Brussels-Capital Region Brussels Hoofdstedelijk Gewest

BRUXELLES ENVIRONNEMENT
LEEFMILIEU BRUSSEL
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Energy Efficiency Action Plan for the Brussels-Capital Region

DIRECTIVE 2006/32/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC published in the OJEU on 27/4/2006 – Article 14

June 2007

Preface

European Directive 2006/32/EC on energy end-use efficiency and energy services (the Directive) entered into force on 17 May 2006.

The objective of the Directive is to ensure more efficient energy end-use. The Directive requires Member States to draw up energy efficiency action plans (EEAPs). These national plans are established with a view to bringing about energy savings of 9% over a nine-year period. The national indicative target is not, however, binding.

National action plans must be approved by the Commission and are to be reviewed every three years. Article 14 lays down the procedure to be followed by the Member States and by the Commission when drawing up reports. Paragraph 2 gives a schedule for submission of EEAPs which states in particular that Member States shall submit a first EEAP to the Commission not later than 30 June 2007.

The minimum content of this first EEAP is defined in Article 4(2) of the Directive:

"For the purpose of the first Energy Efficiency Action Plan (EEAP) to be submitted in accordance with Article 14, each Member State shall establish an intermediate national indicative energy savings target for the third year of application of this Directive, and provide an overview of its strategy for the achievement of the intermediate and overall targets. This intermediate target shall be realistic and consistent with the overall national indicative energy savings target referred to in paragraph 1."

Within this context, the Regions and the Federal State conferred in order to adopt a shared methodology for evaluating the 9% energy savings target based on regional energy audits.

This first energy efficiency action plan includes measures already adopted by the Brussels-Capital Region. Little indication as to the evaluation of the energy savings expected from these measures is provided for the reason that this information (which is not mandatory according to Directive 2006/32/EC) is not yet available. However, steps are being taken for this evaluation to be carried out.

As is the Commission's wish, this plan is modelled on the suggested template proposed by the EMEEES project[1].

PLEASE NOTE

This document covers all measures adopted up until 30 June 2007. Some measures are still in preparation but have not yet been officially decided on. A more complete, more ambitious document is being prepared for 2008.

[1] K. Leutgöb & S. Thomas (2007), Template National Energy Efficiency Action Plan 2007, EMEEES, Wuppertal Institute, 11 May 2007.

Energy Efficiency Action Plan - Table of Contents

Summary

Energy efficiency improvement programmes, energy services and other measures to achieve the national indicative target

Measures in the general construction sector:

I. Measure 1: Supporting the owners of public and private buildings (PLAGE projects)
II. Measure 2: Supporting contracting authorities and building managers (the Facilitators)
III. Measure 3: Providing RUE tools
IV. Measure 4: Training Energy Managers
V. Measure 5: Promoting Passive and Low-Energy Construction
VI. Measure 6: Creating demonstration buildings
VII. Measure 7: Improving thermal regulation
VIII. Measure 8: Implementing requirements on technical installations
IX. Measure 9: Implementing the building's overall energy performance requirement
X. Measure 10: Enforcing regulations
XI. Measure 11: Pooling resources: RUE seminars, Energy meeting
XII. Measure 12: Providing dynamic support for green building professionals (Ecobuild Cluster)

Measures in the residential sector:

I. Measure 13: Informing and raising consumer awareness
II. Measure 14: Providing Social Energy Guidance
III. Measure 15: Supporting contracting authorities and collective housing building managers
IV. Measure 16: Providing RUE Tools for collective housing
V. Measure 17: Developing RUE communication actions
VI. Measure 18: Organising Energy information evenings
VII. Measure 19: Getting a better understanding of the energy situation of housing
VIII. Measure 20: Encouraging individuals to save energy (Energy Challenge)
IX. Measure 21: Presenting the environmental issue (Festival of the Environment)
X. Measure 22: Expanding the household aid scheme (subsidy scheme)
XI. Measure 23: Giving financial support to collective housing (subsidy scheme)
XII. Measure 24: Training Energy Advisers in the Housing sector
XIII. Measure 25: Providing RUE tools to collective housing

Measures in the tertiary sector:

I. Measure 26: Getting a better understanding of the energy situation of buildings
II. Measure 27: Developing the "Entreprise Ecodynamique" (*Ecodynamic Company*) seal of approval
III. Measure 28: Providing RUE Tools to the tertiary sector
IV. Measure 29: Giving financial support to the tertiary sector (subsidy scheme)
V. Measure 30: Providing RUE Tools to the tertiary sector

Measures in the industrial sector (ESD scope):

I. Measure 31: Providing assistance for energy-saving investments

Energy efficiency improvement programmes, energy services and other measures to achieve the national indicative target

Measures in the transport sector:

I. Measure 32: Informing the public about mobility
II. Measure 33: Developing an information tool for help in choosing a vehicle (Ecoscore)
III. Measure 34: Encouraging energy savings in mobility (Mobility Challenge)
IV. Measure 35: Supporting alternative mobility ("Bruxell'air" campaign)
V. Measure 36: Obliging companies to think about staff mobility (company travel plan)
VI. Measure 37: Encouraging soft mobility
VII. Measure 38: Improving the quality of public fleets
VIII. Measure 39: Improving the energy efficiency of STIB vehicles
IX. Measure 40: Providing the public with bicycles
X. Measure 41: Providing the public with a car share scheme

Horizontal and/or cross-sectoral measures:

I. Measure 42: Organising energy market regulation conditions
II. Measure 43: Imposing Public Service Duties and Missions
III. Measure 44: Supporting renewable energy
IV. Measure 45: Promoting cogeneration
V. Measure 46: Developing special tools for schools
VI. Measure 47: Reducing energy consumption through Environmental Licences

Measures to implement Article 5 of Directive 2006/32/EC on the public sector:

I. Measure 48: Improving energy efficiency in public procurement
II. Measure 49: Recovering energy from the Brussels-North treatment plant

Measures to implement Article 7 of Directive 2006/32/EC on availability of information:

See measures in the other sectors

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1. Presentation of the Brussels-Capital Region

Territory
The Brussels-Capital Region has a total surface area of 161.4 km² distributed very unevenly between its 19 municipalities. The municipalities of Brussels and Saint-Josse are at opposite ends of the spectrum with surface areas of 32.6 km² and 1.1 km² respectively. Brussels, Uccle, Anderlecht and Watermael-Boitsfort alone make up 86.1 km², over half the regional territory.

Data from the land registry department gives us details of how the land is used. It shows that housing (mostly houses and apartment blocks) covers 34% of the registered land of Brussels (12 833 ha). Analysis of this data also reveals the relative greenness of the Brussels Region. In fact, the Brussels Region has a large surface area of woods, gardens and parks, farming land, pastures, meadows and orchards and wasteland which together cover 33% of the registered land of Brussels.

Economic activities
The Brussels Region is the country's primary employment centre with approximately 654 000 jobs, only 47% of which are filled by inhabitants of Brussels.
In 2003, 89% of the added value produced in the Brussels Region came from the tertiary sector. In 2002, the primary, secondary and tertiary sectors represented 0.1%, 10.6% and 89.4% of employment in the Brussels Region respectively. The public service, real estate/lettings/business services and trade/repairs sectors as well as financial activities (insurance and financial intermediation) accounted for 54% of the Region's paid employment.
During the period 1999-2002, strong growth of employment in the public service sectors (+11%), financial activities (+14%) and community services (+15%) was observed. The tertiarisation of the Brussels-Capital Region is reflected by a marked reduction in manual jobs (-19% between 1990 and 2002).
The Region is characterised by a dominant tertiary sector and the strong desire of both the Brussels Government and the Federal Government to maintain its position as an international large-capacity city (official bases of international institutions, numerous congress centres, major hotel infrastructures, etc.). According to a study commissioned by the Brussels Region to assess the socioeconomic impact of European and international institutions, in 2001 there were 3 796 international institutions and sectors influenced by the EU employing almost 55 000 people.

Companies
In 2002, there were 33 349 companies in the Brussels Region, including 31 128 in the private sector and 2 221 in the public sector and education.
The economic make-up of Brussels is also characterised by the small size of its companies. Indeed, in 2002 21 686 companies had fewer than 5 employees. At the other end of the scale, 180 companies had more than 500 employees.

Employment
In the Brussels Region, 44.6% of the population (50% of men and 38.7% of women) are considered to be active, i.e. employed or seeking employment. In recent years, the Brussels Region has seen a large increase in the number of out-of-work jobseekers[2] and unemployed. Thus, between 2000 and 2004, the number of out-of-work jobseekers in Brussels increased by 29%. At the end of 2004, the unemployment figures for Brussels reached 21% compared with 8.6% in Flanders and 18.4% in Wallonia. Very significant geographical disparities between the 19 municipalities are also observed. The opposite ends of the scale are in Woluwé-St-Pierre (9.2% unemployment) and St-Josse-ten-Noode (34.2%).

[2] Unemployed people registered as jobseekers with a public regional employment service. Out-of-work jobseekers include complete indemnified unemployed workers, young people in a holding placement, jobseekers freely registered as well as other out-of-work jobseekers mandatorily registered (people presented by the CPAS, excluding the unemployed....).

Buildings
In 2002, the Region had 472 000 dwellings, 72% of which were apartment blocks and 28% single-family houses. The dwellings are distributed throughout 175 373 buildings, including 6 008 with a surface area greater than 1 000 m² amounting to 27% of the total surface area of dwellings. 80% of the housing was built before 1971.
Office blocks account for 12 292 buildings of which 1 866 have a surface area greater than 1 000 m² amounting to 82% of the total office surface area.
The other 39 581 buildings have fairly varied functions, such as schools, hospitals, businesses, etc. Of these, 3 302 have a surface area greater than 1 000 m² accounting for 65% of the total surface area.
9 008 buildings house workshops or factories, 1 087 of which have a surface area greater than 1 000 m² amounting to 80% of the surface area.
In addition, there are 32 154 mixed-purpose buildings (tertiary and housing), including 3 522 buildings with a surface area greater than 1 000 m².

Volume of annual transactions
In the housing sector, the following annual transactions and work took place:
- Sales: 15 000
- Rental: 63 000
- Construction: 275 buildings (2 to 3 000 dwellings)
- Renovation: 774

The data for the service sector is:
- Sales: 1 400
- Rental: 6 000
- Construction: 31
- Renovation: 108

It can be deduced that the effects of the different measures will affect a real proportion of building stock after several years, in particular the obligation of energy certificates related to the volume of transactions.

Population
In 2005, the population was 1 006 749 taking the population density to 62.4 inhabitants/hectare, a figure which varies from 18.8 inhabitants/ha (Watermael-Boitsfort, including the Sonian forest) to 202.6 inhabitants/ha (Saint-Josse).
During the day, the population of Brussels increases significantly due to the presence of commuting students or workers. In 2004, the workforce survey revealed that 344 451 people living in the Flemish and Walloon region had jobs in the Brussels Region. Conversely, 48 125 inhabitants of Brussels worked outside the regional borders.

In terms of the number of households, this rose to 489 850 in 2004, an increase of 2% compared to 1990. The size of private households in Brussels is on average 2 people, which is significantly less than the Belgian average (2.3). Half of these households are people living alone.

Household income
For the 2003 tax year, the average Brussels income, calculated on the basis of taxable income, is the lowest of the country's four major cities and is 14.3% lower than the Belgian average.
Furthermore, this income is distributed very unequally across the population. During the 2003 financial year, 7.8% of tax declarations related to income of over €50 001 and accounted for 28% of declared income. On the other hand, 7.4% of declarations were for income below €5 000 and amounted to 0.7% of declared income in the Region. Moreover, some people living in poverty are not taken into account in these tax statistics because their income is too low and not taxable.
As regards the national average, the Brussels Region is overrepresented in terms of the lowest income categories. In 2003, tax declarations for net taxable incomes below €10 000 accounted for 19.4% of total declarations in the Brussels-Capital Region and 17.1% nationally.

The central districts and the first-ring municipalities (Saint-Josse, Saint-Gilles, Molenbeek-Saint-Jean, etc.) are characterised by the lowest incomes per inhabitant. The development of "poverty pockets" is reaching critical levels in certain first-ring municipalities.

Expenditure
Generally speaking, the inhabitants of Brussels spend significantly more than the national average on rent (including rental charges and ongoing maintenance costs) (128%), water rates (158%) and public transport (193%). In contrast, they spend less of their budget on travelling in private vehicles (82%) and on heating and lighting their homes (88%).

