejected. The registration process is explained in Figure 119.



Figure 119. Registration process

Submitted and approved the RES Cooperative's registration, there are several other steps the social enterprise must take and fulfil in order to transform the RES Cooperative in a Portuguese electricity supplier, including, for instance, the electricity acquisition process. However, to exercise the right to buy and sell electricity in the market, the RES Cooperative shall become a market agent.

Besides MIBEL overview, the following sections will answer to questions such as:

- ✓ Who are the operators acting in the MIBEL and their functions?
- ✓ What are the requirements and procedures to become a market agent?
- ✓ How many ways the RES Cooperative has to purchase electricity? Which are they?

5.4. Operation of the Iberian Electricity Market

One of the natural consequences of the First Directive in Southern Europe was the conceiving of the Iberian Electricity Market (MIBEL). However, this natural response of the Iberian countries was not done overnight. In fact, took almost 10 years to be 100% launched.

Traveling around the history of MIBEL, it all commenced in 1998, period wherein the Portuguese and Spanish governments started debates and conducted research studies in order to increasingly dismantle the barriers and encourage the establishment of the MIBEL.

According to MIBEL website [97], since then, a number of events took place, including the joint of both electrical systems that was formally initiated with the signing of the "*Protocol for collaboration between the Portuguese and Spanish Administrations for the formation of an Iberian Electricity Market*", in November 2001.

In that document, it was established between the two countries the foundations necessary to begin cooperation among the many entities with responsibilities in the sector framework (administrations, regulators and operators), with a view to harmonising the participation conditions of economic agents on MIBEL.

In the context of the *XVIII Portuguese-Spanish Summit*, in October 2002, the organisational model for MIBEL was decided as well as the main objectives for its materialisation, adopting as a strategy for its creation an intermediary regional approach of the integration of the Portuguese and Spanish markets into a single European market.

This organisational model is based on the existence of the *Iberian Market Operator* (OMI), owned in even share by both governments, with two poles:

- ✓ The Portuguese division, responsible for the management of the derivate markets;
- ✓ The Spanish division, responsible for the management of day and intraday markets.

The same summit also states that the model shall follow a phased building model, based on three main pillars (Figure 120):

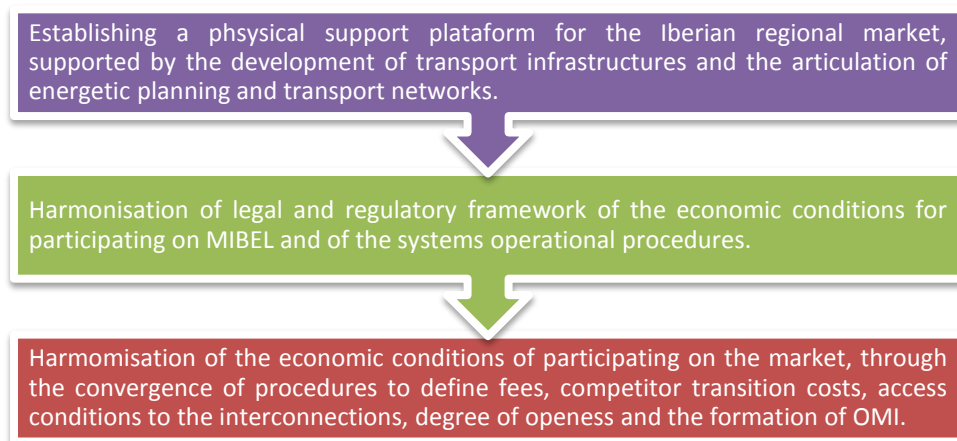


Figure 120. The three main ideas behind the MIBEL organisational model, set by both governments in the *XVIII Portuguese-Spanish Summit*

On year later, at the *XIX Portuguese-Spanish Summit*, both governments signed a *Memorandum of Understanding* relative to the necessary conditions to complete MIBEL, including a timetable predicting all the steps to achieve this Iberian Electricity Market.

Besides the timetable, the signing of an *International Agreement* was also foreseen, which would formalise the creation of MIBEL. This marked the official launch of the integration of the Portuguese and Spanish electricity systems.

Thus, it did not took too long to the sign of a document contained a plan for the integration of both electricity markets. The “*Agreement between the Portuguese Republic and the Kingdom of Spain for the Constitution of an Iberian Electrical Energy Market*” signed in 2004, consolidated the foundations for the construction of a common market, outlining the general development of the project, not just at a legislative and regulatory level but also the market’s operational solutions, including:

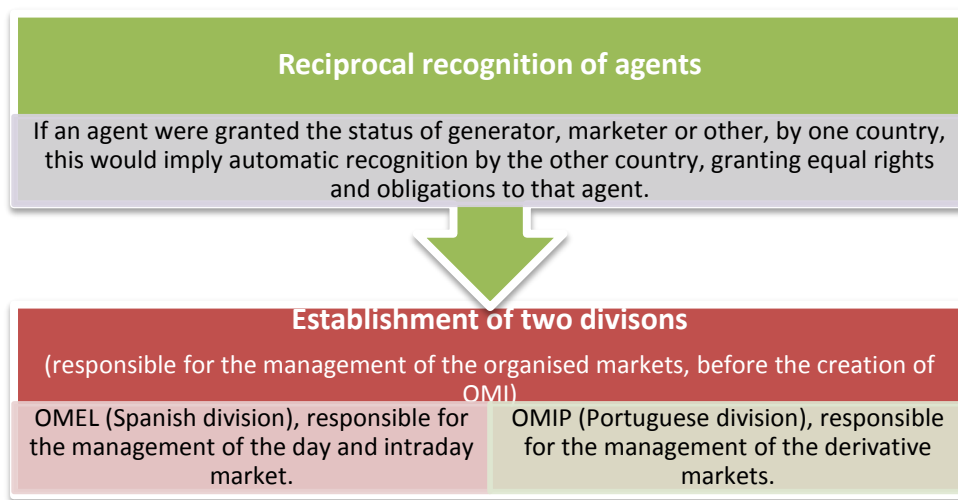


Figure 121. General foundations for the construction of a common market, set by both governments in the XIX Portuguese-Spanish Summit

Under the terms of this agreement (Figure 121), the launch of MIBEL and the start of the integrated working of the two MIBEL divisions should have happened in the same year. However, due to some circumstances of political and legal nature the schedule was postponed.

Taking advantage of this postponement, the two governments decided to review the MIBEL constitution project, which was formalised with the signing of a new *International Agreement* still in the year 2004, under the scope of the XX Portuguese-Spanish Summit.

This new agreement covered topic such as (Figure 122):

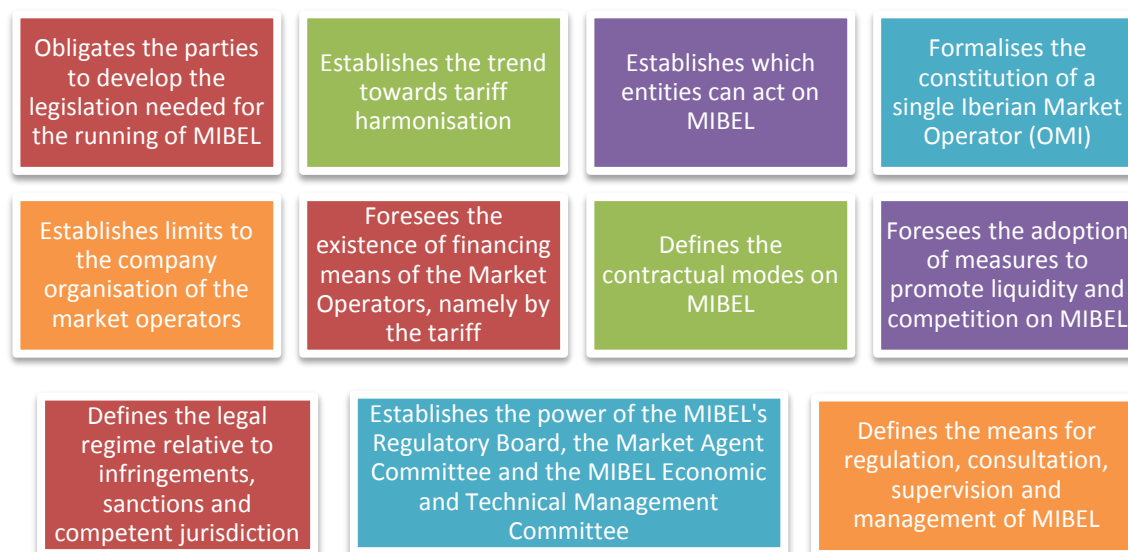


Figure 122. Topics covered by the new agreement, set by both governments in the XX Portuguese-Spanish Summit

Thus, the new agreement decided that the launch of MIBEL would take place until 30th June 2005.

However, the expected difficulties in overcoming the pre-launch period were aggravated once again due to political and legal factors that would not permit the official launch of MIBEL in the schedule previously foreseen. Among these setbacks were:

- ✓ Significant political changes in Portugal, with the election of a new government, which only came into power in March 2005;
- ✓ This fact led to the lack of legal developments needed to launch OMIP;
- ✓ Uncertainties in MIBEL's regulatory framework led to the construction of a "White Book" on the electrical sector, and its impact on the organisational and working model of MIBEL.

In 2005, at the XXI Portuguese-Spanish Summit, both governments reinforce their commitment to building the MIBEL, agreeing that the following steps would be taken, during 2006 (Figure 123):



Figure 123. Proposed steps to reinforce the commitment to create the MIBEL, set by both governments in the XXI Portuguese-Spanish Summit

In 2006, during the *XXII Portuguese-Spanish Summit*, the Portuguese and Spanish governments reiterated their commitment to expanding the MIBEL (Figure 124). Thus, both governments decided to request, from the Energy General Directors, a regulatory compatibility plan, which include a common energy contracting model for last resort distributors and retailers of both countries, both spot and derivatives, to be executed under the scope of OMI.

