Chapter 3: Belgium

3.1 Government Targets

The Belgian federal government's energy strategy is to be guided by the Commission Energy 2030 report, published in 2007. The report recommended a repeal of the 2003 act[1] which banned the building of nuclear power plants on the basis that Belgium's commercially exploitable reserves of renewable energy (RE), about 10,800 MW, cannot displace lost nuclear capacity, whilst simultaneously meeting its GHG emissions targets cost effectively.[2]

Whilst the federal government is answerable to the EU for targets on GHG emissions reduction and RE use, RE development is devolved to the regions, with the exception of offshore wind, which is under federal control. This state of affairs has led to different supporting conditions and markets in the respective regions. The Brussels region is very small and imports most of its electricity, which leaves the other two regions of Flanders and Wallonia as the most important players in RE development in Belgium.

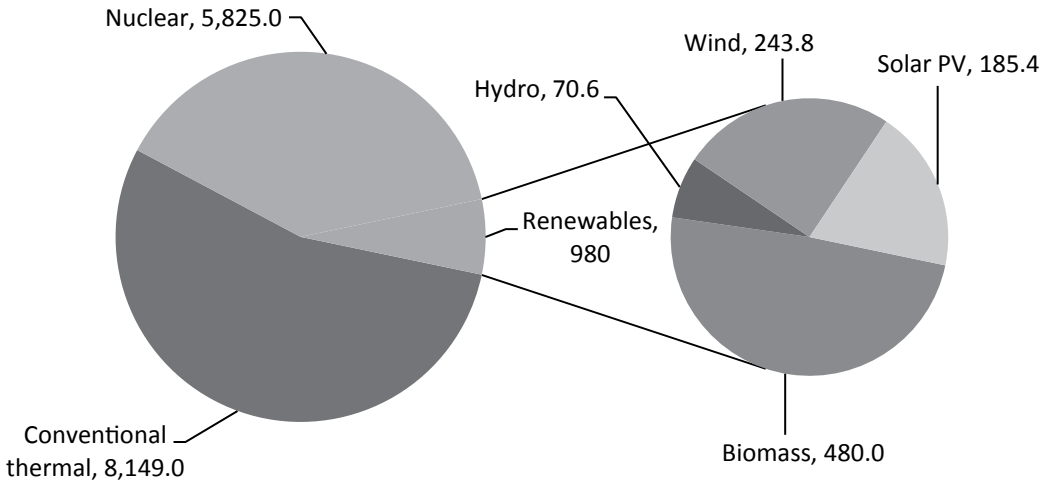
Table 3.1: Belgian federal and state commitments

GHG emissions	A Kyoto Protocol burden-sharing target of a 7.5 per cent reduction by 2012 from 1990 levels, and an EU target of a 15 per cent reduction by 2020 from 2005 levels in areas not covered by the EU Emissions Trading Scheme.
Renewable energy (RE)	An EU target of 13 per cent of final energy consumption from RE by 2020.
Renewable electricity	Wallonia: The target for renewable electricity is 8 per cent by 2010. There is a supplemental target of 4,100 GWh from biomass products by 2010, and 3 70GWh from wind power. Flanders: The target for renewable electricity is 6 per cent by 2010 (and 13 per cent by 2020). There is a supplemental target of 1000 GWh from wind power by 2010.

Source: European Environment Agency, GHG Trends and Projections, June 2010. Available at <www.eea.europa.eu/publications/european-union-greenhouse-gas-inventory-2010>; Commission of the European Communities, Energy. Available at <www.energy.eu>.

