

Country Study - Belgium

1 Belgium in numbers

1.1 Economic and industrial structure

Belgium has an open and private-enterprise-based economy that capitalises on its highly developed transport network, central geographical location and diversified industrial and commercial base. Most of the country's industry is located in the region of Flanders, which consumes two thirds of the country's energy utilisation. With scarce natural resources, Belgium is an important importer of raw materials and is vulnerable to shifts in foreign demand.

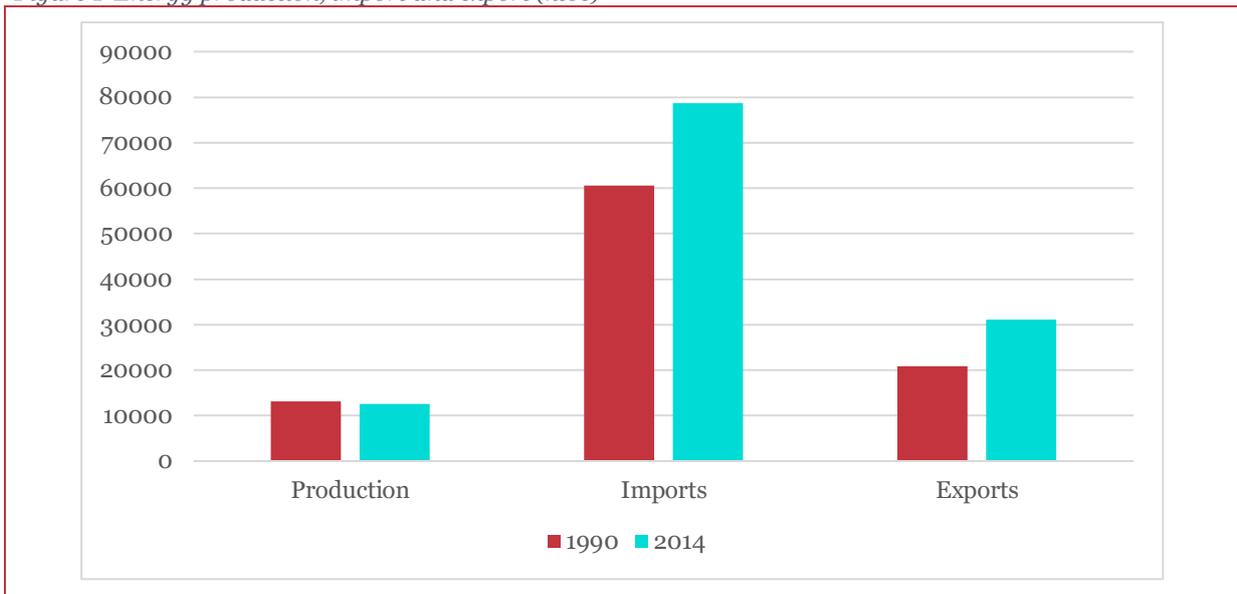
Belgium GDP reached €402 billion in 2014, translating to a GDP per capita of €35,998 (ranked 8th at EU28 level). After a flat GDP growth in 2013, Belgium economy managed to recover with a settled real growth at around 1,3% in the years 2014, 2015 and 2016 (estimated).

In terms of sectoral activity, the Belgian economy has become ever more service-oriented, with services driving economic growth. The GDP composition by sector is largely dominated by services, which represent about 77% of total economic activity, compared with 17% and 6% for the industry and construction sectors respectively. Finally, primary activities represent less than 1%. In terms of employment, the deindustrialisation is also largely visible with 80.1% of the country's labour force in the services sector, 18.6% in industry and 1.3% in agriculture.

1.2 Main indicators on energy generation and usage

Given its geomorphological situation, Belgium is highly dependent on imports (currently around 90%). It has no fossil fuel resources, no natural gas and phased out its coal production a long time ago, hence the only energy it produces comes from its renewable energy sources. In Figure 1, we can observe that the energy production in Belgium has slightly decreased, while both energy imports and exports have largely increased (respectively by 29.75% and by 49.39%). From 1990 to 2014, the total final energy consumption has raised by close to 25% (from 32.13 Mtoe to 40 Mtoe), while the production has decreased by 4.40%. This production decrease is explained by the slight reduction in nuclear energy production since 2013.

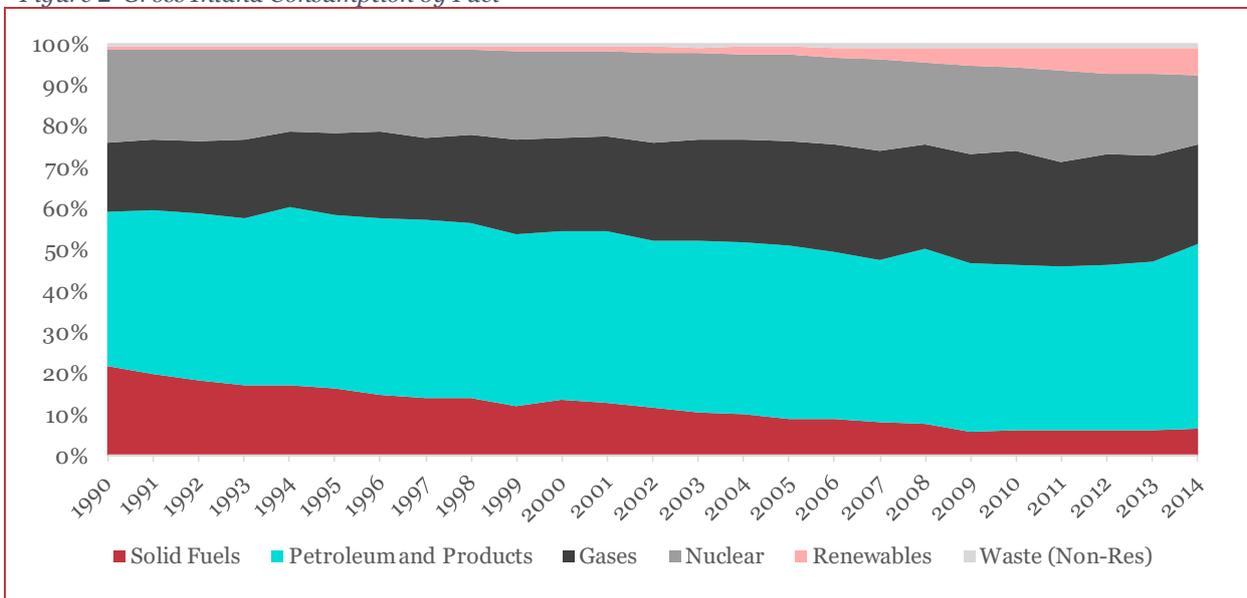
Figure 1 Energy production, import and export (ktoe)



Source: Technopolis Group, using data from IEA

The current Belgian energy mix consists mainly of oil products (45%), gases (24%) and nuclear (17%), as displayed in Figure 2. In the past 25 years, the major changes in the energy mix have come from the important reduction in coal use, the increased use of biofuels and the development of wind and solar power since 2002. Currently, Belgium has the 10th highest share of solar energy among the members of the International Energy Agency (IEA, 2016).