The both governments also decided for 2007:

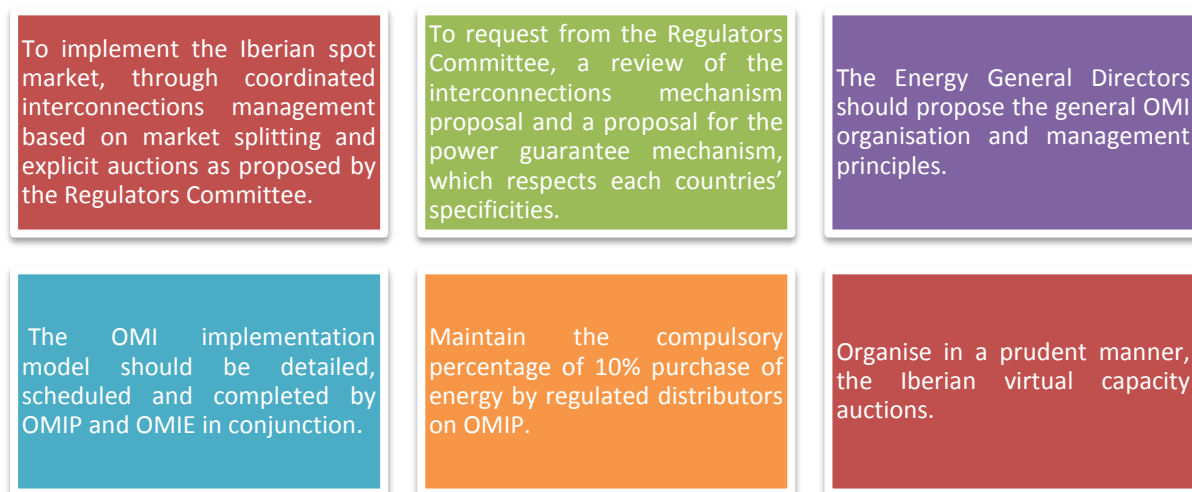


Figure 124. Governments' extra requests to reiterated their commitment to create the MIBEL, set by both governments in the XXII Portuguese-Spanish Summit

In 2007, in line with the *XXII Portuguese-Spanish Summit* guidelines, the governments of Portugal and Spain, drew out a regulatory compatibility plan based on six core initiatives (Figure 125):

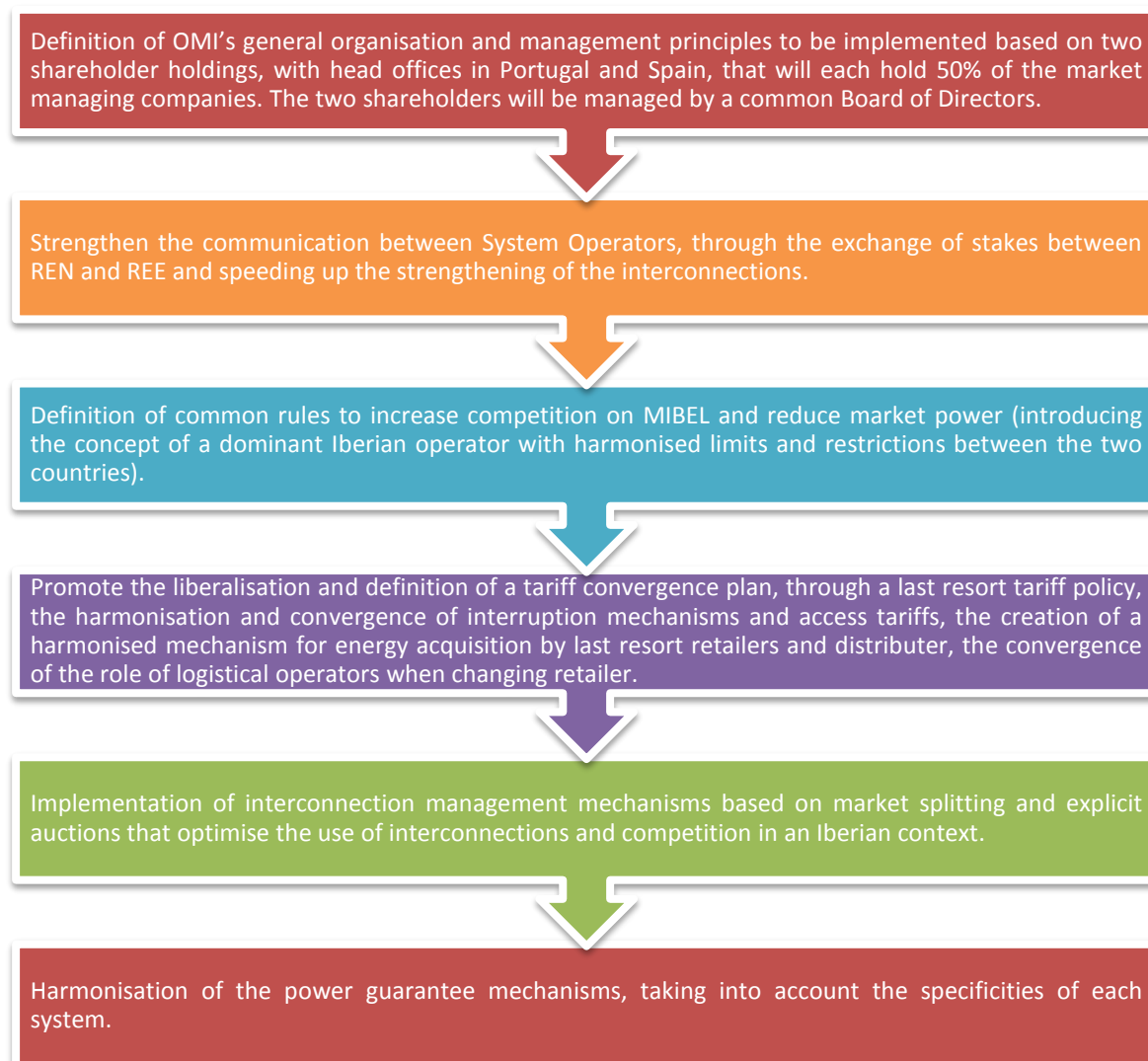


Figure 125. Main ideas behind the regulatory compatibility plan, set by both governments in the sequence of *XXII Portuguese-Spanish Summit*

At the *XXIII Portuguese-Spanish Summit*, that took place in 2008, and with a view to speeding up the development of the MIBEL, both governments signed the *Amendment Agreement* of the *XX Portuguese-Spanish Summit*, with the following fundamental points (Figure 126):

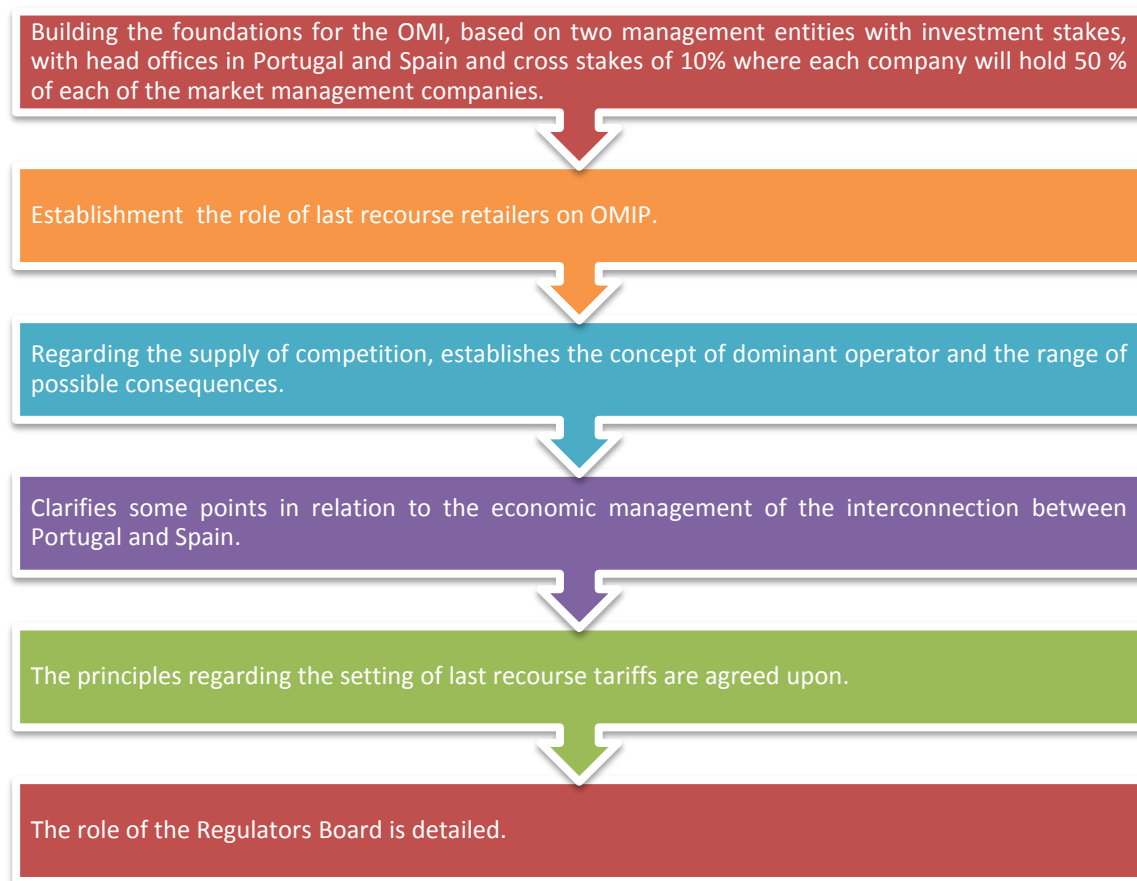


Figure 126. Main ideas behind the *Amendment Agreement of the XX Portuguese-Spanish Summit* set by both governments in the *XXIII Portuguese-Spanish Summit*

In 2009, at the *XXIV Portuguese-Spanish Summit*, both governments agreed the final constitution of the OMI, through the integration of both operating organisms and the creation of a joint working group to accompany the process. The Portuguese and Spanish governments also decided to propose the nomination of Eng. José Carvalho Netto, as OMI Chairman.

In the same year it was also signed the *International Treaty*, which stated the foundation of the company OMIP- Iberian Market Operator SGPS, S.A (Portuguese Holding) was incorporated, to which was transmitted all the shares representing OMIP's share capital.

Two years later, in 2011, the last changes were made in the corporate plan to the definitive constitution of the OMI, namely:

- ✓ An exchange of shares between the Portuguese (OMIP SGPS) and Spanish (OMEL) holdings took place leaving OMIP and OMIE being held in equal parts by these two OMI holdings.
- ✓ REN, which had a 90% stake of the Portuguese Holding Company reduced its participation to 45% through sales to several agents. In the near future REN's participation will be further reduced to 10% of the OMI capital.

