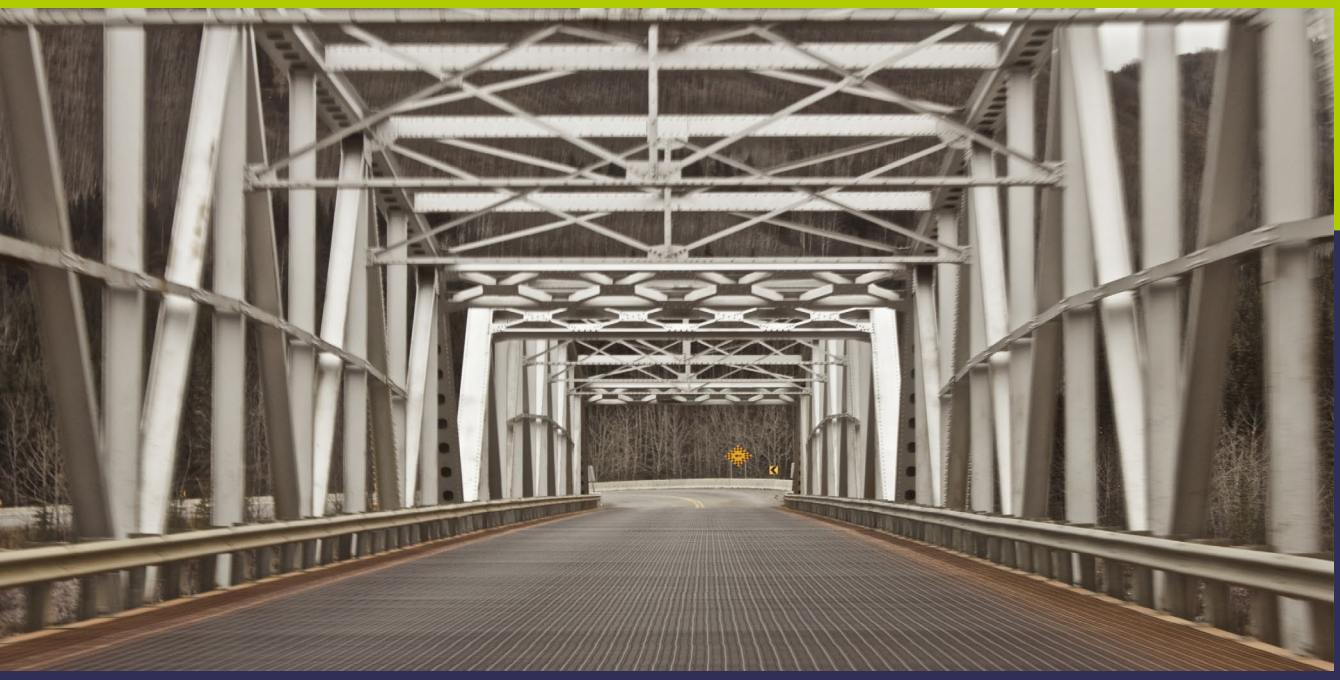
European Commission

EUROPEAN BARRIERS IN RETAIL ENERGY MARKETS



LUXEMBOURG
Country Handbook

Prepared by vaasa ETT REKK MRC CONSULTANTS AND TRANSACTION ADVISERS A member of the MRC Group of Companies THE ADVISORY HOUSE LISTEN-ADVISE-SUCCEED

Energy

EUROPEAN BARRIERS IN RETAIL ENERGY MARKETS PROJECT: Luxembourg Country Handbook

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Please note that this and the other country handbooks form just part of the deliverables of the “European Barriers in Retail Energy Markets” project. For more detail on methodology, Europe-wide results and the Barriers Index, please refer to the following associated reports: “Final Report of the European Barriers in Retail Energy Markets Project”; “Report on the European Retail Energy Market Barriers Index”

SUMMARY

Project outline

The following project outline describes the overall European Barriers in Retail Energy Markets Project. It relates to all the countries and markets which are the focus of the project.

The Context

European retail energy market liberalization is now well into its third decade in the most mature markets. Customers of electricity and gas are now free to choose their electricity and gas suppliers in nearly all markets across the EU and in a number of other European markets. At the same time, the European Commission and national European regulators have created a basis for non-discriminatory market access for energy suppliers through a series of regulations and directives. In theory at least, the European retail energy market is a place where new suppliers and providers of retail services can enter the market and compete relatively freely and on equal terms for customers in the market; a place where formerly incumbent electricity suppliers can compete for gas customers and where gas suppliers can compete for electricity customers; a place where a supplier from one region or jurisdiction can compete in another, without facing unreasonable or excessive barriers; a place where a capacity aggregator or other innovative business model can compete to provide its services to retail energy customers.

Objective

The European Barriers in Retail Energy Markets project was established to research the extent to which the theory is the case in practice; the extent to which energy suppliers across Europe face a variety of barriers to enter and compete in the market; to identify which barriers exist and to provide some suggested solutions to those barriers. The project thereby aims to support the European Commission and Member States in developing policy and implementing actions to reduce barriers.

This project has also designed and calculated a performance index that ranks different countries according to how easy it is to do business in the retail energy segment by combining a selection of measurements into a single score. The project is on the other hand, not intended as a measure or indicator of the ‘competitiveness’ of any given market, and it does not in this respect judge the effectiveness of regulatory authorities or governments, many of which have put great effort into developing their markets.

It is also important to note that all the markets included in this research are continuously evolving. Changes are being planned and improvements (and in some cases additional barriers) are possible as a result. While this project highlights and considers known future changes, it cannot make assumptions as to the effectiveness and outcomes of those changes. This project is therefore weighted in the present, based on the actual context in the market, whilst accepting that the present context may change, in some cases imminently.

Competitor Perspective

What sets this project apart from previous Europe-wide projects looking at the issue of barriers is above-all that it primarily takes the perspective of the competitor rather than any objective view of regulators, economists or academics. This is an important distinction since it requires an acceptance that even if the existence of specific barriers may not seem logical or rational, and even if they are not permitted or legal, even if they were supposed to have been eradicated, those barriers are significant at least in the experience or expectations of competitors in the market.

Notwithstanding this however, the project does not simply accept whatever competitors claim. On the contrary, the researchers have gone to great lengths to ensure that claims are challenged and justified. Cooperation with regulatory authorities to understand the regulatory context of claims, along with survey and interview feedback from competitors (including incumbent suppliers) with alternative perspectives or points of view, have also been considered to ascertain a balanced evaluation of the barriers in any given market. This approach may therefore be of value to policy makers, and complementary to other studies addressing market outcomes.

In some cases, claims by respondents have been made which cannot be corroborated. For instance, there have been claims by many respondents across Europe about integrated utility behaviours that represent barriers to independent suppliers in the markets. Barriers apparently resulting from a lack full ownership unbundling. Such behaviours may well be regulated against, may even be considered illegal, and authorities may have powers to investigate them – and maybe do so. They are impossible to prove given the mandate and resources of the researchers of this project, yet they are widely reported by respondents and broadly documented in other researches. Such barriers may be considered allegations by the respondents, but where they appear to merit further consideration they have been raised since their potential impact on competition is substantial.

Scope & Scale of Research

The project focuses on electricity and (in most cases) gas markets in 30 European countries, namely the EU27 states plus Great Britain, Norway and Switzerland. It was conducted over the course of more than a year with the cooperation and assistance of nearly all of the relevant national regulatory authorities (the report does not however represent their views and has not been ratified by them), around 150 suppliers and many other stakeholder organizations, across all focus markets. Great Britain was included in the project and cooperation was received from numerous suppliers, the regulator (OFGEM) and other stakeholders. Switzerland and Malta were included to a lesser extent since they are not yet open markets for household customers.

Focus Markets

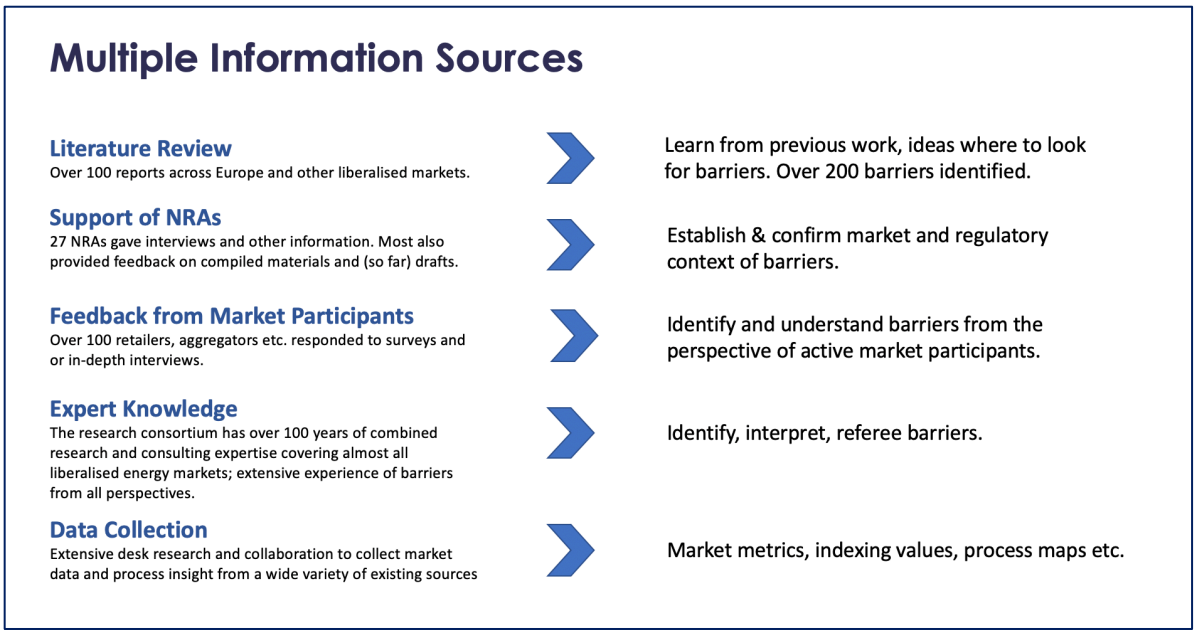
The project focuses on retail (supply), including also demand aggregation services, other additional offerings and new model retail, especially relating to the household segment customers (in some markets households and smaller SMEs may be difficult to distinguish). The project additionally concentrates primarily on barriers that are specific to the energy (electricity and gas) retail market – as opposed to barriers that are true of most markets, such as basic business costs and risk - and it gives priority to barriers for which a potential solution might be sought, as opposed to barriers which are a fact of any energy market and which could not realistically be overcome (such as the barriers relating to the core price volatility of energy as a commodity). The project does not aim to list every possible barrier in the market, however small.

Sources of Information

Many sources of information were used as part of the project. These included an extensive literature review of over 100 public reports, to assist in the targeting of survey questions; interviews with national regulatory authorities (NRAs) to understand the regulatory context in markets; feedback from market participants (suppliers and other competitors) and extensive data gathering for the purpose of collecting market metrics, market processes and index values. For the latter the task of identifying sources that could deliver comparable and reliable index values

was a key challenge of the researchers. The expert knowledge of the project consortium (which has extensive experience from the markets and issues concerned was also used to add judgement to the process. Specifically, the core project team comprised over a dozen researchers and experts from nine European countries, including international experts who have analysed Europe's energy markets since even before they liberalized.

Figure 1 – Multiple Information Sources



Surveys & Interviews

The primary research mediums used in the project were an extensive questionnaire and in-depth interviews. The purpose of the questionnaire, which contained separate questions depending on the type of respondent, was to provide a comprehensive and structured identification, weighting and magnitude of the barriers as experienced and perceived by suppliers and other competitors. Questions were categorized and broken down according to what was known through the body of existing literature and the experience of the project consortium, ensuring that all known barriers were addressed by the questionnaire. The questionnaire additionally facilitated the identification of barriers that hitherto had not been revealed by the literature review, or which were country specific. Interviews provided additional support and clarification to the findings from the questionnaire as well as allowing respondents to focus on top-of-mind barriers and the interviewers to dig deeper into key and / or unclear issues. While some respondents provided both questionnaire and interview responses, many provided one or the other.

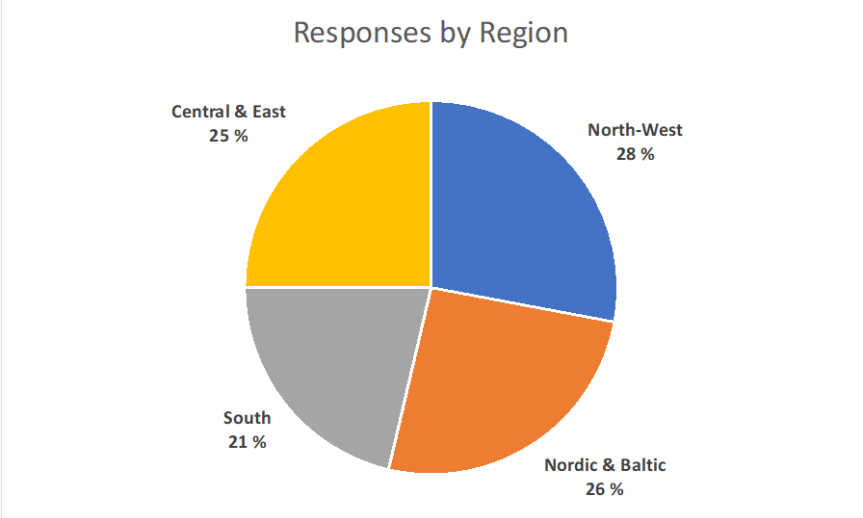
The survey was publicly and widely promoted (via web sites, social media and by other direct means) to potential respondents from 17th June until late October 2019 but remained open until late February 2020 so that stakeholders contacted during Country Handbook development had the chance to respond. The dissemination of information on the project was further facilitated by a widely promoted public website through which over 300 people subscribed.

The Competitor Sample

143 questionnaire and interview responses were received representing 120 unique market-specific responses covering 28 focus markets. 71% of responses were through questionnaires versus 29% through interviews. Malta (a closed market for household customers) and Slovakia were the only markets from which responses were not received, although three additional markets received a level of response which was considered insufficient on which to conclude barriers based solely or primarily on respondent feedback. In these markets, namely Bulgaria, Cyprus, Czech Republic, the project consortium applied their expert insight and additional desk research to support the analysis of the markets. Switzerland, also a closed market for household customers, also naturally received insufficient response. The responses from 24 markets were therefore considered sufficient for the purpose of interpreting the barriers within those markets primarily based on respondent feedback. It is important to note that the response rate in no way impacted the index, which is not dependent on responses.