3.2 Electricity Generation Mix

Figure 3.1: Total installed generating capacity in Belgium in 2008 (MW): Total 14,953.7 MW

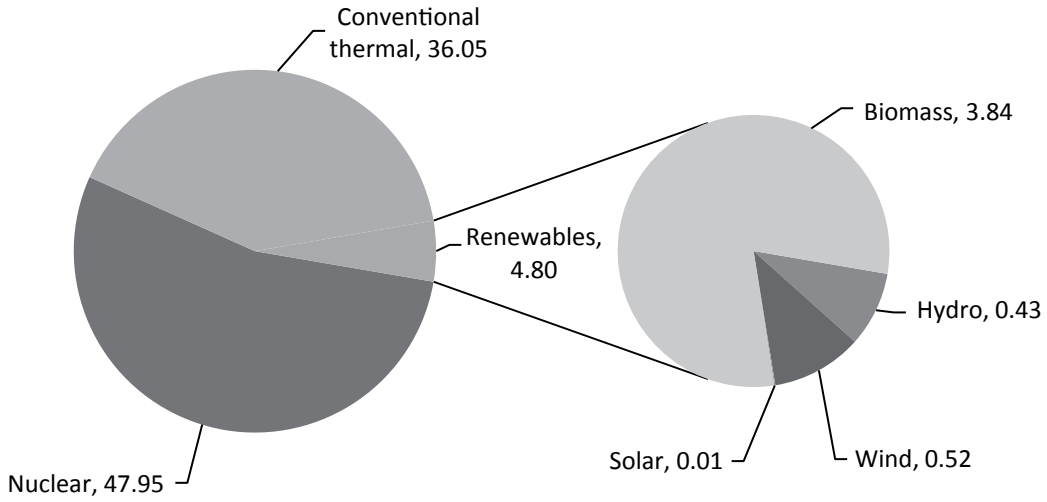


Source: EIA and IEA data, Wallonian Energy Commission, VREG

1 Nuclear Energy Agency, 'Act on the Phase-Out of Nuclear Energy for the Purposes of the Industrial Production of Electricity (NLB 71, p57). Available at <www.nea.fr/law/nlb/INDEX_EN_1_75.pdf?>.

2 Commission Energy 2030 report. Available at <www.ce2030.be/public/documents_publ/CE2030%20Exec%20Summ%20(incl%20C&R)_FINAL.pdf>.

Figure 3.2: Electricity generation mix in Belgium in 2009 (TWh): Total: 88.8 TWh



Source: EIA and IEA data, Wallonian Energy Commission, VREG

3.3 Operating Support Incentives

Belgium uses a tradable green certificate (TGC) system as its primary support mechanism for the deployment of renewable power technologies. The system varies in price and conditions among the regions. There are four different TGCs, including:

- Federal green certificate
- Flemish green certificate
- Wallonian green certificate
- Brussels green certificate.[3]

Apart from the revenue from the sale of the TGCs, renewable power generators also receive the relevant market price of power. In 2009, the average wholesale spot price at PowerNext, the French power exchange that is linked with Belgium, was 43.01 EUR/MWh.[4]

Demand for the TGCs is created through regional quotas whereby suppliers in Flanders, Wallonia, and Brussels must present to the regional energy regulator a certain number of TGCs a year based on the amount of electricity they supplied. The quotas are administered separately by each region and certificates can only be traded in the region in which the renewable electricity they are associated with was produced. Federal certificates are not recognised in any of the regions for meeting the quotas.

3.3.1 Federal Certificates

The federal government issues green certificates through the federal energy regulator, the *Commissie voor de Regulering van de Electriciteit en het Gas* (CREG). Under the federal TGC system, Elia, the transmission system operator (TSO), is committed to purchasing federal TGCs at a minimum price, thus providing an equal base throughout the entire country whereby TGCs are guaranteed to be purchased (see Table 3.2). Renewable power generators can choose which certificate they wish to receive—either regional or federal, although the federal certificates cannot be used to meet the regional quotas.

3 As the Brussels region is very small, no data are shown for the region in this report.
4 PowerNext. Available at <www.powernext.fr>.

In the regions of Flanders and Wallonia, high electricity and TGC prices have led to most renewable power generators selling their TGCs on the regional markets rather than taking the federal minimum-price option. The federal system is, however, especially important for offshore wind power as this is not covered by the regional systems.