The final important step towards the implementation of the OMI, was done in the end of 2011 when took place the first meeting of the common Board of Directors of the companies that manage the MIBEL: OMIE (spot market) and OMIP (derivatives market).

5.4.1. Operators and Trading Members at MIBEL

As said before, the MIBEL agreement provides that the current Portuguese and Spanish market operators will be merged into a single Iberian market operator that will operate with two interconnected centres in Lisbon and Madrid.

Whilst this does not happen, at the moment MIBEL is operated by three distinct companies:

- ✓ **OMIE:** The Spanish division of the Iberian Energy Market Operator, which is responsible for the spot electricity market with daily transactions and intraday adjustments (intraday markets), wherein electricity sale (production) and purchase programmes are established for the day following that of the trade.
- ✓ **OMIP:** The Portuguese division of the Iberian Energy Market Operator, that ensures the management of the MIBEL futures market in Portugal and is currently a regulated market.
- ✓ **OMIClear:** The Clearing Platform for the Iberian Forward/Derivatives Markets, which acts as a clearing house, central counterparty and managing entity of the settlement system. Fundamentally, its main activity is that of clearing, registration, risk management and the settlement of transactions traded on the OMIP.

In spite of the successive restrictions on participatory interests in the managing companies of the market operators, imposed by the transitional period regime, the technical system operation of the markets is still assured by the two companies responsible for the management of the Iberian transmission networks: REE and REN, respectively.

It is also important to say, in name of transparency on the business, that none of the five previous companies buy nor sell electricity (Figure 127).

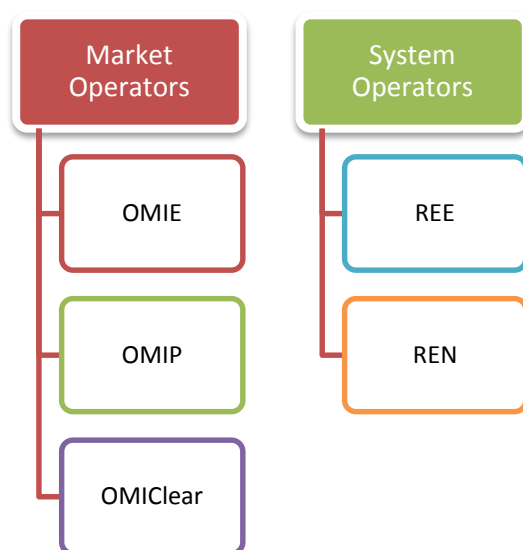


Figure 127. Market Operators and System Operators acting in MIBEL

Focusing on OMIE, the electricity market where the RES Cooperative aims to participate, currently there are four market participants:

- ✓ Electricity power producers;
- ✓ Resellers;
- ✓ Qualified direct consumers in the market;
- ✓ Representatives.

In order to operate on the market managed by OMIE, buying and selling electricity, the RES Cooperative must comply with several preliminary and complex requirements established in the regulations that can be identified in OMIE's website [98].

According to *OMIE Market Access Guide (OMAG)*[99], the first step of the process begins with the activation of the local *Energy Identification Code (EIC)*¹⁹.

This activation is carried out through a request submitted to any Local Issuing Office (LIO). In the case of Coopérnico, the EIC code is supplied and administered by the Portuguese LIO: REN.

However, in order to achieve the EIC code it is important to have initiated the request of the status of Market Agent. Why? Because the RES Cooperative must provide the code of Agent in OMIE (5 characters). This code of Agent in OMIE will be a constituent part of the local EIC code to be issued by REN.

The allocation of an EIC code to a market participant is broken down into three main steps:

- ✓ **Submission by the market participant:** the RES Cooperative applies to REN for a EIC code;
- ✓ **Validation and allocation:** REN validates the credentials of the RES Cooperative and allocates the code;
- ✓ **Verification and Integration:** REN publishes the allocated EIC code on its LIO web page.

There is no financial cost on the activation of the EIC code.

Once the EIC code is obtained, the second step of the process is an electronic procedure (Figure 128), through which the information required for acquiring the status of market agent is provided to OMIE. This electronic process is divided into two phases:

¹⁹ The EIC code is the easiest and most reliable way to identify the market participants and other entities active within the European IEM. The EIC coding scheme is maintained by the European Network of Transmission System Operators for Electricity (ENTSO-E).

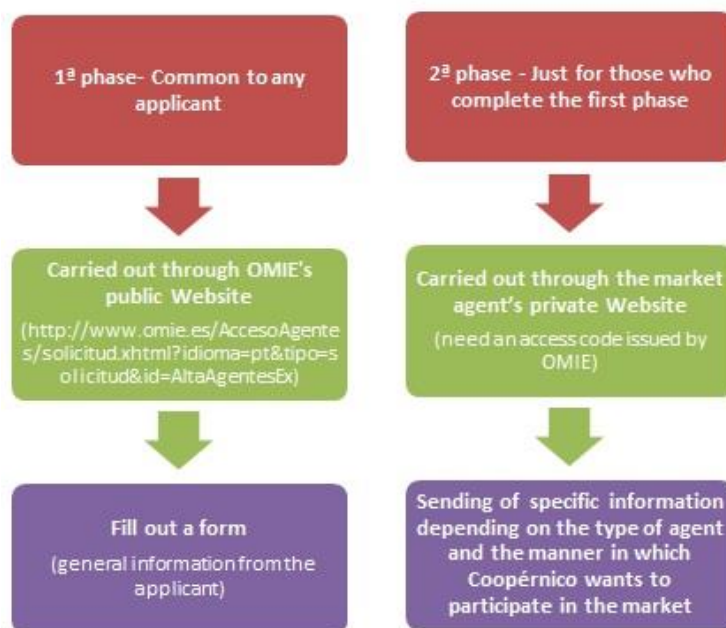


Figure 128. General description regarding the two phases of the electronic procedure

As part of the first phase of the electronic process, there is some required extra information (written hard copies of additional documents) that must be referred to OMIE:

- ✓ Copy of the document issued by the Tax Agency certifying the Tax identification Number (VAT or NIF, in Portuguese) of the RES Cooperative or the Representative Agent.
- ✓ Copy of the National Identity Card (BI, in Portuguese) of the person signing the request, (person included on the form as the entity's representative, who must have sufficient powers for conducting all the acts and signing all the documents required for the complete adhesion of the requester, or his clients to the Market).

After activating the EIC code, it is time to go straight to the first phase of the electronic procedure (*Agent Registration Form*). Within the first phase, the RES Cooperative must define between two options which one will choose for purchasing electricity in the market:

- ✓ **Being a Market Agent;**
- ✓ **Access to the market through a Representative Agent.**

As the process is different depending on the option considered, it is important to analyse each one independently.

Being a Market Agent:

Thus, after the first phase of the electronic process is carried out (Figure 129):

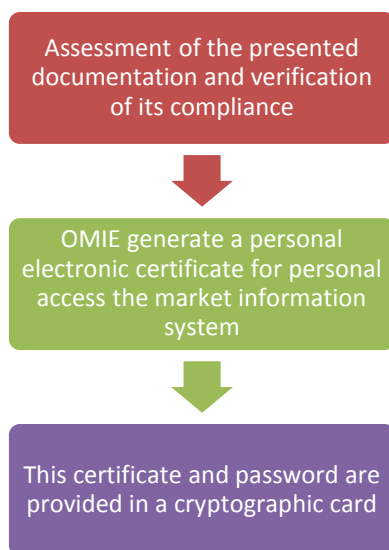


Figure 129. Proceeding between the two phases of the electronic process

The cryptographic card is sent to the attention of the person inside the RES Cooperative that has been authorised to carry out the administrative actions, along with elements or information required for its use, such as:

- ✓ Card reader and the software and information required for its use;
- ✓ An e-mail with the PIN.

Since the information is private, the *OMIE's Market Agent Website* in the second phase of the electronic process (www.mercado.omie.es), is accessed with help of this cryptographic card to confirm the identity of the person and allows safely entering or modifying the associated data.

The set of data required to be entered through this application is the following (Figure 130):



Figure 130. The set of data identified in the Agents Data Maintenance application

After the second phase of the electronic process is completed, there is a set of events that may be compiled in the following figure:

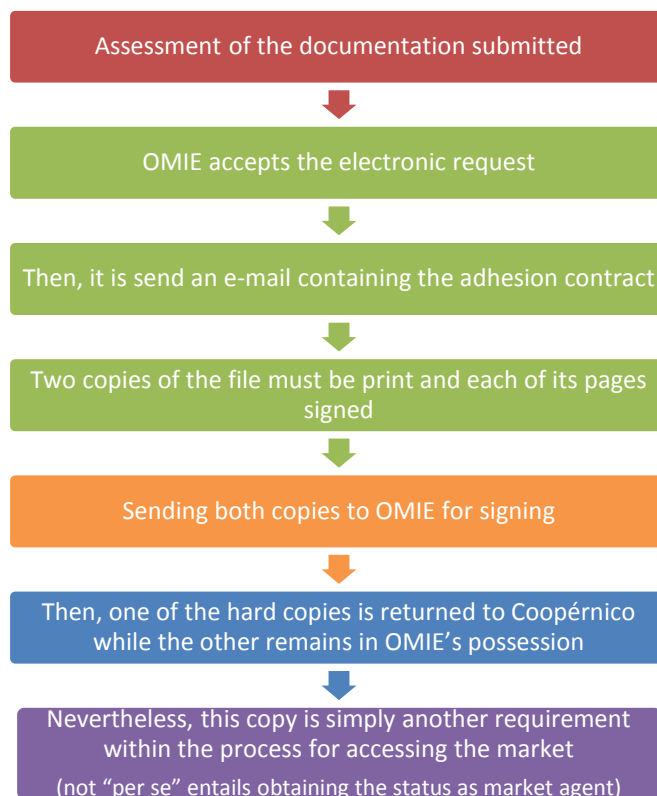


Figure 131. Proceeding after the second phase of the electronic process

Once all the information received through the electronic forms has been verified and the hard copies have also been received and verified, OMIE notify the completion of the process and the acquiring of the Market Agent status by the RES Cooperative.

Access to the market through a Representative Agent:

In this case, the process is simpler for the RES Cooperative's side. Basically, the Representative Agent is responsible for the whole process, as it's explained below.