Analysis of the sample shows that responses were spread evenly among the regions. 66% of responses were non-incumbent competitors compared with 34% which were former incumbents in the markets concerned. In many cases the former incumbents are only former incumbents in one region within the overall country they are in. A large proportion of the former incumbents are furthermore active across multiple regions and countries, and therefore are both incumbents and non-incumbents, defenders and challengers. Among the non-incumbent players were a mix of more established competitors and more recent new entrants, along with more traditional supplies, new model suppliers and aggregators.

More information on the nature of the sample and responses can be found in the Final Report for this project.



Confidentiality

The importance of data protection and anonymity within the project cannot be stressed enough. Most respondents provided information on condition of anonymity. It was promised by default to questionnaire respondents and was in most cases explicitly requested by interviewees. Many participants additionally stated that they were nervous to respond at all since they were active in a market where there were only a handful of suppliers (or at least independent suppliers) which they felt meant that their responses could easily identify them. This risk was perceived as even greater in cases where the participant had made public statements on issues that would be contained in the research (the risk of readers putting two and two together was a concern). In some cases, respondents stated that they even feared a backlash from other stakeholders if their identity was revealed, or (for e.g. a brand-new entrant in a market with one brand-new entrant) stated that if we revealed that they were a new entrant the market authority would instantly know who they were and that they were afraid it might inhibit their entry process.

Under such circumstances, it was decided that not only would all responses be anonymous, but also that the type of respondents would not be revealed in connection with given responses on a country level. It has been claimed by a handful of market authorities that this policy reduces the value of the research. The researchers feel that it in fact increases the value of the research since it has allowed respondents to provide information in an uninhibited fashion in a European market where, by and large, independent suppliers – and especially independent new entrant suppliers – are few and far between.

Deliverables

The project has three key deliverables:

- **28 country specific handbooks** detailing the barriers identified in each country together with suggestions for possible solutions. While most of the handbooks cover electricity and gas markets, some only cover electricity or cover gas to a lesser extent due to the absence or limited presence of gas. Additionally, two countries, Malta and Switzerland do not have country reports due to their closed nature with respect to household customers.
- **A robust, peer-reviewed barriers index** of how easy it is to do business in each country. The European Retail Energy Market Barriers Index, contained in the separate European Retail Energy Market Barriers Index Report, allows the objective comparison of market barriers across the focus markets. The report also includes a ranking of the focus markets.
- **An overall Final Report** containing a full project description and bringing together the findings and common learnings from all countries.

The Barriers and Ranking

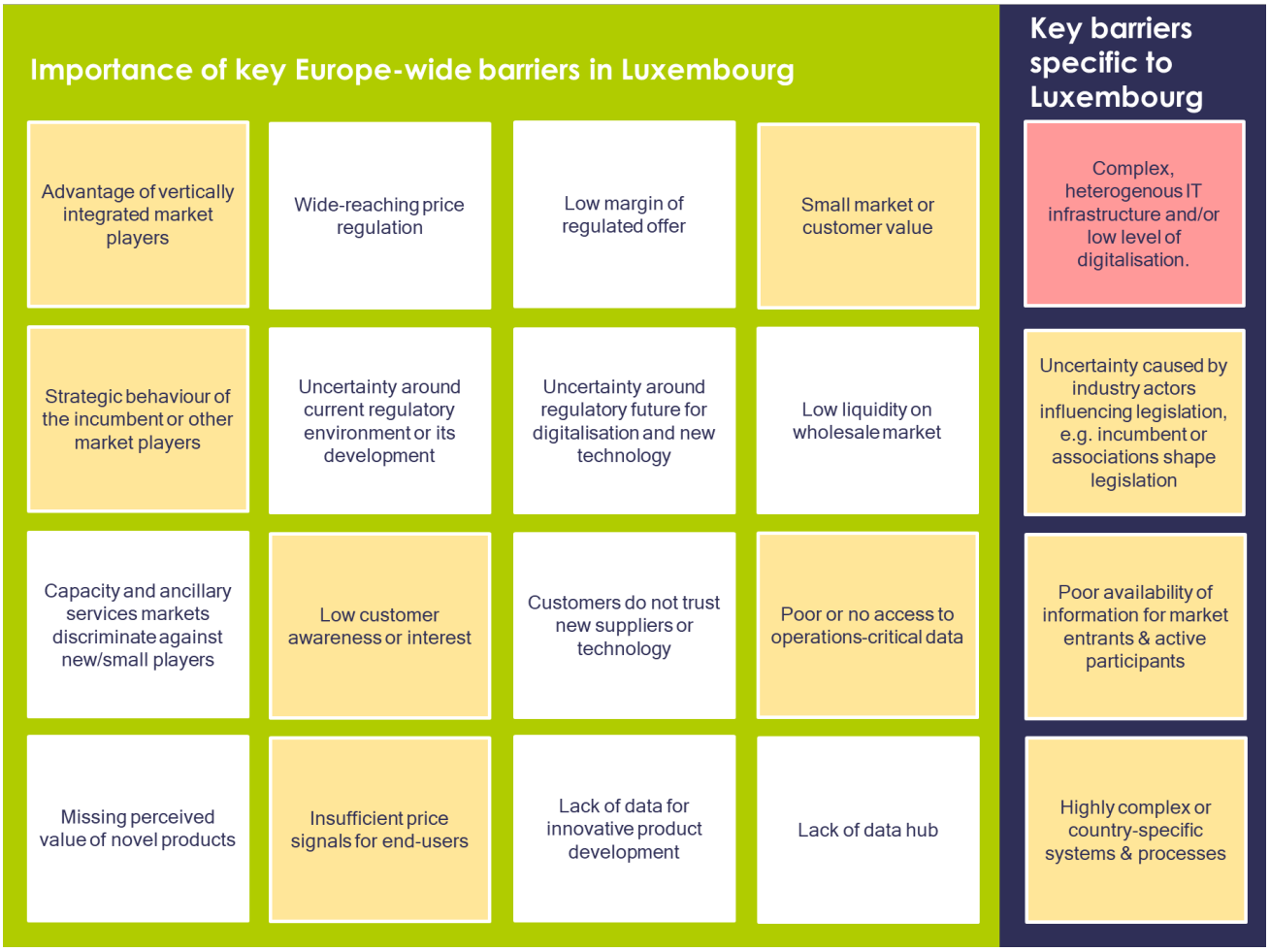
The purpose of the 'European Retail Energy Market Barriers Index' is to enable a degree of comparability between the barriers' context in each of the markets. It is based on metrics that can be collected for all markets, metrics for which available data currently exists. As such it provides a simple, best-available proxy benchmark measure for each of the categories of barriers identified by the project, for each market, and thereby ranks each market. It is intended to be used as an evolving periodical index and ranking on a European and national level.

The index and ranking should, however, presently be considered more of an approach and an indication than an absolute or definitive ranking. It represents the current state of market monitoring data in Europe and will evolve over time as data availability improves. Over time we would expect and recommend that governments and NRAs advance new metric collection to better enable future editions of the index and ranking.

A full description of the Index, its methodology and detailed findings and the ranking can be found in the separate Index report for this project. Within each country handbook the index values for that given country is presented.

Key barriers in Luxembourg´s market

The following figure highlights the key barriers in the Swedish market. Please note, the terms are generic across all researched markets.



LEGEND

Has not been raised, indicated or identified as a barrier in this country

Has been raised or indicated as an issue in this country

- May include issues that still are present in the country or are experienced by suppliers even though regulation to address the issue has been enacted by the regulator and effects still awaited; reporting a lag between the regulatory framework structure and its awaited effects
- May include issues where suppliers suffer the effects despite the country being relatively advanced on this topic compared with other EU countries, pilot projects being in place or institutions working to overcome the problem.

Has been identified as an issue in this country and is supported by facts, data or substantial respondent evidence in light of limited initiatives deployed by institutions to control or overcome the issue.

Key recommendations

- **Complex, heterogenous IT infrastructure**. Increasing the level of standardization of systems and processes within the country and throughout Europe can help in reducing the existing barriers.
- **Poor availability of information for market entrants & active participants and highly complex and country-specific systems & processes** are issues indicated with respect to operational compliance. It is recommended to fully define market and market communication rules for all relevant market participants in order to diminish those barriers.
- **Uncertainty caused by industry actors influencing legislation**, is the main barrier identified by market participants. A maximum level of transparency and open discussions for all market participants can substantially decrease the uncertainty caused by lobbying activities.

MARKET OVERVIEW

Market background

Prior to market liberalisation, the major regional utilities and the municipal utilities were solely responsible for grid operation and energy supply. End customers were bound to their supplier and had no free choice.

Based on the EU's 1st Internal Energy Market Package, the energy market in Luxembourg was progressively opened up, finishing the liberalization in 2007. The beginning of this process was the transposing of the EU directive into Luxembourg law in 2000, assigning powers in the field of electricity to the Luxemburg Institute for Regulation (ILR). In 2001 the competences were extended to natural gas.

Two laws, the law of 7th August 2012 on electricity market[1] and the law of 7th August 2012 on natural gas market[2], entered into force transposing Directives 2009/72/EC and 2009/73/EC, concerning common rules for the internal market in electricity and gas. An infringement procedure for incorrect transposition of the Third Energy Package Directives was launched in March 2014 and is on-going. Luxemburg has been partly exempt from the unbundling provisions of the Third Energy Package, but due to legal, functional and financial requirements the system operators remain relatively independent.

Market structure

In the electricity retail market, 10 electricity companies are active in Luxembourg: 7 in the household sector (Eida S.A., Electrics by Hoffmann Frères, Enovos Luxembourg S.A., LEO S.A., NordENERGIE S.A., Steinergy S.A. and Sudstroum) and the remaining three (ArcelorMittal Energy SCA, Electrabel S.A. and Sudgaz S.A.) are serving business customers. The top 4 electricity suppliers for the household segment in Luxembourg are Enovos Luxembourg S.A., LEO S.A., Sudstroum S.A. and NordEnergie S.A.. On the retail gas market, 9 suppliers are sharing the market: 5 suppliers (Eida S.A., Electrics, Enovos Luxembourg S.A., LEO S.A. and Sudgaz S.A.) are active in the household sector and the other 4 (ArcelorMittal Energy SCA, Electrabel S.A., Eni S.p.A and Gas Natural Europe SAS) are serving business customers. The top 4 gas suppliers for the household segment in Luxembourg are: Sudgaz S.A., LEO S.A., Enovos Luxembourg S.A. and Eida S.A.

The DSO landscape consists of five electricity DSOs (CREOS Luxembourg S.A., Hoffmann Frères S.à r.l. et Cie S.e.c.s., City Diekirch, City Ettelbruck and Sudstroum S.à r.l. & Co S.e.c.s.) and 3 gas DSOs (CREOS Luxembourg, Sudgaz S.A. and Dudelange). Luxembourg has one TSO, called CREOS Luxembourg S.A., which is responsible for both, the electricity and the gas market. In the gas market in addition to CREOS, there is another market participant, Balansys S.A, which is conducting the balancing coordination. Luxembourg's NRA for electricity as well as gas is the ILR (Institute for Regulation). The ILR is responsible for network access and pricing, cross-border cooperation, monitoring investment plans and monitoring the function and transparency of the energy markets. The ILR is not a competition authority, which sanctions anti-competitive behaviour, but must prevent abuse and create an environment with fair conditions for all market actors. On top of that, the energy market in

[1] http://legilux.public.lu/eli/etat/leg/memorial/2012/178
[2] http://legilux.public.lu/eli/etat/leg/memorial/2012/179

Luxembourg has two important associations, Organisation des Entreprises d'Electricité du Luxembourg (for electricity, member of Eurelectric) and Alugaz ASBL (for gas).
As mentioned in the report "European smart metering benchmark[3]", the primary regulatory framework that defines Smart Metering for electricity in Luxembourg is "Loi modifiée du 1er août 2007 relative à l'organisation du marché de l'électricité (Art 29)". This law was last revised in 2015, introducing the mandate to roll out Smart Meters. The Smart Meter rollout target in Luxembourg is set to 95% of all metering points by 31 December 2019 and 90% of all gas metering points by 31 December 2021. Similar to other European countries, the DSOs are the owners and are responsible for the Smart Meter rollout and operations.
As of 30.06.2019, 258 821 (out of 308 143) Electricity Smart Meters have been installed, which represents a penetration rate of 84.8%. At the same time, 49 616 (out of 89 722) Gas Smart Meters have been installed, which represents a penetration rate of 55.3 %.

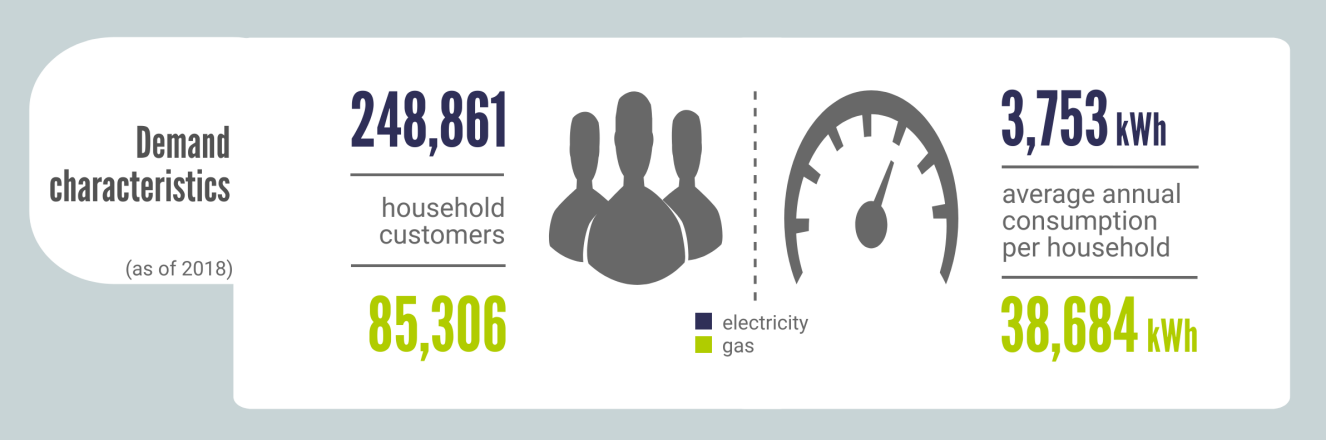
According to the IEA key energy statistics[4], electricity generation in Luxembourg amounted to about 2.18 TWh in 2018. 1,337 GWh Hydro (61%) and 245 GWh wind (11%) power were the main sources of generation. Additional 194 GWh natural gas (9%), 170 GWh biofuels (8%), 124 GWh waste (6%) and 112 GWh Solar PV (5%) generation results in a share of renewables (solar, hydro and wind) of 77%. On a side note: The generation includes volumes from the pump storage Vianden, which is connected directly to the German grid.
Total electricity imports amounted to 7.5 TWh and exports amounted to 1.4 TWh in 2018.