Figure 2 Gross Inland Consumption by Fuel

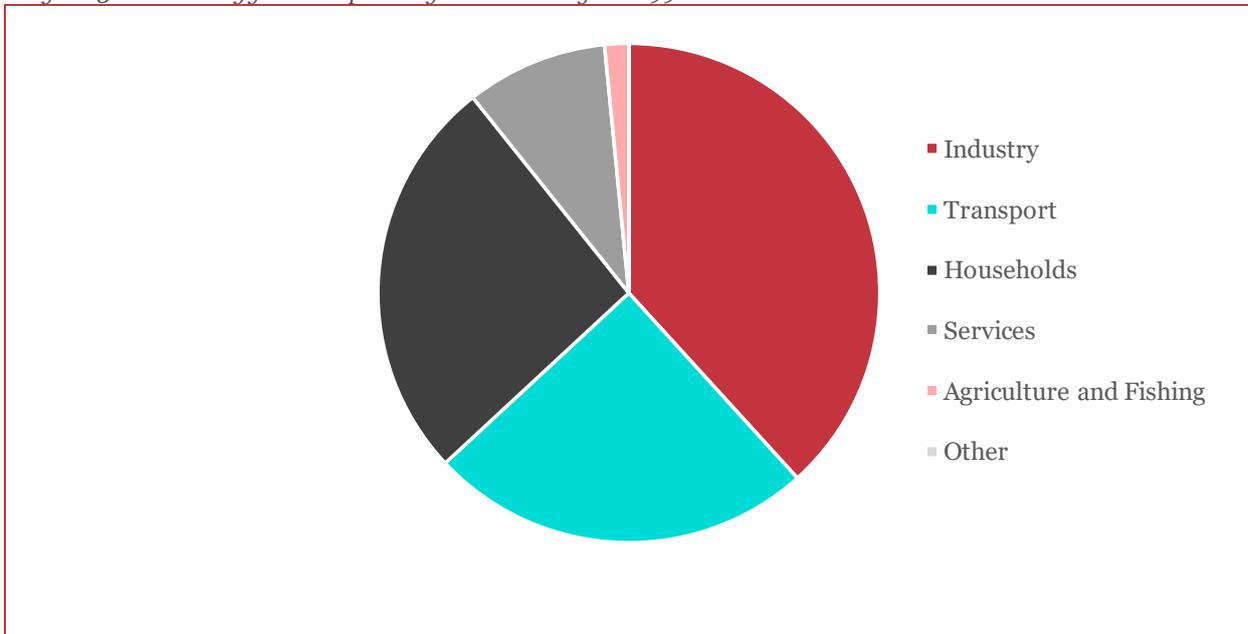


Source: Eurostat

Industry is the largest energy consumer in the country, accounting for 34% of the final energy consumption. It is followed closely by transport (29%) and then by household consumption (22%). In the past 25 years, the energy consumption by the industrial sector has been relatively stable while transport has increased its consumption by around 25%. Household

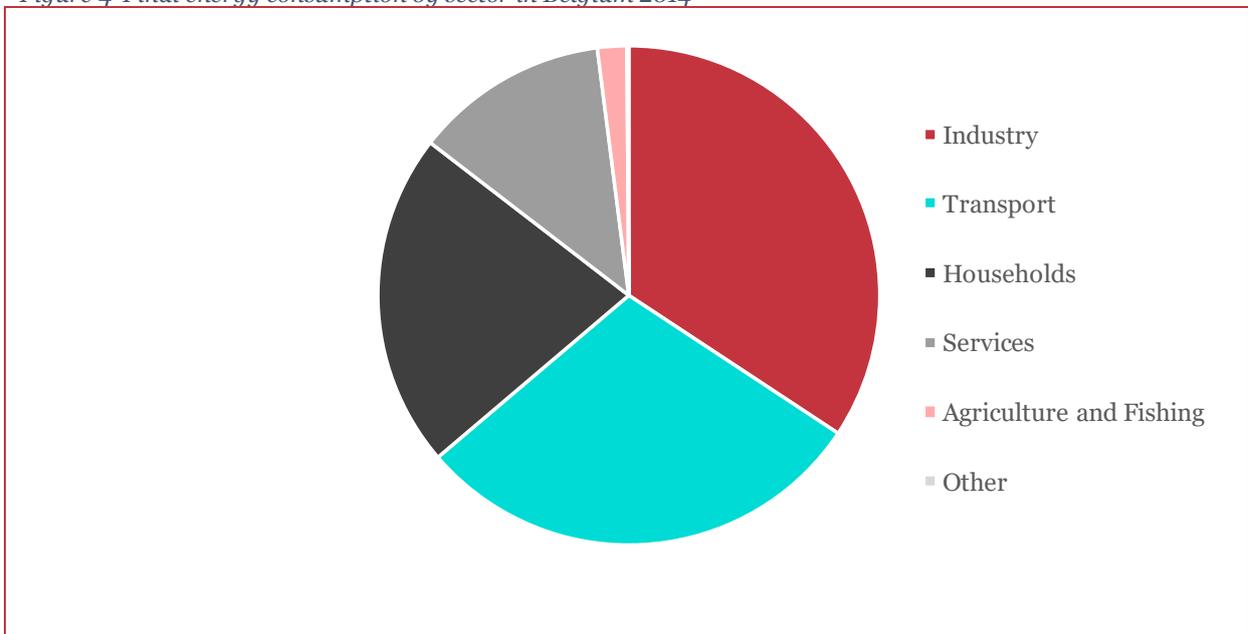
consumption has been fluctuating since 1990, and a clear trend cannot be drawn just looking at the last years.