Table 3.2: Minimum purchase price for federal TGCs in Belgium

Technology		Price (EUR/MWh)
Offshore wind	First 216 MW of capacity	107
	Over 216 MW	90
Onshore wind		50
Hydropower		50
Solar PV		150
Other renewables (including biomass)		20

Source: CWaPE, 2008 Rapport Annuel Specifique sur 'l'évolution du marché des certificats verts', Available at: <www.cwape.be/servlet/Repository?IDR=12411>.

3.3.2 Wallonian Certificates

In Wallonia, the Wallonian Energy Commission (*Commission Wallonne pour l'Energie*, CWaPE) is responsible for enforcing the TGC system, including setting the quota obligations for suppliers.

The Wallonian TGC is called the *Certificat Vert* (CV). The federal act (AGW-PEV) of November 2006 mandates all electricity retailers in Wallonia to submit CVs on a quarterly basis equal to a percentage of their total retail volume, with one certificate equivalent to one MWh. Only certificates issued in Wallonia can be used to meet the quota. This quota is set at:

- 7 per cent between 1 January 2007 and 31 December 2007
- 8 per cent between 1 January 2008 and 31 December 2008
- 9 per cent between 1 January 2009 and 31 December 2009
- 10 per cent between 1 January 2010 and 31 December 2010
- 11 per cent between 1 January 2011 and 31 December 2011
- 12 per cent between 1 January 2012 and 31 December 2012.

The penalty fine per missing certificate is currently set at EUR 100 by the Walloon government. Revenue generated from fines is used to support regional renewable energy programmes.

Renewable power plants (with the exception of solar PV) receive CVs proportional to the rate of CO_2 offset relative to the emissions of a gas-fired combined cycle turbine for the same amount of electricity produced.[5] A multiplier, τ, is applied to the amount of generation in a given quarter (in MWh) to determine the number of CVs created in that period by the plant. The equation governing the multiplier is:

$$\tau = G \div E_{ref}$$

where:

- **G** (gain) is equal to the difference in CO_2 emissions between F (the emissions of the respective power project in kg of CO_2/MWh) and a reference level of emissions **(E_{ref})**[6]
- E_{ref} is a reference level of emissions based on a combined cycle gas turbine operating at 55 per cent efficiency (in kg of CO_2/MWh).

5 CWaPE, Le Regime de Certificats Vertes, 2003. Available a: <www.cwape.be/servlet/Repository?IDR=587>.
6 Guideline reference and emission levels are available at <www.cwape.be/servlet/Repository?IDR=587>.

For renewable power production involving co-firing with fossil fuels, G is calculated slightly differently as: **$G = E_{ref} + Q - F$**

where:

- **F** is the rate of CO_2 (in kg of CO_2/MWh) emitted by the respective installation
- **Q** is the rate of CO_2 emissions (in kg of CO_2/MWh) of a boiler which produces heat equivalent to that of the installation concerned, when it produces 1MWh of electricity.

The creation of certificates from solar PV is subject to a multiplier which is applied dependent on the installed capacity of the plant in question. Table 3.3 outlines the range of possible rates of CV creation in Wallonia based on the formula above.

Table 3.3: Indicative technology banding for Walloon CVs

Technology		Technology banding (CV per MWh)	Minimum remuneration for CVs created per MWh (EUR)[a]	Theoretical maximum remuneration for CVs created per MWh (EUR)[b]
Wind		1	65	100
Hydro (≤ 20 MW)		1	65	100
Biomass (≤ 20 MW)[d]		0.1-0.4	6.5-25	10-40
CHP biomass (≤ 5 MW)		0.1-2.0	6.5-130	100-200
Solar PV	0-5 kW	7	455	700
	5-7 kW	5	325	500
	> 7 kW[c]	1	150[c]	150[c]

Notes: [a]Based on a minimum price of EUR 65 per certificate and the technology banding. [b]As the penalty fine is EUR 100, it is assumed that the ceiling price of the certificate is EUR 100. [c]Above 7 kW technology banding is not applied to solar PV and it is optimal for producers to sell CVs under the Federal system where the guaranteed minimum price is EUR 150. [d]For biomass power plants, certificate creation has been limited to the first 20 MW of installed capacity.
Source: CWaPE, 2008 Rapport Annuel Specfifique sur 'l'évolution du marché des certificats verts'. Available at <www.cwape.be/servlet/Repository?IDR=12411>.