Therefore, after activating the EIC code, the RES Cooperative only have to indicate in the *Agent Registration Form* that is going to access the Market through a Representative Agent.

Regarding the Representative Agent, it shall provide a paper copy of the authorisation of said representation, based on Form V and VII included in OMAG, which consists of the accreditation of the granting of sufficient powers so that the applicant company can act as representative for the RES Cooperative.

The Representative Agent is also responsible for sending the written copies of the required documentation to OMIE.

Moreover, the Representative Agent shall fill out the different electronic forms to enter the information associated with the RES Cooperative. The entire process is carried out through the Market Web Agents Data Maintenance application in the *OMIE's Market Agent Website*.

Among the data to be electronically filled out, it is included the RES Cooperative's bank account data that can be represented between two options:

- ✓ **“In the name and for the account of third parties”**: It's the account used by OMIE to pay the RES Cooperative directly;
- ✓ **“In its own name and for the account of third parties”**: It's the backup account exclusively used in the case that the Representative Agent-RES Cooperative relationship is terminated.

Once all the electronic forms have been completed and the required documentation has been received at OMIE, the RES Cooperative is registered as a new agent.

In order to operate in OMIE, the RES Cooperative must provide a financial warranty that would cover its bids for the next market session, as well as the payment obligations related to the RES Cooperative's energy purchases until they are paid.

Moreover, the financial warranty depends on the RES Cooperative's customer portfolio and its energy demand forecasting. That means, the RES Cooperative is free to place on the market the amount of money that it decides according to its forecasts. However, in case the RES Cooperative does not have the minimum financial warranty to cover the bids, its purchases will be automatically rejected in the matching process.

In relation to Coopérnico, at the moment the RES Cooperative does not have the appropriate human, technical and operational resources and know-how to perform directly in OMIE, but the main issue is the estimated financial warranty²⁰: € 550,000.

This total value of guarantee to be paid is based on the expected customer portfolio (3000 customers) and their energy demands (9000 MWh), with a maximum expected purchase bid price of 70 €/MWh.

Moreover, it is important to have a minimum amount of working capital. Based on the estimated energy demands (9000 MWh), and considering an applicable daily market estimated price of 55€/MWh, Coopérnico needs to have every month approximately € 41,000 to purchase in advance the required energy demand for the next market session.

As it is possible to identify the amount of financial capital required is unbearable. Even considering a loan of € 550,000 from a bank with an interest rate of 5%, the annual cost for Coopérnico would be € 27,500 plus the € 41,000 every month.

For the aforementioned reasons, added to the uncertainty regarding the number of customers and its energy demands for at least the first two years of operation, the “Access to the market through a Representative Agent” option seems the most reasonable choice for now.

²⁰ The amount of payment guarantees was calculated according to the expected energy demand and sales, through the simulator available in the public site of OMIE [98].

It is important to underline too, that such uncertainty in the numbers may lead to additional fees for the RES Cooperative. For instance, if consumers need more energy than the amount that the RES Cooperative buys, the Cooperative has to pay an extra fee for the energy consumed. The opposite is also true, if the RES Cooperative's consumers do not use all the energy bought, the Cooperative has also to pay an extra fee.

Despite the many forecasting solutions available, the energy markets are becoming increasingly complex. If even mature companies have trouble to know exactly how much energy they are going to need in advance, the scenario for the Coopérnico does not look very encouraging. Thus, the RES Cooperative's access to the market can be done by two types of possible agreements with a Representative Agent:

- ✓ **Via Broker:** The RES Cooperative indicates the needs of their customers and these are bought by the Broker.
In this option, the adjustments and settlements are made directly by the Cooperative. The Broker is only in charge of buying the desired electricity volume without assuming any responsibility.
- ✓ **Via Business Process Outsourcing (BPO):** The transactions are undertaken based on an "outsourcing" methodology.
Thus, the Representative Agent assumes not only the responsibility of buying the electricity needs of the RES Cooperative's customers but the settlement of any adjustments, on the opposite of the first option.

Obviously, the BPO agreement implies lower margins for the RES Cooperative but ensures the outsourcing of the risk of operating in the market.

5.5. Conditions for access the transmission and distribution networks

Considering the RES Cooperative's eventual success for accessing to OMIE, the next natural step is to take the electricity purchased in the market to its customers. However, as it does not own any grid, the RES Cooperative shall also access the transmission and distribution networks, including the access to the energy market information system, through license agreements.

5.5.1. Transmission network – REN

As the RNT is done by REN, under a concession granted by the Portuguese government in the form of a public service provided exclusively, the RES Cooperative shall celebrate a license agreement with them.

As a TSO, REN is responsible for the Overall Management of the System (GGS) which includes [100]:

- ✓ The systemic coordination of infrastructures which make up the SEN, which ensures its full and balanced operation and the security and continuity of supply of electrical power;
- ✓ The management of Ancillary Services through the operationalization of an Ancillary Services Market and the contracting of Ancillary Services following prior approval by ERSE;

- ✓ Management of the power guarantee mechanism in accordance with current legislation;
- ✓ Settlement for transactions made within the scope of this activity, including imbalances settlement;
- ✓ The reception of information from Market Agents which are members of organised markets or which are contracting parties in bilateral contracts, on facts liable to influence the regular operation of the market or the setting of prices in accordance with Commercial Relation Regulations for the Electricity Sector.

According to the manual of procedures of the GGS [101], available in REN website, the RES Cooperative shall obtain the status of Market Agent in order to negotiate electricity through bilateral contracts, participate in the organised markets and in the Ancillary Services Market. By other words, become Market Agent within the GGS, and thus having the access to the energy market information system.

The elements required for the celebration of the adhesion contract with the REN are:

- ✓ The application for registration as a Market Agent (forward to REN). This document shall be requested to REN;
- ✓ The access code to the permanent certificate of business registration, plus the identification of the Conservatory where it was done;
- ✓ Identification of the persons responsible for the relationship with the GGS, as well as their contacts;
- ✓ Required information for the effect of Settlement and Billing;

In relation to the last two points, the procedures and forms can be also found in REN website.

Moreover, it is also required the authenticated copy of the registration of electricity supplier issued by DGEG.

Delivered the application, there is a set of events that may be compiled in the following figure:

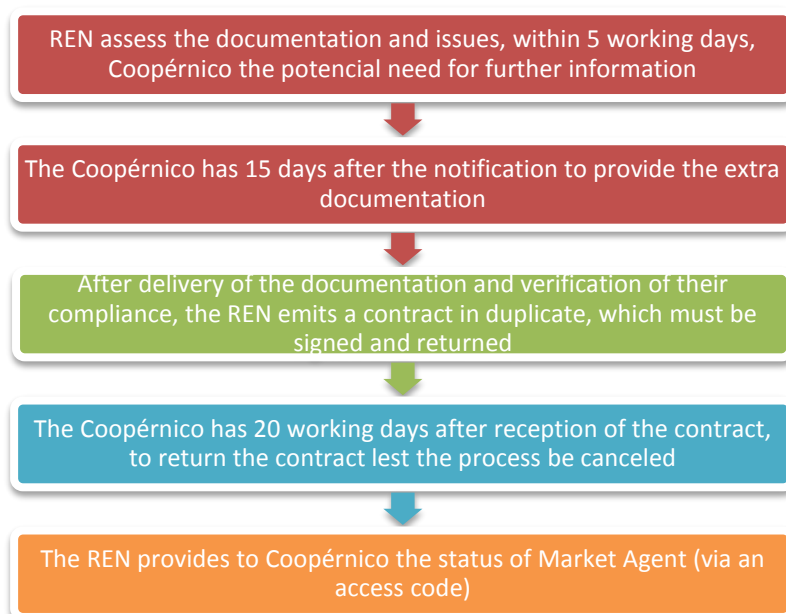


Figure 132. Proceeding after delivery of the request

At the same time, it will be generated another document related to the financial warranties, whose signature shall be certified by a lawyer or notary. For the purpose of deviations and additional costs associated with the GGS, the RES Cooperative must provide a financial warranty of € 50,000. Considering a loan of € 50,000 from a bank with an interest rate of 5%, the annual cost for Coopérnico would be € 2,500.

The warranty may increase due to changes in the load profile of any transmission system facility, production facility directly connected to the transmission system or that may directly influence on the functioning of the transmission system and any distribution or customer facilities directly connected to the transmission system. Moreover, the ability to control the deviation level, as well as the number of clients supplied by the RES Cooperative may also influence the amount of the financial warranty.

5.5.2. Distribution network – EDP Distribuição

Besides the access to the transmission network (becoming Market Agent within the GGS)[101], the RES Cooperative shall also celebrate a license agreement with the DSO operator, EDP Distribuição, which integrates general conditions approved by ERSE²¹, as well as particular conditions defined by the DSO.

Whilst the particular conditions must be requested to the EDP Distribuição, in relation to the ERSE conditions they can be found in the *Dispatch n°18899/2010* and in EDP Distribuição website [102].

It is of outmost importance to understand the impossibility to carry out both agreements with REN and EDP Distribuição, simultaneously. That means to complete this final step, it is mandatory to have already fulfilled the registration as a Market Agent within the GGS, with the celebration of the accession agreement to the energy market information system.

As in the previous point, in this case the RES Cooperative must be also in possession of the registration of electricity supplier issued by DGEG.

Reading carefully the DSO's particular conditions, it is defined another financial warranty of € 50,000 that RES Cooperative must provide in order to fulfil the process. Once again, considering a loan of € 50,000 from a bank with an interest rate of 5%, the annual cost for Coopérnico would be € 2,500.

With all these documents (Figure 133), the RES Cooperative is in conditions to proceed to an agreement with EDP Distribuição in order to have access to RND.