Figure 3 Final energy consumption by sector in Belgium 1990



Source: Eurostat

Figure 4 Final energy consumption by sector in Belgium 2014

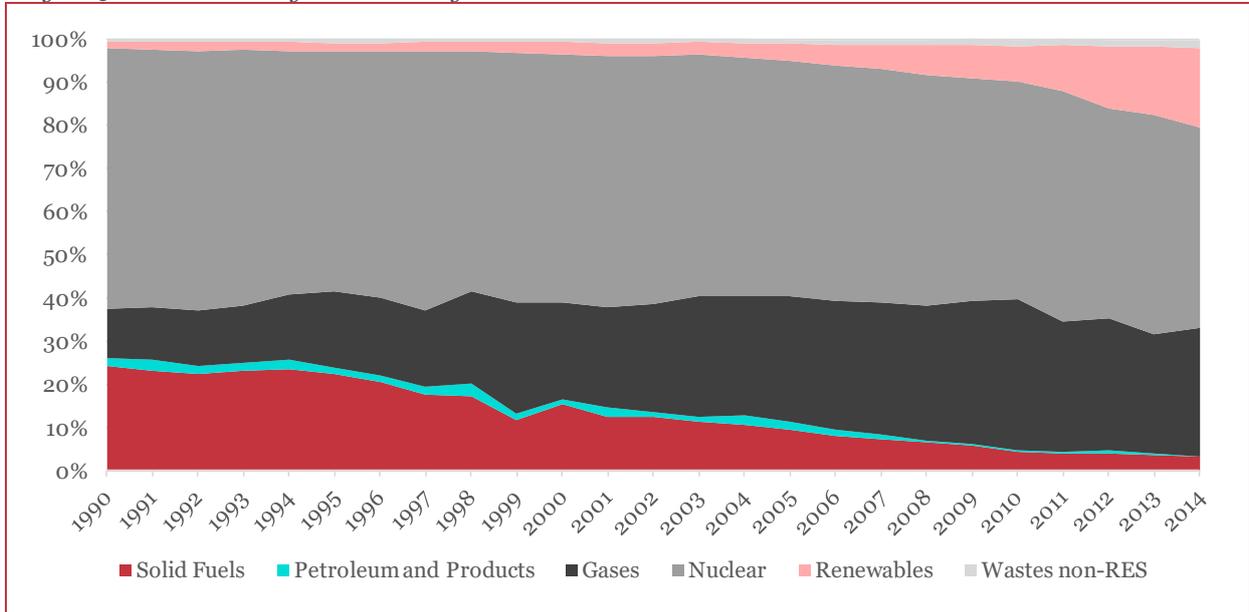


Source: Eurostat

Looking more precisely at the electricity generation mix, one can see that nuclear power generates an important part of the Belgian electricity (46.4%), while gases (29.5%) and renewables sources (18.4%) are the other major sources used. This dependency on nuclear power generation is an important factor of the energy transition in Belgium, as we will see further in the report. It is also worth mentioning that the share of renewables electricity

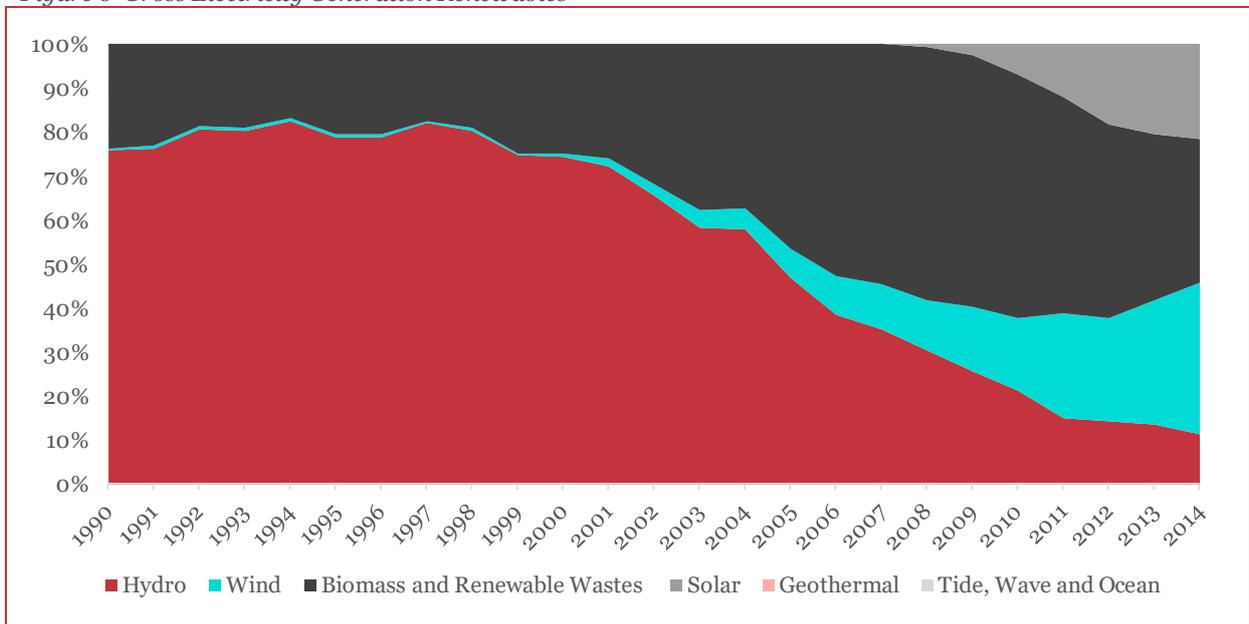
generation has risen from 8.2% to 18.4% from 2010 to 2014, which was due to an increase in renewable electricity production (from 7,9TWh to 13,4TWh) and a reduction of the total electricity generation at the same time.

Figure 5 Gross Electricity Generation by Fuel - TWh



Source: Eurostat

Figure 6 Gross Electricity Generation Renewables



Source: Eurostat

2 Culture and history around energy policy

2.1 Policy history, informal rules and structures, events that shaped the country's energy transition

The following section describes the major decisions and policy changes that have shaped Belgium's energy transition. Also, it presents the drivers of change and barriers to the energy transition and discusses the place of energy and climate issues in the public debate.

2.1.1 Events that shaped the country's energy transition

European, national and regional decisions intertwine in the Belgian energy policy landscape. We identified four major events that shaped the country's energy transition until now.

- In order to understand the current energy policies in Belgium, one has to go back to the second reform of the State in 1980 (and the following one from 1988). This reform gave birth to the Flemish and Walloon Regions and divided the policy competences between the Regions and the Federal level. Among other competences, energy policies were to a large extent delegated to the Regions, only a few competences were kept at Federal level (including high voltage transportation, nuclear energy cycle and energy rates). The 3rd constitutional reform from 1988 gave birth to the Brussels Capital Region, that also received regional policy competences under its jurisdiction. These reforms have shaped the political landscape and the way energy policies are made until today.
- The second major event that shaped the energy policy scene was the law from 29 April 1999 following the Directive concerning common rules for the internal market in electricity 96/92/EC¹. This law acted the market liberalisation of the electricity and gas markets and the separation of the activities of production, transport and distribution. The sector, that had long relied on a loose legislative base in which many decisions were made by conventions, was now framed by the federal and regional decisions. As Declercq & Vincent (2000) said, "it was the regulation of the deregulation".
- In 2001, the European Union issued the Directive on Electricity Production from Renewable Energy Sources 2001/77/EC² (superseded in 2009 by the Renewable Energy Directive) which promoted renewable energy use in electricity generation. It was an important step towards energy transition as it set national targets for renewable energy production. The directive was transposed at the regional level in Belgium and, from 2002 onwards, it opened the way to subsidies in renewable energies.
- Finally, the law from 23 January 2003 stipulated the phase-out of nuclear energy production in Belgium. It scheduled it to progressively close down power plants from 2015 to 2025. The presence of Walloon and Flemish Green political parties in the government from 1999-2003 was pivotal to the decision on the nuclear phase-out. They set the nuclear phase-out as a condition to join the government coalition led by the former Belgian prime-minister Guy Verhofstadt.