Housing
According to data from the socioeconomic survey carried out in 2001 by the INS, 28% of Brussels households live in single-family dwellings, which represents an absolute increase of 6.6% over 10 years. Despite this growth, this percentage remains significantly lower than in the country's other regions and major cities. More than one Brussels dwelling in 4 is located within a building comprising at least 10 dwellings.
Again according to this same source, each inhabitant of Brussels has a **living space of 35.5 m²** (35.1 m² in 1991). This area is very similar to that occupied by people in Antwerp (35.6 m²), Ghent (35.5 m²), Liège (36.7 m²) and, to a lesser extent, Charleroi (32.9 m²).
On average, in 2004, it was twice as expensive to buy a house in the Brussels Region as in the rest of Belgium, taking all regions into account (INS, 2006).
In comparison to the country's other regions and cities, Brussels has few owner-occupiers. In 2001, 41.3% of housing in Brussels was occupied by its owner or life tenant.

The highly developed Brussels Region has relatively few private gardens compared to the rest of the country. In 2001, 34% of dwellings in Brussels had a garden.

As regards the insulation rate of housing, a great deal of progress is still to be made, as the following figures demonstrate:
- 64% are double glazed
- 63% have roof insulation
- 34% have insulated outer walls and
- 56% have insulated heating pipes.

Travel
According to the Administration des Équipements et des Déplacements (AED), the major trends in the development of travel in Brussels can be summarised as follows:
- increase in distances travelled;
- increase in the number of daily journeys;
- increase in motorised travel;
- strong increase in travel for leisure and shopping;
- staggering of peak hours (currently from 6 am to 10 am).

According to data from the 1998-1999 INS national household mobility survey, in an average day, 76% of people over the age of 6 living in the Brussels Region make journeys. Of these, 13% travel only by foot, 17% only by public transport, 60% by private vehicle (cars, 2 wheels) and 9% combine public and private transport. In addition, according to this same source, more than 25% of journeys are shorter than 1 km and 62% shorter than 5 km. On average, inhabitants of Brussels make 3 journeys in a working day, 2.2 of which are by means other than on foot.
The proportion of people travelling, the number of daily journeys and the occupation of vehicles do not vary much from one region to the next. As is to be expected, the Brussels Region stands out for its lower use of motorised journeys, the distances travelled and the lower average journey speed.

The number of motor vehicles, calculated from registrations, is 49 cars for every 100 inhabitants of Brussels compared with 47 cars for 100 people in the whole of Belgium. These figures must, however, be adjusted insofar as the number of vehicles registered in the Brussels Region also includes a large number of company vehicles only some of which are used by inhabitants of Brussels.

The vehicles used in the Brussels Region essentially include cars belonging to inhabitants of the Region, on the one hand, and, on the other hand, the cars of regular commuters.

Cars in Belgium are ageing: indeed, the average age has gone from 4 years in 1980, 6 years in 1990 and 7 years and 9 months in 2004. Compared to cars in Belgium, cars in Brussels include both a large

proportion of old vehicles (pre-1988) and a high proportion of newer cars (2001 to 2004). This may be explained by the presence of major differences between social classes in the Brussels Region but also by the fact that many hire companies registering only new vehicles are based in the Region.

The number of diesel cars has increased constantly going from 12% nationally in 1983 to 26% in 1990, 32% in 1995, 40% in 2000 and 47% in 2004. In Brussels, 43% of cars are diesel.

In 2001, 60% of Brussels households had at least one car and 11% 2 cars or more. This percentage is slightly lower than the average of the 5 major towns and significantly lower than the Belgian average.

Urban public transport

The number of journeys made by urban public transport has seen a significant and constant increase in recent years. Between 1996 and 2005, journeys made by customers of the Société de Transport Intercommunal Bruxellois (STIB) increased by 57.5%. In 2005, 44% of these journeys were made on the Metro. According to STIB's 2004 annual report, this growth is due to the "short-term upwards trend in mobility demand" as well as the introduction by STIB of various measures (increased frequency, price adjustment, boarding at the front, etc.).
In 2005, the bus, metro and tram fleet had 951 vehicles (919 in 1996). Between 1996 and 2005, the STIB network grew by 103 km, a 43% growth. Between 2000 and 2005, the number of stops went from 2 128 to 2 204.
The assessment of public transport in the Brussels-Capital Region is relatively positive and similar to that in Antwerp and Ghent. Out of 100 households, 47 say they are very happy with the public transport service and 45 rate it as "reasonable".

In general, the use of stations in Brussels increased by 7% between 1990 and 2004. The increases at Etterbeek station (+113% between 1991 and 2001), Nord station (+54%), Midi station (+47%) and Schuman station (+23%) are explained by the occupation of new office blocks around these stations. On the other hand, the loss of custom at the central stations (-19% between 1991 and 2001) and Luxembourg station (-16%) reflects the effects of relocation and renovation of office spaces in these districts (AED, 2006).

2. Energy audit and Overall indicative target

2.1 Brussels energy audit

The Brussels-Capital Region is highly energy-dependent: more than 96% of the total energy consumed comes from outside. However, some power plants are located in its territory, the main one being the Schaerbeek Electrabel plant, which uses steam produced by the Neder-over-Hembeek household and assimilated waste incinerator. Renewable energy (excluding biomass) represents barely 0.2% of the Region's consumption. The main energy vectors are liquid petroleum products (37%), natural gas (38%) and electricity (21%). Coal, still used by a small number of households still represents 0.1% of the energy consumption of Brussels. The main energy consumer is the housing sector (41%), followed by the tertiary sector (31%), transport (24%) and finally industry (4%).

Energy audits reveal that buildings in Brussels consume the most energy, and so Rational Use of Energy priorities focus on this issue. With this in mind, the Region's actions relate to building categories: residential and tertiary. Of these, specific actions have been developed for public authorities, who are major operators of buildings in the Region. Then, the actions are broken down into either the building structure or its technical installations, essentially heating, ventilation and air conditioning.
Efforts are also focused on promoting renewable energy, where particularly demonstrative actions are carried out.

Energy audit (end-use) GWh	**2001**	**2002**	**2003**	**2004**	**2005**
fuel	**19 845**	**18 923**	**19 612**	**19 695**	**19 118**
fuel (after correction)*	19 625	18 711	19 394	19 474	18 901
electricity (final)	5 404	5 456	5 507	5 678	5 766
heat (final)	16	22	37	53	46

* ("renewable energy"), "non-energy use", defence are deducted

Energy end-use in undertakings covered by Emissions Trading (ET) GWh	**2001**	**2002**	**2003**	**2004**	**2005**
fuel (after correction)**	**260**	**244**	**185**	**215**	**213**
electricity (final)	160	157	158	162	157
heat (final)	0	0	0	0	0

Energy audit LESS ET undertakings GWh	**2001**	**2002**	**2003**	**2004**	**2005**		
fuel (after correction)*	19 365	18 467	19 209	19 259	18 688		
electricity (final)	5 244	5 298	5 348	5 516	5 609		
heat (final)	16	22	37	53	46		
Total	**24 625**	**23 787**	**24 594**	**24 828**	**24 343**		
2001-2005 average						*24 436*	*9% = 2 199 GWh*
fuel (after correction)*	19 365	18 467	19 209	19 259	18 688		
primary electricity (factor 2.5)	13 111	13 246	13 371	13 789	14 022		
primary heat (90% output)	18	24	41	59	51		
Primary energy total	**32 493**	**31 737**	**32 621**	**33 107**	**32 762**		
2001-2005 average						32 544	9% = 2 929 *GWh*

distribution by sector

2001-2005 average

	Total fuel	electricity	total	%	**Primary energy total** total	%
Industry	319	308	628	3%	1 090	3%
Tertiary	4 317	3 375	7 692	31%	12 755	39%
Residential	8 797	1 434	10 232	42%	12 383	38%
Transport	5 592	285	5 877	24%	6 305	19%
Total	**19 026**	**5 403**	**24 429**	100%	**32 534**	100%

2.2 Estimate of the regional target

The Brussels-Capital Region has carried out its energy audit every year since 1990. This audit lists energy consumption by vector (electricity, gas, oil fuel, petrol or other petroleum products, etc.). It is drawn up from consumption lists provided by distribution companies and professional gas and electricity federations and based on surveys of all customers connected to high voltage and the largest customers connected to low voltage.

The regional target is estimated from the average energy consumption of the last five available years (2001-2005).

The final inland consumption takes into account energy consumption of the industrial, tertiary, residential and transport sectors.

The final inland energy consumption corresponds to the quantity of energy sold or distributed to end customers not adjusted by degree-days, structural changes or change in production. Renewable energy consumption that is not purchased is deducted from this consumption. This is mostly solar energy produced by solar panels installed in the Brussels-Capital Region. In 2005, renewable energy (excluding biomass) represented 0.2% of the region's consumption. Non-energy use is also deducted.

Directive 2006/32/EC excludes from its scope companies covered by Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading. Thus, the energy consumption of undertakings covered by the Emissions Trading (ET) Directive is discounted from the values of the regional energy audit.

The conversion factor used for electricity is the default factor provided in Directive 2006/32/EC, namely 2.5. This means that 2.5 kWh of primary energy needs to be introduced into power plants to produce 1 kWh of electricity.

On the basis of the foregoing, the average annual final energy consumption totals 24 343 GWh, or the equivalent of 32 762 GWh of primary energy. The 9% primary energy saving indicative target for the period 2008-2016 would therefore represent a saving of 2 929 GWh for the Brussels-Capital Region.

The sectoral distribution of primary energy shows that industry accounts for 3.5%, transport for 19.5% with the remainder distributed almost equally between the tertiary sector (39%) and the residential sector (38%). This situation is mainly explained by the exclusively urban nature of the Brussels-Capital Region as well as by the almost total absence of electricity production. Indeed, the only electricity production processes are to be found at the Neder-Over-Heembeek incineration installation and in some cogeneration facilities.

The energy policy of Brussels

Even at the start of the 21st century, the issue of energy efficiency was still not a major political concern. In the Brussels Region, it was limited to several studies relating to energy consumption and a regulation that was little applied, if at all, on heat insulation of buildings.

It was the issue of air quality and the fight against climate change that led the Brussels-Capital Region to adopt an initial structural air quality improvement plan on 13 November 2002, of which several measures deal with energy efficiency and demand management.

Since then, various political decisions relating to climate change (burden sharing between Belgian federated entities, Emission Trading for major emitters, joint implementation) have been added to the political activity base.

Since July 2004, the Brussels energy policy (essentially relating to buildings and energy production) has been rolled out based on the following observations:

- energy consumers are still not convinced of the significance of energy efficiency;
- those that do wish to invest in energy efficiency do not always have the technical information required for demand side management;
- professionals who are called on are not fully competent to meet energy efficiency demand;
- even if investment is viable, it is still not enough of a priority in allocation of resources;
- technical solutions that make use of renewable energy sources are still not well known and continue to suffer due to their poor economic viability.

Based on this, the Brussels energy policy has been redeployed along the following lines:

- developing energy culture and stimulating demand for energy supply;
- providing competent, expert support services to consumers;
- leading by operational example both in terms of management and investment that it is possible right now to improve energy efficiency while remaining economically-minded;
- offering the financial boost to finance the additional costs involved with the most effective investments;
- training experts and creating economic activity around the energy performance of buildings;
- developing a binding legal framework encouraging consideration of energy efficiency and the use of renewable energy sources both in construction and renovation of buildings and in decentralised energy production.

To implement this policy, regional budgets were increased from €3.6 billion (2004) to €16.7 billion (2007) and the financial aid scheme from €1 billion (2004) to €11 billion (2007). Finally, a green certificate scheme for green electricity production was set up, with an annual turnover (2007) of approximately €15 billion.

As regards transport, the mobility policy of the Brussels-Capital Region has seen the modal transfer target increased. Emphasis is on improving the range of options for travelling by means other than by car. Public transport, which is experiencing tremendous growth in the number of passengers, almost 70% between 2000 and 2006, has increased capacity in both its infrastructure and in rolling stock. Facilities for cyclists are also improved within the context of the cycle plan which aims to achieve 10% of journeys by bike by 2010 (between 2000 and 2006, bike journeys rose from 1 to 4%). At the same time, road capacities are being rationalised and more and more road space is being reallocated exclusively to public transport.