Each CV is valid for five years from the date of its creation. Walloon renewable power producers have three potential sales outlets for the CVs which they create. They can sell them to the regional arm of the Belgian grid operator Elia, for a fixed price of EUR 65, or to the federal government arm, according to the pricing scheme laid out in section 3.3.1. Finally, owners of Walloon CVs may choose to sell their CVs in the spot markets to electricity suppliers wishing to fulfil their mandated quota in Wallonia. The average spot price of a Walloon CV was EUR 88.1 in 2009.[7]

3.3.3 Flemish Certificates

In Flanders, the Flemish electricity regulatory agency (*Vlaamse Reguleringsinstantie voor de Electriciteits en Gasmarkt*, VREG) is responsible for enforcing the TGC system. Suppliers need to sell a certain percentage of renewable electricity to end-users every year, which they can either purchase from generators or generate themselves. In 2002/03, the first year of the TGC system, the quota level for TGCs was calculated at 0.8 per cent of total electricity supply. For 2010/11 the TGC quota will be 6 per cent (see Table 3.4).[8]

7 See the CWaPE website at <www.cwape.be/xml/themes.xml?IDC=1559>.
8 Federal Department for Economics and Energy. Verslag van Belgie inzake de uitvoering van de doelstellingen. (Report on the Realisation of Renewable Energy Targets in Belgium) 18 May 2004, p. 37.

Table 3.4: Renewable electricity quota in Flanders

Year end	Quota (%)
31 March 2003	0.8
31 March 2004	1.2
31 March 2005	2.0
31 March 2006	2.5
31 March 2007	3.0
31 March 2008	3.75
31 March 2009	4.50
31 March 2010	5.25
31 March 2011	6.00
31 March 2012	7.00
31 March 2013	8.00
31 March 2014	9.00
31 March 2015	10.00
31 March 2016	10.50
31 March 2017	11.00
31 March 2018	11.50
31 March 2019	12.00
31 March 2020	12.50
31 March 2021	13.00

Source: VREG, Green Certificates. Available at <www.vreg.be>.

Only TGCs issued by VREG in the Flanders region may be accepted to meet the quota, and a penalty fine of EUR 125 is applicable for every missing certificate.

The rate of generation of TGCs in Flanders is set at one certificate per MWh of renewable power generated, which differs from the system in Wallonia. The price of the Flemish TGCs has historically been very stable. During the first five months of 2010, the average price per TGC was EUR 107.80.[9]

Under the minimum-price TGC system, Elia, which is also the distribution system operator (DSO) in Flanders, is obliged to purchase Flemish TGCs at a predetermined price set by VREG (see Table 3.5). The price of solar PV TGCs is higher and is shown in Table 3.6. As these minimum prices are higher than those offered by the federal legislation, Flemish generators are likely to sell their certificates through the Flemish system. Elia then sells these TGCs on the open TGC market. These minimum prices are guaranteed for 10 years for all renewable electricity plants installed in 2010, with the exception of solar PV for which prices are guaranteed for 20 years if installed in 2010. Renewable power generators are also able to sell their TGCs under the federal system, as described in Section 3.3.1.