²¹ This contract shall apply the rules contained in the legislation, regulations and other documents in force, namely: Regulation of network access, trading regulation, tariff regulation, quality of service regulation, RNT and RND regulations, network operation regulations, the contract of adhesion for access the system services market, the manual of procedures of the GGS, guide for reading, metering and availability of data, and a protocol for exploration (when applicable)

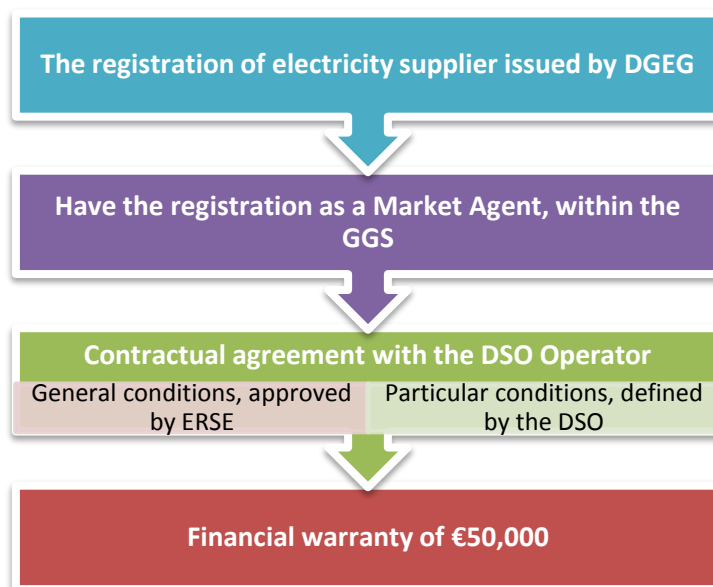


Figure 133. Required documents to fulfill the access to RND

The license agreement with the DSO has the duration of one year, and it is automatically and successively renewed for periods of one year.

Described and compiled all the steps and necessary requirements for a RES Cooperative to become a new electricity supplier in Portugal, it is now time to list the possible cases that the Cooperative has on the Figure 134.



Figure 134. The different options available for the RES Cooperative to become an electricity supplier

In relation to case 4, the RES Cooperative is just an intermediary of a company that already operates in the market. Through conditions well-defined in the contract, the RES Cooperative retails electricity in the name of others. However, within this last case there are two available options: The billing be, or not to be, made by the Cooperative itself.

As the intention is that the Cooperative logo appears in the electricity bill of the customer, as well as in the ERSE's simulator, the only logical option is the billing be made by the RES Cooperative.

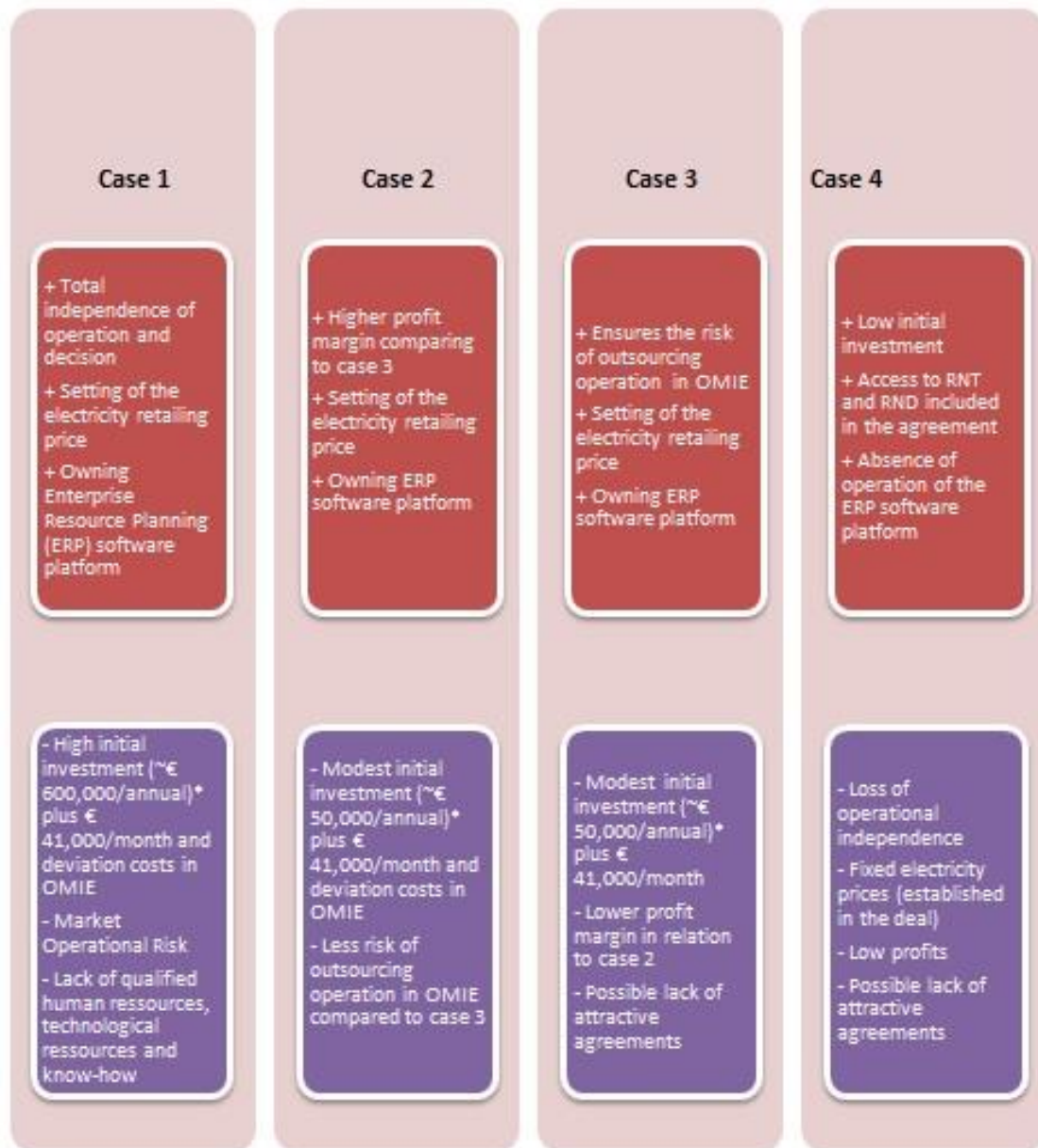


Figure 135. Advantages and Disadvantages of each Case (*considering loan banks are granted)

In relation to case 1, 2 and 3 it was considered an annual operating cost for Coopérnico of € 46,000 plus the € 41,000 every month to purchase in advance the required energy demand for the next market session. The cost of € 46,000 is divided in the annual cost with the ERP software platform (~ € 10,000/year) and the annual cost with staff (~ € 36,000/year, considering two person fully dedicated to the activity).

Although at this moment there is the idea of all the necessary requirements to be a supplier of electricity in Portugal, in Coopérnico are the members who choose the path to be followed by

the Cooperative, regardless of the subject or activity. This time will be no different, which means the electricity retailing supply process will be also subject of consideration in short term.

Thus, based on the advantages and disadvantages of each of the four possible cases (Figure 135), members must choose the path that they consider to be the best for the Coopérnico's electricity retailing supply process in accordance with their values, beliefs and what they think is the best for the future of the Cooperative.

6. Conclusions

The IEM is an European purpose since the early nineties, however today it is still far from being achieved. The end of 2014 is just around the corner, and it's more than a certainty that the latest published deadline for the completion of the IEM will not be met, once again.

Besides the obvious differences in the EU member's approaches to the implementation of the European directives or the failure to prevent the established monopolies with regard to market entry, market exit and pricing, there are also other reasons for failure to create a unified, competitive European energy market, such as:

- ✓ Deliberate government interference motivated by a desire to support the main players in each electricity market;
- ✓ Lack of interest by dominant players or governments to build additional transmission lines to facilitate cross-border energy trade;
- ✓ Weak enforcement of EU directives at country level.

This means that somehow, the same economic and political reasons that led to deregulation and liberalisation of the European energy market are now preventing the IEM of being fully achieved. However, the path is already in its ending, and slowly the EU's vision is now becoming a clear image.

On the other hand, this long and evolutionary process of market liberalisation has also brought in the last decades new environmental, social and economic trends that are pushing Europe to urgently rethink the current energy system. Thus, supported by the raising awareness on climate changes and the introduction of RES policies, market volatility, the increasing energy prices as well as security of energy supply, "social enterprises" are emerging as new independent energy players, in a number of European countries.

Believing in the transformation of the energy system of the past towards a decentralised energy model, the RES Cooperatives are democratising the energy sector in almost every areas. For instance, whilst the EU is just focused in the adoption and promotion of RES generation, in relation to the supply activity there are no incentives to the green energy supply yet. As always, the RES Cooperatives are already a step forward, and despite the non-existent incentives to fully supply customers with green energy, currently the RES Cooperatives, based just on their convictions and mission, are already a green option in their national electricity retail market supplying those who wish to, with green electricity.

Besides the four case studies (The Co-operative Energy in the UK, EWS in Germany, Som Energia in Spain and Ecopower in Belgium), there are much more examples across Europe: Enercoop in France, GoiEner, Nosa Enerxía, EnerPlus and Zencer all from Spain, Greenpeace Energy in Germany or NLD Energie and DE Unie from Netherlands.

According with their feedback, the reasons why RES Cooperatives are becoming a solid alternative solution to the traditional energy companies are:

- ✓ Electricity at reasonable prices and good service provided;
- ✓ Low level of trust in the big energy suppliers;
- ✓ Consumers can reduce their environmental impact (by relying on RES);
- ✓ Contribution for a new energetic paradigm;
- ✓ Bringing energy production and consumption to the local level;
- ✓ Promoting local and economy development;

Moreover, this work came with the conclusion that the two main causes behind the entry of the RES Cooperatives in the electricity retail market are the market opportunity and the non-existence of an option more environmentally friendly that could contribute for a new sustainable energy model supported by the RES Cooperatives.

Based on the experience shared by the RES Cooperatives, the work identified the main barriers that a RES Cooperative may face during its electricity retailing supply process, such as:

- ✓ Legislative complexity;
- ✓ Financial issues;
- ✓ The difficulty to clarify details related to the legislation and the energy market;
- ✓ Buying electricity in the organised energy market.

Nevertheless, to overcome these possible obstacles it was suggested that in addition to qualities such as patience and perseverance, for instance the RES Cooperative shall have a clear marketing strategy, besides create partnerships with other entities, whether Cooperatives or public institutions, and seek the assistance of experts in the area.

Finally, this study also came to the conclusion that an electricity retailing supply process is usually quite complex, which means that the RES Cooperative will not take less than half a year to complete. However, from the moment the RES Cooperative has its offer in the national electricity market the consumer's receptivity will be very positive, which will simultaneously boost the number of members of the Cooperative.

The costs involved in the process can vary according to the method chosen by the RES Cooperative to operate in the organised energy market. Nevertheless, the experience tells that a value below € 50,000 will be enough for the RES Cooperative to start the activity of electricity retailing in Portugal.