With regards to the current state of unbundling, Luxembourg has a derogation from Article 9 of Directive 2009/72/CE as foreseen by Article 44.2 of the same Directive and has not adopted any of the TSO unbundling models under the 3rd Package Directives as also highlighted in the report "Status Review on the Implementation of Transmission System Operators' Unbundling Provisions of the 3rd Energy Package[5]" by the CEER. However, as the Luxembourg Electricity and Gas TSOs operate as a combined transmission and distribution system operator, it must fulfil the minimum requirements applicable to the DSOs serving more than 100,000 connected customers, i.e. the legal, functional and accounting requirements as the requirement related to its communication and branding in order to be clearly distinguished from the supplier of the VIU.

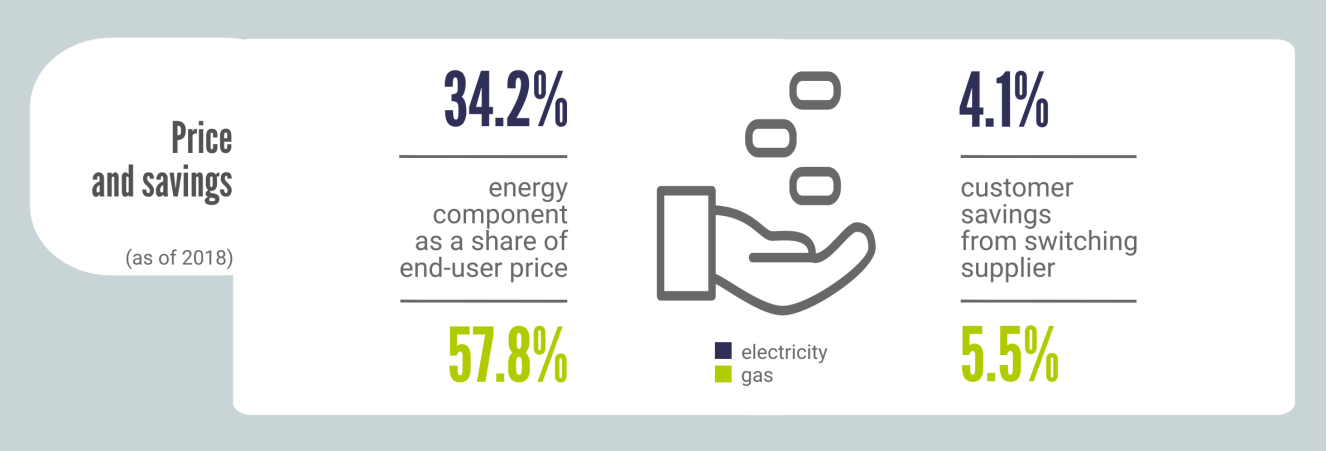
The energy retail market in Luxembourg consists of around 248,861 household electricity customers with an average annual consumption of 3,759 kWh[6].

[3] https://www.vert.lt/SiteAssets/teises-aktai/EU28%20Smart%20Metering%20Benchmark%20Revised%20Final%20Report.pdf
[4] https://www.iea.org/countries/luxembourg
[5] https://www.ceer.eu/documents/104400/3731907/C15-LTF-43-04_TSO-Unbundling_Status_Review-28-Apr-2016.pdf/a6a22f89-3202-4f8b-f9ed-adf705185c33

6 For yearly updated figures of the electricity market, please refer to ILR publications on https://web.ilr.lu/FR/Professionnels/Electricite/Commun/Publications/Rapports-et-etudes/Pages/default.aspx



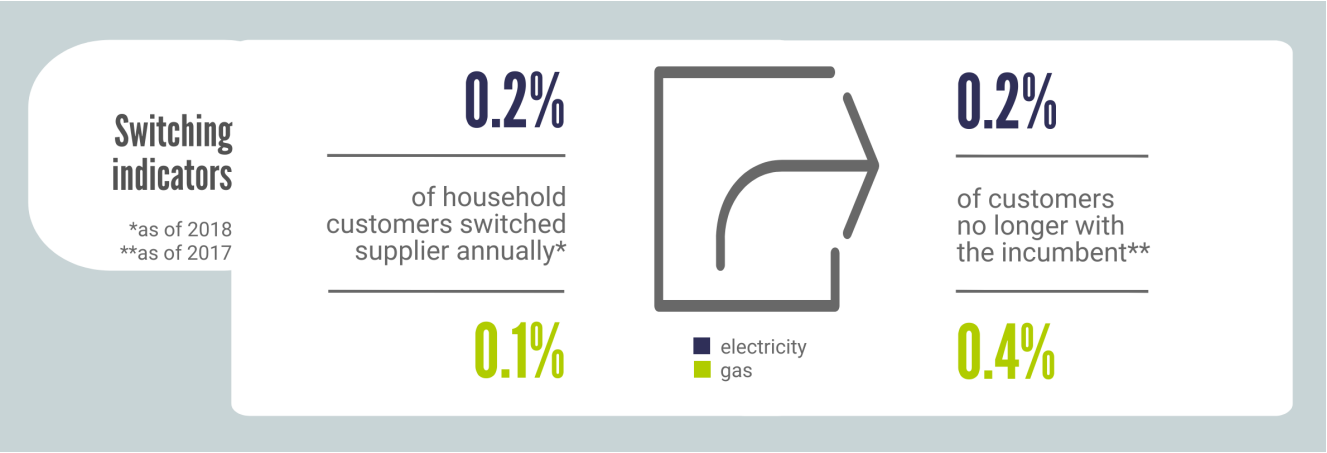
The 85,306 household gas customers are consuming 38,684 kWh on average, annually[7].
The energy component of the electricity bill accounts for 34.2% for electricity and 57.8% for gas customers, the rest of the bill comprises of grid tariffs, taxes and duties.



Consumers, switching their electricity or gas supplier can expect savings of 4.1% (for electricity) or 5.5% (for gas). As of 2019 there were 5 suppliers for electricity and gas available for residential customers of the capital city area in Luxembourg. In 2018 9 electricity supply companies received their license to operate in the whole market (be it residential or non-residential), 1 gas supplying company received a license in the same year.

[7] This includes small business and collective residential heating. For yearly updated figures of the natural gas market, please refer to ILR publications on https://web.ilr.lu/FR/Professionnels/Gaz-naturel/Commun/Publications/Rapports-et-etudes/Pages/default.aspx

With 0.2% for electricity and 0.1% for gas, switching rates in Luxemburg are among the lowest in the EU. It is therefore also not surprising, that 0.2% of the electricity and 0.4% of the gas customers are no longer with the incumbent.



The status of market competition in Luxembourg is best described by focusing on the key topics market share, new market entries and churn. Referring to the "Monitoring Report on the Performance of European Retail Markets in 2018" of the Council of European Energy Regulators (CEER)[8] from November 2019, the market share of the three largest nationwide electricity supplier (CR3) on the household sector market is about 98 %.

Political and regulatory orientation

Luxembourg´s regulator ILR is an independent body, financed through levies imposed on the network operators and responsible for monitoring and preventing any market abuse.

Luxembourg´s National Action Plan for Renewable Energy (NREAP) was set in 2010 and targeted a renewable share of 11% of gross consumption, with most of this share being achieved through biodiesel and biomass. In

[8] CEER Report – Monitoring Report on the Performance of European Retail Markets in 2018 (21. Nov. 2019)

2016 the National Energy Efficiency Plan (NEEAP) was adopted that set a target of 1760 GWh for 2020 through improvements in buildings, transportation and small industries.
Renewable energy promotion is mainly done through feed-in tariffs, there are also subsidies in place. Households can apply for tax benefits for their small-scale solar installation.

Regulatory market characteristics

Electricity prices are not regulated in Luxembourg, neither for households nor for industrial customers. In order to start as an energy supplier in Luxembourg, an authorization from the Ministry of Energy is required.
More detailed information on the registering process and the difference between registering in the gas- or electricity market can be found in the appendix under the chapter “Licenses, registrations and contracts”.
Another market characteristic is, that in Luxembourg combined billing is allowed, but except for household consumers it’s not mandatory, meaning the supplier can decide on collecting grid fees on behalf of the DSOs.

Other market characteristics

Luxembourg itself has no institutionalised electricity wholesale market, the electricity wholesale market in Luxembourg is fully integrated into the German market / price zone. Since there are no capacity constraints at the border interconnection capacity is assigned implicitly and without cost to market players (Day-ahead).
The Luxembourg gas balancing market is integrated with the Belgium gas market. Gas quantities traded at the Zeebrugge Trading Point (ZTP) are available for the entire market area in Belgium and Luxembourg.

Context for aggregation/demand response

The demand response market in Luxembourg has seen very little activity so far. Market actors are not prevented to offer demand response on the intra-day and day-ahead markets, but the market activity is limited. The role of aggregator is defined by law, but there is currently no regulatory framework in place for aggregation. Luxembourgish market participants do also not have access to balancing markets as the TSO Creos has subcontracted the sourcing of balancing services from the German TSO Amprion, and the required technical procedures are currently not in place for Luxembourgish actors to bid on the German balancing platform. Options to make this possible are currently being evaluated.

BARRIERS

The European Barriers to Entry and Competition in Retail Energy Markets project has researched barriers across 30 European markets. From this research, barriers to entry have been identified and grouped into four over-arching pan-European barriers' blocks.

Over-arching pan-European barrier blocks

Barrier Blocks	1	Regulatory disincentivisation
	2	Market inequality
	3	Operational and procedural hinderance
	4	Customer inertia

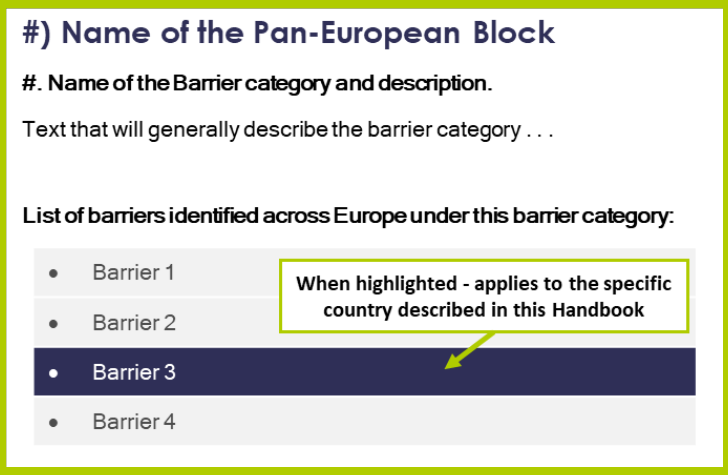
Description of the four-over-arching pan-European barrier blocks:

1. **Regulatory disincentivisation:** barriers arising as a consequence of the general regulatory framework of the natural gas and electricity retail markets. We address the impact of price regulation, burden (-sharing), regulatory unpredictability and access to innovation. All these items may disincentivize competition within the natural gas and electricity retail markets, as well as entrance by new suppliers.
2. **Market inequality:** barriers arising from an uneven playing field for different types of suppliers. Often, certain market players already have a competitive advantage by being very close to the formerly integrated DSO (or still being vertically integrated in case the de-minimis rule applies), controlling a large amount of generation capacity or having a large market share. If market rules do not prevent this, such players can exercise their market power to treat other market players in a discriminatory way, creating market barriers. We examine issues related to unbundling, historical roles and access to market mechanisms.
3. **Operational and procedural hindrances:** barriers arising as a consequence of the complexity and national/regional differences in standards and procedures in different process areas, affecting how easily new entrants can enter and operate in the energy retail market. We look at issues and differences in licensing, signing up and operations compliance, as well as data access, processes and data management from the suppliers' point of view.
4. **Customer inertia:** barriers arising due to customer behavior and attitude. For the energy market to function, end-users must be willing and able to switch supplier. If customers do not switch supplier, suppliers need not worry about losing customers, so there is no incentive for suppliers to improve their services, minimize prices or innovate to compete for customers. We examine barriers related to customer inactivity or disinterest in the energy markets.

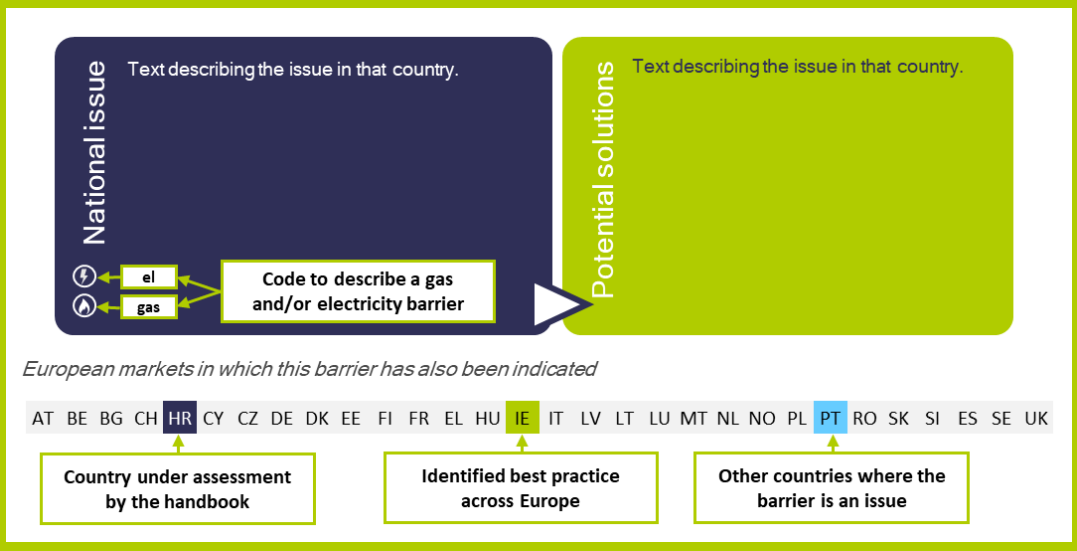
Within each of these high-level blocks are contained sub-categories, which are also mostly pan-European in nature. Each of these sub-categories contain the specific barriers which relate to individual markets as described in the following chapter. Altogether, we identified 45 barriers, most of which broadly across Europe. Only a selection of them apply to the Luxembourg case as reported in the following chapters of this handbook.

HOW TO READ AND INTERPRET THE FOLLOWING SECTIONS

Each of the following four chapters explores one of the four pan-European blocks of barriers and report how each sub-category barrier apply to Luxembourg. When a barrier applies to Luxembourg, it will be highlighted in the table following a general description of the barrier itself as shown in the example below:



As showed in the above figure, the table lists all the barriers we have identified in Europe within the specific barrier category. Only if a sub-category barrier is highlighted in the table, it means that suppliers raised it as a barrier, and it is a prevalent issue in Luxembourg. Highlighted sub-category barriers are then briefly described following a twofold methodology which reports what the suppliers are experiencing in the market as a national issue and suggests potential solutions to the problem as depicted in the below figure



At the end of each chapter, Country's performance within the category, according to quantitative indicators, is then presented. For additional market context, please see Appendix 1: Process Maps, which gives a high-level graphical overview of the most critical steps involved in establishing and operating as a supplier in the national market.