2.1.2 Drivers of change and barriers to the energy transition

There are barriers and drivers to the energy transition, and it is important to identify those to understand what drives the transition and what slows it down.

¹ More information at: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31996L0092&from=FR>

² For more information: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32001L0077&from=FR>

Based on interviews and desk research, we identified three types of barriers and drivers to the energy transition decisions and, for each type, we identified the factors or actors that foster the transition, and those that slow it down. The following give an overview of the main drivers and barriers to energy transition in Belgium:

1. The Stakeholders:

The stakeholder’s influence is very important in the Belgian energy system; their actions and interactions together and with the government can have major impacts on the energy policy decisions. On the drivers’ side, we find a wide and heterogeneous range of actors, from NGOs to political green parties and energy cooperatives. On the barriers’ side, we find mainly stakeholders from the private sector: energy intensive industries and business federations, while unions also play a role. In the past 15-20 years, the biggest decision in the energy sector were influenced by the historic industrial actors who had important stakes in the energy sector. These actors are the energy suppliers (e.g. electricity, gas, oil), and the energy intensive industries (chemical sector, iron and steel, manufacturing (now Agoria), etc.). The role of each stakeholder and their level of power and interest are discussed in the 4th section.

2. The Political factors:

The institutional and political framework frequently came up in the interviews as a major factor of influence. Unanimously, the lack of a common political vision and the tergiversations on the nuclear phase out were identified as two major political barriers to the energy transitions. The existence of conflicting or inadequate regulations came out as another political barrier. For example, the fiscal advantages given to company cars are very counter-productive, although the first objective of the measure is unrelated to energy policies.

Regarding the political drivers, the European Union plays an important role as a motor of the regulations towards the transition. Interestingly, the innovation framework in Belgium was also identified as a driver. Experimentation is assisted by innovation policies through funds that are made available for innovation in fields related to the energy transition (notably through the Marshall Plan in Wallonia or through European funds) and through other innovation policies, discussed in section 3.

Table 1: Drivers and barriers to the energy transition

	<i>Drivers</i>	<i>Barriers</i>
Stakeholders	NGOs, Some municipalities, Cooperatives, sustainable energy industry, Green parties...	Energy intensive industries, business federations, unions...
Political factors	European Union directives towards the energy transition Innovation framework	Lack of a common political vision Delay of the nuclear phase-out Conflicting regulations
Environmental factors	Other concerns (such as air pollution)	Urban sprawl, population density

3. The Environmental factors:

These are the physical or human factors that have an influence on the transition. On the one hand, the urban sprawl and high population density act as a barrier to the transition. Town and country planning decisions of the past imply lifestyles that are incompatible with the

energy transition. In addition, the high population density in Belgium hampers the development of wind turbines, often undesired by the local populations. On the other hand, other environmental issues that are not directly related to the energy transition also play a role. For example, air quality and health issues push the government to question transport policies, hence turning to greener transportation modes.

2.1.3 *Climate and energy in society*

- Climate and energy as political topics:

According to our interviewees, the political interests and the interests of the major energy providers and consumers are largely intertwined. The politicians in place do not see the energy transition as a major concern and have a short-term vision. Energy transition is only really put into the political agendas when Green parties get into the federal or regional governments. The decisions on energy policies seem to be often dictated by the energy sectors, and especially by the old monopolistic energy providers. Although the energy minister sets some objectives regarding the energy transition, they remain vague and are not translated into a clear vision of the transition along with a strategy.

In Belgian politics, the climate debate is an overarching question that parties often use to position themselves regarding other debates: energy, environment, mobility, immigration, scientific research, development aid, etc. Hence, the energy discussions are often tied to the climate discussions. Regarding the engagement of the political parties on climate change issues, Piet (2015) finds a major drawback in the 2014 election, after a voluntaristic period.

- Climate and energy in the public debate:

Climate and energy are two subjects very present in the public debate. As an interviewee pointed out, each day up to 6-7 new press articles on energy issues can be found in the main Belgian newspapers.

Two energy subjects have particularly been debated in society these past years: (1) the nuclear phase-out, and (2) the energy security issues (both being interrelated). Firstly, the current state of the nuclear plants and the phase-out schedule are often debated in the media, among politicians and by the civil society. Secondly, the threat of an energy black-out following the phase-out is also often raised by the media.

The Public opinion is highly influenced by media and lobbying groups (e.g. Nuclear Forum). From the citizens' point of view the choice of primary sources of energy is often an indirect consideration. Their focus is more on the availability and price of energy. Their considerations on the primary sources of energy come from the considerations on environmental impacts such as climate change, pollutions and the impacts on landscapes. Nevertheless, there is a message carried out by cooperatives, civil society associations and other alternative actors in favour of a new way to control the economy. This message has some outreach on the public opinion and pushes in favour of renewable energies.

It is important to point out that the focus on 'energy' is lower than the attention for 'Climate', given the higher visibility given to climate change (e.g. the yearly UNFCCC COPs, the IPCC reports, media coverage, etc.). Generally, renewable energy projects attract local attention

when these directly affect them (e.g. wind turbine installation; subsidies for Photovoltaic panels; etc.).

3 Formal rules and instruments

As mentioned earlier, the Belgian energy policy is divided into two competence levels: the Federal level, and; the regional level (Wallonia, Flanders and Brussels-Capital regions). Following the Belgian Constitution revision of 1980, regional competences were extended in several areas, including energy. The regional energy policies cover, among others:

- distribution and local transmission of electricity through networks with a nominal voltage lower or equal to 70,000 volts;
- public distribution of gas;
- district heating distribution networks;
- new energy sources with the exception of those related to nuclear energy;
- energy recovery by industries and other users;
- the rational use of energy.

At Federal level, the energy policy competences include all matters where technical and economic indivisibility requires equal treatment at the national level, namely:

- The national equipment plan for the electricity and gas sector;
- the nuclear fuel cycle;
- large storage infrastructure (gas), transport and energy production;
- the energy rates.