Considering the complexity of each European electricity system with all its particular features, including the difference between national legislations, as well as the cultural differences between nations, this work tried to assess the role and experiences that each one of the RES Cooperatives has faced in their own electricity supply market. Identified the positive and negative practices that may influence the RES Cooperative's process, at the moment it is possible to conclude Coopérnico has all it takes to become the first green electricity supplier in Portugal.

Moreover, all the steps and requirements demanded by the Portuguese and Iberian legislation were compiled, including:

- ✓ The registration of electricity supplier issued by DGEG;

- ✓ The license agreement with the DSO operator, which integrates general conditions approved by ERSE, as well as particular conditions defined by the DSO;
- ✓ The status of Market Agent within the GGS;
- ✓ The available options to operate on the market managed by OMIE, buying and selling electricity.

Based on such information, it was listed four possible cases, including the advantages and disadvantages of each one. Nevertheless, all in the end will transform the Coopérnico as the first green electricity supplier in Portugal.

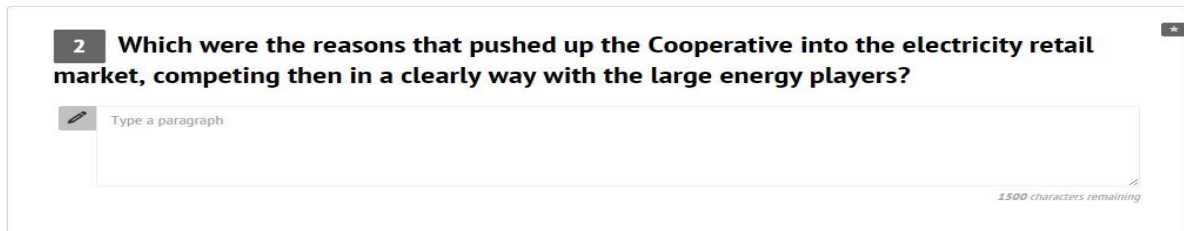
As in any other Cooperative, in Coopérnico the internal democratic control is based on the principle of “one person, one vote”. However, more important than the present, is the future and the strategy for the year ahead will be decided in the Coopérnico’s General Assembly in the mid-December 2014.

Thus, independently of the voted path to be taken for the missing process, one thing is certain: from next year, the name of Coopérnico will appear in the electricity bill of many consumers in Portugal.

7. Annex

Responses to inquiry:

Question 2.



2 Which were the reasons that pushed up the Cooperative into the electricity retail market, competing then in a clearly way with the large energy players?

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- ✓ **The Co-operative Energy:** We entered the domestic energy supply market in December 2010. At the time, the United Kingdom had six major energy companies (British Gas, EDF, Eon, Npower, Scottish Power and SSE) who supplied over 98% of domestic customers. However consumer confidence in these companies was incredibly low, roughly in line with the banking industry. Customers were disengaged, didn't understand an incredibly complicated market with thousands of different tariffs which were almost impossible to compare and had received consistent annual bill increases significantly higher than inflation. We entered the market with the intention of creating a genuine Co-operative alternative to these six companies, acting in an open and honest manner, inviting customers to join as members and have a say in how things are run, and heavily promoting the growth of sustainable, green electricity.
- ✓ **Enercoop:** The core philosophy of Enercoop is to decentralize the energy market. In France the nuclear programme, that was established in the 1970's in response to the oil crisis, has strongly biased centralized production, neglecting the opportunities of decentralized and RES production. Enercoop wants to change this system. The liberalization of the energy market in 2004 enabled new actors to enter and change this market. The idea behind the development of regional cooperatives was to bring the production and supply of energy back on the local scale and therefore create an Enercoop in every region in France, or at a more local scale. The cooperative model allows citizens to get involved in the governance and ownership of supply and production. This is important according to Julien Noé, Deputy Director of Enercoop: "Enercoop believes that the consumer should be closer to the production. This will enable consumers to get a better understanding of what kind of product he is consuming and how this is produced. People will use it more rationally when they are involved on a local scale. They also better understand the goal behind developing energy production when they get involved in the decision-making process." Enercoop primarily operates as a supplier, meaning it buys energy from RES producers and sell it to its customers. The producers can be member of the cooperative. The production itself is not necessarily cooperatively owned, although Enercoop is increasingly investing in the field.
- ✓ **EWS:** The decision of EWS to start supplying electricity was a natural consequence of the protest against nuclear power, and subsequent events. As the renounce of the use of nuclear energy itself was not enough to build up a new energetic paradigm, right after there were some questions that came out. The most important was: Is it possible to save energy in a relevant dimension without changing lifestyle?
The first step was an energy saving competition across the village of Schönau. As it was not enough to satisfy the people's needs, the next step was to proof that a green

electricity supply in the village was possible, including a new tariff structure. As the local electricity supplier at the time did not share people's intentions, the citizens decided to buy the electricity grid.

- ✓ **Greenpeace Energy:** The liberalisation of energy markets towards in the late 1990s opened up the possibility to supply customers with green electricity. The environmental protection organisation Greenpeace e.V. used the opportunity to develop criteria for high quality green electricity and, through the campaign “electricity switch”, gathered supporters who demanded clean electricity. A public tender showed, however, that no supplier was able meet all criteria. Greenpeace e.V. in response took matters into their own hands and initiated in autumn 1999 the foundation of the cooperative Greenpeace Energy, an entity that is legally and financially independent of the environmental protection organisation. Greenpeace Energy started supplying customers with clean electricity according to the Greenpeace criteria on January 1st, 2000, and in 2001 founded the subsidiary Planet energy, which constructs green power plants.
- ✓ **NLD Energie:** There are a couple of reasons, but being most important is introducing a truly local company for promoting local sustainability in a way that helps participating local initiatives attaining their sustainable goals.
- ✓ **DE Unie:** DE Unie (THE Union) was established to operate independently of the existing large energy companies. Local parties have different needs than the existing large companies.
- ✓ **Ecopower:** The decision of Ecopower to start supplying electricity was initiated by its members at the general assembly in 2003 after the electricity market for private households in Flanders was liberalised. Ecopower then applied for a license to supply 100% green electricity to its members. In 2003 Ecopower only had 2.975 shareholders. From then on the number of shareholders started growing rapidly. By 2008 we had 16.815 members, by 2013 47.419 members.
- ✓ **Som Energia:** The Cooperative identified an opportunity in the Spanish electricity market: the promoting of an democratic and clean energy model, based on RES, at the service of the people and that protects the environment. As a consequence, Som Energia started to give customers the chance to buy green electricity at a price equivalent to conventional electricity.
- ✓ **GoiEner:** Our first intention was producing and after start into the electricity retail market. Spanish laws changed in 2012, just the year we started to think about how to start the cooperative. Producing was impossible so we went into the electricity retail market. No option.
- ✓ **Zencer:** To provide consumers with real access to the liberalized electricity market, through a democratic formulated and environmentally sustainable.
- ✓ **EnerPlus:** The fight against corruption and backdoor deals.
- ✓ **Nosa Enerxía:** The governance their own power company , achieve 100% electricity , low level in trust in the big energy companies, seek a sustainable development, social empowerment,...

Question 3.

3 From 1 to 5, how hard do you describe all the electricity retailing supply process?
(1- hard ; 5- easy)

Just like all the other social enterprises, the Cooperative started its activity as an electricity producer based on RES, and just then spreaded its domain into the electricity retailing.



- ✓ **The Co-operative Energy:** 2
- ✓ **Enercoop:** 2
- ✓ **EWS:** 1
- ✓ **Greenpeace Energy:** 3
- ✓ **NLD Energie:** 4
- ✓ **DE Unie:** 5
- ✓ **Ecopower:** 5
- ✓ **Som Energia:** 4
- ✓ **GoiEner:** 1
- ✓ **Zencer:** 1
- ✓ **EnerPlus:** 1
- ✓ **Nosa Enerxía:** 1

Question 4.

4 Going deeper into the process, how long did it take?

< 3 months

between 3 and 6 months

between 6 and 9 months

between 9 and 12 months

> 1 year

- ✓ **The Co-operative Energy:** between 9 and 12 months
- ✓ **Enercoop:** between 9 and 12 months
- ✓ **EWS:** >1 year
- ✓ **Greenpeace Energy:** >1 year
- ✓ **NLD Energie:** >1 year
- ✓ **DE Unie:** >1 year
- ✓ **Ecopower:** between 6 and 9 months
- ✓ **Som Energia:** between 6 and 9 months
- ✓ **GoiEner:** between 6 and 9 months
- ✓ **Zencer:** >1 year
- ✓ **EnerPlus:** >1 year
- ✓ **Nosa Enerxía:** between 9 and 12 months

Question 5.

5 Which were the main barriers the Cooperative had to face during the entire process? (Order the list according to the relevance)

1. Financial issues
2. Legislative complexity
3. Not easy to find all the necessary information and someone to clarify some doubts
4. Lack of qualified human resources
5. Lack of technology resources (for instance ERP software)
6. Buying electricity in the organised market
7. Other *Type your answer*

.100 characters remaining

- ✓ **The Co-operative Energy:** 1. Legislative complexity, 2. Buying electricity in the organised market, 3. Not easy to find all the necessary information and someone to clarify some doubts, 4. Lack of technology resources, 5. Financial issues, 6. Lack of qualified human resources, 7. Other
- ✓ **Enercoop:** 1. Other: Market Context, 2. Buying electricity in the organised market, 3. Financial issues, 4. Legislative complexity, 5. Not easy to find all the necessary information and someone to clarify some doubts, 6. Lack of qualified human resources, 7. Lack of technology resources
- ✓ **EWS:** 1. Financial issues, 2. Legislative complexity, 3. Not easy to find all the necessary information and someone to clarify some doubts, 4. Lack of technology resources, 5. Lack of qualified human resources, 6. Buying electricity in the organised market, 7. Other
- ✓ **Greenpeace Energy:** 1. Legislative complexity, 2. Not easy to find all the necessary information and someone to clarify some doubts, 3. Buying electricity in the organised market, 4. Financial issues, 5. Lack of technology resources, 6. Lack of qualified human resources, 7. Other
- ✓ **NLD Energie:** 1. Not easy to find all the necessary information and someone to clarify some doubts, 2. Legislative complexity, 3. Financial issues, 4. Lack of technology resources, 5. Buying electricity in the organised market, 6. Lack of qualified human resources, 7. Other
- ✓ **DE Unie:** 1. Legislative complexity, 2. Financial issues, 3. Lack of qualified human resources, 4. Lack of technology resources, 5. Buying electricity in the organised market, 6. Not easy to find all the necessary information and someone to clarify some doubts, 7. Other
- ✓ **Ecopower:** 1. Legislative complexity, 2. Financial issues, 3. Buying electricity in the organised market, 4. Not easy to find all the necessary information and someone to clarify some doubts, 5. Lack of technology resources, 6. Lack of qualified human resources, 7. Other
- ✓ **Som Energia:** 1. Buying electricity in the organised market, 2. Legislative complexity, 3. Not easy to find all the necessary information and someone to clarify some doubts, 4. Lack of technology resources, 5. Financial issues, 6. Lack of qualified human resources, 7. Other
- ✓ **GoiEner:** 1. Other: Hard finding collaboration in Spain in 2012, 2. Legislative complexity, 3. Not easy to find all the necessary information and someone to clarify some doubts, 4. Lack of qualified human resources, 5. Financial issues, 6. Lack of technology resources, 7. Buying electricity in the organised market