1) Regulatory disincentivisation

Within regulatory disincentivisation, barriers across Europe have been sub-categorised into four areas encompassing 17 specific barriers[9]:

1. **Price regulation.** Regulated prices usually refer to regulation or control of end-user's prices by a public authority, usually the National Regulatory Authority (NRA). Price regulation can take different forms, such as setting or approval of prices, price caps or various elements of these. In Europe, there still exist Member States which have maintained end-user regulated prices during the market opening process and after, in the intention of protecting households or even non-household customers from significant increases in energy prices, especially in a context of limited competition. In some cases, this regulation has led to below cost prices and to low margin to cover the supplier activity risk, discouraging investments and the emergence of newcomers.
   In the majority of the 30 analyzed countries, energy prices are no longer regulated. Where regulated prices remain, NRAs tend to consider them as a significant barrier to entry for alternative suppliers. All Member States, where NRAs consider regulated prices as a significant barrier, are planning to remove them, at least for non-household customers.[10]
   Across Europe, the following specific barriers related to "price regulation" were detected by this study. Those highlighted in blue have been raised, indicated or identified as barriers in Luxembourg:

   - Price regulation discriminates against certain suppliers.
   - High penetration of price regulation
   - Low margin of regulated offer (margin squeeze)

2. **Burden sharing.** Energy suppliers across Europe are often required to collect payments for services not part of their business, or to provide other services such as services related to energy efficiency, or to manage assets such as those of the metering system. These requirements can pose a barrier for suppliers' operation on the retail market by raising their costs and distracting focus from their core business and might deter entry into the retail market by newcomers. Across Europe, the following specific barriers related to "burden(-sharing)" were detected by this study. Those highlighted in blue have been raised, indicated or identified as barriers in Luxembourg:

   - Obligation to collect tariffs unrelated to energy on behalf of others.
   - Obligation to keep a minimum-security stock as a gas reserve

[9] Please note: these definitions are Europe focused, not Luxembourg specific. Highlighted barriers have been identified as country specific.
[10] CEER Benchmarking report on removing barriers to entry for energy suppliers in EU retail energy markets. April 2016 [footnote wording and format to be improved].

3. **Regulatory unpredictability.** The establishment of an internal natural gas and electricity market in the European Union is an ongoing process. European legislative packages are boosting this process, making market regulation evolve rapidly. Transposition of regulation into the national regulatory frameworks is not always smooth and NRAs' actions are sometimes unpredictable. This leads to uncertainties for suppliers related to unclear and unknown future developments of the regulatory framework, including the attitude of the institutions that regulate the retail market and oversee market operation and organization. This uncertainty is a barrier that impacts suppliers' business, preventing their entrance in the market, making strategic business planning difficult or forcing them to adopt different approaches during operation. Across Europe, the following specific barriers related to "unpredictability of regulatory framework" were detected by this study. Those highlighted in blue have been raised, indicated or identified as barriers in Luxembourg:

- Suppliers face uncertainty because of a newly liberalized regulatory environment or uncertain future development of the regulatory framework
- Uncertainty caused by industry actors influencing legislation, e.g. incumbent or associations shape legislation
- Uncertainty regarding future regulatory developments, especially in the field of digitalization and new technology
- Attitude of authorities hinders development of the market
- Uncertainty regarding environmental obligations and non-renewable generation capacity

4. **Access to innovation.** Most European energy market are currently designed based on practices as they were during the period of national monopolies by what today are incumbent suppliers. Allowing suppliers and new entrants to be innovative depends not only on the opportunity to compete on prices, but also to diversify, welcoming new products, market actors and business models. When national regulatory frameworks do not take into account innovation in the retail market (regarding e.g. availability and functionality of smart metering, the possibility of flexible contracting and tariffs, or whether the demand side can bid in the balancing system), this may pose a barrier for new market entries, particularly more modern players. If new entrants are to be enabled in order to increase the level of competition in the retail market, regulations must accommodate future developments on the energy markets, especially considering that in the future new entrants may not only be electricity and gas suppliers but also act as aggregators or energy service companies (ESCOs). Across Europe, the following specific barriers related to "innovation-friendliness" were detected by this study. Those highlighted in blue have been raised, indicated or identified as barriers in Luxembourg:

- Data protection issues
- Lack of incentivisation for novel pilot projects or post-pilot market rollout
- Lack of data for innovative product development
- No fit between new business models and existing regulation/obligations

- Missing flexibility in tariff structures
- Missing information and incentives for demand-side grid management
- Market structures does not incentivize novel products (missing market value)

1.1 Description of regulatory disincentivisation barriers in Luxembourg: Price regulation

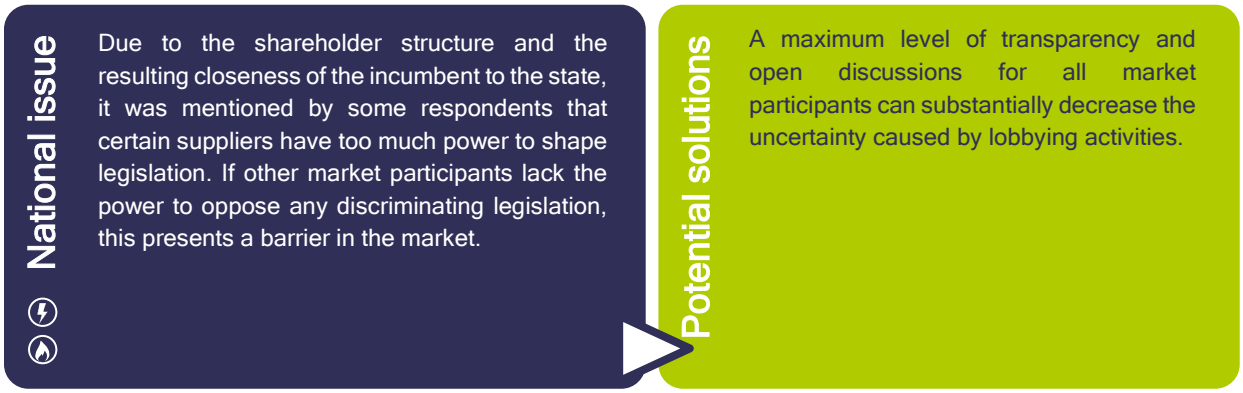
No barriers around price regulation were identified in Luxembourg.

1.2 Description of regulatory disincentivisation barriers in Luxembourg: Burden (-sharing)

No barriers around burden-sharing were identified in Luxembourg.

1.3 Description of regulatory disincentivisation barriers in Luxembourg: Regulatory unpredictability

Uncertainty caused by industry actors influencing legislation, e.g. incumbent or associations shape legislation. In the research this barrier was raised as an issue in Luxembourg. While cooperation between authorities and market actors is essential for functioning and lasting market developments, industry bodies or actors may be given too much power to shape legislation, allowing the legislation to be shaped for the benefit of these actors to the detriment of other actors or customers or market competitiveness. This also increases uncertainty for market players around what the legislation will look like when complete.



European markets in which this barrier has also been indicated

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1.4 Description of regulatory disincentivisation barriers in Luxembourg: Access to innovation

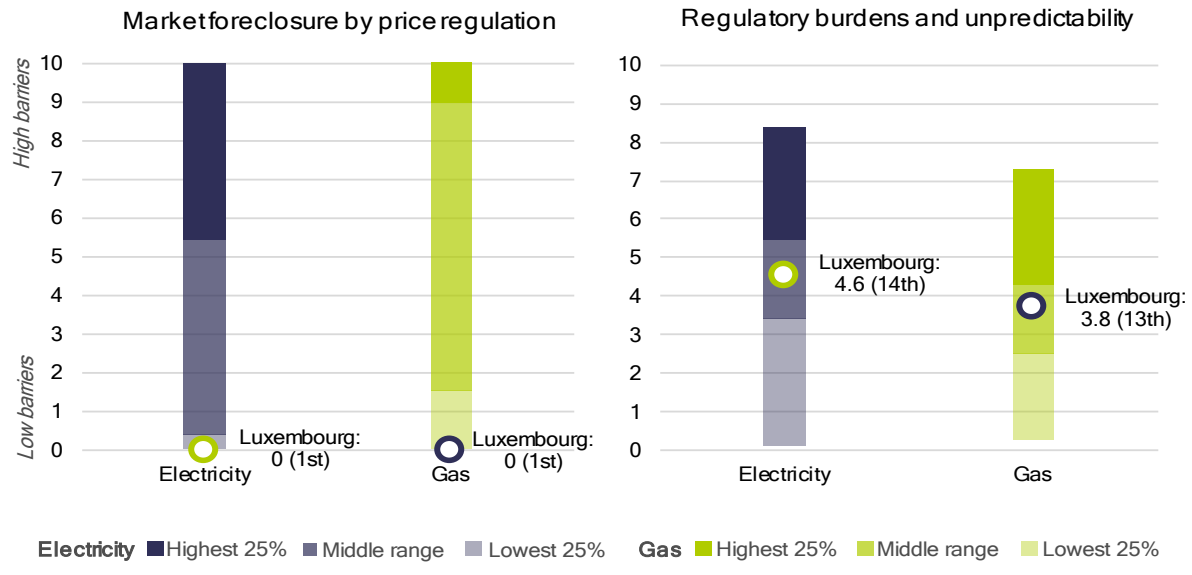
No barriers around access to innovation were identified in Luxembourg.

1.5 Luxembourg´s performance in this barrier category

The following figure shows quantitative indicators of how far regulatory disincentivisation acts as a barrier in this market. The values for Luxembourg are shown against the range across all analyzed countries. These scores contribute to the performance index. The performance indicators of regulatory disincentivisation are the followings:

- **Market foreclosure by price regulation:** The index consists of sub-indicators, the penetration of price regulation (among residual customers), and the mark-up of the regulated offer. High score is attributed if the penetration is high, and the mark-up is significantly lower than the average mark-up on the competitive markets.
- **Regulatory burdens and unpredictability:** The index consists of two sub-indicators. Regulatory burdens reflects to the non-energy share of the energy bill in an average household, which are regulated (taxes, network fees). Regulatory unpredictability was measured with the related question in the supplier's survey. High score is attributed if the share of the non-energy elements is high, and the survey respondents gave high score for the question.

Performance indicators



Luxembourg has no price regulation in place. Regarding regulatory burdens and unpredictability the score is 4.6 for electricity (14th place) and 3.8 for gas (13th place).

2) Market inequality

Within market inequality, barriers across Europe have been sub-categorised into two areas encompassing 8 specific barriers[11]:

1. **Unbundling and market power.** In order to facilitate better competition and improve performance of the individual parts of the energy companies, the Energy Directives introduced rules for legal, functional and accounting unbundling between DSOs and supplier. Although legal unbundling has been implemented throughout all EU member states, barriers arising from vertical integration can still be observed in many markets, raising the question if the required level of unbundling is sufficient in order to meet the goal of a fair and competitive retail market. Companies serving less than 100 000 customers are only obliged to implement accounting unbundling.

   In order to avoid confusion among end customers between the separate parts of integrated energy businesses, brand unbundling has been a focus area for NRAs over the last years. Nevertheless, in several EU countries, the difference in the branding of the supplier and the DSO is perceived as insufficient. Strategic and unfair advantages for incumbent suppliers around transparency, pricing and access to information and data occur in most of the European countries studied. Access to production capacities can also be limited for small suppliers if market players with a large generation portfolio can withdraw production capacity from the accessible markets. Balancing and ancillary services markets can also be distorted as they are often still designed to mainly benefit large-scale generation, discriminating against smaller market participants. Below, we describe these barriers related to market power in more detail.

   Across Europe, the following specific barriers related to “unbundling and market power” were detected by this study. Those highlighted in blue have been raised, indicated or identified as barriers in Luxembourg:

   - Lack of brand unbundling
   - Discriminating, strategic behaviour of incumbent, and obstruction by other market players.
   - Strategic, unfair advantage of vertically integrated market players and lack of transparency.
   - Limited or biased access to production.
   - Discrimination against new and small market players in capacity and ancillary services markets.

2. **Equal access to and maturity of wholesale market.** The wholesale markets present one of the most important sources for energy procurement for all market participants. New and small suppliers tend to have weaker bargaining position in bilateral negotiations, which occurs higher sourcing costs, therefore leading to a competitive disadvantage. Access to a well-functioning wholesale market (an energy exchange) therefore enables smaller suppliers to buy energy for competitive prices.

[11] Please note: these definitions are Europe focused, not Luxembourg specific. Highlighted barriers have been identified as country specific.

Barriers related to the wholesale market can arise by discriminatory market platform access and the absence of any viable alternative. Furthermore, a lack of available products and low liquidity can both lead to an increase in risk, disadvantaging small market participants substantially more than large, established suppliers. Across Europe, the following specific barriers related to "equal access to and maturity of wholesale market" were detected by this study. Those highlighted in blue have been raised, indicated or identified as barriers in Luxembourg:

- Discriminatory market platform access (standards, guarantees, etc.)
- Low liquidity in the wholesale market
- High price or volume risk in energy procurement

2.1 Description of market inequality barriers in Luxembourg: Unbundling and market power

Discriminating, strategic behaviour of incumbent, and obstruction by other market players. In the research this barrier was raised as an issue in Luxembourg. The incumbent/existing suppliers are able to use tactics in pricing, customer access, combined billing etc., which are not available to new entrants. For example, large established players can afford to apply predatory pricing for certain customers to retain them. Market players with a lot of power, i.e. market share, may act in an obstructive way, especially around data exchange. This can especially disadvantage small suppliers with only a limited customer base to draw data from. If regulated DSOs are involved in other areas of activity such as customer care or flexibility services, it can narrow deregulated suppliers' potential to expand into these areas.

European markets in which this barrier has also been indicated

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Strategic, unfair advantage of vertically integrated market players and lack of transparency. In the research this barrier was raised as an issue in Luxembourg.DSOs are required to separate distribution activities from supply both legally and in practice, so that unregulated distribution activities do not cross-subsidise any supply business. However, co-ownership is allowed, and small DSO/supplier companies are often exempted from any unbundling.

Vertically integrated companies are still able to use their market power to gain an advantage in terms of information, allowing them for example to target customers based on consumption profiles or win back customers during the switching process, or in terms of access to financing through e.g. DSOs favouring sister companies when procuring services.