The Environment and Mobility Ministers are pulling together to improve its task force. This enhanced collaboration is the source of modal transfer awareness initiatives, such as the Bruxell'Air campaign which offers a season ticket and/or a bicycle in exchange for number plate delisting and, if appropriate, destruction of the polluting vehicle. Similarly, Friday Bikeday invites employees to cycle to work on Fridays.

3 Sectoral presentation of energy efficiency improvement programmes, energy services and other measures to improve energy efficiency

3.1 Energy efficiency improvement measures in the general construction sector

Raising awareness – Information: the Energy reflex

Measure 1: Supporting the major real estate managers (PLAGE projects)

Concrete examples demonstrate that the energy performance of some buildings can improve by 20 to 30% without the need for major investment. The "Energy Reflex" is not sufficiently entrenched in management of facilities and maintenance and renovation of existing constructions even though there is potential for cost-effective energy savings. A local energy management action plan (*Plan Local d'Actions pour la Gestion Energétique/PLAGE*) is in keeping with the gradual introduction and implementation of a coherent, coordinated set of actions and methods applied to the buildings of one estate, which:

- gives information on its energy efficiency;
- enables internal management to be organised towards energy-efficient maintenance of facilities;
- identifies the potential energy saving and the priority actions, in particular through building audits;
- raises the awareness amongst occupants of how to behave;
- involves energy efficiency in investment choices (new construction and renovation, refurbishment of facilities, etc.);
- ensures transparency of information through the publication and promotion of a regular summary of results.

In order to encourage the implementation of an active demand side management policy, the Brussels-Capital Region backs, by call for proposals, the development of 3-year schemes for major building owners. These will be accompanied by methodologies to ensure their success. –The first municipality has already achieved a 16% improvement in its energy performance.

Known as PLAGE (*Plan Local d'Actions pour la Gestion Energétique*), this programme currently supports 15 municipalities, 7 hospitals and 2 public housing managers. Other calls for proposals are already planned for coming years.

This commitment mechanism will be extended to smaller consumers by a pooling of resources through collective PLAGEs, particularly in schools.

Measure 2: Supporting contracting authorities and building managers (the Facilitators)

The Brussels-Capital Region provides a free advice service through the Facilitators. These are assigned the task of advising corporate bodies and institutions in their approach to improving the energy performances of their property and activities.

This service is aimed at two main categories of consumer: collective housing and the tertiary sector. Two other Facilitators have also been dedicated to promising technologies that are not yet well-known on the Brussels market: cogeneration and renewable energy – large systems.

The Facilitators are energy specialists known for their expertise garnered from carrying out numerous projects both in Brussels and abroad. Their mission is to provide independent and impartial assistance to contracting authorities and building managers on energy consumption management actions, rational use of energy (RUE) and promotion of renewable energy, at every stage of a project. They do not replace the architect, the design office or the installer, but rather guide these people in their work and make recommendations to improve the energy quality of projects.

The Facilitators provide the following services:

- technology and supplier information;
- identification and assistance in compiling administrative files for financial aid;

- top-level technical expertise with permanent telephone and e-mail support, critical review of specifications, supervision of research and specific guidance (namely closer monitoring of certain project sponsors);
- information on energy-related tools;
- guidance at the different stages of an "energy" strategy;
- help with energy analysis of buildings;
- supervision of construction and renovation projects;
- comparison of commercial offers for any energy installation.

The **Collective Housing Facilitator** deals with managers of collective public housing, apartment blocks or co-ownerships. It provides the following services in addition to those mentioned above:

- comparison of bids for lighting, heating and domestic hot water production systems, etc.;
- review of feasibility studies;
- review of specifications.

The **Tertiary Facilitator** deals with private or public institutions (hospitals, rest homes, office buildings, swimming pools, schools, businesses, service companies, etc.).

The **Cogeneration Facilitator** deals with large buildings: offices, swimming pools, hotels, collective housing, etc. It provides methodological assistance in project management, cogeneration design and financial viability assessment. In Brussels, there is particularly cost-effective and underexploited potential.

As the use of renewable energy in large systems is a specific issue in its own right, the Brussels-Capital Region has decided to call on a Facilitator specialised in this field: the **Renewable Energy Facilitator**. It provides, in addition to the general services mentioned above, information on renewable energy tools. The large system concept refers to the need for a specific design and it aims to direct large projects to this facilitator (e.g. a thermal solar installation with more than 25 m² of panels). For individual installations, specific support is provided by the non-profit organisation APERe (*Association pour la promotion des énergies renouvelables*).

Some Facilitators also work on energy within the context of broader topics such as green building or sustainable districts.

The Brussels-Capital Region will provide the construction sector with top-level technical expertise in **green building**. This involves Facilitator missions and guidance aimed at anyone involved with a building for which environmental support may be useful in actions relating to the design, renovation, construction, management or deconstruction phases etc. regardless of the stage the project is at.

The mission of the Green Building Facilitator is:

- to promote the green building tools developed by Bruxelles Environnement – IBGE;
- to provide information on and raise awareness of green building (other than IBGE tools);
- to analyse obstacles to the development of green building and suggest solutions.

The Brussels-Capital Region will also set up an **Eco-District Facilitator** as part of a proactive policy of developing sustainable districts. The aim of this service, which is available to design engineers (architects, design offices, etc.), developers of both private projects (investors, promoters, etc.) and public projects (Municipalities, SISPs (Public Service Real Estate Companies), etc.) and public town planning authorities, is to introduce the principles of sustainable planning, green building techniques and energy-saving, as well as the principles of eco-management and sustainable mobility into sustainable district development work.

This Eco-District Facilitator will provide energy and environmental performance improvement services through stimulation, constant information, assistance and guidance in the field of sustainable district development:

- specific guidance: closer monitoring of project sponsors by taking part in work meetings;
- analysis of obstacles to development of sustainable districts and solution proposals.

Measure 3: Providing tools for rational use of energy (RUE)

The Brussels-Capital Region provides building managers with a series of RUE tools and publications on energy savings.

- **RUE vade-mecum:** RUE vade-mecums for the tertiary sector and for collective housing give assistance to sector managers in their approach to rational use of energy (RUE) and help them to improve the energy performance of their buildings. These highly practical guides give answers to the many questions frequently asked by sector managers about better energy management in their buildings.
- **Energy savings study:** it demonstrates the many ways in which energy can be saved through description of four examples of profitable construction and renovation projects.
- **The Energie+ CD-Rom** is a collection of information and tools designed to make the comprehension, design and economic evaluation of specific technologies, such as cogeneration or major solar-powered hot water systems, easier.
- **The audit checklist** is a questionnaire to assist in carrying out an energy audit of buildings, particularly office buildings. The user gets a series of concrete suggestions on how to save energy and improve the efficiency of his facilities. A distinction is made between buildings with air conditioning and those without. The topics covered include the structure of the building, heating, sanitary ventilation, lighting, hot water, electrical equipment, refrigeration air conditioning installation.
- **The management manual** is a collection of explanatory sheets giving practical, accessible advice on improving energy management of facilities and helping to get more in-depth results from the audit via the audit checklist. The manual covers the subjects of office technology, heating, lighting, building structure, cooling, heat regulation and ventilation.
- etc.

These different publications, along with others, can be consulted on the Bruxelles Environnement – IBGE website at www.bruxellesenvironnement.be.

Measure 4: Training Energy Managers

Based on the observation that technical managers of large properties do not always fully understand the concepts of energy efficiency and performance, specific training was introduced in 2004. Different topics are dealt with from the point of view of energy performance and financial viability: energy accounting, building insulation, heating, ventilation, air conditioning, lighting, cogeneration, renewable energy, etc.

The training also includes specific modules such as the energy audit, renewable energy, high-quality cogeneration, etc. Energy managers are also told about the array of financial aid available. Finally, this training provides an opportunity to meet energy facilitators, whose mission is to accompany the various people involved free of charge.

Measure 5: Promoting Passive and Low-Energy Construction

The concepts of "passive" and "low-energy" buildings arrived in Brussels in 2005 with the construction of the first passive office. Since then, this concept has become significantly more widespread with:

- the organisation of a visit to Fribourg and the Vauban district with developers;
- the holding of a Passive Symposium in Brussels;

- the organisation of the "Ice Challenge", a real people's challenge to test the melting rate of a block of ice in a passive house
- and finally the launch of a new subsidy scheme that has been in operation since 2007 to fund construction of passive houses or apartment blocks or low-energy renovations. A similar incentive for the tertiary sector is in the pipeline. These incentives are defined in Measures 22 and 23 of this plan (Passive / Low-energy housing – Subsidy 7 – Households and Passive / Low-Energy Construction – Subsidy 14 – Collective Housing).

Moreover, the Region has set up a specific service of support by experts, aimed at applicants for "passive / low energy" subsidies. The aim of this service is to provide telephone or e-mail assistance. There is also the possibility to meet the experts. For new buildings, a "blower door" leakage test is financed by the Region.

Financial instruments: providing financial support

Measure 6: Creating demonstration buildings

The Brussels-Capital Region has launched an initial call for proposals for the design and construction of exemplary buildings in terms of energy and the environment by inviting construction and renovation project developers in Brussels to prove their daring, courage and commitment.

The aim is to see buildings being built in the short term that have high energy and environmental performance levels while remaining within acceptable technical reproducibility and financial viability limits so that these buildings may serve as an example. The energy targets of the building must seek to minimise the primary energy needs of the building and to minimise the use of traditional energy sources (oil, gas, nuclear).

In order to support the design and construction of exemplary buildings, the Brussels-Capital Region is offering financial aid to the tune of €100/m² with a total budget allocation of €5 million. In addition, the Region offers technical support to help the authors of projects to achieve quality targets.

84 projects have been submitted totalling more than 200 000 m².

This scheme offering financial incentives for developing efficient buildings is to be renewed.

Regulations: acting structurally on demand

Directive 2002/91/EC requires Member States to apply legislation relating to the energy performance of buildings (EPB) based on 4 key pillars:

- to lay down a methodology for calculating the energy performance of a building;
- to set minimum performance requirements which all new buildings, and existing buildings undergoing major renovation, must meet;
- the obligation of energy performance certification of buildings if they are sold, rented or when they are new;
- the implementation of a regular inspection system for boilers and air conditioning systems in buildings as well as assessment of the whole heating installation in certain conditions.

The Energy Performance and Indoor Climate of Buildings Order (OPEB/*Ordonnance relative à la performance énergétique et au climat intérieur des bâtiments*), dated 7 June 2007, published in the Belgian Official Journal of 11 July 2007, transposes Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings into Belgian law. The general principles of the OPEB are:

- to promote the improvement of the energy performance of buildings taking into account outdoor climatic and local conditions, as well as indoor climate requirements and cost-effectiveness;
- to promote the improvement of the indoor climate of buildings;
- to minimise primary energy requirements;
- to reduce CO_2 emissions;
- to determine a certification procedure for the energy performance of buildings.

The OPEB is more than a simple transposition of the European Directive.

On the one hand, the European Directive imposes energy performance requirements for renovations and new buildings over the 1 000 m² threshold, while the OPEB incorporates 2 additional conditions which apply to buildings of less than 1 000 m².

- the feasibility study imposed by the Directive extends to the energy design of buildings and, in particular, to the study of overheating and passive cooling. Furthermore, it applies to major renovations over 5 000 m².
- basic renovations are subject to heat insulation and ventilation requirements.

On the other hand, the OPEB includes requirements which apply specifically to the new technical installations of a building (new construction or major renovation) and lays down energy efficiency conditions: boiler burner, insulation of heat and cold distribution pipes, partitioning and distribution system regulation obligations, etc.

A series of execution decrees will be published as and when required in order to implement the provisions of the OPEB. This implementation should commence in July 2008.

Measure 7: Improving thermal regulation

Since the entry into force of Section V of the Regional Planning Regulation (RRU) on 1 January 2000, heat insulation of the shells of office buildings, dwellings and schools is mandatory for constructions or renovations subject to planning permission (PU). The requirements relate to the heat transfer coefficient of walls, whether for a new construction or for a renovation subject to planning permission. The RRU also includes a requirement for the overall level of insulation of the building: K = 55. The overall level of insulation (K) is calculated according to Belgian standard NBN 62-301.

This regulation will be repealed and replaced by provisions adopted in the OPEB. The provisions of the OPEB generally have the same technical criteria as Section V of the RRU (heat transfer coefficient

of walls, technical requirements, K level and calculation methods) but the thresholds set will be stricter. This therefore constitutes a strengthening of the heat insulation regulation.

Measure 8: Implementing requirements on technical installations

For new buildings and renovations that are classified as "major renovations", requirements specific to technical installations are laid down in the OPEB.