3.1 Laws and regulations

In terms of climate and energy policies, Belgium follows the European objectives and transposes them into national and regional objectives (IEA, 2016). The most important documents with regard to the laws and regulations influencing the energy transition are the regional action plans and the national climate plan. These pluri-annual plans expose the measures on climate and energy for the following years. While Belgium sets itself some national objectives in line with the European ones, the division of the effort between the three regions is debated and a burden sharing agreement is negotiated. This can sometimes delay the policy making process. This section presents some of the recent plans at the national and regional level.

- The **National Energy Efficiency Action Plan “NEEAP” 2014** is the national transposition of the Energy Efficiency Directive 2012/27/EU and sets the national target of an 18% reduction in primary energy consumption compared to the projections for 2020 (equivalent to a reduction of 9,6 Mtoe). This plan gathers the plans made by the regional authorities (every region has to develop its own energy efficiency action plan) and the federal policy measures. The competent bodies for control and supervision of the energy policies are: the DG Energy of the SPF (the Federal Public Service) of Economy at

the Federal level; the Brussels Institute for Environmental Management for Brussels-Capital Region; the Department for Energy and Sustainable Building from the Operational Directorate General of the Walloon Public services for Wallonia, and; the Flemish Energy Agency for Flanders.

The “*Third Walloon energy efficiency action plan*”, the “*Third energy efficiency action plan of the Brussels-Capital Region*” and the “*Third Flemish energy efficiency action plan*” are built on the NEEAP, and propose a more encompassing set of policy measures. These plans include additional specific targets for each region and present their policy measures³. Although measures are specified by sector, they are rarely quantified. There are quantitative objectives for building in the three regions (100% of newly constructed building energy neutral in 2020 in Brussels Capital Region and Wallonia, 75% in 2018 in Flanders), and in Brussels Capital Region for transportation (a decrease of 20% of traffic by 2020).

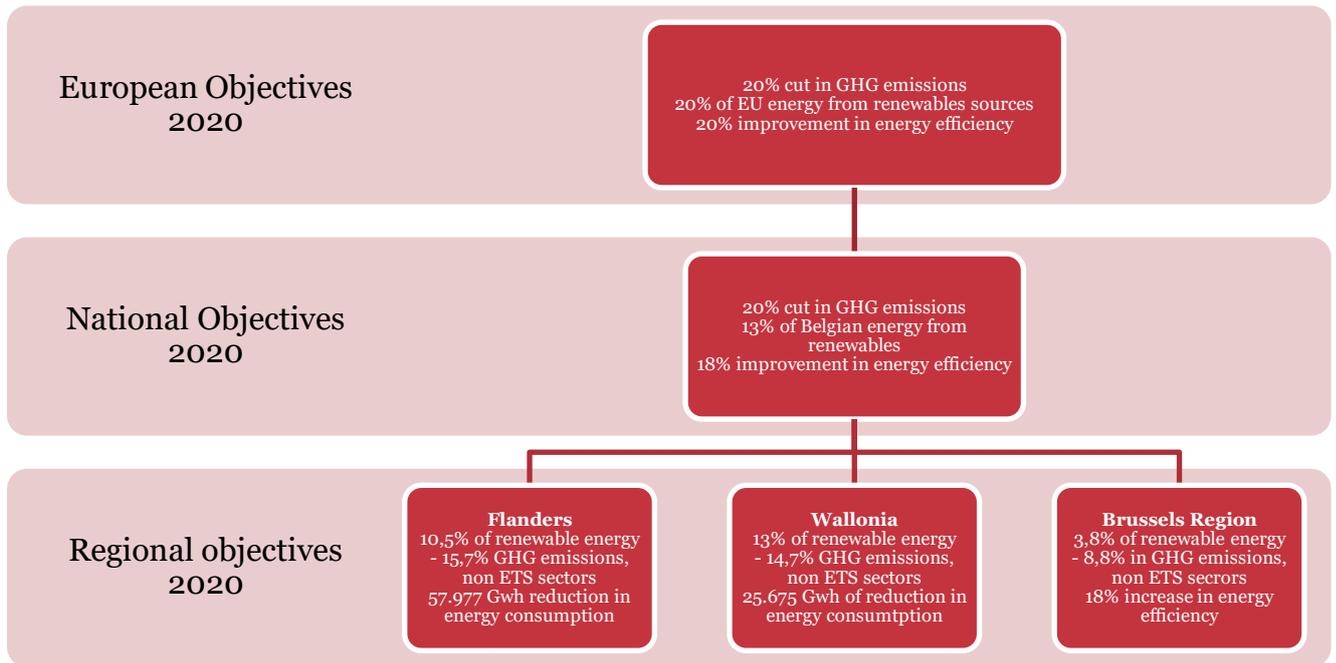
- The **burden-sharing agreement on Climate efforts** was reached in December 2015 after long deliberations. It covers: the GHG emission reductions in non-ETS sectors; objectives for renewable energies; revenues from ETS auction sell, and; international financing of the climate fund. The agreement splits the efforts needed to reach the European Energy-Climate Package. As a consequence, it sets the regional objectives for renewable energy development and GHG emissions reductions in non-ETS sectors, which can be found in Figure 7.

The **Air-Climate-Energy plan** for Wallonia and for Brussels-Capital Region and the **Action plan** of the Flemish Energy Agency set out the policy measures designed by each region to reach the objectives.

Figure 7 summarises the different objectives at the European, national and regional levels for 2020. The burden sharing between the regions is very apparent here.

³ For more information: <https://ec.europa.eu/energy/sites/ener/files/documents/Belgium%20NEEAP.pdf>

Figure 7 Belgium energy efficiency objectives



Source: Technopolis Group

The objectives at the horizon 2030 follow the commitments made by the European Union:

- -40% GHG emissions, 27% renewable Energy, 27% Energy efficiency, 15% interconnection
- -43% of GHG emissions (compared to 2005) for sectors under ETS and -30% (compared to 2005) for sectors not covered under ETS.

The burden-sharing agreement only covers the efforts for the 2020 objectives and does not mention those for 2030. Similarly, the regional action plans specific objectives are not formulated by energy function and the policy measures seldom do not go further than the 2020 timespan. The objectives set are vague and expressed in terms of indicators rather than actual energy consumption. Hence, looking at the objectives per energy function at the horizon 2030 (and further) is not relevant for the Belgian case.

Targets for 2050 are currently at the stage of scenarios. Prospective studies attempt to identify the different scenarios to meet the European goals on GHG emissions reduction and the measures each scenario implies.

3.2 Energy policy and instruments

In the following section, we present the main policy instruments put in place in Belgium at the different jurisdictional levels. The policy instruments have been classified by energy function (space heating, industrial heat, transport and electrical power). When policy instruments target all energy functions we have included them in a specific subsection devoted to pluri-sectoral instruments.