National issue

Information advantages regarding grid tariffs and special agreements for electronic invoicing between the DSO and certain suppliers can lead to a substantial financial disadvantage for other market participants. These examples have been raised by some respondents as reasons for this specific barrier to exist in the market.

Potential solutions

One potential option to address this barrier is to reduce the cap of the "de minimis rule" (100.000 customers)

European markets in which this barrier has also been indicated

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UK BEST PRACTICE: Unbundling of DSOs and supply businesses

Great Britain provides an example of well-functioning separation between distribution and supply. Ten of the 14 electric DNOs (distribution network operators) are free standing companies, while 4 are part of groups that include generation and supply businesses. Of the 4 companies that distribute gas, only 1 is part of a group that also owns a gas supply business. The companies that have generation or gas supply affiliates are effectively unbundled.
In this study, we found no evidence of incomplete unbundling presenting a problem in Great Britain. DNOs are prohibited from providing end-user services, they are invisible to the customer, and no suppliers in the study had experience of the supplier/DNO relationship being exploited.

2.2 Description of market inequality barriers in Luxembourg: Equal access to & maturity of wholesale market

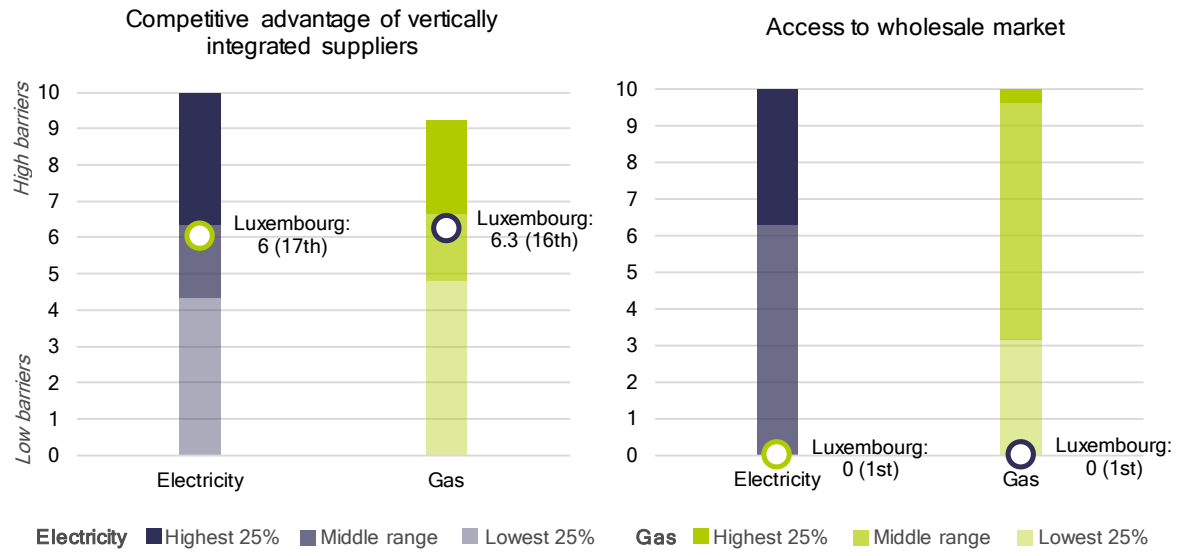
No barriers around equal access to & maturity of wholesale market were identified in Luxembourg.

2.3 Luxembourg´s performance in this barrier category

The following figure shows quantitative indicators of how far market inequality acts as a barrier in this market. The values for Luxembourg are shown against the range across all analyzed countries. These scores contribute to the performance index. The performance indicators of market inequality are the followings:

- **Competitive advantages of vertically integrated players:** The index consists of sub-indicators, the market share of vertically integrated suppliers (on the residential competitive market), and the strictness of DSO unbundling. High score is attributed if the vertically integrated suppliers have a high aggregated market share, and the unbundling regime is not very strict (brand unbundling is not in force, high share of local, integrated companies).
- **Access to wholesale market:** The indicator measures the accessibility of wholesale market by quantifying the liquidity of wholesale markets. High score is attributed if the traded volume is relatively low compared to the consumption of the country (churn rate). Traded volume includes volumes that are traded at hub as recorded by brokers (OTC) or exchanges and does not include 'contracted' (LTC or other bilateral deals) volumes which are conducted 'off market'.

Performance indicators



The score regarding the competitive advantage of vertically integrated suppliers is 6 for the electricity market (17th place) and 6.3 for the gas market (16th place). Regarding access to wholesale market the score is 0 for electricity and gas (1st place) due to the fact that the market is coupled with Germany (elec.) and Belgium (gas).

3) Operational and procedural hindrances

Within operational and procedural hindrances, barriers across Europe have been sub-categorised into two areas encompassing 13 specific barriers[12]:

1. **Sign-up & operations compliance.** Sign-up, licensing or registration, along with other administrative requirements or system establishment such as arranging contracts with relevant stakeholders (TSOs,

[12] Please note: these definitions are Europe focused, not Luxembourg specific. Highlighted barriers have been identified as country specific.

DSOs, BRPs) are among the first steps that a new supplier undergoes to enter and operate in a retail energy market. To deliver natural gas or electricity to final consumers in Europe, an energy supplier usually needs to be registered to a certain institution list, or to proceed with a notification, or follow a process to grant a licence. Entrance processes for suppliers often requires commitments such as a minimum standard of customer service obligations, requirements on service quality, to provide financial guarantees or to have a communication system in place.

In most responding NRA countries, suppliers need to register and make contracts with certain stakeholders (mainly TSOs and DSOs) to procure the access to the energy grid: transport capacity, balancing. This procedure can be very different from a country to another. Accessing wholesale markets and balancing may also require a license or prior agreement/registration with the market operator. In some markets, business processes to enter and operate in the retail market can be extremely detailed and burdensome. The lack of a functioning national wholesale market may also hinder the entrance of retail companies that are not vertically integrated.

Across Europe, the following specific barriers related to "sign-up & operations compliance" were detected by this study. Those highlighted in blue have been raised, indicated or identified as barriers in Luxembourg:

• Poor availability of information for market entrants & active participants
• Heavy administrative process for entry (registration / licensing)
• High financial requirements (incl. long working capital cycles) and forced risk during operations
• Excessive reporting requirements during operations
• Excessive information requirements around billing and energy labelling
• Highly complex or country-specific systems & processes
• Regional differences or differences between DSOs within a country
• Cumbersome or biased switching process
• Unduly burdensome environmental obligations
• Unduly burdensome or insufficiently regulated market exit

2. **Data access & processes.** Data access and management refers to the processes by which data are sourced, validated, stored, protected and processed and by which it can be accessed by suppliers or customers. In a well-functioning energy retail market, it is important that the information required to operate in the market is available to newcomers (subject to applicable legislation on data protection). This may include information on, for example, individual consumption or more specific meter details. This data is required in order for suppliers to carry out their market role, such as initiating a switch, or billing a customer. A standardized approach to the provision and exchange of data creates a level playing field among stakeholders and helps to encourage new, challenging market actors to enter the market. In order

to avoid data management and access processes acting as a significant barrier to entry, Member States' initiatives to standardize data format and processes, including investments in data hub infrastructure, have the potential to make a positive impact.

Across Europe, the following specific barriers related to "data access & processes" were detected by this study. Those highlighted in blue have been raised, indicated or identified as barriers in Luxembourg:

- Lack of data hub
- Complex, heterogenous IT infrastructure and/or low level of digitalisation
- Missing access or poor quality of operations-critical data

3.1 Description of operational and procedural hindrances barriers in Luxembourg: Sign-up & operations compliance

Poor availability of information for market entrants & active participants. In the research this barrier was raised as an issue in Luxembourg. Detailed information about legislation, licensing requirements and procedures during operations etc. are not readily available, or only in the local language. This makes it difficult for potential new entrants to (1) understand the market and judge its suitability for their business; (2) efficiently go through the entry process to establish on the market; (3) operate effectively and efficiently.

National issue

Non-existence of or incomplete market and market communication rules are open to interpretation and lead to an inconsistent implementation among the market participants such as DSOs and clearing operators. Combined with a low level of transparency, this leads to a substantial barrier in the market.
Furthermore, it has been raised, that certain DSOs insist on invoicing special tariffs which are neither published nor approved by the regulator.

Potential solutions

Market rules as well as market communication rules need to be fully defined and made transparent for all relevant market actors, ideally via a central location.

European markets in which this barrier has also been indicated

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AUSTRIAN BEST PRACTICE CASE: Availability of information for market entrants & active participants.
The Austrian NRA, E-Control offers a comprehensive "starter kit" with all the necessary information for new market entrants in German and English language. Furthermore, statistical data, covering switching rates, price levels, smart metering rollout progress and others is frequently being published. Therefore, a barrier is not only non-existing, but even more, the situation in Austria can be regarded as a best practice.

Highly complex or country-specific systems & processes. In the research this barrier was raised as an issue in Luxembourg. The systems landscape (forecasting, customer service etc.) can require significant costs, especially when first being established. Limits to or costs of outsourcing can fall disproportionately on smaller suppliers with less expertise in-house. If these systems are similar to those required in other markets, this investment can be capitalised on when expanding to other markets; if they are country-specific, expansion requires the same investment again in the new market.

National issue

The costs associated with the introduction of market communication systems has been mentioned as too high. Especially in a small market and in case the system is country specific, this presents a barrier as the investment is hard to recoup.

Potential solutions

Need for standardization across Europe of systems and procedures required by the country retail market. When these systems are similar to those required in other markets, suppliers´ investment can be capitalized when expanding to other markets.

European markets in which this barrier has also been indicated

AT BE BG HR CY CZ DE DK EE FI FR EL HU IE IT LV LT LU NL NO PL PT RO SK SI ES SE UK

3.2 Description of operational and procedural hindrances barriers in Luxembourg: Data access & processes

Complex, heterogenous IT infrastructure and/or low level of digitalisation. In the research this barrier was raised as an issue in Luxembourg. Heterogenous and complex IT infrastructure, required to communicate and exchange data with all relevant market participants, or a high level of manual processes in such exchanges, can both increase costs substantially. Such systems can be financed more easily by large market players via economies of scale, so small players are disadvantaged for technical reasons.

National issue

Heterogenous and inconsistent systems and processes in combination with a lack of transparency lead to complex workarounds and manual interventions. This limits the scalability of the systems and processes and can substantially increase the costs for certain suppliers. See also: “Poor availability of information for market entrants & active participants.”

Potential solutions

Besides ensuring harmonisation of all relevant processes and systems within the country, especially due to the market size, it is highly recommended to focus on a wider harmonisation with other European countries (e.g. Germany). This will substantially lower the associated costs and lead will therefore lower this barrier substantially.

European markets in which this barrier has also been indicated

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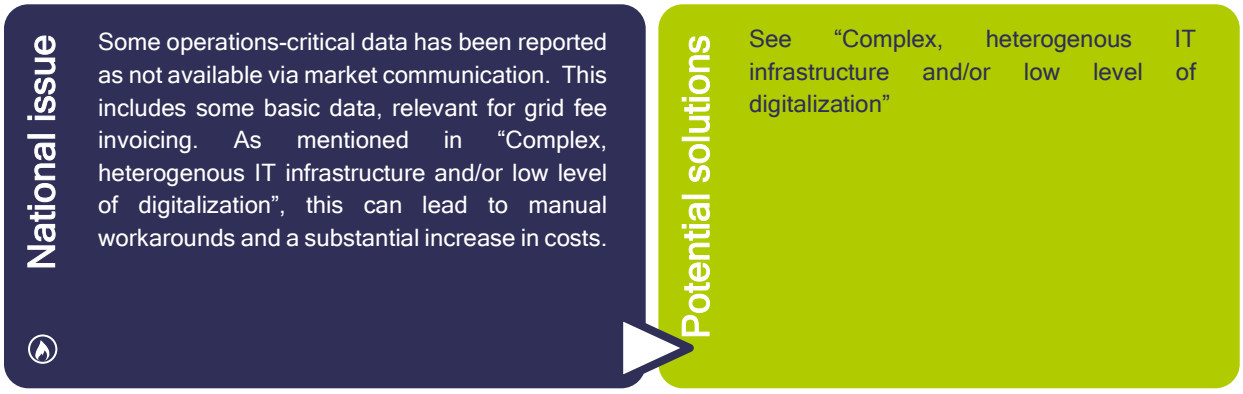
Missing access or poor quality of operations-critical data. In the research this barrier was raised as an issue in Luxembourg. Non-availability, delayed or low quality of operations-critical data (incl. smart meter data) presents a main barrier as it increases the need for manual processing and therefore costs. Especially in combination with information advantage, this can give certain market participants such as DSOs and incumbents a major advantage in providing the required service level to the customers.



European markets in which this barrier has also been indicated

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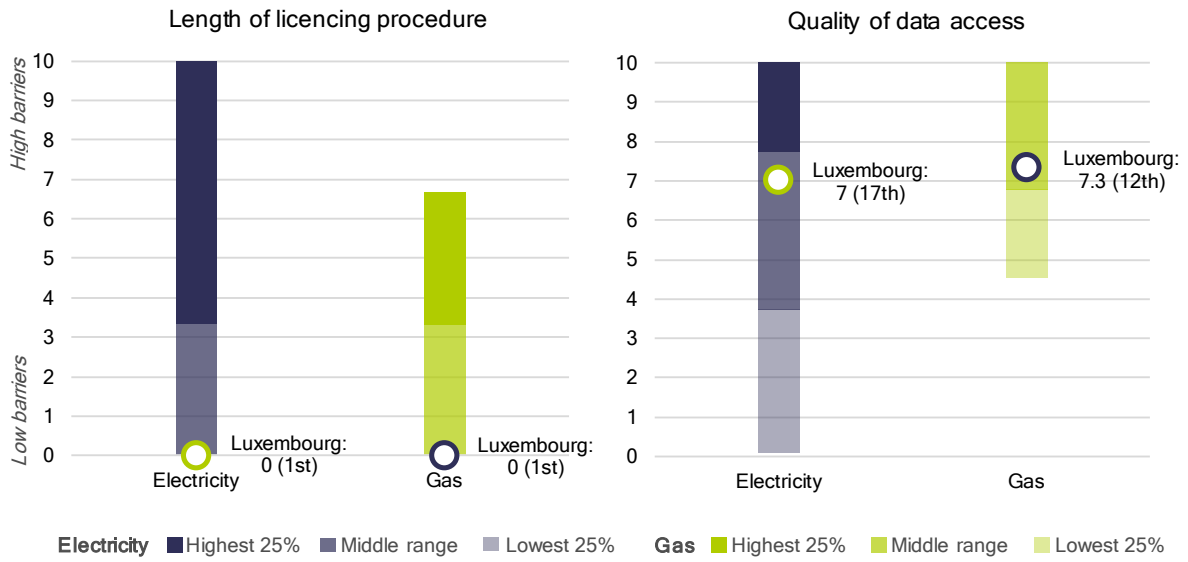
3.3 Luxembourg´s performance in this barrier category

The following figure shows quantitative indicators of how far operational and procedural hindrances act as a barrier in this market. The values for Luxembourg are shown against the range across all analyzed countries. These scores contribute to the performance index. The performance indicators of operational and procedural hindrances are the followings:

- **Length of licensing procedure:** The complexity of the licensing procedure is quantified with the legal deadline of the licensing procedure. High score if attributed if the regulator has more moths for authorization, while 0 score is attributed if there is no licensing obligation in the country.