Measure 9: Implementing the building's overall energy performance requirement

This overall energy performance requirement, known as level E, shall apply to new buildings to be used for housing, schools and office and service activities.

Measure 10: Enforcing regulations

The regulation on heat insulation of buildings which entered into force on 1 January 2000 is now the only compulsory standard in the Brussels-Capital Region. Although administrative checking of the completeness and validity of the data included in the planning permission application form is effectively carried out by the Government, there are few dedicated resources for onsite monitoring and inspection of the effectiveness of heat insulation levels.

Implementation of the OPEB, during this year 2008, will be accompanied by a collection of guidance and support services (mainly by external facilitators and partly by the Government) and monitoring and inspection services (by the Government). The administrative procedure will be implemented through existing procedures (planning permission and/or environment permit).

The inspection procedures and application thereof in the field are taken into account in the OPEB. The requirements that apply to the different hypothetical situations will be specified in future implementing decrees. For new buildings and major renovations these procedures apply to the start and end of the work but also to the lifespan of the technical installations. They also relate to:

- the EPB (Energy Performance of Buildings) notification of start of works: this is a document by which the contracting authority notifies the government of the start of works. It gives various administrative data and indicates that the different energy performance calculations necessary for meeting requirements have been carried out and are available;
- the EPB declaration (at the end of works): this is a document which describes the steps taken to meet the EPB requirements and determines by calculation if these requirements have been met. It gives, on the one hand, the elements affecting the physics of the building, included if necessary in the planning permit and, on the other hand, the other steps taken to meet EPB requirements;
- administrative fines and penalties: these will be imposed by the authority if the EPB declaration shows that the EPB requirements have not been met and/or if the inspection reveals that the EPB declaration is not accurate.

The procedure for basic renovations is simplified as the simplified declaration is done **before the start** of the work (and not after the work is completed as for new buildings or major renovations). Similarly, for basic renovations the notification of the start of work and the simplified declaration are included in the same document.

Actions targeting professional stakeholders

The Brussels-Capital Region has introduced a series of measures to improve the technical competence of professional construction stakeholders, create exchanges between stakeholders and facilitate the implementation of the Energy Performance and Indoor Climate of Buildings Order.

Measure 11: Pooling resources: RUE seminars, Energy Meeting

Energy Meetings are regularly held between those involved in the field and professional federations under the auspices of the Region. They are discussion fora aimed at identifying lines of action, clarifying data and concepts on the subject of energy and providing concrete evidence as to the political commitment of the Brussels-Capital Region in terms of energy performance. These meetings are targeted at professional stakeholders in the public sector and the private sector. In 2007, for example, the topics covered range from organisation of the city, the structuring and regulatory approach to energy management in construction, renovation and management of public buildings.

RUE seminars are aimed at decision-makers, technical managers and energy and construction professionals. Topics relating to energy management in buildings, for example, "Investing in energy savings", "Building and renovating with energy" and even "How to reduce the energy consumption of buildings" are fully developed. During these seminars, the construction professional learns about successful schemes and projects both in Brussels and throughout Belgium. The aim is to enable professionals to manage investments, renovations and daily energy consumption.

Finally, in order for successful implementation of the OPEB, training cycles are put in place with architects' federations. The aim of the training content will be specifically: effective energy design of buildings, including the "passive", the regulation and management of the calculation method.

Measure 12: Providing dynamic support to green building professionals

The Brussels-Capital Region actively supports the green building sector. It is an up-and-coming sector for the Region due to the fact that the environmental approach, including the large part relating to energy, presents interesting potential in the construction sector.

The Region offers dynamic support to the green building sector through the creation of a platform encouraging synergies between the different stakeholders in the sector. This platform, known as **Ecobuild Cluster**, is organised jointly by Bruxelles-Environnement – IBGE and the Agence Bruxelloise pour l'Entreprise (*Brussels Enterprise Agency*).

In an economic market and innovation approach, this cluster is an interesting tool. The professionals involved have a dedicated contact and support for their development. They have access to wider visibility and collective benefits as a result of synergy with other companies in the sector, collaboration with research centres and closer contact with public bodies.

The identity of the Ecobuild Cluster is above all formed by the requirements, projects, initiatives and enthusiasm of its members. Any professional in Brussels active in the field of construction who applies good green building practices may apply to join the cluster: building shell, final outfitting, manufacture and sale of green materials and ecological products, architects and engineering offices, green building consultancy companies and design offices, R&D centres, universities, information and awareness bodies and associations.

The Region has also set up the **Green Building Reference Centre**. This is a non-profit platform made up of the public authorities of Brussels and the construction sector in equal parts. It is responsible for improving the training supply and demand balance in the Brussels-Capital Region. It carries out inventories of requirements given the state of the sector and new technologies and activates the most suitable training operators.

3.2 Energy efficiency improvement measures in the residential sector

Raising awareness – Information: the Energy reflex

The Brussels-Capital Region has put in place a series of communication tools in order to raise awareness amongst end users of energy efficiency improvement. Through various special campaigns, an infrastructure for reception and expert advice, the Region gives end users the opportunity to acquire the "Energy reflex".

Measure 13: Informing and raising consumer awareness

The Brussels-Capital Region funds an "Energy Helpdesk" and defines the missions thereof. This helpdesk gives impartial information on RUE (insulation, heating installation, solar water heating, etc.). It helps households analyse their own energy use and conducts free residential energy audits. It also informs end users about financial aid that is available at both federal (tax relief for energy-saving investment) and regional (solar water heater subsidy, roof insulation, etc.) level.

Measure 14: Providing Social Energy Guidance

Social Energy Guidance (SEG) falls within the scope of liberalisation of the electricity and gas markets. In the Brussels-Capital Region, the issue is regulated by the Order of 14 December 2006 amending the Orders of 19 July 2001 and 1 April 2004 on organisation of the electricity and gas market in the Brussels-Capital Region and repealing the Order of 11 July 1991 on the right to minimum electricity supply and the Order of 11 March 1999 laying down measures to prevent domestic gas cuts.

SEG is very generally defined as support for disadvantaged persons with a view to encouraging them to reduce the energy consumption in their homes while maintaining their level of comfort. Practice and experience enable this definition to be refined.

The Brussels-Capital Region is just starting. It wishes to be active in this field and has already initiated a series of schemes to incorporate and monitor the tools and methodology for action. This project has already enabled creation of technical and communication tools, provision of an effective organisational support system for professionals in contact with the target audience and creation of a summary giving the factors for success and failure of a high percentage of Belgian schemes. The conclusion is that the efficiency of SEG is down to the quality of the tools, the coordination of site workers and the particular context of the service user.

Measure 15: Supporting contracting authorities and collective housing building managers

This measure is explained in section 4 of Measure 2 on support of contracting authorities and building managers (the Facilitators) in the Brussels-Capital Region.

Measure 16: Providing RUE tools for collective housing

The Brussels-Capital Region provides collective housing managers with a series of RUE tools and publications on energy savings. These are covered in Measure 3 above.

Amongst the tools specifically dedicated to collective housing, the Region has developed in particular:

- **the advice guide for collective housing (contracting authorities)**: applies to the design of new buildings or renovation of existing buildings and equipment. It highlights at each stage of a project both the required standards to be adopted and concrete actions to be implemented (the version of this guide aimed at design engineers is mentioned in Measure 25, page 35);
- **the energy register for collective housing:** enables buildings to be classified according to their energy quality, action priorities to be determined and the progress of improvements to be monitored.

Measure 17: Developing RUE communication actions

The Brussels-Capital Region develops its communication actions encouraging consumers to adopt sustainable behaviour aimed at a rational use of energy.

Therefore, since 2003, an annual rational use of energy (RUE) campaign and a campaign to promote subsidies for energy-saving investments have been run.

In Brussels, the housing sector represents 38% of all energy consumed. The aim of the "Green Homes" days is to raise awareness amongst citizens of air pollution, climate imbalance and the growing consumption of energy. This action is an opportunity for end users and public bodies to meet and share experiences of green building and efficient energy management and ask home-related questions. In 2007, 25 sites (21 private premises and 4 public buildings) in the Brussels Regions opened their doors.

In addition, special actions highlight the Region's desire to raise awareness amongst end users. For example, the "Ice Challenge" through which the Region hoped to raise public awareness of the effectiveness of proper heat insulation of dwellings. This educational event was based around a competition in which two blocks of ice were each placed inside a roof. One of the roofs was poorly insulated while the other "passive house" was very well insulated. Entrants had to guess how much would be left of each block of ice after 40 days. Throughout the competition, the public received various pieces of advice on how to improve the heat insulation of their dwellings, how to identify potential energy savings and on the energy situation in Belgium.

Measure 18: Organising Energy information evenings

From the viewpoint of communication, awareness raising and advice, the Brussels-Capital Region organises training evenings. The topics covered vary and deal with both renewable energy and energy bills. This measure is targeted at households.

Measure 19: Getting a better understanding of the energy situation of housing

The Region already has some information on the energy situation of housing, notably:

- the Brussels Energy Audit (BEB) which gives an annual view of the energy situation of housing and enables it to be analysed;
- the Brussels Energy Agency (ABEA) which has carried out 100 personal energy audits of specific dwellings in Brussels (tenants, beneficiaries);
- energy audits have been carried out in three social housing companies;
- the Region has "Energy Opinion Procedure" software for energy audit of existing residential buildings which has an optional module for data collection.

Effective implementation of the Energy Performance and Indoor Climate of Buildings Order into Brussels law in July 2008 will provide a great opportunity to collect data and learn more about the energy situation of housing. Data collection is organised, for example, through certification.

Measure 20: Encouraging individuals to save energy (Energy Challenge)

Since 2005, the Brussels-Capital Region has issued a challenge to Brussels households. This challenge requires entrants to modify their day-to-day behaviour for six months to make energy savings. In November 2005, this challenge involved 200 Brussels households and since then it has had many entrants with the participation of 1 435 households in 2006-2007.

The efforts of all those involved shows that in all cases a change in day-to-day behaviour and basic habits can influence a household's energy consumption (-8% in 2005-2006 and -20% in 2006/2007). They therefore prove the importance of encouraging households to look at their behaviour. It is important to point out that a good number of participants seem to have developed or consolidated an "energy reflex".

Analysis of results reveals that this approach has often incited participating households to consider making bigger investments and/or led to introduction of other daily green habits. Many of them continue to pass their experiences on to those around them.

The scheme is being continued in order to put in place new ways for citizens to get involved enabling everyone to have a personal aim to improve their energy efficiency, without the need for investment.

Measure 21: Presenting the environmental issue (Festival of the Environment)

Organised each year by the Brussels-Capital Region, the Festival of the Environment is the event that welcomes the largest number and the most varied public. 2007 sees the Festival of the Environment's ninth year.

The principle is to present everything related to the environment, whether in terms of action by public authorities, associations or the private sector: alternative energy, mobility, construction, sustainable consumption, research, parks and green spaces, active recreation, etc.

As the festival is the event's leitmotiv, attempts are made to present the different topics in a fun way and each stand tries to get the public involved with "try it yourself" and "enjoy learning".

Financial instruments: providing financial support

Subsidies are financed through contributions included in gas and electricity tariffs provided for respectively in:

- the Order of 1 April 2004 on the organisation of the gas market in the Brussels-Capital Region, concerning gas and electricity transmission system fees and amending the Order of 19 July 2001 relating to the organisation of the electricity market in the Brussels-Capital Region, in particular Article 18a thereof, which imposes public service obligations on the distribution system operator, which include the promotion of rational use of gas through information, demonstrations and the supply of equipment, services and financial aid to the municipalities and other end customers
- and the Order of 19 July 2001 relating to the organisation of the electricity market in the Brussels-Capital Region, in particular Article 24 thereof, which imposes public service obligations on the distribution system operators, in particular promotion of the rational use of electricity through information, demonstrations and supply of equipment, services and financial aid to the municipalities and other end customers.

Consequently, only measures which have an impact on electricity or gas end use are taken into account.

Measure 22: Expanding the household aid scheme (subsidy scheme)

Regional subsidies have been introduced for citizens who are keen to improve their home or acquire equipment to reduce their consumption of fossil energy. To promote the use of solar water heaters in homes, the Region has granted subsidies for the purchase of solar panels since 2002. Since then, the subsidies have been extended both in terms of the variety of investments subsidised and the budget allocated.

In 2007, 17 types of subsidy are available to Brussels households. They relate to insulation, efficient heating, solar power and efficient household appliances.