On top of the energy function distinction, policy instruments are also categorised by:

- Type of policy instrument (economic, informational, regulatory, R&D driven or voluntary);
- Implementation year;
- Jurisdictional level (Federal or Regional); and
- Policy nature (Energy Efficiency “EE” and/or Renewable Energy “RE”)

Overall, there is in Belgium a huge package of initiatives put in place at both the Federal and Regional levels. Table 2 gives an overview of the main findings per energy function. It is interesting to note that among the economic instruments that are put in place, only two are taxes; all the others work as “reward” instruments for good practices.

Table 2 Overview of policy instruments per function

<i>Instrument</i>	Space heating	Industrial heat	Transport	Electrical power	Multi-sectoral
Economic	9 instruments, including: tax reductions, energy subsidies schemes	One specific instrument found in Flanders	Several measures targeting freight, biofuels and road vehicles	7 instruments mainly supporting green electricity production	12 instruments, from all regions and federal level
Information, education, networks	4 instruments	--	One measure at Federal level (eco-friendly vehicles)	5 instruments (e.g. labels, information networks)	Federal and regional action plans and programmes
Policy and regulations	Energy renovation programme in Flanders	Access to grid regulation	Two regulations targeting biofuels	5 regulations mainly targeting green electricity generation	Federal and regional energy policy initiatives and action plans
Research and development	One support scheme in Flanders	Energy fund for research in Wallonia	--	Energy fund for research in Wallonia	Innoviris (Brussels)
Voluntary instruments	1 measure found	--	EE initiatives (e.g. car sharing)	2 measures found	2 measures at regional level

Some examples of successes and failures of policy instruments targeting energy transition have been discussed during the case study interviews. The main messages are described below:

- The **Green certificate system**⁴ has been established to promote electricity generation from renewable sources. It is a quota system established at the different regional levels that imposes a share of the electricity sold to come from renewable sources, while ensuring a minimum selling price for the generation of certain renewable electricity technologies. As mentioned during the interviews, this measure presented some clear advantages, such as:
 - support for renewable energies compatible with the opening of electricity market;
 - control the evolution of the renewable electricity sector by determining the quota achieved in a specific area;

⁴ For more information: http://www.apere.org/manager/docnum/doc/doc81_Certvert.pdf

- encourages lower prices for renewable energies.

However, this system also presented many disadvantages, acting as a barrier to achieve an optimal energy transition. For example, the system did not differentiate appropriately between technologies. Technologies that are “cheaper” make significant profit while those developed recently have no margins. In other words, there was no incentive to invest in the creation of new technologies for renewable energy production. Reforms to tackle those pitfalls have been ongoing for several years.

In addition, the system lacked flexibility and did not adapt quickly enough to the fall of the price of green certificates. This incurred large costs for the system operator and these costs were eventually paid by the final users (Collard, 2012).

- Similarly to the problem raised for the Green Certificates Scheme, the **poor calibration** of some policies can become a barrier. For example, the calculations of the PEB (Buildings’ energy performance) hardly take into account decentralised sources of heat, so when district heating is installed, PEB points are lost even if the district heating actually reduces the energy consumption. Equivalently, the designed subsidies for greener transportation modes are, to some extent, controversial. It is for instance possible to receive subsidies to buy a luxurious electric car, but not to buy an electric bicycle.
- As mentioned in section 2, the **innovation framework** is favourable to the energy transition in Belgium. Although the innovation policies are not always directed to energy related research and thus not counted as energy policy instruments, our interviewees pointed them as important drivers of the transition. Two main instruments were identified.
 1. The innovation subsidies at the regional and European level help develop research and development related to energy efficiency and renewable energies.
 2. The establishment of “experimental zones” in which pilot projects can be tested. This instrument is currently being discussed; the Flemish energy minister is working on a decree to establish such zones. In those zones, the regulatory barriers will be made less stringent so that new technologies and business models that could foster the transition will be implemented more quickly.⁵

The policies create some room for experimentation and creating more room is in the political agenda. However, the innovation policies are currently mainly centred on R&D and innovating industries are calling for some assistance also in the launching and commercialisation of new products.

- **Branch agreements** have had very positive results. They gather large numbers of industries and propose a global approach to energy issues for industries rather than an individual one. They have boosted the energy transition on industrial sites and there is some political will to work further with that instrument.

⁵ For more information: <http://www.tommelein.com/minister-tommelein-opent-energyville-en-werkt-aan-regelluwe-zones/>

3.2.1 Space heating

Table 3 Overview of policy instruments targeting Space heating

Instrument	Policy title	Year	Authority	Policy nature
Economic	Tax deduction for roof insulation	2004	Federal	EE & RE
	Energy Subsidies	2004	Brussels	EE
	Grants supporting solar energy	2007		RE
	Subsidies for energy in tertiary sector buildings	2007		RE
	Property Tax Reduction	2009	Flanders	EE
	Building renovation	2007 (amended 2009)		EE
	Soltherm (strategy for solar water heating)	2000	Wallonia	RE
	Subsidy scheme for households supporting energy saving measures and housing refurbishment	2015		EE & RE
	UREBA Subsidies to Improve Energy Efficiency of Public Buildings	2000 (updated in 2014)		EE & RE
Information & Education	Zero interest green loan	2008	Federal	EE
	Advice and support for building professionals: The Facilitator network	2008		EE
	Sustainable neighbourhoods contracts		Brussels	EE
	Energy Performance Certificate made mandatory	2008	Flanders	EE
	Information Networking on Energy Savings	2000	All regions	EE
Policy support	Flanders Energy Renovation Programme 2020	2007	Flanders	EE
Regulatory	Decree on wood pellets for non-industrial heating appliances	2011	Federa	RE
	Energy Audit Obligation	2012	Brussels	EE
	Energy Performance Certificate	2011		EE
	Energy Performance of Buildings regulation	2006	Flanders	EE
	Outline agreement for telemetric (sub)metering and an energy accounting platform			EE
Research and development	Support scheme for renewable heat and the production of biomethane	2013	Flanders	RE
Voluntary	EMAS for Federal Administrations	2005	Federal	EE

3.2.2 Industrial heat

Table 4 Overview of policy instruments targeting Industrial heat

Instrument	Policy title	Year	Authority	Policy nature
Economic	CHP Certificates. Encourage combined production of heat and power.	2004	Flanders	EE

Instrument	Policy title	Year	Authority	Policy nature
Regulatory	Access to the Grid (Renewables and CHP)	2000	Federal	EE & RE
Research and development	Energy Fund - Supported Research	2003	Wallonia	EE & RE