- ✓ **Zencer:** 1. Legislative complexity, 2. Not easy to find all the necessary information and someone to clarify some doubts, 3. Financial issues, 4. Lack of qualified human resources, 5. Lack of technology resources, 6. Buying electricity in the organised market, 7. Other
- ✓ **EnerPlus:** 1. Not easy to find all the necessary information and someone to clarify some doubts, 2. Financial issues, 3. Legislative complexity, 4. Lack of qualified human resources, 5. Lack of technology resources, 6. Buying electricity in the organised market, 7. Other
- ✓ **Nosa Enerxía:** 1. Legislative complexity, 2. Not easy to find all the necessary information and someone to clarify some doubts, 3. Financial issues, 4. Lack of qualified human resources, 5. Lack of technology resources, 6. Buying electricity in the organised market, 7. Other

Question 6.

6 How did you overcome these obstacles?

Type a paragraph

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- **The Co-operative Energy:** There is a huge amount of red tape and legislative and regulatory complexity that needs to be adhered to prior to being provided a supply license and completing Ofgems (the UK's regulator) controlled market entry process. We overcame this by recruiting an experienced Regulation Manager who, along with our Group General Manager, oversaw the entire process to ensure we were fully compliant. Moreover, the company had the support of a larger Cooperative, The Midcounties Co-operative.
- ✓ **Enercoop:** I don't know.
- ✓ **EWS:** Learning from experts, learning by doing and through the anti-nuclear solidarity.
- ✓ **Greenpeace Energy:** Greenpeace Energy was founded 15 years ago. It is difficult for us to answer this question as we didn't work for Greenpeace Energy then. What we know is that Greenpeace Energy worked together with different service providers and benefitted from their knowledge and experience.
- ✓ **NLD Energie:** By talking to knowledgeable people and working patiently on the development of the company.
- ✓ **DE Unie:** Hard work, no sleep and perseverance.
- ✓ **Ecopower:** Patience and perseverance.
- ✓ **Som Energia:** Perseverance.
- ✓ **GoiEner:** We got the know-how thanks to our market agent and the financial issues thanks to our cooperativists. And a lot of work made by our volunteers.
- ✓ **Zencer:** It is difficult to specify in a few words, but the creation of our consumer cooperative has been an evolution of my professional experience in the technical field and management company. In the end all comes down to full dedication to an exciting project, studying and analysing the current regulations of the electricity sector and applying all our knowledge and of our partners in the project. Collaboration in a Cooperative Project is crucial for proper development.
- ✓ **EnerPlus:** With help from other Cooperatives.
- ✓ **Nosa Enerxía:** With the support of people, social economy organisations, public institutions and lot of work and dedication.

Question 7.

7 Counting the transmission and distribution network access, the requirement for trading electricity in the organised market and the retailing supply register itself, how many licenses did you have to fulfill to operate in the national electricity retail market?

1

2

3

4

5

>5

- ✓ **The Co-operative Energy:** >5
- ✓ **Enercoop:** 3
- ✓ **EWS:** 2
- ✓ **Greenpeace Energy:** 3
- ✓ **NLD Energie:** 2
- ✓ **DE Unie:** 2
- ✓ **Ecopower:** 5
- ✓ **Som Energia:** >5
- ✓ **GoiEner:** >5
- ✓ **Zencer:** 4
- ✓ **EnerPlus:** 2
- ✓ **Nosa Enerxía:** 2

Question 8.

8 When the Cooperative started the retailing supply activity, how did you purchase electricity in the organised energy market?

Directly (The Cooperative itself)

Indirectly (Via Broker)

Indirectly (Via BPO)

Through an intermediate company: The billing is made by the Cooperative (Option when the Cooperative do not participate in the organised energy market)

Other

100 characters remaining

- ✓ **The Co-operative Energy:** Directly (The cooperative itself)
- ✓ **Enercoop:** Directly (The cooperative itself)
- ✓ **EWS:** Other: Buying directly from the RES producer
- ✓ **Greenpeace Energy:** Directly (The cooperative itself)
- ✓ **NLD Energie:** Indirectly (Via BPO)
- ✓ **DE Unie:** Through an intermediate company: The billing is made by the Cooperative
- ✓ **Ecopower:** Through an intermediate company: The billing is made by the Cooperative
- ✓ **Som Energia:** Indirectly (Via BPO)
- ✓ **GoiEner:** Indirectly (Via BPO)
- ✓ **Zencer:** Directly (The cooperative itself)

- ✓ **EnerPlus:** Through an intermediate company: The billing is made by the Cooperative
- ✓ **Nosa Enerxía:** Through an intermediate company: The billing is made by the Cooperative

Question 9.

9 What was the total amount of financial warranties the Cooperative had to provide in the end of the process?

< € 50,000

between € 50,000 and € 100,000

between € 100,000 and € 150,000

between € 150,000 and € 200,000

> € 200,000

- ✓ **The Co-operative Energy:** between € 50,000 and € 100,000
- ✓ **Enercoop:** > € 200,000
- ✓ **EWS:** > € 200,000
- ✓ **Greenpeace Energy:** between € 100,000 and € 150,000
- ✓ **NLD Energie:** > € 200,000
- ✓ **DE Unie:** > € 200,000
- ✓ **Ecopower:** < € 50,000
- ✓ **Som Energia:** < € 50,000
- ✓ **GoiEner:** < € 50,000
- ✓ **Zencer:** < € 50,000
- ✓ **EnerPlus:** < € 50,000
- ✓ **Nosa Enerxía:** < € 50,000

Question 10.

10 From 1 to 5, how good was the market receptivity, especially consumers, to the Cooperative entry? (1- bad ; 5- good)

★ ★ ★ ★ ★

0/5

- ✓ **The Co-operative Energy:** 5
- ✓ **Enercoop:** 4
- ✓ **EWS:** 4
- ✓ **Greenpeace Energy:** 4
- ✓ **NLD Energie:** 4
- ✓ **DE Unie:** 4
- ✓ **Ecopower:** 4
- ✓ **Som Energia:** 5
- ✓ **GoiEner:** 5
- ✓ **Zencer:** 3
- ✓ **EnerPlus:** 4

- ✓ Nosa Enerxía: 5

Question 11.

11 Considering the statement below, what measures did the Cooperative take to settle down in such a competitive market? (Order the list according to the relevance)

Despite the rising global awareness for a new energetic paradigm, the ordinary people are not familiar with these social companies yet.

- 1. National advertising campaigns (TV, radio, flyers)
- 2. Local promotion (talking face-to-face with people)
- 3. Low price billed
- 4. Partnerships with other social movements and public organisations
- 5. Partnerships with private entities and research institutes
- 6. Extra-services (energy saver guide)
- 7. Green electricity
- 8. Other *Type your answer*

100 characters remaining

- ✓ **The Co-operative Energy:** 1. Partnerships with other social movements and public organisations, 2. Green electricity, 3. Local promotion (talking face-to-face with people), 4. Low price billed, 5. Extra-services (energy saver guide), 6. Partnerships with private entities and research institutes, 7. National advertising campaigns (TV, radio, flyers), 8. Other
- ✓ **Enercoop:** 1. Green electricity, 2. Other: Cooperative statutes, 3. Partnerships with other social movements and public organisations, 4. Partnerships with private entities and research institutes, 5. Local promotion (talking face-to-face with people), 6. Extra-services (energy saver guide), 7. National advertising campaigns (TV, radio, flyers), 8. Low price billed
- ✓ **EWS:** 1. Green electricity, 2. Local promotion (talking face-to-face with people), 3. Partnerships with other social movements and public organisations, 4. National advertising campaigns (TV, radio, flyers), 5. Partnerships with private entities and research institutes, 6. Extra-services (energy saver guide), 7. Low price billed, 8. Other
- ✓ **Greenpeace Energy:** 1. Partnerships with other social movements and public organisations, 2. Local promotion (talking face-to-face with people), 3. National advertising campaigns (TV, radio, flyers), 4. Green electricity, 5. Low price billed, 6. Partnerships with private entities and research institutes, 7. Extra-services (energy saver guide), 8. Other
- ✓ **NLD Energie:** 1. Other: Partnership with local energy cooperatives acting as “resellers”, 2. Local promotion (talking face-to-face with people), 3. Green electricity, 4. Partnerships with other social movements and public organisations, 5. Low price billed, 6. Partnerships with private entities and research institutes, 7. Extra-services (energy saver guide), 8. National advertising campaigns (TV, radio, flyers)
- ✓ **DE Unie:** 1. Local promotion (talking face-to-face with people), 2. Green electricity, 3. Partnerships with other social movements and public organisations, 4. Extra-services (energy saver guide), 5. Partnerships with private entities and research institutes, 6. Low price billed, 7. National advertising campaigns (TV, radio, flyers), 8. Other
- ✓ **Ecopower:** 1. Green electricity, 2. Local promotion (talking face-to-face with people), 3. Extra-services (energy saver guide), 4. Low price billed, 5. Partnerships with other social movements and public organisations, 6. Partnerships with private entities and research institutes, 7. National advertising campaigns (TV, radio, flyers), 8. Other

- ✓ **Som Energia:** 1. Local promotion (talking face-to-face with people), 2. Green electricity, 3. Low price billed, 4. Extra-services (energy saver guide), 5. Partnerships with other social movements and public organisations, 6. Partnerships with private entities and research institutes, 7. National advertising campaigns (TV, radio, flyers), 8. Other
- ✓ **GoiEner:** 1. Local promotion (talking face-to-face with people), 2. Green electricity, 3. Partnerships with other social movements and public organisations, 4. Partnerships with private entities and research institutes, 5. Extra-services (energy saver guide), 6. Low price billed, 7. National advertising campaigns (TV, radio, flyers), 8. Other
- ✓ **Zencer:** 1. Green electricity, 2. Partnerships with other social movements and public organisations, 3. Local promotion (talking face-to-face with people), 4. Extra-services (energy saver guide), 5. Low price billed, 6. Partnerships with private entities and research institutes, 7. National advertising campaigns (TV, radio, flyers), 8. Other
- ✓ **EnerPlus:** 1. Green electricity, 2. National advertising campaigns (TV, radio, flyers), 3. Local promotion (talking face-to-face with people), 4. Partnerships with other social movements and public organisations, 5. Partnerships with private entities and research institutes, 6. Extra-services (energy saver guide), 7. Low price billed, 8. Other
- ✓ **Nosa Enerxía:** 1. Green electricity, 2. Low price billed, 3. Partnerships with other social movements and public organisations, 4. Local promotion (talking face-to-face with people), 5. Extra-services (energy saver guide), 6. National advertising campaigns (TV, radio, flyers), 7. Partnerships with private entities and research institutes, 8. Other

Question 12.