- **Quality of data access:** The barriers relating to the quality of data access are measured with a checklist indicator, which focuses on the DSO's practices regarding data collection and access provision to suppliers. High score is attributed if the format of the data provision is not standardised, third party access is not available via website or data hub, and the smart meter rollout is small.

Performance indicators



Although Luxembourg currently has a very light licensing procedure in place, the score for the Length of licencing procedure is 0 (1st place) since it has not been raised as a barrier. Regarding Quality of data access, Luxembourg's score is 7 for electricity (17th place) and 7.3 for gas (12th place).

4) Customer inertia

Within operational and procedural hindrances, barriers across Europe have been sub-categorised into one area encompassing 6 specific barriers[13]:

1. **Customer orientation.** Whether customers want to or can engage with the market depends on a broad range of market characteristics, including how well authorities inform and support customers and how energy companies are viewed by the customer. For example, if there is no trusted central place to compare offers from different suppliers, customers may struggle to make an informed choice; or if customers perceive all energy companies as irresponsibly profit-driven, or providing a poor service, they may feel there is nothing to be gained from switching. Moreover, across Europe, most energy markets have been liberalized relatively recently (last 20 years, some only a few years ago), so for a considerable portion of customers the potential for them to engage may still feel unfamiliar.
   Across Europe, the following specific barriers related to "customer orientation" were detected by this study. Those highlighted in blue have been raised, indicated or identified as barriers in Luxembourg::

[13] Please note: these definitions are Europe focused, not Luxembourg specific. Highlighted barriers have been identified as country specific.

- Lack of information regarding available offers and switching possibilities
- Low customer awareness or interest makes it difficult to attract customers
- Insufficient price signals for end-users
- Changing supplier is cumbersome or has little pay-off for the customer
- Consumers prefer status quo
- Lack of trust in new or foreign suppliers and in new technology

4.1 Description of customer inertia barriers in Luxembourg: Customer orientation

Low customer awareness or interest makes it difficult to attract customers. In the research this barrier was raised as an issue in Luxembourg. If customers are not well informed about their opportunities to participate in the market or are not motivated to use them, or find the market too complex to access, they are not driven to seek out or engage with new energy suppliers. If energy is not a core priority for customers in their lifestyle (due to e.g. low prices, lack of interest/"sexiness" etc.), it is difficult to engage them in the market overall. This barrier also prevents uptake of novel services such as DR, as the benefits are difficult to promote to customers who do not already value energy or their role in the market.

European markets in which this barrier has also been indicated

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Insufficient price signals for end-users. In the research this barrier was raised as an issue in Luxembourg. Many factors can mean that market price signals do not reach end users, e.g. small energy component of bill, low energy prices, simplified/estimated settlement, etc. With limited price signals, there is little incentive for customers to engage with the market as they have limited power to bring their costs down, or to see an impact of their behaviour on their bills.

National issue

Some respondents also mentioned that electricity costs are too low in order to incentivize any market engagement by offering lower prices, than the competitors.

Potential solutions

The price signals are mainly derived by the absolute overall price levels as well as by the share on the energy component of the bill. How the potential savings are visualised (relative to the energy component) is key in sending the correct signals, especially when the overall price levels are relatively low.

European markets in which this barrier has also been indicated

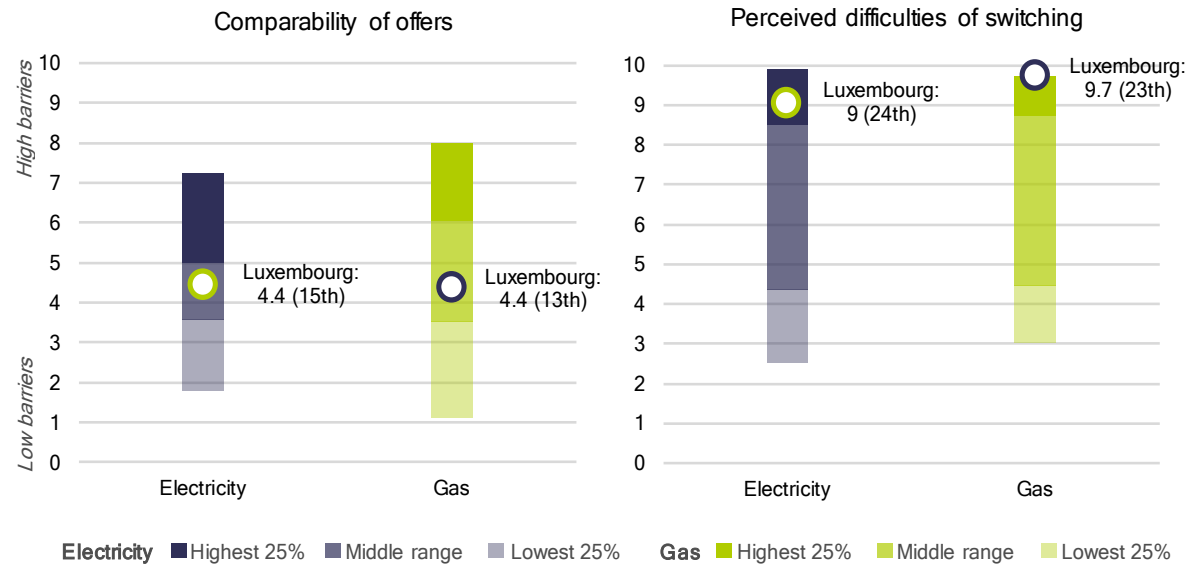
AT BE BG CH HR CY DE DK EE FI FR EL HU IE IT LV LT LU NL NO PL PT RO SK SI ES SE UK

4.2 Luxembourg´s performance in this barrier category

The following figure shows quantitative indicators of how far customer inertia acts as a barrier in this market. The values for Luxembourg are shown against the range across all analyzed countries. These scores contribute to the performance index. The performance indicators of customer inertia are the followings:

- **Comparability of offers:** The index consists of sub-indicators. The first measures consumer's ability to compare offers, based on a survey commissioned by the DG Justice and Consumers. The second is a checklist indicator which quantifies the availability of comparison websites, based on their number and functionalities. High score is attributed if the consumers gave low scores for comparability, and there are no comparison websites in the country.
- **Perceived cost of switching:** The difficulties of the switching process is also measured based DG Justice's survey. The indicator incorporates the experience and opinions of customers who have switched, and also of those who haven't because they faced obstacles or thought it might be too difficult. High score is attributed if the high share of consumers has bad experience or opinion on switching process among all customers who considered to switch.

Performance indicators



Luxembourg's score regarding comparability of offers is 4.4 for the electricity market (15th place) and 4.4 for the gas market (13th place). Regarding perceived difficulties of switching, Luxembourg's score is 9 for electricity (24th place) and 9.7 for gas (23rd place).

5) Other

Other aspects of the market not directly related to its functions, as addressed above, may also impact suppliers' ease to enter and operate in the market. These relate to characteristics of the market that are not necessarily a barrier per se, but their impact on the energy retail environment could be minimized to benefit market function.

5.1 Description of other barriers in Luxembourg: Other

Small market or customer value. In the research this barrier was raised as an issue in Luxembourg. A small population and/or low consumption hinders profitability. Market size as a barrier could be ameliorated by better harmonization of markets.

National issue

Especially in combination with barriers such as country-specific systems and processes, a low level of digitalisation and a low level of customer awareness (see above), small markets such as Luxembourg can become very unattractive for new market entrants.

Potential solutions

Further steps towards harmonisation can help in eliminating this barrier as the country-specific processes and system requirements will be diminished.

European markets in which this barrier has also been indicated

AT	BE	BG	HR	CY	CZ	DE	DK	EE	FI	FR	EL	HU	IE	IT	LV	LT	LU	NL	NO	PL	PT	RO	SK	SI	ES	SE	UK

FINDINGS & RECOMMENDATIONS

This handbook provides a high-level framework of relevant barriers to entry and operate for energy suppliers into the **Luxembourg** retail electricity and gas markets, as well as examples of actions that relevant institutions as NRAs, ministries, etc., have taken, are taking or could take in the future to remove them.

In particular, the handbook groups the barriers to entry and operate in the energy retail market into four different categories as listed below.

1. Regulatory disincentivisation.
2. Market inequality.
3. Operational and procedural hindrances.
4. Customer inertia.

In this section we report the main findings and recommendations for each category.

Under the first group, **regulatory disincentivisation**, suppliers did not raise any concerns regarding "price regulation" (as there is no price regulation in place), "burden sharing" and "access to innovation". The main concerns relate to "regulatory unpredictability".

Uncertainty caused by industry actors influencing legislation, is the main barrier identified by market participants. A maximum level of transparency and open discussions for all market participants can substantially decrease the uncertainty caused by lobbying activities.

Regarding **market inequality**, barriers have been identified arising from a perceived uneven playing field for different types of suppliers. Suppliers responding to the survey or interviewed mainly reported barriers regarding "unbundling and market power".

The respondents raised that market power barriers arise from "discriminating, strategic behaviour of incumbent, and obstruction by other market players" as well as "strategic, unfair advantage of vertically integrated market players and lack of transparency". Stricter mechanisms to verify correctness of transmitted data and fining non-compliance can help in reducing those barriers.

No barriers were indicated by market participants in the category "equal access to and maturity of wholesale market".

Operational and procedural hinderances are regarded as barriers by some of the suppliers responding to the survey or being interviewed. Barriers have been raised regarding "sign-up and operations compliance" and "data access & processes".

"Poor availability of information for market entrants & active participants" and "highly complex or country-specific systems & processes" are issues indicated with respect to operational compliance. It is recommended to fully define market and market communication rules for all relevant market participants in order to diminish those barriers.

“Complex, heterogenous IT infrastructure and/or low level of digitalisation” and “missing access or poor quality of operations-critical data” also present relevant barriers in the market. Increasing the level of standardization of systems and processes within the country and throughout Europe can help in reducing the existing barriers.

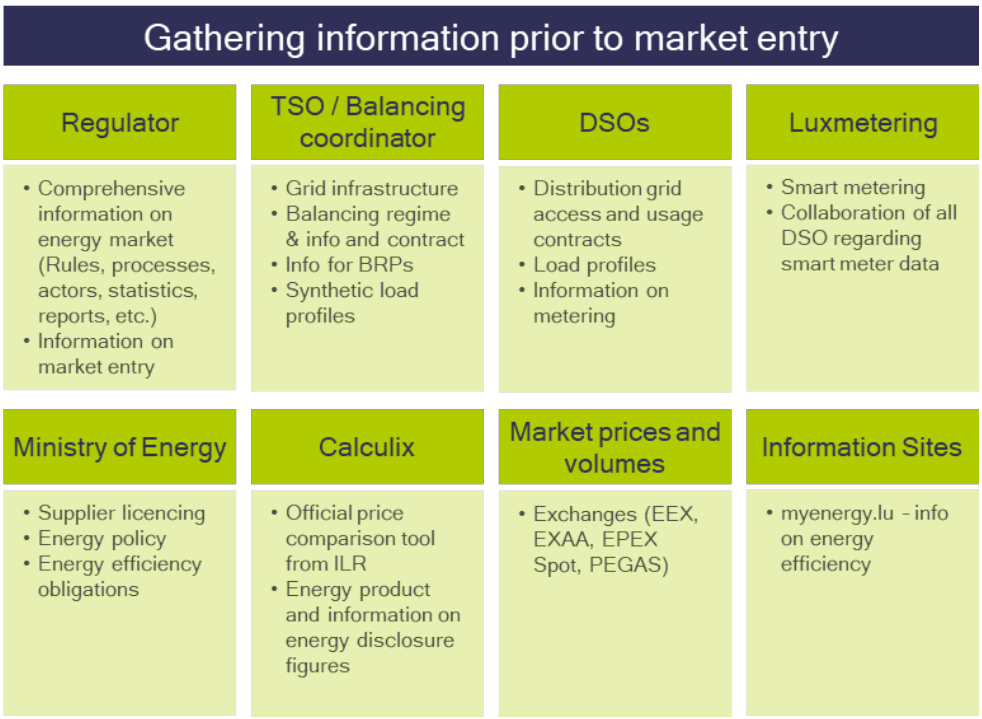
Customer inertia barriers category, groups all those issues related to customer behaviour and attitude within the retail energy market.

“Low customer awareness or interest makes it difficult to attract customers” and “insufficient price signals for end-users” have been raised specifically in this category. Raising awareness and the overall information level will help in reducing those barriers.

APPENDIX 1: PROCESSES

This section describes market processes in energy retail in Luxembourg. This provides context for the market barriers described above by giving a high-level overview of the most critical aspects involved in establishing and operating as a supplier in the national market. The stages of market entry and operation are described in sequence, each with an illustration ("process map") showing that stage's various processes together with comments/details on market specifics.

1) Information gathering before market entrance



Further comments

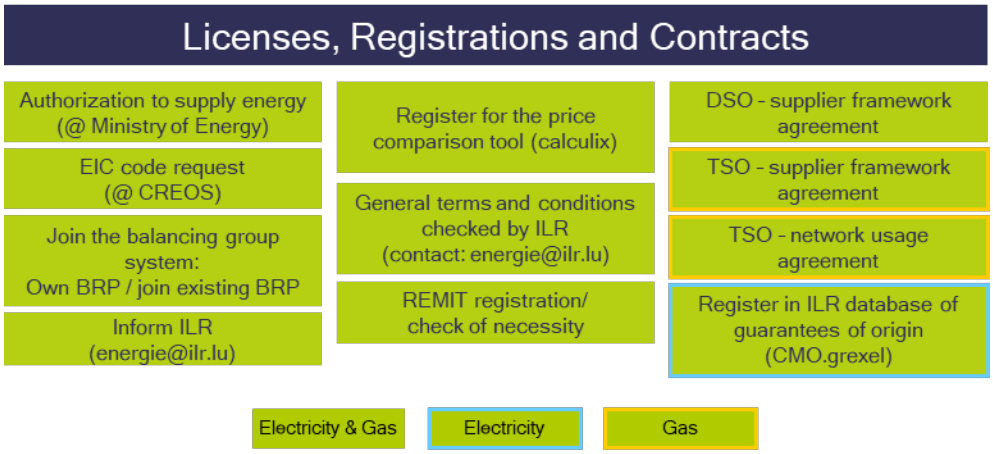
- ILR (Institut Luxembourgeois de Régulation) is the regulator responsible for electricity, natural gas, electronic communications (telecom), radio frequencies, postal service, air and rail transport, and network information security: www.ilr.lu
- ILR provides comprehensive information on the energy market and is thus the first and main point of contact (energie@ilr.lu). A guide for new entrants[14] explains the main requirements and contracts to conduct
- CREOS[15] - TSO for both electricity and gas and one of 5 electricity DSOs and one of 3 gas DSOs - provides comprehensive information on grid infrastructure, connectivity and electricity balancing regime.