Roof insulation – Subsidy 1 – Households

In general, most heat is lost through the roof. Therefore, careful effective insulation means a shorter heating season, reduced power for the heating installation and a higher temperature of the interior walls. As a consequence, energy bills can be significantly reduced and comfort increased while helping to protect the environment.

There is a €12 subsidy per m² of insulated surface, with a €1 000 ceiling per dwelling. It is also possible to benefit from a 40% tax deduction under certain conditions.

Roof insulation with green roofing – Subsidy 2 – Households

A green roof allows a building's temperature and humidity to be regulated naturally. It increases the building's thermal inertia and can improve its insulation. It provides a significant thermal effect in summer through evaporation meaning that occupants are not tempted to fit air conditioning. There are two types of green roofing: the intensive roof (or roof garden) and the extensive green roof (or vegetated roof).

For extensive green roofing, the subsidy is €7.5 per m² of insulated surface, with a minimum of 10 m² and a maximum of 100 m² per dwelling. For intensive green roofing, the subsidy is €15 per m² of insulated surface, with a minimum of 10 m² and a maximum of 100 m² per dwelling.

Insulation of external walls – Subsidy 3 – Households

After the roof, most heat tends to be lost through the walls. It is not always easy to insulate walls and it is sometimes better to enlist the help of a professional to assess and carry out the work. In existing constructions, there are three main ways to improve wall insulation: filling of existing cavity walls with an insulating material, wall insulation from the outside and wall insulation from the inside.

There is a €25 subsidy per m² of insulated surface, with a €2 500 ceiling per dwelling.

Floor insulation – Subsidy 4 – Households

The choice and laying of floor insulation are often a matter for an expert.

There is a €25 subsidy per m² of insulated surface, with a €2 500 ceiling per dwelling.

Super-insulating glazing – Subsidy 5 – Households

Despite their relatively small surface area compared to walls, windows are nevertheless a major source of heat loss. Compared to single glazing, efficient double glazing reduces heat loss from glazed walls by more than two thirds. As the properties of the frame (in particular the material) also have a significant effect on the window's energy efficiency, the glazing and frame unit must be taken into account.

There is a €50 subsidy per m² of double glazing, with a €2 500 ceiling per dwelling. At federal level, it is also possible to benefit from a 40% tax deduction for the cost of fitting double glazing under certain conditions.

Mechanical ventilation with heat recovery – Subsidy 6 – Households

All houses must have adequate ventilation if you want the air inside to be healthy, to avoid the risk of condensation and, in certain cases, to have a sufficient quantity of air to ensure correct operation of combustion equipment.

The subsidy is equivalent to 50% of the bill for supply and installation of the mechanical ventilation system, capped at €3 000 per dwelling.

Passive / low energy housing – Subsidy 7 – Households

The "passive house" concept applies to new dwellings in which the heat insulation is so effective that a conventional heating system becomes almost or even completely superfluous. The "passive house" does not exceed 15 kWh/m² per year for heating the premises. The "passive house" concept also applies to renovation. However, in this case, as the existing situation does not allow for correction of building orientation and structure problems, the energy requirements will be less strict. In this case, we talk about "low energy house", where the performance level is set at 60 kWh/m² per year of energy consumption for heating the premises.

Generally speaking, there is a subsidy per dwelling of €100 per m² of floor area up to 150 m² and of €50 per m² of floor area above 150 m². This subsidy cannot be added to the 6 subsidies mentioned above.

External solar protection – Subsidy 8 – Households

Good protection against the sun's rays in summer combined with appropriate ventilation may avoid the need to fit air conditioning and increase comfort. The ideal solution is to install a solar protection system on the outside of glazing in the form of a blind or a shutter.

The subsidy is 20% of the cost for supply and installation of the solar protection, capped at €400 per dwelling.

Low-temperature (HR+) / condensation (HR TOP) gas boiler – Subsidy 9 – Households

A low temperature boiler is characterised by operation within water temperature ranges lower than for a traditional boiler, thus reducing energy losses and gas consumption. The condensation boiler, on the other hand, recovers a large proportion of the calories still available in the fumes, thus generating an even greater energy gain.

The subsidy relates to boilers used for heating and mixed heating/hot water and amounts to 50% of the cost for supply and installation of the boiler, capped at €150 per HR+ low temperature gas boiler and at €500 per HR TOP condensation gas boiler. At federal level, it is also possible to benefit from a 40% tax deduction for the amount of the boiler installation under certain conditions.

Instantaneous gas water heater – Subsidy 10 – Households

Savings are possible, in particular through the use of instantaneous bypass gas water heaters with no pilot light, in which the gas flow automatically adjusts to hot water demand.

The subsidy is 50% of the cost for supply and installation of the water heater, capped at €200 per installation.

Thermal control – Subsidy 11 – Households

Thermal control is a key component of a heating system. Thermal control ensures that a comfortable temperature is maintained as and when required in different rooms. Incorrect or inappropriate adjustment is a major source of loss of thermal comfort and energy waste. There are various equipment options for thermal control: air thermostat with clock, thermostatic valves and external sensor.

The subsidy is equivalent to 50% of the cost of supplying and installing the control devices, capped at €500 per dwelling. In addition to this subsidy, the Federal Government grants a 40% tax deduction of the cost of installing a control system (thermostatic valves, air thermostat, external sensor) under certain conditions.

Heat pump for domestic hot water – Subsidy 12 – Households

The heat pump is a machine which transfers the calorific energy of a cold environment to a warmer environment through the intervention of mechanical energy (compressor). Rather than producing heat by burning fossil fuels, the heat pump exploits the heat present in the environment: in the water, the ground and the air. Heat is most often distributed in the dwelling by a system of low temperature underground pipes (30-35 °C), which requires all walls to be well insulated.

The subsidy is 50% of the cost for supply and fitting of the heat pump, with a cap of €2 500 per dwelling for installation of a domestic hot water heat pump and €5 000 per dwelling for heating of the premises. Alongside this subsidy, the State grants a tax deduction of 40% of the total for the installation of a heat pump under certain conditions.

Solar water heater for domestic hot water / for additional installation of central heating – Subsidy 13 – Households

Thermal solar collectors transform sunlight into heat. They are used with the solar water heaters to transfer the solar energy to the water. Combined systems are also available, which enable domestic hot water and some of the heating water to be produced with the solar collectors. This system does however need a larger surface area of panels. The radiators also need to have a larger emission surface area as it is a low temperature system (55 °C).

The subsidy amounts to 50% of the total cost for supply and installation of the solar water heater with a maximum of €3 000 per dwelling for the installation of domestic hot water heating and a maximum of €6 000 per dwelling for installation of domestic and additional water heating for central heating of the premises.

In addition to the subsidy, the end user can not only benefit from a tax deduction of 40% of the total for installation of a solar water heater (without exceeding a ceiling and under certain conditions) but also from a municipal subsidy (currently: Anderlecht, Brussels, Evere, Ganshoren, Woluwé-St-Lambert and Uccle).

Photovoltaic electricity production system – Subsidy 14 – Households

Photovoltaic solar collectors directly transform light into electricity. Given that the sun does not shine at all times, it is appropriate to either use a storage system or be connected to the grid to ensure a permanent supply. This second option is more appropriate to our urban environment: when electricity production is lower than consumption, current is taken from the grid and, conversely, the grid is supplied when demand is lower than production. To do this, the installation must meet certain technical conditions of compatibility and security.

The subsidy is 50% of the cost for supply and installation of the photovoltaic system, capped at €3 000 per dwelling. At federal level, there is also a tax deduction of 40% of the total for the installation of photovoltaic panels (up to a given ceiling). Moreover, for each MWh produced, a green certificate (CV) may be obtained. Green certificates are issued annually, by fraction and on a flat rate basis for panels less than 4 m² according to the estimated electricity production.

A++ refrigerator (including combined) – Subsidy 15 – Households

Each household appliance is sold with a label or information sheet indicating the electricity consumption category (from A to G) to which the appliance belongs. Therefore, consumers are given objective, standardised information allowing them to choose equipment that has better energy efficiency. A category A household appliance is economical, while a category G appliance is not very economical. A "+" is added to category A to distinguish appliances that are even more economical.

Category A++ designates a new generation of refrigeration equipment more economical than that in category A. This subsidy will partially cover the additional cost involved with buying an A++ appliance compared to category A. This subsidy is €200 per A++ refrigerator.

A++ freezer – Subsidy 16 – Households

Category A++ designates a new generation of refrigeration equipment more economical than that in category A. This subsidy will partially cover the additional cost involved when buying an A++ appliance compared to category A. This subsidy is €200 per A++ freezer.

Category A electric / gas tumble dryer – Subsidy 17 – Households

Drying laundry inside the home may cause humidity and hygiene problems. Heating the air and cooling it requires a lot of energy. It is not surprising therefore that tumble dryers are high energy-consuming machines. The vast majority of models have energy label C. Some more economical models are coming onto the market. Tumble dryers with label A are rather uncommon. The subsidy therefore seeks to make this more efficient category more accessible. Moreover, there are tumble dryers which operate on natural gas and which are much more efficient than electric tumble dryers.

The amount of the subsidy will depend on the type of tumble dryer. Thus, €200 will be granted for each category A electric tumble dryer and €400 for each gas tumble dryer.

Moreover, under **renovation subsidies** arranged by the Housing Department of the Territory and Housing Planning Administration, the Region offers subsidies, in the event of renovation of a building used for housing, for heat insulation, for work done to the building shell (rendering, cladding, frames and doors) and for installation of heating and hot water production systems. The content and amount of the subsidies are defined in Articles 8 to 10 of the ministerial decree relating to the conditions for application of the decree of the Government of the Brussels-Capital Region of 13 June 2002 on granting subsidies for housing renovation.

Measure 23: Giving financial support to collective housing (subsidy scheme)

The Region has created a subsidy programme for the professional sectors, financed through the public service RUE (Rational Use of Energy) missions of the gas and electricity network operator Sibelga.

Collective housing subsidies are available to the following stakeholders with an operating base, registered office, main establishment or management office in the Brussels-Capital Region: Public Service Real Estate Company (SISP), Communal Land Management Agency (RFC), CPAS (Public Social Action Centre), Social Real Estate Agency (AIS), Joint Building Ownership with or without legal personality, etc.

Eligible buildings must be in the Brussels-Capital Region. The building must have at least two dwellings. Eligible studies and investments must affect the whole of the building. Studies and investments relating to an individual dwelling are excluded (for individual dwellings, refer to the Energy Subsidies for end users).

Energy Audit – Subsidy 1 – Collective housing

The energy audit is a method which assesses the energy features of a building and its installations or those of a production process. The aim is, after creating a report of the energy consumptions of a building or a process taking into account its characteristics and its uses, to identify areas for energy efficiency improvement depending on technical and economic possibilities.

The subsidy amounts to 50% of the cost of the study.

Feasibility study – Subsidy 2 – Collective housing

The feasibility study is a study that seeks to determine the design and the technical, energy and economic characteristics of a specific energy-saving investment without making any reference to a type or a specific brand relating to this investment. Specific investment is taken to mean any investment which does not correspond to equipment and installations currently in use and which requires a specific design study. Traditionally, this is a technical and economic study which assesses the benefit of installing a specific technology compared to a traditional or pre-existing technology.

The subsidy amounts to 50% of the cost of the study.

Energy design study for a future building – Subsidy 3 – Collective housing

An energy design study is an analysis of future energy consumptions of the building, prior to its construction, including any possible variations. It is carried out in particular by computer simulation. Its purpose is to optimise the characteristics of the building structure and the equipment installed as well as their suitability. It incorporates an assessment of future operating costs, so that the contracting authority may make choices based on overall costs (investment and operating costs).

The subsidy amounts to 50% of the cost of the study.

Energy accounting – Subsidy 4 – Collective housing

Energy accounting enables energy consumption of a building to be monitored over time and clarification of the decisions to be made in terms of energy management of this building. It is an accounting system for energy fluxes, firstly to create a tool for making energy management decisions in particular through the collection, processing and communication of information relating to energy vectors consumed by each technical operation unit, by department or by use, secondly to establish consumption ratios and thirdly to raise the alarm where necessary and enable control of energy consumption deviations. The scale of the arrangements must be assessed according to the size of the building and its installations.

The subsidy amounts to 50% of the cost for supply and installation of the equipment.