9 VREG 2010. Available at <www.vreg.be/vreg/documenten/Statistieken/54946.pdf>.

Table 3.5: Guaranteed minimum price for Flemish TGCs in 2010 (excluding solar PV)

Source	Minimum price per TGC (EUR)	
	Commissioned before 01/01/2010	Commissioned after 01/01/2010
Hydro	95	90
Wind	80	90
Biomass and non-waste derived biogas	80	90
Waste-derived biogas	80	60
Other technology (apart from solar PV)	N/A	60

Source: VREG 2010, 'Groenestroomproducenten – Handel en prijs – Minimumprijs van een groenestroomcertificaat – aankoopverplichting netbeheerders.' Available at <vreg.be/nl/06_sector/04_groenestroomproducenten/04_handelenprijs/04_handelenprijs/01_netbeheerders.asp>.

Table 3.6: Guaranteed minimum price for Flemish solar power TGCs

Commissioning Date	Minimum price per TGC (EUR)	Duration of eligibility for TGC creation
Before 2006	150	10 years from the commissioning date of the plant.
2006-2009	450	20 years from the commission date of the plant.
2010	350	
2011	330	
2012	310	
2013	290	15 years from the commission date of the plant.
2014	250	
2015	210	
2016	170	
2017	130	
2018	90	
2019	50	
2020	10	

Source: VREG 2010, 'Groenestroomproducenten – Handel en prijs – Minimumprijs van een groenestroomcertificaat – aankoopverplichting netbeheerders.' Available at <vreg.be/nl/06_sector/04_groenestroomproducenten/04_handelenprijs/04_handelenprijs/01_netbeheerders.asp>.

3.4 Investment Support Incentives

3.4.1 Federal Investment Support Incentives

A tax exemption of 13.5 per cent for the investment costs for energy-saving or renewable energy systems is applicable in all regions, including Brussels.[10]

3.4.2 Wallonian Investment Support Incentives

Since 2005, Wallonia has operated a system of investment subsidies and partial exemptions from real estate taxation targeted at firms investing in the sustainable use of energy. Eligible renewable generating sources include hydro, wind, solar, geothermal, and biomass energy. The overall amount of subsidy and the level of exemption from taxation depends on the size of the firm and the objectives of the investment programme.[11]

10 Income Tax Code of 1992, Article 69, § 1, 2, b and c. Available at <www.fiscus.fgov.be>.
11 Walloon Ministry of Economics 2010. Available at <economie.wallonie.be/02Databases/Prog_Midas/index.cfm?fuseAction=details&num_aide=324.0>.

Small and medium enterprises

- A power plant built by a small enterprise is exempt from real-estate taxation for five years, or exempt for four years if built by a medium enterprise
- The combined value of investment subsidies and exemption from real estate taxation is for 50 per cent of investment costs and it cannot exceed EUR 1 million.

Large enterprises

- A power plant built by a small enterprise is exempt from real-estate taxation for three years
- The combined value of investment subsidies and exemption from real estate taxation can be for 20 per cent, 25 per cent and 30 per cent of investment costs (depending on the region), and cannot exceed EUR 2 million.

Subsidies of 50 per cent are also available for wind farm and anaerobic digestion-based biomass pre-feasibility reports, up to a maximum of EUR 5,000 for the former, and EUR 2,500 for the latter.

3.4.3 Flemish Investment Support Incentives

Small or medium enterprises (under 250 employees) are eligible for a grant of 20 per cent of their eligible[12] investment costs in developing projects that generate electricity from renewable sources, to a maximum of EUR 1.5 million.[13]

Large enterprises are eligible for an investment grant of 10 per cent of their eligible investment costs in developing projects that generate electricity from renewable sources, to a maximum of EUR 1.5 million.

Municipal authorities also offer various grants specific to their jurisdiction, particularly for microgeneration. Flanders maintains a web portal which details the particular features of each authority's incentive programme.[14]

12 That is, those which are essential to the project. Full definition is provided at <ewbl-publicatie.vlaanderen.be/Uploads/EP-call%20 Algemene%20infoteksten%2020100115,0.pdf>.
13 Investment Incentives in Flanders. Available at <www.investinflanders.com/en/doing_business/incentives/investment_incentives/>.
14 Available at <www.energiesparen.be/subsidies/subsidiemodule>