[14] Electricity: https://web.ilr.lu/FR/Professionnels/Electricite/Acteurs/Guide-dentree-sur-le-marche
Natural gas: https://web.ilr.lu/FR/Professionnels/Gaz-naturel/Acteurs/Guide-dentree-sur-le-marche
[15] https://www.creos-net.lu/start.html

- Electricity DSOs: Creos Luxembourg S.A., Ville de Diekirch, Hoffmann Frères S.àr.l. et Cie S.e.c.s., Ville d'Ettelbruck, Sudstroum S.àr.l. & Co S.e.c.s.
- Gas DSOs: Creos Luxembourg S.A., Ville de Dudelange, Sudgaz S.A.
- Each DSO also publishes load profiles and contracts that each supplier has to conclude with a given DSO.
- Gas balancing is coordinated by Balansys S.A.[16]
- ILR operates an official price comparison tool – "Calculix"[17]. It compares different electricity and natural gas supply offers available to residential customers in Luxembourg. In 2020 Calculix will be upgraded to include among others energy products for SMEs too.
- Information on energy policy and energy efficiency obligations and targets as well as on supplier licensing can be found at the Ministry of Energy[18]
- "Luxmetering", an economic interest group founded by 7 DSOs, acts as a common operator of smart meter processes and data management on behalf of its members[19]. In principles, the Supplier does not interact with Luxmetering. Luxmetering retrieves data from Smart Meters and sends such data to the DSOs. The DSOs are responsible for proving data to Suppliers.
- Note: Most information are only available in French (partly also in German and English)

[16] http://www.balansys.eu/
[17] www.calculix.lu
[18] https://mea.gouvernement.lu/fr.html
[19] https://www.luxmetering.lu/

2) Licenses, registration and contracts



Further comments

- Obtaining a supply authorisation from the Ministry of Energy. During application the technical, economic and financial capacities, as well as the professional experience and the quality of the organisation is proofed
- Balancing system (electricity):
    - Energy volumes are managed in balancing groups, which are managed by a balancing group responsible party
    - Supplier must have their own balancing group(s). The(ir) management can be done by themselves (own BRP) or by a third party BRP (bilateral contract).
      Note: BRPs are not obliged to serve as a 3rd party BRP
    - Registered BRPs are listed online on the Creos website[20]
- New entrants need to obtain a licence from the Ministry of Energy to be able to enter the market.
- Suppliers serving residential customers are invited to publish their energy product data on “Calculix” using the back-end online access to Calculix
- Register in ILR database of guarantees of origin:
    - ILR, a member of the AIB, offers the possibility for players to participate in the electronic certificate market of guarantees of origin (GO), by allowing them to open an account in the Luxembourg register operated through Grexel Systems' IT platform: CMO.grexel[21]
    - ILR GO register is connected to the AIB Hub, the central registration database for European Energy Certificate System (EECS)® certificates, further info on https://www.aib-net.org/portal

Contracts to conclude as electricity supplier[22]:

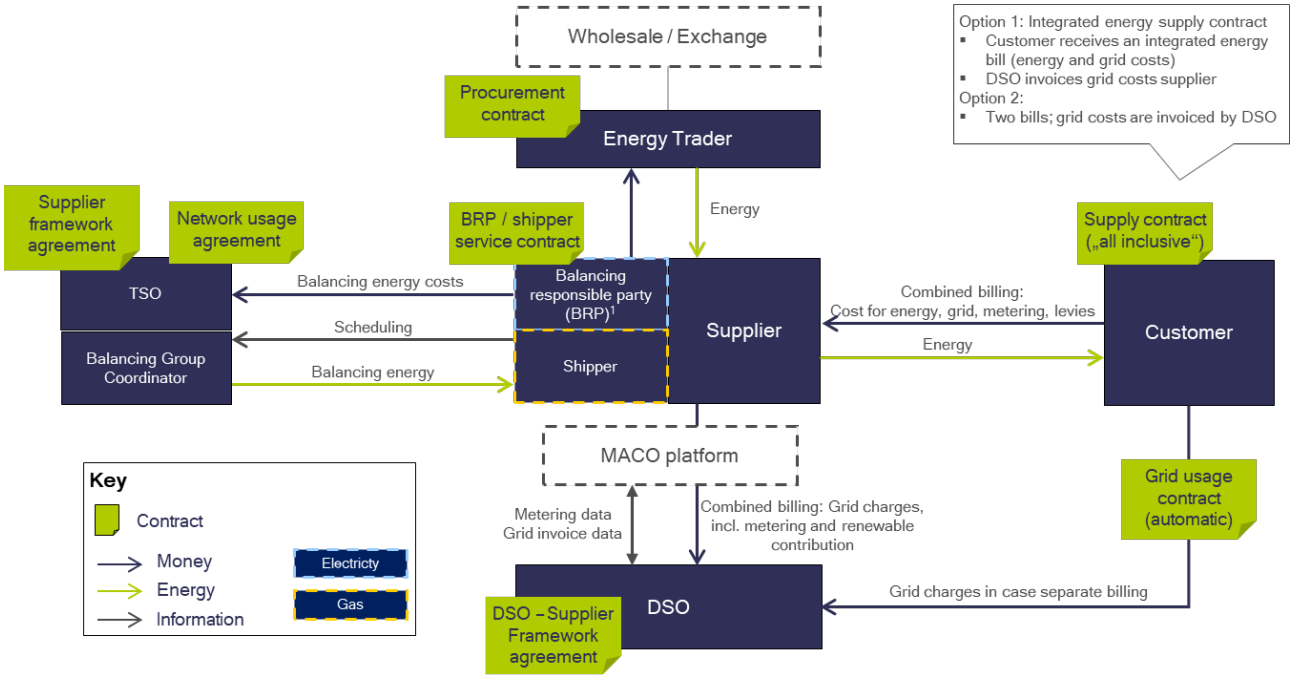
- DSO supplier framework contract to be concluded with each DSO (alternatively to be concluded by BRP). It lays down detailed rules for switching procedures and data exchange

[20] https://www.creos-net.lu/de/creos-luxembourg/bilanzkreis-koordinator/bilanzkreisverantwortliche.html
[21] https://cmo.grexel.com/default.aspx
[22] https://web.ilr.lu/FR/Professionnels/Electricite/Acteurs/Guide-dentree-sur-le-marche/Contrats-a-conclure/Pages/default.aspx

- Optional: If a supplier wants to offer integrated billing to its end customers (energy + grid charges) a network usage agreement with the relevant DSO must be concluded
- If a supplier is also its own balancing group responsible party, a BRP contract with the balancing group coordinator (Creos) must be concluded. Otherwise a BRP service agreement with an existing BRP can be concluded

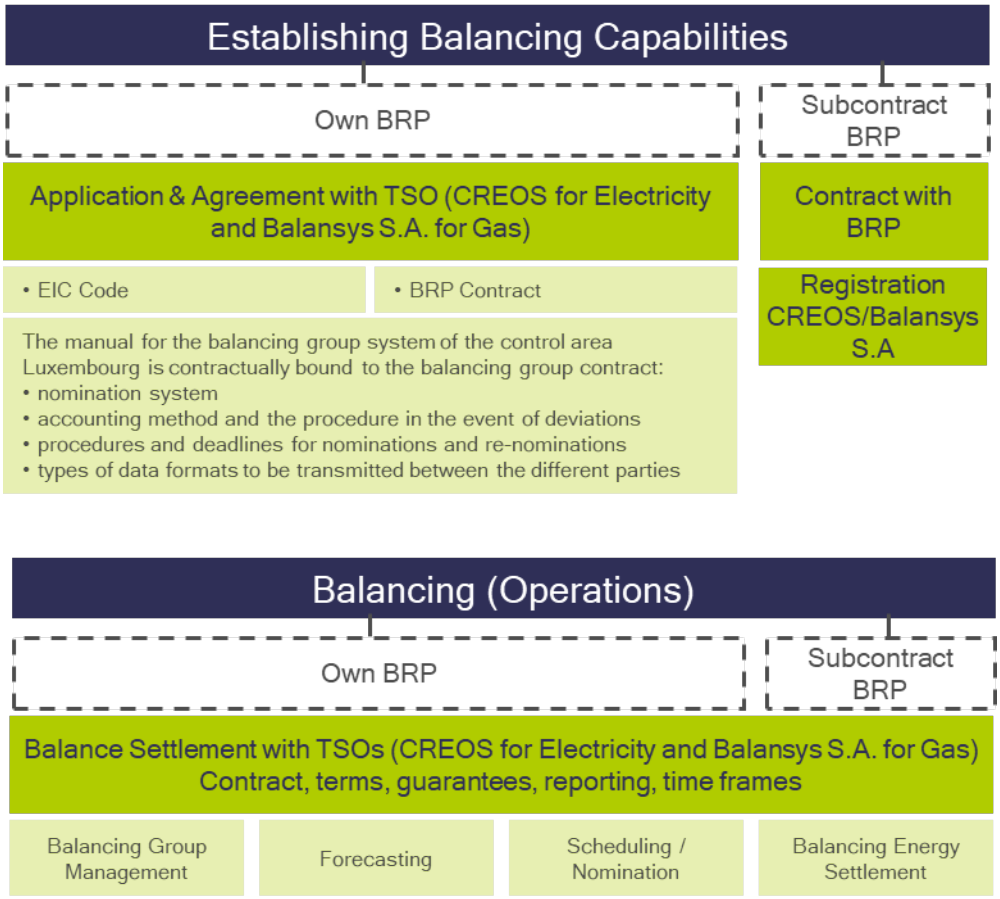
Contracts to conclude as gas supplier[23]:

- TSO/supplier framework agreement (Contrat-cadre fournisseur)[24] - Defines responsibilities and duties between TSO and supplier for gas transports on the transmission grid
- TSO/ supplier network usage contract (Contrat d'utilisation du reseau) - The purpose of the network usage contract is to regulate the contractual relations between the transmission system operator Creos Luxembourg S.A. and an end customer who uses the network
- BRP contract for BeLux gas zone ("Contrat d'équilibrage en zone BeLux")[25] defining the balancing of natural gas in the Luxembourg market
- DSO / supplier contracts for grid usage (Contrat d'acheminement) and framework contract for the provision of quantity allocation forms (Contrat de participation avec le gestionnaire de réseau de transport)



[23] https://web.ilr.lu/FR/Professionnels/Gaz-naturel/Acteurs/Guide-dentree-sur-le-marche/Contrats-a-conclure/Pages/default.aspx
[24] https://www.creos-net.lu/fournisseurs/gaz-naturel/contrats.html
[25] http://www.balansys.eu/wp-content/uploads/2015/10/ContractsTarifs_ContratEquilibrageFR.pdf

3) Establishment & operation of balancing



Further comments

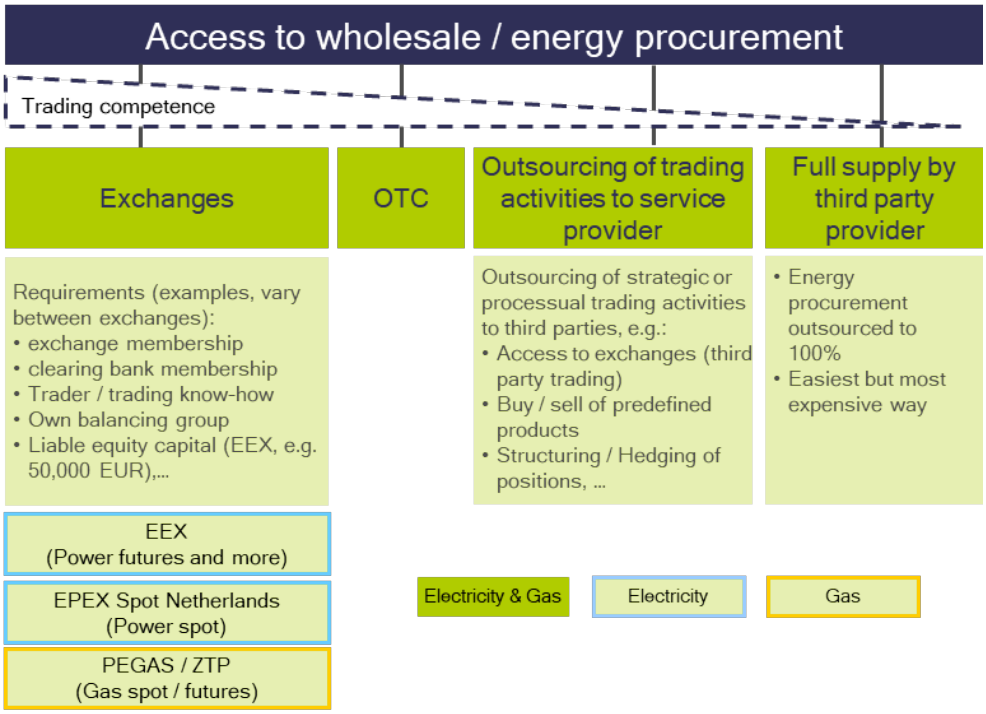
Electricity

- Option 1 (being your own BRP) is more complicated, technically more difficult and more expensive than option II. On the other hand, a supplier depends on a third-party BRP with option II and he must give insights to his business model and strategy
- Application as own BRP must be done at Creos
- The balancing system and processes as well as the handling of deviations is described in a "balancing handbook". This handbook is part of the balancing contract to conduct.
- The handbook as well as the contract is available online under: https://www.creos-net.lu/creos-luxembourg/coordinateur-dequilibre/contrats.html

Gas:

- With the entry into force of the integrated BeLux market (October 2015), balancing is managed exclusively at the transmission network level done by the balancing operator Balansys S.A..
- In the "Balance manual" ("Manuel d'équilibre") the system for managing and accounting for natural gas flows and quantities in the natural gas transmission area is described. The manual is available at the balance coordinator's website: www.balansys.eu