Cogeneration facility – Subsidy 5 – Collective housing

The investments that are permitted are as follows:

- a high-quality cogeneration facility,
- the investment includes the electrical connection specific to the installation that is required for the needs of a building or several neighbouring buildings;
- trigeneration is not eligible.

It is useful to consult the electricity distribution system operator on the technical connection and metering conditions applicable to private electricity generation facilities. All the equipment and implementation thereof must comply with applicable technical provisions which are available from Sibelga.

The subsidy amounts to 20% of the total investment for high-quality cogeneration (including installation studies)[3].

Relighting of communal areas – Subsidy 6 – Collective housing

Relighting is an RUE technique to improve the lighting system of a room according to its use. Using this technique, users will have better lighting, will consume less energy, will need to use air conditioning less and will reduce their polluting gas emissions. In other words, their energy consumption will be improved.

The subsidy amounts to 30% of the invoice total.

Ventilation/Cooling – Subsidy 7 – Collective housing

All work involved with installing a speed regulator on ventilation compressors, pumps and systems benefits from this subsidy, which amounts to 20% of the cost for supplying and fitting the frequency regulator, with a cap of €5 000 per substation.

Insulation of the building roof – Subsidy 8 – Collective housing

This subsidy works in the same way as Subsidy 1 for the residential sector (see Measure 22).

There is a €12 subsidy per m² of insulated surface, with a €1 000 ceiling per dwelling.

[3] For urban mini heating, the cost of hydraulic connections is included in the investment total.

Green roofing – Subsidy 9 – Collective housing

This subsidy works in the same way as Subsidy 2 for the residential sector (see Measure 22).

For extensive green roofing, the subsidy is €7.5 per m² of insulated surface, with a minimum of 10 m² and a maximum of 100 m² per dwelling. For intensive green roofing, the subsidy is €15 per m² of insulated surface, with a minimum of 10 m² and a maximum of 100 m² per dwelling.

Insulation of external walls – Subsidy 10 – Collective housing

This subsidy works in the same way as Subsidy 3 for the residential sector (see Measure 22).

There is a €25 subsidy per m² of insulated surface, with a €2 500 ceiling per dwelling.

Floor insulation – Subsidy 11 – Collective housing

This subsidy works in the same way as Subsidy 4 for the residential sector (see Measure 22).

There is a €25 subsidy per m² of insulated surface, with a €2 500 ceiling per dwelling.

Super-insulating glazing – Subsidy 12 – Collective housing

This subsidy works in the same way as Subsidy 5 for the residential sector (see Measure 22).

There is a €50 subsidy per m² of double glazing, with a €2 500 ceiling per dwelling.

Mechanical ventilation with heat recovery – Subsidy 13 – Collective housing

This subsidy works in the same way as Subsidy 6 for the residential sector (see Measure 22).

The subsidy is equivalent to 50% of the cost for supply and installation of the mechanical ventilation system, capped at €3 000 per dwelling.

Passive / Low energy construction – Subsidy 14 – Collective housing

This subsidy works in the same way as Subsidy 7 for the residential sector (see Measure 22).

Per dwelling, there is a subsidy of €100 per m² of floor surface up to 150 m² and €50 per m² of floor surface over 150 m². There are various limitations to this subsidy.

External solar protection – Subsidy 15 – Collective housing

This subsidy works in the same way as Subsidy 8 for the residential sector (see Measure 22).

The subsidy is 20% of the cost for supply and installation of the solar protection, capped at €400 per dwelling.

Pipe insulation – Subsidy 16 – Collective housing

There is a subsidy of up to 20% of the cost with a cap of €5 000 per building.

Condensation boiler – Subsidy 17 – Collective housing

All work involved with installing a condensation gas boiler is eligible for the subsidy.

The subsidy is €10 per kW of rated power installed with a minimum of €400 and a ceiling of €10 000.

Instantaneous gas water heater – Subsidy 18 – Collective housing

This subsidy works in the same way as Subsidy 10 for the residential sector (see Measure 22).

The subsidy is 50% of the cost of supply and installation of the water heater, capped at €200 per installation. The subsidy is aimed at the installation of individual instantaneous gas water heaters in collective housing. The subsidy is multiplied by the number of dwellings.

Thermal control – Subsidy 19 – Collective housing

This subsidy works in the same way as Subsidy 11 for the residential sector (see Measure 22).

The subsidy is equivalent to 50% of the cost of supply and installation of the control devices, capped at €1 000 per boiler room.

Heat pump – Subsidy 20 – Collective housing

This subsidy works in the same way as Subsidy 12 for the residential sector (see Measure 22).

The subsidy is 50% of the cost of supplying and fitting the heat pump, with a cap of €2 500 per dwelling for installation of a domestic hot water heat pump and €5 000 per dwelling for heating of the premises.

Solar water heater – Subsidy 21 – Collective housing

This subsidy works in the same way as Subsidy 13 for the residential sector (see Measure 22).

The subsidy is 50% of the total costs for supply and installation of the solar water heater with a maximum of €3 000 per dwelling for the installation of domestic hot water heating and a maximum of €6 000 per dwelling for installation of domestic and additional water heating for central heating of the premises.

Photovoltaic collective electricity production system – Subsidy 22 – Collective housing

This subsidy works in the same way as Subsidy 14 for the residential sector (see Measure 22).

The subsidy is 50% of the cost of supply and installation of the photovoltaic system, capped at €3 000 per dwelling.

Actions targeting professional stakeholders

Measure 24: Training Energy Advisors in the Housing Sector

The Energy Advisor gives technical energy advice within the context of his professional activity. This skill may be acquired by taking a training course, run by the Region, in giving energy advice within the housing sector.

This training is targeted at professionals who are active in the residential sector, namely municipal and regional architects, eco-advisors, experts, members of the Housing Network, those involved with District Contracts, Social Real Estate Agencies, building assignees, etc.

During this training, all the aspects to be mastered by an Energy Advisor to implement a policy of responsible energy within the context of his mission or to raise awareness amongst occupants of energy savings in their dwelling are covered, with particular attention paid to the comfort of the occupants. The seminars also provide a solid technical base which the Energy Advisor may exploit during contact with specialists.

On completion of the training, participants develop a project which falls within their professional context. It is on the basis of this project, which validates their capacity to act as an Energy Advisor, that a certificate is issued. The training given is therefore certifying.

Measure 25: Providing RUE Tools to collective housing

The Brussels-Capital Region provides collective housing managers with a series of publications on energy savings.

Amongst these publications, the advice guide for collective housing (design engineers) gives design engineers the technical criteria to be used to achieve a high level of energy performance. This guide which claims to be 100% practical makes it easy for everyone to find the information relevant to him. The advice is classified into two separate categories: requirements and recommendations.

The explanatory notes developed in the management manual give practical, accessible advice on improving the energy management of installations. They help to deepen the results of the audit through the use of an audit checklist covering energy management, office technology, heating, lighting, building structure, cooling, thermal control and ventilation.

Together these notes are an excellent tool for those working in the sector.

3.3 Energy efficiency improvement measures in the tertiary sector

In the Brussels Region, the tertiary sector accounts for almost 39% of energy consumption. The tertiary sector includes a wide range of establishments, such as governments, schools, hospitals, office buildings, public undertakings, small and medium-sized enterprises (garages, printers, coachworks, dry cleaners, etc.), large supermarkets, etc. The Brussels-Capital Region has put in place information, awareness raising and management tools to help this sector to better manage the energy aspects of its better. A wealth of financial incentives is also available.

Raising awareness – Information: the Energy reflex

Measure 26: Getting a better understanding of the energy situation of buildings

Given the importance of the building sector for final energy consumption, the quest to control energy consumption requires general information to be collected from users. An audit of the building must provide information that is both reliable and easy to access demonstrating the design and use of the building by users. To this end, the development and use of standardised audits created from digital processing of a restricted number of parameters will be widely distributed.

In addition, the effective implementation of Directive 2002/91/EC on the energy performance of buildings into Brussels law from 2009 will provide a great opportunity to collect information. This information will expand knowledge of the energy situation of buildings. The collection of data is to be organised.

Furthermore, the Energy Performance and Indoor Climate of Buildings Order (OPEB/*Ordonnance relative à la performance énergétique et au climat intérieur des bâtiments*) also covers inspection of boilers over 20 kW. The boiler inspection system should be in place by 2009 which will also give a better view of the energy situation of buildings.

Article 20(4) of the OPEB relates to the regular inspection of air conditioning systems with a power over 12 kW. It is evident that faced with the trend in the tertiary sector to fit air conditioning, the energy management has a role to play in encouraging natural techniques. It is necessary to raise awareness amongst design engineers (architects and design offices) and future design engineers (via architecture students) of the energy design of office buildings, both in terms of structural composition and of the performance of the system associated with it, using an educational IT tool.

Measure 27: Developing the "Entreprise Ecodynamique" (Ecodynamic Company) seal of approval

In 1999, the Brussels-Capital Region launched the "Entreprise Ecodynamique" seal of approval. This seal is designed for all types of body (large or small enterprise, private, public or mixed, multinational subsidiary, SME, management or association) regardless of its field of activity.

This seal, awarded for a period of 3 years, demonstrates the desire of these companies and bodies to take on an innovative long-term approach. This is centred on environmental (springboard towards the EMAS management system), financial (assessment of company accounts) and health (protection of internal air quality or noise reduction within the establishment) aspects. During the three years in which the seal is valid, companies must put in place the action plan defined by them in their environmental programme, assess their actions, update their analysis and draw up a new action plan.

From 2008, the energy aspect will take on greater significance and will be the priority area of the "Entreprise Ecodynamique" seal by working in the same way as the PLAGE programme but at company level.

Measure 28: Providing RUE Tools to the tertiary sector

The Brussels-Capital Region provides building managers with a series of RUE tools and publications on energy savings. These are covered in Measure 3 above.

Amongst the tools specifically dedicated to the tertiary sector, the RUE maintenance specifications give answers on how to organise the operation of a service sector building between the different stakeholders in a spirit of cooperation, give the conditions to be met for equipment and determine the intervention needed.

Financial instruments: providing financial support

Measure 29: Giving financial support to the tertiary sector (subsidy scheme)

The Region has created a subsidy programme for the professional sectors, financed through the public service RUE missions of the gas and electricity network operator Sibelga.

The subsidies for the tertiary sector and industry are available to the owners of public sector buildings in Brussels, non-commercial bodies, undertakings and the self-employed in the Brussels-Capital Region and federations representing a sector of activity.

Energy Audit – Subsidy 1 – Tertiary sector

This subsidy works in the same way as Subsidy 1 for collective housing (see Measure 23).

The subsidy amounts to 50% of the cost of the study.

Feasibility study – Subsidy 2 – Tertiary sector

This subsidy works in the same way as Subsidy 2 for collective housing (see Measure 23).

The subsidy amounts to 50% of the cost of the study.

Energy design study for a future building – Subsidy 3 – Tertiary sector

This subsidy works in the same way as Subsidy 3 for collective housing (see Measure 23).

The subsidy amounts to 50% of the cost of the study.

Energy Accounting – Subsidy 4 – Tertiary sector

This subsidy works in the same way as Subsidy 4 for collective housing (see Measure 23).

The subsidy amounts to 50% of the cost for supply and installation of the equipment.

Cogeneration facility – Subsidy 5 – Tertiary sector

This subsidy works in the same way as Subsidy 5 for collective housing (see Measure 23).

The subsidy amounts to 20% of the total investment for high-quality cogeneration (including installation studies)[4].

[4] For urban mini heating, the cost of hydraulic connections is included in the investment total.

Use of renewable energy – Subsidy 6 – Tertiary sector

Investments eligible for the subsidy are for installations using energy from renewable sources and which are designed above all to meet the needs of the building.

Renewable energies are understood to mean any energy source, other than fossil fuels and nuclear fission, the consumption of which does not limit its future use, in particular hydraulic energy, solar energy, geothermic energy, biogas, organic products and waste from agriculture and forestry arboriculture and the organic biodegradable fraction of the waste. This also includes the use of heat pumps insofar as there is a net gain in primary energy over the annual result of the installation.

Before any private generation installation that can function in parallel, contact must be made with the electricity distribution network operator regarding the technical connection and metering conditions. The installation (equipment and implementation) must comply with applicable technical provisions (available from Sibelga).

The subsidy is 40% (including studies) for the use of renewable energy sources.

Installation of a heat network – Subsidy 7 – Tertiary sector

The subsidy is 30% of the cost of making an investment (including studies).