3.2.3 Transport

Table 5 Overview of policy instruments targeting Transport

Instrument	Policy title	Year	Authority	Policy nature
Economic	Excise Tax Reduction for Biofuels	2006	Federal	RE
	Supporting alternative mobility - the Bruxell'Air bonus	2006	Brussels	EE
	Freight Transport Infrastructure Investment	2010	Flanders	EE
	Registration tax for vehicles according to emission and euronorm parameters	2012		EE
	Kilometer tax for freight road transportation	2016	Federal	
Information & education	Choosing an eco-friendly vehicle: The ecoscore	2005	Federal	EE
Regulatory	Law of obligation for the incorporation of biofuels in fossil fuels	2009	Federal	RE
	Decree on biofuel product norms	2011		RE
Voluntary	Carpooling & Car Sharing	1998	All regions	EE
	Transport Planning in Businesses	2006		EE

3.2.4 Electrical power

Table 6 Overview of policy instruments targeting Electrical power

Instrument	Policy title	Year	Authority	Policy nature
Economic	Energy subsidies	2004	Brussels	EE
	Grants supporting solar energy	2007		RE
	Subsidies for energy in tertiary sector buildings	2007		RE
	VIREG (the Flemish Agency for the Rational Use of Energy) subsidy	1997	Flanders	RE
	Provincial and municipal grants for solar energy			RE
	SOLWATT	2008	Wallonia	RE
	Green Certificates Scheme	2002	All regions	RE
Information & education	Electric Appliance Labelling	2004	Federal	EE
	Energy Guzzlers Website (Energivores/energievreters)	2006		EE
	Sustainable neighbourhoods contracts		Brussels	EE

Instrument	Policy title	Year	Authority	Policy nature
	Advice and support for building professionals: The Facilitator network	2008	Flanders	RE
	Information Networking on Energy Savings	2000	All regions	EE
Regulatory	Offshore Domanial Concessions for Wind and Ocean Energy Production	2004	Federal	RE
	Ecodesign implementation	2009		EE
	Green Certificate Scheme	2003 (last amended 2014)		RE
	Access to the Grid (Renewables and CHP)	2000		EE & RE
	Apply PEB Requirements Comparable to the Passive Concept for All New Constructions by 2015	2015	Brussels	EE
Research & development	Energy Fund - Supported Research	2003	Wallonia	EE & RE
Voluntary	EMAS for Federal Administrations	2005	Federal	EE
	Local Action Plans for Demand-side Management (PLAGE)	2005	Brussels	EE

3.2.5 Pluri-sectoral policy instruments

Table 7 Overview of pluri-sectoral policy instruments

Instrument	Policy title	Year	Authority	Policy nature
Economic	Tax deduction for investments in energy efficiency & renewable energy by Enterprises	1992	Federal	EE & RE
	Public Procurement Rules for Federal Administrations and Public Services	2013		EE
	Technology subsidies	1991	Flanders	EE & RE
	Financial support for demonstration projects	1992		EE & RE
	Ecological investment subsidy	2007		RE
	Subsidies for companies investing in renewable energy	2002	Wallonia	RE
	Subsidies for Renewable Energy Investment	2005		RE
	Energ'ethic Communities (Commune Energ'éthiques)	2007		EE
	AMURE subsidies to support commercial and non-commercial companies acting for reducing their energy use and promoting a rational use of energy in the private sector	1990 (Updated in 2014)		EE & RE
	Subsidies for Energy Efficiency and Rational Use of Energy in private enterprises (AMURE)	2002 (Updated in 2014)		EE & RE
	Subsidies for energy efficient equipment	2004 (Updated every year)	EE	
	Economic Development Subsidies - Investments for Environment and Sustainable Energy Use - (Aides UDE)	-	EE	
Information & education	National Renewable Energy Action Plan (NREAP)	2010	Federal	RE
	Regional Circular Economy Programme (RCEP)	2016	Brussels	EE

<i>Instrument</i>	<i>Policy title</i>	<i>Year</i>	<i>Authority</i>	<i>Policy nature</i>
	Wallonia's 1995 Environment Plan for Sustainable Development	1995	Wallonia	RE
Policy support	National Climate Plan	2002	Federal	EE
	National Action Plan on Energy Efficiency	2008		EE
	Energy efficiency target declared by Belgium under the EU Directive (2012/27/EU)	2013		EE
	Air, Climate, Energy Plan	-		EE
	Flemish Climate Fund	-	Flanders	EE
	Flemish Climate Policy Plan 2013-2020	-		EE
Regulatory	COBRACE (Brussels Air, Climate and Energy Code - Code bruxellois de l'air, du climat et de la maîtrise de l'énergie)	2013	Brussels	EE
	Energy Auditing - Wallonia, Flanders & Brussels-Capital	1999	All regions	EE
Research and development	Innoviris	2004	Brussels	EE
Voluntary	Entreprise Ecodynamique (Ecodynamic Company)	1999	Brussels	EE
	Voluntary Agreements with industry	2001	Wallonia	EE

4 Interaction and governance

As previously mentioned, the Belgian energy policy competences are shared between the different institutional layers - federal and regional. The regional level plays a major role and the absence of a common national energy vision and plan increases the level of uncertainty on how and when Belgium, as a country, will move at full speed towards its energy transition.

The energy stakeholders' nature, position on energy transition and influence varies considerably depending on their interests and needs in terms of energy supply or demand. How they will lobby and to whom is also significantly different from one to another, depending on both the government decision level and their energy interests.

When looking at stakeholders placed on the “supply” side of energy functions, several stand out for their strong dominant positions and capability to reach and influence the political sphere. The electricity (excluding renewables) and fuel sectors are controlled by large companies that defend their dominant position and that keep on “delaying” the energy transition. One concrete example of their influence is translated in the repeatedly postponed nuclear phase-out, which is a major blocking factor for investors and developers in new energy solutions.

Unlike the above-mentioned sectors, renewable energies are mainly represented by SMEs and are pushed by a combination of citizen movements, outsider companies and municipalities. Energy cooperatives are increasing, and stand for the acceptability and development of renewable energy production. The support of the municipality is needed in order to develop local plans of renewable energy, however, not all municipalities are engaged in energy transition as they are still influenced by the electricity incumbent.

On the “demand” side of energy functions, industrial stakeholders are driven by different interests. The industrial sector is represented by both (1) companies that are high energy consumers, thus driven by cheap prices and careless of the energy source, and (2) companies that foresee the opportunities that alternative energy sources will bring (renewable energies, new services, new technologies), SMEs are more represented under this category. In the building sector, there are growing movements carried by the new generation of architects, which are more and more incorporating energy efficient design in new buildings. In the transport sector, especially within the freight corporations, a strong lobby is made in favour of legislative stability and cheap fuel prices. Belgium recently implemented a kilometre tax for freight road transportation; the measure was difficult to put in place as a result of the strong opposition made by the freight lobbies.