12 Is it mandatory to a customer become a member of the Cooperative? *

(May use the "Other" option, to give extra details about the answer)

Yes
 No
 Other

100 characters remaining

- ✓ **The Co-operative Energy:** No
- ✓ **Enercoop:** No
- ✓ **EWS:** No
- ✓ **Greenpeace Energy:** No
- ✓ **NLD Energie:** No
- ✓ **DE Unie:** No
- ✓ **Ecopower:** Yes
- ✓ **Som Energia:** Yes in the beginning. Nowadays, each member can bring in 5 contracts of friends and family.
- ✓ **GoiEner:** Yes
- ✓ **Zencer:** Yes
- ✓ **EnerPlus:** Yes
- ✓ **Nosa Enerxía:** Yes

Question 13.

13 According to your experience what makes people join the Cooperative and participate in this green revolution? (Order the list according to the relevance)

1. Pro-RES approach
2. Anti-oligopoly
3. The possibility to participate in the governance of their local energy systems and utilities
4. Low level of trust in the big energy companies
5. Good service provided
6. Concentrated market economy and decentralised model of power production and supply (Development of the local community and economy)
7. Monetary interests (People just see RES projects as a better investment than banks)
8. Other *Type your answer*

100 characters remaining

- ✓ **The Co-operative Energy:** 1. Low level of trust in the big energy companies, 2. Pro-RES approach, 3. Good service provided, 4. Concentrated market economy and decentralised model of power production and supply (Development of the local community and economy), 5. Monetary interests (People just see RES projects as a better investment than banks), 6. The possibility to participate in the governance of their local energy systems and utilities, 7. Anti-oligopoly, 8. Other
- ✓ **Enercoop:** 1. Pro-RES approach, 2. The possibility to participate in the governance of their local energy systems and utilities, 3. Low level of trust in the big energy companies, 4. Concentrated market economy and decentralised model of power production and supply (Development of the local community and economy), 5. Anti-oligopoly, 6. Good service provided, 7. Monetary interests (People just see RES projects as a better investment than banks), 8. Other
- ✓ **EWS:** 1. Pro-RES approach, 2. Concentrated market economy and decentralised model of power production and supply (Development of the local community and economy), 3. The possibility to participate in the governance of their local energy systems and utilities, 4. Monetary interests (People just see RES projects as a better investment than banks), 5. Anti-oligopoly, 6. Low level of trust in the big energy companies, 7. Good service provided, 8. Other
- ✓ **Greenpeace Energy:** 1. Low level of trust in the big energy companies, 2. Anti-oligopoly, 3. Good service provided, 4. Pro-RES approach, 5. The possibility to participate in the governance of their local energy systems and utilities, 6. Concentrated market economy and decentralised model of power production and supply (Development of the local community and economy), 7. Monetary interests (People just see RES projects as a better investment than banks), 8. Other
- ✓ **NLD Energie:** 1. Concentrated market economy and decentralised model of power production and supply (Development of the local community and economy), 2. The possibility to participate in the governance of their local energy systems and utilities, 3. Low level of trust in the big energy companies, 4. Pro-RES approach, 5. Good service provided, 6. Anti-oligopoly, 7. Monetary interests (People just see RES projects as a better investment than banks), 8. Other
- ✓ **DE Unie:** 1. Concentrated market economy and decentralised model of power production and supply (Development of the local community and economy), 2. Anti-oligopoly, 3. The possibility to participate in the governance of their local energy

- systems and utilities, **4.** Pro-RES approach, **5.** Good service provided, **6.** Low level of trust in the big energy companies, **7.** Monetary interests (People just see RES projects as a better investment than banks), **8.** Other
- ✓ **Ecopower:** **1.** Pro-RES approach, **2.** Good service provided, **3.** Concentrated market economy and decentralised model of power production and supply (Development of the local community and economy), **4.** Monetary interests (People just see RES projects as a better investment than banks), **5.** The possibility to participate in the governance of their local energy systems and utilities, **6.** Low level of trust in the big energy companies, **7.** Anti-oligopoly, **8.** Other
 - ✓ **Som Energia:** **1.** Pro-RES approach, **2.** Anti-oligopoly, **3.** The possibility to participate in the governance of their local energy systems and utilities, **4.** Low level of trust in the big energy companies, **5.** Good service provided, **6.** Concentrated market economy and decentralised model of power production and supply (Development of the local community and economy), **7.** Monetary interests (People just see RES projects as a better investment than banks), **8.** Other
 - ✓ **GoiEner:** **1.** Low level of trust in the big energy companies, **2.** Anti-oligopoly, **3.** Concentrated market economy and decentralised model of power production and supply (Development of the local community and economy), **4.** The possibility to participate in the governance of their local energy systems and utilities, **5.** Pro-RES approach, **6.** Good service provided, **7.** Monetary interests (People just see RES projects as a better investment than banks), **8.** Other
 - ✓ **Zencer:** **1.** Pro-RES approach, **2.** The possibility to participate in the governance of their local energy systems and utilities, **3.** Good service provided, **4.** Concentrated market economy and decentralised model of power production and supply (Development of the local community and economy), **5.** Anti-oligopoly, **6.** Low level of trust in the big energy companies, **7.** Monetary interests (People just see RES projects as a better investment than banks), **8.** Other
 - ✓ **EnerPlus:** **1.** Low level of trust in the big energy companies, **2.** Pro-RES approach, **3.** Anti-oligopoly, **4.** The possibility to participate in the governance of their local energy systems and utilities, **5.** Good service provided, **6.** Concentrated market economy and decentralised model of power production and supply (Development of the local community and economy), **7.** Monetary interests (People just see RES projects as a better investment than banks), **8.** Other
 - ✓ **Nosa Enerxía:** **1.** The possibility to participate in the governance of their local energy systems and utilities, **2.** Low level of trust in the big energy companies, **3.** Good service provided, **4.** Concentrated market economy and decentralised model of power production and supply (Development of the local community and economy), **5.** Anti-oligopoly, **6.** Monetary interests (People just see RES projects as a better investment than banks), **7.** Pro-RES approach, **8.** Other

Question 14.

14 Finally, what would be your advice to a Cooperative who wants to become an electricity supply option in their domestic market?

Type a paragraph

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- ✓ **The Co-operative Energy:** We have found that in the UK the public have welcomed the introduction of Co-operative Energy and we have had a huge amount of interest and well-wishers. When entering a new industry it is important to get the right mix of senior management in the business, containing both experienced professionals from the energy industry and also from a co-operative background to ensure that the business is run differently to the other players in the industry. Stay true to the co-operative ethics and values and there will be a captive audience waiting to join.
- ✓ **Enercoop:** Make sure there is no other existing offer (market study). Have a strong team of people carrying the project. Cooperate with other cooperatives (national and European level) to get their input on the process and have a full project behind the idea of being an electricity supplier, not just a business model if you want people to join the process.
- ✓ **EWS:** Don't talk and think too much, just start and convince your neighbours and friends to join the movement. Produce clean energy and don't give your money to nuclear industry. Cooperate with the municipality, have fun while working, believe in solidarity and create new ideas.
- ✓ **Greenpeace Energy:** Do not only sell green energy, try to become a producer as well. Build new green power plants. Be an real alternative to the big energy companies and involve your cooperative members in the project.
- ✓ **NLD Energie:** Think it through. We experience it to be a difficult market. You need to have a good marketing strategy, because only gaining early adopters is not enough. You need to gain scale to be viable as a company.
- ✓ **DE Unie:** perseverance.
- ✓ **Ecopower:** Big advantage to have a single cost per kWh because it makes people more aware of their energy consumption. People consider the consumption of their own sustainable energy more important than a financial return. Finally, there's a good chance that the number of shareholders will increase if you start supplying energy.
- ✓ **Som Energia:** Just start, give same price and great service.
- ✓ **GoiEner:** If you are going to be a Cooperative for all Portugal, and there are local smallest cooperatives, help them to develop. Don't use a centralized model for retail electricity. Share the know-how with other cooperatives in Portugal and share the tools for that. We are sharing now the costs of the software platform we are developing with the other small cooperatives in Spain.
- ✓ **Zencer:** Each market is different and the way of being and thinking of the people who compose it, so it's tricky to give you some advice about it. First I would advise to get in contact with other social economy companies or associations who share with you the goals set in your Cooperative (the union makes the strength), this being your natural market growth. Social networks play in this sense a great role, which should be exploited. Start slowly and retraining, initiating economic activity on a solid financial base and management, enabling partners to obtain from the outset the objectives promise. Finally, from our cooperative we offer you our support and advice from our experience in the electricity market and the beginning of a journey of collaboration between both cooperatives, such as your representation as agents in the market, if it is of your interest or collaboration on the joint development of projects of renewable energy generation.
- ✓ **EnerPlus:** Just do it.
- ✓ **Nosa Enerxía:** The cooperative needs to do an action and business plan and try to get a minimum of members to hold the project.

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