Heat insulation of building walls – Subsidy 8 – Tertiary sector

This subsidy applies for all work carried out to achieve overall heat transmission coefficients for the walls lower than or equal to the reference threshold values. In addition, any investment in insulation must be accompanied by an analysis of the wall's future hygrothermal behaviour and information relating to the relative future humidity of the insulated premises (with potential suggestions for improving ventilation).

The subsidy is 30% of the cost of making an investment (including studies).

Replacement or improvement of any heating system – Subsidy 9 – Tertiary sector

The system must fall within one of the following categories:

- condensation boilers;
- partitioning work on the heat distribution system (zone heating);
- thermostatic valves suitable for the type of usage of the premises;
- control systems;
- any other work relating to heating installations that is designed so that the heating system (boiler, heat distribution and control) is particularly efficient, namely a system which, on the one hand, develops a higher level of energy efficiency than a traditional system and, on the other hand, enables heat distribution and control adapted to the principles of rational use of energy for the building's different uses.

The subsidy is 30% of the cost of making an investment (including studies).

Lighting systems – Subsidy 10 – Tertiary sector

In order to benefit from the subsidy, replacement of the lighting system must meet certain conditions. On design, the choice of the lights and fittings to be fitted should be such that it cannot lead to an average level of lighting more than 20% higher than the requirements of Belgian standard NBN EN 12464-1 (NBN EN 12193 for sports facilities).

The subsidy is 30% of the cost of making an investment (including studies).

Optimisation of the lighting system operation – Subsidy 11 – Tertiary sector

Investments eligible for the subsidy are those relating to:

- timers, possible associated with sensors, in passageways, corridors and toilets;
- on-off or continuous control of the light level according to the natural lighting of the room;
- dual circuits for reduced lighting.

The subsidy is 30% of the amount invested (including studies).

Rotating electrical equipment – Subsidy 12 – Tertiary sector

This relates to any rotating electrical equipment (pumps, fans, compressors) with a motor fitted. As regards heating, ventilation or refrigeration installations, it must be fitted with automatic control suitable for the actual needs of the building and its occupants.

The subsidy is 30% of the amount invested (including studies).

Any ventilation and cooling equipment – Subsidy 13 – Tertiary sector

The equipment must fall within a given category.

The subsidy is 30% of the amount invested (including studies).

Any equipment or system for improving energy efficiency – Subsidy 14 – Tertiary sector

The equipment must be particularly efficient, i.e. any equipment or system which develops a higher level of energy efficiency than normal and must fit with the principles of rational use of energy for the different uses of the building in question.

The subsidy is 30% of the amount invested (including studies).

Energy efficiency actions – Subsidy 15 – Tertiary sector

Any professional federation representing a particular Brussels sector may submit an application for a grant to cover 100% of any action that seeks to improve energy efficiency and the use of renewable energy sources for the benefit of a large number of institutions or stakeholders in their sector in Brussels.

This may involve organisation of a seminar or training session, conducting research, a support mission, creation of an information brochure, etc. The aim is to improve the energy efficiency, namely the reduction of primary non-renewable energy consumption to meet the final energy needs.

Actions targeting professional stakeholders

Measure 30: Offering RUE Tools to the tertiary sector

The Brussels-Capital Region provides tertiary sector building managers with several RUE tools: **standard specifications for design engineers, the management manual and AlterClim software.**

The standard specifications are documents to help specialists apply criteria for achieving energy or environmental performance levels. The topics covered are hot water, lighting, heating, air conditioning and the energy design of a tertiary sector building.

The explanatory notes of the management manual give practical, accessible advice on improving the energy management of installation and help to deepen the results of the audit through the audit checklist (the chapters included are energy management, office technology, heating, lighting, the building structure, cooling, thermal control and ventilation).

AlterClim is a piece of software that can be found online on the IBGE website which answers the question "How to completely or partially avoid air conditioning without affecting comfort?". It contains the results of 50 000 dynamic simulations, which the user can easily look at to see if a room with certain characteristics could avoid air conditioning. It also contains substantial technical and educational documentation in the form of sheets that can be read online or printed.

3.4 Energy efficiency improvement measures in industry

Industry represents 3.5% of the end use of the region. The largest industrial undertaking in Brussels is the Audi car assembly plant (ex VW) in Forest which alone accounts for a quarter of this sector. However, this establishment is involved in a greenhouse gas emission allowance trading scheme (Directive 2003/87/EC) and is therefore not targeted by this plan.

The rest of this sector is made up of a variety of small enterprises involved in various activities. Therefore, the industrial sector is not a priority area for the Brussels-Capital Region within the context of this plan.

Financial instruments: providing financial support

Measure 31: Providing assistance for energy-saving investments

The Brussels-Capital Region grants enterprises aid for energy-saving investments. The Order of 1 July 1993 on promoting economic expansion in the Brussels-Capital Region, governs the granting of financial aid to certain companies in Brussels that make investments or which have resorted to consultancy. This aid is granted in the form of investment incentives and represents 20% of the total investment.

Aid is agreed for investments made on the condition that they seek to improve energy efficiency and that they fall within one of the 16 eligible categories. These investments must directly relate to the company's production process (e.g.: furnace, boiler, compressor, dryer, refrigerators or freezers, etc.)

Within the context of promoting economic expansion, a grant of up to 50% (capped at €25 000) of the costs incurred in carrying out feasibility studies may be received from the Region.

3.5 Energy efficiency improvement measures in the transport sector

The Brussels-Capital Region had 583 493 registered vehicles in 2006, or 9.3% of the Belgian total (59.7% in the Flemish Region and 31% in the Walloon Region), a 20.9% increase compared to 1990 (+35.9% /nationally), which represents 5.7 vehicles for every 10 inhabitants.

It is worth noting that some vehicles registered in the Brussels Region are not driven there as there are a certain number of "company cars" and "long-term rental vehicles". Similarly, the Brussels-Capital Region has a daily influx of vehicles registered elsewhere.

On average, the engine capacity of the vehicles has increased (64% of vehicles are over 1600 cc) and diesel engines have seen a sharp upturn, to the point where today almost 80% of new private vehicles on the market have a diesel engine.

There has also been an increase in the number of kilometres travelled in the Brussels-Capital Region: 9.3% increase between 1995 and 2005.

In terms of mobility, the main challenge to be tackled by the Region involves improving accessibility to business areas while reducing the use of private cars, which are a source of pollution, a cause of accidents and which use a lot of energy.

For this purpose, a first Iris Regional Transport Plan was adopted in 1998. The Iris Plan deals with a series of actions on urban structures, public transport, traffic, pedestrians, two wheels and goods transport. This Plan states, amongst other things, that the Brussels Government is committed to reducing traffic by 20% between 1999 and 2010. At present this plan is being revised.

A series of measures known jointly as "Bruxell'Air", presented by the Environment Minister and the Mobility Minister on 11 May 2006, coordinates and strengthens the introduction of priority structural operational actions to reduce atmospheric emissions caused by traffic. They also result in a reduction of the energy use of the transport sector. The operational actions specify certain requirements of the 2002-2010 Air-Climat Plan.

The structural measures mostly relate to the modal transfer of journeys made by car to walking, cycling and public transport. This transfer should be brought about by the improvement of public transport, the development of conditions to encourage the other modes of transport, parking management and informing and raising public awareness on the subject.

Raising awareness – Information: the Energy reflex

Measure 32: Informing the public about mobility

Within the context of the European Mobility Week which takes place at the end of September every year, a "Car-Free Sunday" has been organised by the Brussels Region and the 19 municipalities for several years. This festive day has been hugely successful.

The Region launches other campaigns to improve the image of cyclists and pedestrians:

- Friday Bikeday is an operation, which since 2007 has encouraged people to cycle to work on Fridays, with the direct involvement of companies and organisations;
- Operation "Dring Dring" is a yearly campaign aimed at encouraging people to cycle to work;
- "Buy-a-bike" is an annual campaign aimed at demonstrating, to customers and businesses alike, that the bicycle is a viable alternative to the car when it comes to shopping.

Several publications and other communication tools are also available to those who are interested, notably:

- an "Alternative Transport" leaflet giving behavioural advice and various links to interesting websites;
- a billboard advertising campaign in September 2002: "Tomorrow, I'll travel a different way";
- a "1001 solutions" brochure giving a range of advice on mobility and in particular less polluting behaviour, the choice of clean vehicles, the nature and impact of pollutants, including on health;
- IBGE's webpage "Green mobility for households" giving advice on less polluting ways to travel;
- a new brochure entitled "My travel and the environment" to be developed in 2007;
- almost 100 000 flyers distributed to drivers on 21, 22 and 23 June 2005, encouraging them to adopt a more balanced driving style. The flyer was designed to be hung from the car's rear view mirror. The purpose of this action was to encourage people to act by telling drivers about simple things that anyone could do on a daily basis to make savings.
- The introduction of charges for driving on busy roads, pollution meters giving a real-time indication of the air quality
- In 2007, a communication campaign on alternative transport for short journeys (TV adverts, radio adverts, etc.)
- etc.

Measure 33: Developing an information tool for help in choosing a vehicle (Ecoscore)

The Ecoscore is an environmental score for vehicles. It gives an indication of the overall ecological impact of a vehicle. The impact on the greenhouse effect, air quality (impact on health and ecosystems) and noise pollution are combined in a single indicator. This score therefore enables comparison of vehicles with different technology and different fuels and on the single, same basis.

A protocol between the Federal Authority and the Regions on the use of the Ecoscore method as an instrument for assessing the overall environmental character of road transport vehicles is in the pipeline.

Measure 34: Encouraging energy savings in mobility (Mobility Challenge)

Within the Energy Challenge (see Measure 20), a specific commitment is proposed to households with one or more vehicles: saving on fuel by avoiding short car journeys or adopting a balanced driving style (balanced driving lessons are available through the 1007 edition of the challenge), trying out journeys using alternative transport (bikes are provided through the 1007 edition of the challenge), etc.

Financial instruments: providing financial support

Measure 35: Supporting alternative mobility ("Bruxell'air" bonus)

With the "Bruxell'air[5]" bonus, the Brussels-Capital Region provides a tool aimed at getting people to give up their own car.

The aim of this incentive is to encourage drivers in Brussels to give up their cars for more environmentally friendly modes of transport: public transport, cycling, walking and car sharing.

The incentive involves, under certain conditions, receiving a one-year subscription for the car share scheme (CAMBIO - see Measure 41). This subscription is accompanied by the choice of an annual pass for public transport or a bike bonus towards the purchase of a bike and/or approved accessories.

In addition, if an owner decides to have his vehicle destroyed at a centre approved for this purpose, his bonus may be doubled (renewal of one or two passes and/or double bike bonus).

5 all information is available at www.prime-bruxellair.be.

Regulations: acting structurally on demand

Measure 36: Obliging companies to think about staff mobility (Company travel plan)

The Brussels Order of 25 March 1999 on the assessment and improvement of the air published in the Belgian Official Journal of 24 June 1999 (and its executory decisions) requires a Company Travel Plan to be implemented for all public or private bodies with more than two hundred employees on the same site.

On 5 February 2004, the Brussels Government adopted the decree implementing this order (published in the Belgian Official Journal of 18 March 2004), the circular and the form relating to company travel plans (published in the Belgian Official Journal of 22 March 2004). These documents define the content of the travel plans and the administrative terms and conditions to be met by 31 December 2004 and afterwards.

The aim of the Company Travel Plans is to better organise all journeys related to the company. They include the research, implementation and the monitoring, in a company or a group of companies, of measures aimed at promoting sustainable management of travel associated with the activity of this company or these companies.

A decree relating to the obligation to implement travel plans for major events is being prepared.

Measure 37: Encouraging soft mobility

The Region takes measures to implement the necessary arrangements for non-polluting travel associated with walking and cycling. All this is done by way of "green links". These arrangements provide continuous, safe and comfortable non-motorised travel routes. They link up green spaces and as far as possible use the city's existing planted areas.

Within the context of developing non-motorised travel methods, the Region, through its Iris Plan, aims for 10% of journeys to be made by bicycle by 2010. As a contribution, the Region is planning to develop cycle lanes and routes, is creating cycle boxes at the region's 478 crossroads, is facilitating intermodality with public transport and is installing bike points in the four main stations.

The Region supports initiatives for cycling training, school cycle groups, etc.

Measure 38: Improving the quality of public fleets

In application of the Framework Order on assessment and improvement of air quality (Air Order), the Region adopted a decree obliging public authorities with a fleet of more than 50 vehicles to achieve a rate of 20% so-called "clean" vehicles by 2008.