Table 8 Stakeholder type mapping by interest on energy transition and influence power

	High power	Medium power	Low power
High interest	Major energy producers Historically powerful industries	Trade Unions, Environmental umbrella organisations, Clusters with focus on renewable energy or energy efficiency (e.g. TWEED), Universities	CAN, Climaxi, GreenPeace, REScoop...
Medium interest	Municipalities	WWF	
Low interest	Governments		

As presented in Table 8, several stakeholders such as industry, NGOs, energy cooperatives and government at various levels shape Belgium’s energy transition ecosystem.

The Belgian energy market is controlled by the big industrial players “*high power stakeholders*”, whose main concern is to keep the price of electricity as low as possible. Since the liberalisation of the electricity and gas market, the central business model of the energy sector started disintegrating and new opportunities grew for diverse actors and initiatives. However, the energy incumbents have pursued a centralised renewable energy transition approach (large wind parks, photovoltaic stations rather than roof panels) and, as stressed by our interviewees, the industrial sector still dictates most of today’s policies, which still hinders the development of alternative energy production models, such as the energy cooperatives. This results in a trade-off between a transition model centred on the traditional energy producers and the new-comers in alternative energy sources “*less powerful stakeholders*”.

Despite the growing interest for energy matters and public debates on energy transition and climate, the government (at federal and regional level) has other priority duties than energy (e.g. social matters and employment). At the level of municipalities, local action is needed to bring forward renewable energy plans, and a growing number of local authorities have signed up to the “*Covenant of Mayors for Climate & energy*”⁶.

⁶ The Covenant of Mayors for Climate and Energy brings together thousands of local and regional authorities voluntarily committed to implementing EU climate and energy objectives on their territory.

For more information: http://www.covenantofmayors.eu/index_en.html

Trade Unions have access to politicians and also take part in the energy transition debate, however, despite having a general vision in favour of energy transition, they remain conservative in their acts and jobs' protective. NGOs have access to media and politicians, they are also able to lobby, but with very limited power in comparison to industry.

In Belgium, the consultations on energy items have long been conducted only with the major energy producers and consumers. However, since the liberalisation of the electricity and gas market, things have changed to some extent and public hearings and measures to include other stakeholders are being taken. Some efforts are made by the regional governments to increase the representativeness of the consultation groups. Examples of such are presented below:

- The Flemish government has established policy stakeholder groups, for specific topics where the opinion of consumers is needed (e.g. smart metering and smart grids). For example, there is an initiative called Stroomversnelling⁷, which works with different stakeholders' groups and the whole playing field is represented and consulted (scientific and technological stakeholders, consumer panels, etc.).
- The Walloon government, together with the relevant public administration, organises working groups on specific agenda items related to climate and energy. Under this "*preparatory work to future policy measures*", meetings are organised with several civil society actors. The stakeholders invited to these meetings are generally business federations, associations and NGOs. Stakeholders are encouraged to react on the debated texts and propose modifications.

As reported by our interviewees, some agenda items, categorized as sensitive (e.g. tender for a biomass plant), will not see major modifications and are just opened to public for the sake of transparency. However, some working groups are specifically organised because a real consultation and cooperation with economic actors is needed in order to come-up with a political measure (e.g. the zero-energy buildings measure).

4.1 Stakeholders groups and individuals that stand out because of their initiatives and intentions

Founded in 1905, **Electrabel** is Belgium's historical producer and supplier of electricity, also active in the Benelux market (with over 6 million customers). In 2014, it held 66% of the generating capacity in Belgium (this percentage was as high as 85% in 2007). Most importantly, Electrabel controls the nuclear power plants in Belgium (they own fully two plants, 89.8% of four units and 50% of the last one) and is hence in the centre of the discussions regarding the phase-out and the nuclear rent (IEA, 2016). Furthermore, Electrabel is a subsidiary of Engie (former SUEZ / Gaz de France).

Belgium has four umbrella environmental associations that represent the organisations that work for the environment preservation, these are: **Bond Beter Leefmilieu Vlaanderen** (Flanders); **Fédération inter-environnement** (Wallonia); **Inter-Environnement Bruxelles** (Brussels Region, French) and; **Brusselse Raad voor het Leefmilieu** (Brussels Region, Dutch). These associations are composed mainly of volunteers, they defend citizens' political choices and are respectful of what constitutes Belgium's common heritage. The associations stand for a sustainable development and fight against harm to the

⁷ For more information: <http://www.stroomversnelling.vlaanderen/>

environment, whether at the local, regional, federal and even European level. Their actions aim to integrate the environment in all sectoral policies, alongside the social, economic and cultural dimensions, in particular by ensuring that the environment is further included in the legal texts and policy choices.

The **APERe** is an independent association that accompanies, since 1991, citizens and territories that seek for an energy independence that is sustainable and positive for the environment. The APERe puts its expertise at the service of all citizens, schools, municipalities, cooperatives, government, media and energy professionals with activities such as: information campaigns, training courses, conferences, events, etc.⁸

The **Organisation for Sustainable Energy** “*Organisatie Duurzame Energie ODE*”, is the sector organization for renewable energy in Flanders. ODE brings more than three hundred companies, knowledge centers, universities and organizations together in technology platforms and working groups, to share knowledge and to do advocacy. ODE is the main stakeholder on renewable energy to the authorities concerned.⁹

The **Cluster TWEED** “*Walloon Technology Energy - Environment and Sustainable Development*” is a Walloon organization bringing together over a hundred companies active in the sustainable energy sector. The Cluster plays a major role in the business development of sustainable energy areas such as: renewable energy; energy saving processes; greenhouse reduction; etc.¹⁰

Citizens and renewable energy cooperatives are represented by the *Belgian federation for renewable energy cooperatives*, **REScoop.be**¹¹. REScoop’s main vision is to have citizens at the core of the energy transition, and thus acts as the voice of Belgium citizens and renewable energy cooperatives to policy makers. At regional level, two branches exist and cooperate to take-up this role, *REScoop Wallonie* in Wallonia and *REScoop Vlaanderen* in Flanders.

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⁸ For more information: <https://www.apere.org>

⁹ For more information: <http://www.ode.be/>

¹⁰ For more information: <http://clusters.wallonie.be/tweed-fr/index.html?IDC=1668>

¹¹ For more information: <http://www.rescoop.be>

6 Interviews

Table 9 Interviews overview

Name	Organisation	Interview date
Aviel Verbrugge	Professor University of Antwerp, Energy & Environmental Economist	Thursday 13 October
Pieter Lodewijks	Energyville, Technologie ontwikkeling	Monday 24 October
Michel Huart	Apere, ULB	Friday 21 October
Cédric Brüll	Technology of Wallonia Energy, Environment and sustainable Development	Thursday 20 October
Tom Williams	Ecopower	Thursday 20 October