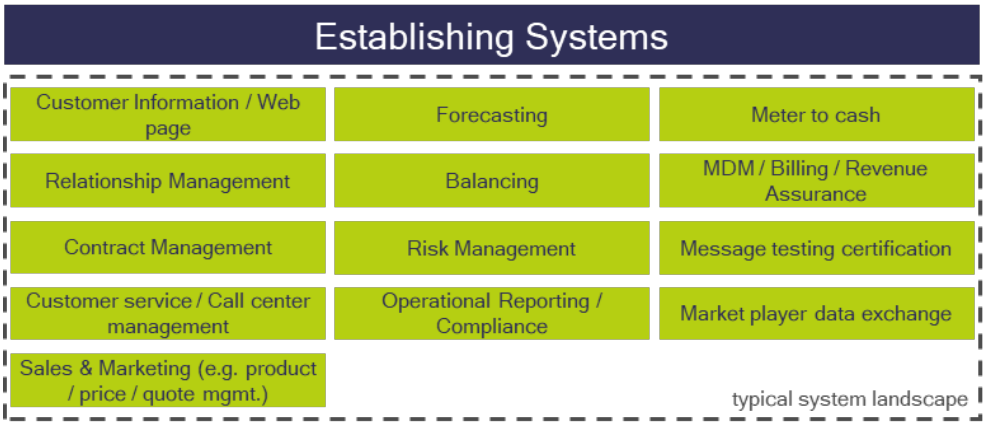
4) Acquiring wholesale / energy procurement



Further comments

- Energy procurement and related risks can be partially or fully outsourced to external service provider
- Trading on behalf of supplier can be done by the BRP or other third parties (e.g. brokers, financial institutions, ...)
- Depending on trading knowledge, business model and resources, suppliers procure energy directly via exchanges or OTC

5) Provision of system landscape

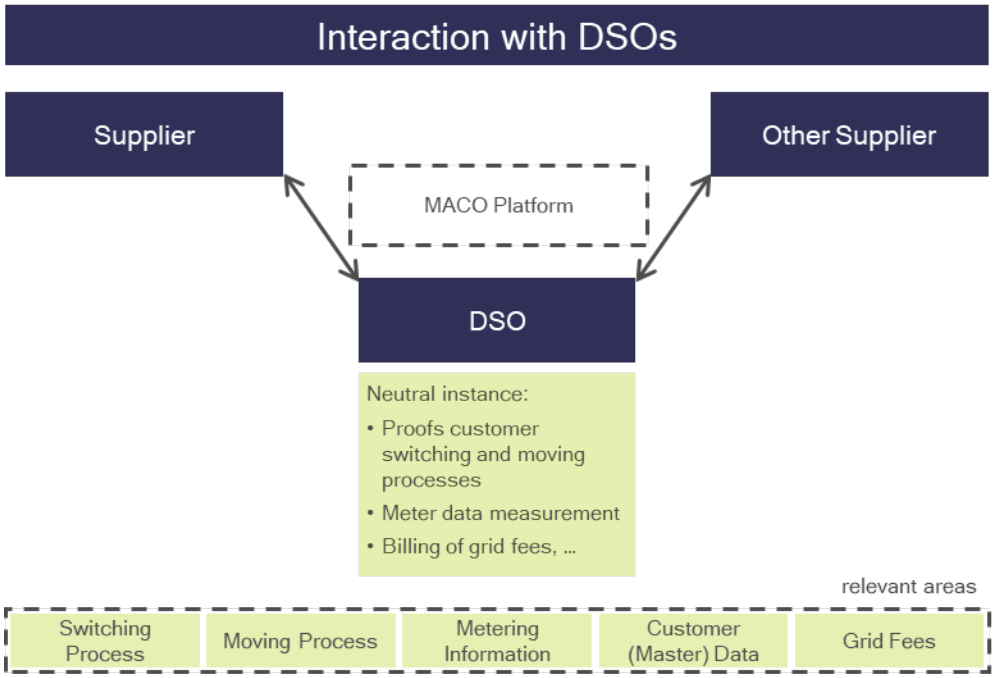


Further comments

- In general, there are no obligations to run specific systems in-house -> everything could be outsourced to third parties
- In 2017 a new market communication system[26] (=MACO) was established to ease the information exchange between DSO and suppliers. In this system, all relevant market processes are covered

[26] Electricity: https://luxmaco.vbulletin.net/forum/luxmaco-forum-aa/public-area/publications-aa/mdms
Gas: https://luxmaco.vbulletin.net/forum/luxmaco-forum-aa/public-area/publications-aa/migs/3672-mig-utilmd-1-2a

6) DSO related operations / market communication



Further comments

General

- The grid operators have jointly developed a communication model of the automated market (observed and approved by ILR)
- This new market communication (MACO) was established in October 2017 in order to ensure data exchange in a transparent and non-discriminatory manner to all stakeholders of the electricity and gas market
- MACO standardizes and automates the flow of data exchange and market processes such as switching suppliers, relocation / moving or disconnecting
- Standardised market processes can be found online on the LuxMaco Forum[27]
- The MaCo still has some gaps, which are yet to be implemented, such as injection points (producers are not covered yet, triggering of smart meter services and electronic billing. MACO is continuously being improved to increase the level of automation.
- In the gas sector, the processes are closely aligned with the processes that were used before the automation of communication. This causes issues with automation as, for example, control messages are not implemented, and market partners cannot get a confirmation that their message has been successfully received

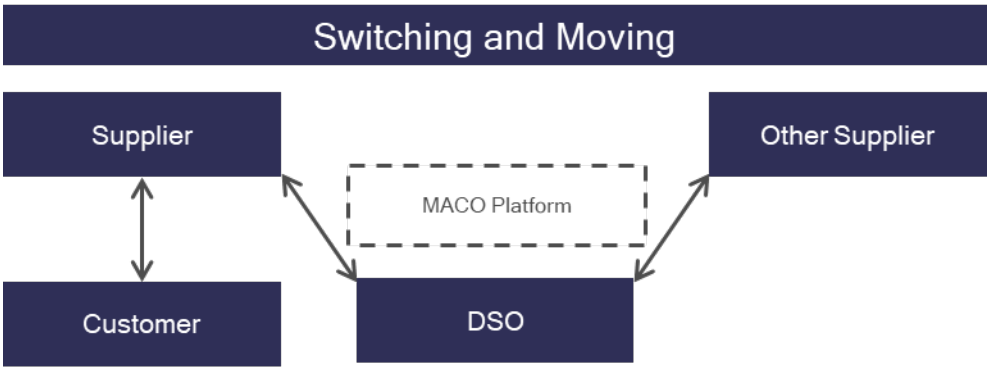
Smart Metering

- Smart meter data management is operated by DSOs cooperating through Luxmetering

[27] Strom: https://luxmaco.vbulletin.net/forum/luxmaco-forum-aa/public-area/publications-aa/mdms/3659-mdms-modell-der-marktkommunikation-strom-3-0
Gas: https://luxmaco.vbulletin.net/forum/luxmaco-forum-aa/public-area/publications-aa/migs/3672-mig-utilmd-1-2a

- One meter reading is done for electricity every 15 min (for gas every hour) and sent to the concentrator (street level), which sends it to the central system every day.
- They are sent daily during the night to the grid operators, who send the data to the suppliers before 8 a.m.

7) Customer switching and moving



New Contract (Switching)	Moving In
• New supplier cancels contract at old supplier on behalf of customer • Standard contract: permanent contract, terminable at will • Fixed-term contracts not terminable during contract duration; Special cancellation rights in case of price or condition changes	No active choice when moving in • Default supplier supplies customer for max 6 months • afterwards supplier of last resort takes over) • Default supplier informs customer to chose regular supplier contract No active choice after 6 months • Supplier of last resort informs customer to chose a tariff (with him or another supplier) No active choice after 12 months • Supply will be cut off

Further comments

- By signing a new contract, the customer normally also mandates the new supplier to terminate the existing contract
- The law does not provide for a maximum contract duration. In practice (92%), suppliers generally offer supply contracts of indefinite duration
- Though various discounts are also available (e.g. for direct debit or electronic invoicing) the pricing regime is easy to understand (compared to DE)
- Switching process are standardized but not automated (often still paper forms to fill out)
- Savings between standard offer of incumbent supplier and cheapest offer in the market are not negligible, however supplier switching rates remain low; Suppliers try to differentiate in energy quality (e.g. source of renewable energy; financing contribution for renewable projects)

Default supplier

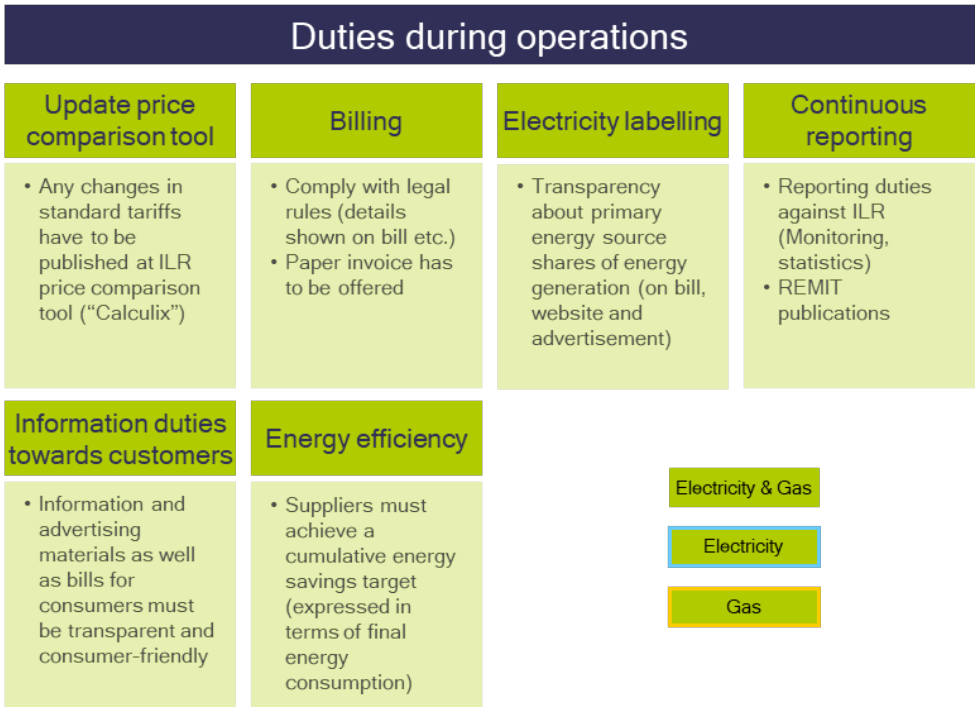
- The default supplier is designated by the ILR in a public call process (before 2017 it was the supplier with most customers in the area)
- The default supply is a supply on terms and at prices approved by the ILR which is provisionally applied for a limited period of time (maximum 6 months) to customers who have not yet chosen a supplier

- If after six months in default supply the customer has not chosen a new supplier, the supplier of last resorts takes over the energy supply (this step will disappear soon, as foreseen by a bill that is due to be voted upon by the parliament in Q1 2020 - cut off will then be after 6 months).
- After another six months in last resort supply, the energy will be cut off
- The supplier of last resort is designated by ILR for a period of 3 years

Fixed-term-contracts

- After the termination of a fixed term contract, in most cases, the customer is switched to a variable contract (suppliers can also define other options in their general terms and conditions)
- Generally, moving is a valid reason to break a fixed term contract, and it is up to the supplier whether they apply the same offer to the same customer at a new address (suppliers can also define other options in their general terms and conditions)

8) Operational obligations / duties



Further comments

Electricity labelling

- To enable consumers to know the environmental impact of the electrical energy they consume, their supplier must provide them, at least once a year, with a statement (i.e. label) of the energy sources used to produce the electricity they have supplied, as well as the environmental impact
- A predefined label must be used by each supplier in its external communication
- ILR is responsible for monitoring the information provided to consumers
- An Excel for reporting can be found on the ILR website ("Recensement de données auprès des des fournisseurs/ Formulaire relatif au système d'étiquetage de l'électricité: https://web.ilr.lu/FR/Professionnels/Electricite/Acteurs/Formulaires)

Reporting

- Each supplier must submit, by the deadlines set by the ILR, an annual report on its activities in Luxembourg. Downloadable forms are made available to suppliers on the Institute's website.

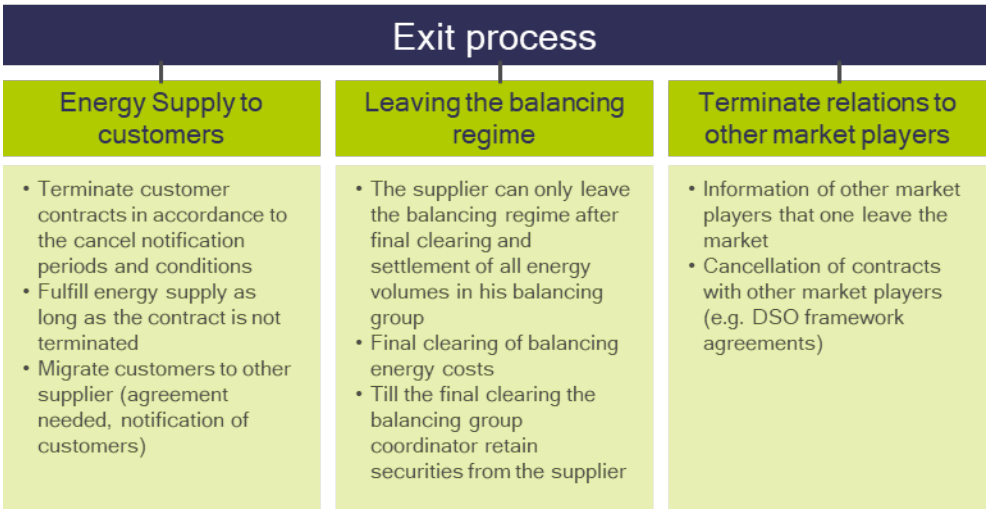
Energy efficiency

- A supplier is responsible for the distribution of the determined meter readings for all small-scale consumption connections for which he is registered as a supplier in the connection register
- Suppliers serving final customers are subject to an energy saving obligation
- Suppliers must achieve a cumulative energy savings target (expressed in terms of final energy consumption)
- The volume of energy savings to be achieved by each supplier is calculated according to its market share

- The obligated parties may fulfil their obligations by saving energy either directly or through third parties[28]

[28] Link to regulation: http://legilux.public.lu/eli/etat/leg/memorial/2015/170

9) Exit Process



Further comments

- Energy suppliers can leave the market, but they must fulfill their obligations in the role as energy supplier
- There are no penalties for leaving the market per se. Penalties might arise in case legal obligations are violated.
- Conditions for cancellation of bilateral contracts (e.g. with service providers or balancing responsible parties) are depending on the individual contracts

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