The technology used to fit with the definition of a "clean" vehicle seeks to reduce fossil energy consumption and atmospheric emissions. This decree is being reviewed in order to improve its effectiveness.

Actions targeting professional stakeholders

Measure 39: Improving the energy efficiency of STIB vehicles

The Société des Transports Intercommunaux de Bruxelles (STIB/Brussels Intercommunal Transport Company) is the Region's preferred partner for increasing the public transport service.

The management contract signed between STIB and the Region lays down, amongst other things, a 35% increase in public transport by 2011. With overall mobility of the population on the increase, we must keep in mind that all measures aimed at reducing the use of personal motorised transport must be at least compensated by an adequate public transport service.

The management contract also lays down the investment that needs to be made for ecological renewal of the bus fleet and announces the creation of a regional working party the aim of which is to define, by 2009, a purchasing strategy for new environmentally-friendly efficient vehicles.

Actions targeting the general public

Measure 40: Providing the public with bikes

In order to encourage people to travel occasionally by bike, a roadside bicycle hire system was put in place in 2006, throughout the historical centre. The system's effectiveness will be improved when it is expanded to a wider area, perhaps even throughout the whole Region.

Measure 41: Providing the public with a car share scheme

Backed by the Region, the company Cambio provides subscribers with personal vehicles from 25 roadside car parks. This scheme allows people to give up ownership of a private vehicle, thus reducing the number of car journeys made as they do not have a car available all the time.

4 Horizontal and/or cross-sectoral measures

Measure 42: Organising energy market regulation conditions

The Brussels-Capital Region created the Commission for energy regulation in the Brussels-Capital Region, known as "Bruxelles Gaz Electricité", or "BRUGEL" for short. The various missions of this Commission seek to effectively regulate the organisation and running of the regional electricity and gas market and to provide information for consumers. They must:

- legally and technically ensure operation of the green certificates scheme (including resolution of grievances, transposition of the renewable energy directive) and check its relevance in the funding of renewable energies and cogeneration;
- ensure that invoices are legible;
- improve the information that is available on the quality and continuity of the electricity supply through transport and distribution networks, and the provision of gas through distribution networks;
- improve the information that is available on the quality of associated services (connection, repair, etc.);
- revise the technical regulation clauses and check whether Public Service Obligations also need to be taken;
- provide regular information on the electricity and gas supply, supplier reliability and the quality of their products;
- ensure monitoring of actions relating to management of the electricity and gas market: gas and electricity supply authorisation files, monitoring, customer eligibility, certification of green installations);
- ensure that the opening up of the residential market runs smoothly: compile technical information, monitor operators;
- put in place a complaint handling procedure: both internally, by dealing with and redirecting claims, and externally, through the organisation of the Appeal Chamber and the mediation procedure;
- develop an information system within the regulator;
- allow market players to participate in the information system (UMIX);
- allow the exchange of information between regulators;
- analyse investment plans;
- actively participate in the Belgian Regulators Forum and in active working parties.

For management, a series of actions are put in place in ensure follow-up for gas and electricity market policies:

- monitoring and coordinating legislative action and defining policies related to the gas and electricity markets;
- creating conditions for supply of electricity and gas to vulnerable households;
- putting procedures and support measures in place for managing the energy debt and improving social energy tariffs (negotiation with the Federal Government);
- modifying "all-in" tariffs to move towards, in agreement with the Federal Government, a tiered pricing system;
- participating in federal bodies to obtain a price reduction for social tariffs and those of customers transferred outside the market, and technical support;
- setting up the secretariat of the Users Committee;
- processing road system licence applications;
- maintaining contact with the regulator;
- working with SIBELGA to write the public service mission programme;
- introducing additional information tools relating to awareness of energy consumption by the different type of consumers in the Brussels-Capital Region and determining factors for this consumption.

Measure 43: Imposing Public Service Duties and Missions

Chapter IV and associated chapters of the Order of 14 December 2006 amending the Orders of 19 July 2001 and 1 April 2004 on organisation of the electricity and gas markets in the Brussels-Capital Region describe the content and procedures relating to Public Service Duties and Missions.

Amongst these duties, the distribution network operator and the suppliers are obliged to promote the rational use of electricity through information, demonstrations and supply of equipment, services and financial aid for the benefit of the municipalities and other end customers.

Measure 44: Supporting renewable energy through the use of Green Certificates

In 2007, renewable energy support measures were multiplied. Investment in renewables is now 40 to 50% financed (see Measure 29). The "renewable energy" Facilitator (see Measure 2) is called upon more and more to give advice and support for specific projects.

In addition, a system of green certificates has been in place since 2005. This involves an obligation for electricity suppliers to release a certain number of green certificates for the quantity of electricity supplied. Suppliers must get green certificates from green electricity producers to satisfy their allowance obligation.

The support mechanism for green electricity production in Brussels relies on the operation of a "green certificates market":

- on the one hand, green electricity producers regularly receive green certificates on a pro rata basis of the CO_2 saving they make on production of electricity and
- on the other hand, electricity suppliers are obliged to present a green certificate allowance to the regulator each year or otherwise incur a fine.

Suppliers are therefore led to negotiate with green electricity producers the buy-back of their green certificates. The value of green certificates traded will depend on the amount of the fine, the number of certificates available on the market and the allowance required of suppliers which is set by the Government of the Brussels-Capital Region.

At the end of each year, by 31 March at the latest, suppliers must hand their green certificates allowance over to the regulator. This allowance is a percentage of the annual volume of electricity supply in MWh.

Any supplier who fails in its allowance obligation must pay a fine of €100 for each green certificate lacking.

Below are the green certificates allowances for the next few years, as set by the Government of the Brussels-Capital Region[6].

2007	2.5%
2008	2.5%
2009	2.5%
2010	2.75%
2011	3%
2012	3.25%

These allowances do not represent the percentage of green electricity produced in Brussels. In fact, the number of green certificates granted per MWh of electricity to an installation varies greatly from one technology to another. This number may be lower or more often greater than the number of MWh produced. In addition, the green certificate allowance is not met every year by all suppliers. Finally, a large proportion of the green certificates issued to Brussels come from the Walloon Region.

To be able to benefit from green certificates and origin guarantee labels, an installation must have been subject to prior certification. Certification vouches for the fact that it is a green electricity installation and that its design allows the quantities of energy consumed and produced to be metered in accordance with the provisions of the metering law[7].

A green electricity installation must make CO_2 savings of at least 5% compared to the reference channels to be able to benefit from green certificates. Furthermore, an installation only receives green certificates during the first 10 years following its commissioning[8]. This period may be extended by 5 or 10 years if the installation is significantly modified[9].

The number of green certificates granted is directly proportional to the CO_2 saving made by the installation compared to the reference channel. The reference installations are a TGV unit for electricity and a gas boiler for heat. A green certificate is granted for every 217 kg of CO_2 avoided.

In 2007, the support for photovoltaic solar energy was strengthened by way of a specific multiplication factor: the Region grants 7.27 green certificates for every MWh of electricity produced in photovoltaic installations of less than 20 m² during the 10 years following its commissioning. Green certificates are granted at the end of each quarter. Green certificates are entered into an open account in the name of the producer. Green certificates are valid for five years. These certificates may be sold by the producer at any time. The number of green certificates awarded for every MWh produced gets gradually smaller according to the size of the installation[10].

Photovoltaic green certificates work in two different ways:

- the purchase by Elia (transport network operator) at €150/MWh, which is the equivalent of €20.63/green certificate;
- the sale of the green certificate to a supplier at market price, namely €92/green certificate.

The value of the green certificate depends on the amount of the fine imposed on a supplier not meeting its quota. As the fine is set at €100, this is the approximate value of the green certificates.

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6 Ruling of the Government of the Brussels-Capital Region of 29 March 2007 setting the green certificates quotas for 2008 and subsequent years.

7 Ministerial Decree of 12 October 2004 establishing the Brussels metering code for the metering of energy.

8 See Article 14, section 1(2) of the decree of 6 May 2004 amended by the decree of 19 July 2007.

9 See Article 14(3) of the decree of 6 May 2004 amended by the decree of 19 July 2007.

10 For further information, see the decree of the Government of the Brussels-Capital Region of 19 July 2007.

Biomethanisation also has a specific multiplication factor.

Measure 45: Promoting cogeneration

Investment in high-quality cogeneration are financed up to 20% (see Measure 29). The Cogeneration Facilitator is called upon more and more to give advice and support for specific projects.

Green certificates have been awarded since 2005 if cogeneration is so-called "high-quality", i.e. it allows sufficient CO_2 savings compared to separate production of heat and electricity (see Measure 44).

Measure 46: Developing special tools for schools

Each year, more than 200 000 children and teenagers attend the various primary and secondary schools in the Brussels-Capital Region. This gives a wide range of opportunities to instil good reflexes from a young age.

For this purpose, the Region provides teachers with complete teaching files to raise young people's awareness on the topic of energy. Amongst the many educational tools available, a file called "child's personal commitment to help save the planet" is aimed at pupils in Brussels in the final year of primary education and the first year of secondary education. The file is made up of the pupil's section, the teacher's section, the correction of the pupil's section and additional activities. It relies on project teaching and focuses on 3 stages:

- "Discovering energy challenges": a phase during which children learn the basics to understanding energy issues and the reasons why we are changing the way we consume;
- "Acting for my planet": this second part shows the child his own habits in terms of energy and helps him to assess energy management in his school environment;
- conclusion: short but vital as it allows children to step back from their commitment, evaluate what they have done, say what the main reasons were for them taking action and look at their long-term behaviour now that the project is coming to an end.

There is also a "turnkey" Energy project. Experts come into the classroom to help pupils carry out an educational, socially responsible and fun project. Pupils, transformed into energy ambassadors, will put simple things into practice to reduce energy consumption within the school.

Measure 47: Reducing energy consumption through Environmental Licences

The Order of 5 June 1997 on environmental licences has implications for the reduction of energy consumption.

Depending on certain specific conditions, the use of boilers is subject to an environmental licence. The areas for which energy requirements apply are the minimum combustion efficiency, compulsory maintenance (also for natural gas), the adjustable burner requirement, the fuel meter requirement to monitor energy consumption, heat insulation of pipes and valves and the control requirement.

In addition, with type 1A licences, the recommendations of those responsible for energy research are included.

5. Specific measures required to be reported in the 2007 EEAP by Directive 2006/32/EC

5.1 Article 5 on measures in the public sector

According to Directive 2006/32/EC, Member States shall ensure that energy efficiency improvement measures are taken by the public sector, that they communicate the exemplary role and actions of the public sector to citizens and/or companies and that they enable the exchange of best practices between public sector bodies.

Measure 48: Improving energy efficiency in public procurement

Public authorities lead by example. Thus, energy efficiency requirements will be incorporated into public contract procedures. A guide specifically dealing with the incorporation of energy efficiency criteria will be promoted.

In addition, the Government of the Brussels-Capital Region is preparing a ministerial circular for the attention of all Public Interest Bodies in Brussels, encouraging the practice of sustainable procurement. The insertion of ecological criteria into public contracts includes points on energy consumption and the purchase of sustainable energy equipment.

Measure 49: Recovering energy from the Brussels-North treatment plant

The Brussels-Capital Region launched and financed the Brussels-North treatment plant, work on which began in June 2003. This plant treats the wastewater of 1 100 000 inhabitants, or 325 000 m^3 on average per day.

In terms of energy, the Brussels-North plant produces in operation phase up to 15% of its electricity needs. This electricity is produced using a hydraulic turbine which recovers the energy released by the head the water falls (the water goes from the second floor of the plant into the Senne) and by recovering the biogas resulting from the digestion of slurry.

This biogas is burnt in a cogeneration facility which provides electricity, steam (used for the thermal hydrolysis and oxidation by steam process requirements) and hot water (used for heating the premises).

The electrical power of the cogeneration installed is 1.2 MW. The expected rated biogas production is 650 Nm^3/h, of which 463 Nm^3/h will go to cogeneration and the rest to the boilers. Cogeneration is also designed to work with natural gas.

5.2 Article 7 on availability of information

Article 7 of Directive 2006/32/EC requires Member States to widely disseminate in a transparent manner information associated with promoting energy efficiency and financial and legal frameworks by which Directive 2006/32/EC is governed. This article also requires Member States to increase their efforts to promote energy efficiency.

All measures relating to the content of this article can be found in certain measures covered in previous paragraphs. In fact, these are measures that relate to the points marked "Raising Awareness – Information: the Energy reflex".