

# BRUSSELS

from eco-building to sustainable city







Het nieuwe g  
van Brussel  
op weg naar  
een duurzame

Le nouveau visage  
de Bruxelles...  
vers une ville durable!

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# A sustainable city for all in Brussels

For several years, Brussels has been involved in a large number of activities aiming to meet the environmental challenges specific to a modern city-region. The objective: **for Brussels to become a model in the coming years with regard to sustainable development.** In signing the Covenant of Mayors, Brussels has committed itself, with 1600 other signatory cities, to reducing its greenhouse gas emissions by 30% by 2025, thus exceeding the European objective of a 20% reduction in 2020. The Brussels-Capital Region wants to be among the leading European and world metropolises with regard to sustainable urban management.

Building a sustainable future for cities is a challenge. To meet it, the Brussels-Capital Region has chosen to develop several courses of action involving all areas of life in the community. First of all, choices were made to greatly improve the energy efficiency of buildings through large-scale promotion of sustainable reno-ovation and construction techniques. In this regard, a number of measures are already allowing a very high level of energetic and ecological performance to be achieved. In the long term, general implementation of the **'very low energy'** and **'passive'** standards are clear objectives of the developed policy.

But a sustainable city is also constructed through transversal policies at the neighbourhood level: beyond renovations of the building stock, the development of sustainable neighbourhood contracts aims to **create a new local dynamic**

**with regard to housing, public spaces and public facilities.** Within this dynamic, environmental aspects are now substantially taken into account.

As for green spaces and biodiversity, they are **an essential resource for ensuring the quality of life in the urban fabric.** Their environmental management, the development of playgrounds, and the layout of the Green Trail that allows people to tour the Region via its green spaces are all practical manifestations of this.

Finally, significant resources are devoted to **combating environmental pollution:** water purification, stricter standards for radiation from transmitting antennas for mobile phone networks, combating pollution peaks, waste reduction, etc.

Action toward a sustainable city also **involves supporting hundreds of local initiatives** of citizens who are active everyday: sustainable neighbourhoods, collective buying groups that promote short food supply chains, the creation of vegetable gardens and neighbourhood composting, etc.

But the ecological transition will not take place without **a real social project.** It must ensure an equitable distribution of these changes and protect the most vulnerable residents. For this reason, following the example of the social 'green loan' system, specific measures target this fringe of the population and are an integral part of the policies conducted. Likewise, special attention is paid to creation of new lines of employment related to the new environmental trades.

Our ambition: **a global culture of the sustainable city,** so that respect for the environment contributes to the human and social development of Brussels and the joie de vivre of its residents.

**Every act counts when there are one million residents in Brussels.**

Evelyne Huytebroeck,  
Minister for the Environment, Energy and Urban  
Renewal of the Brussels-Capital Region



# For a 'coming out' of ecological practices

The proliferation of good examples and their 'snowball effect' are changing Brussels in a more and more visible way.

Is it because it is also the capital of the European administration – often described as centralist and technocratic – that Brussels opted for other methods in defining a new energy and environmental policy in 2004?

Faced with the enormous challenges posed by climate change (which is even more rapid than foreseen) and humanity's entry, willy-nilly, into the post-oil era, the question was simple: how, starting from zero, to make the changes necessary to face up to these challenges, with Belgium bringing up the rear in Europe with regard to reductions in energy consumption?

The alternatives were, broadly speaking, as follows: either to launch large pilot projects that the public authorities risked having to bear single-handedly and pay for in full; or to encourage projects from the field, borne by designers and clients committed to eco-construction.

Brussels chose the participatory method by stimulating demand and supporting innovative pilot projects to allow them to go as far as possible. It was a matter of harnessing the enthusiastic initiatives of businesses, individuals and public authorities. Of relying on people, starting from their specific needs and banking on their skills, in so doing, of progressively allowing a growing number of participants to incorporate the dynamic by demonstrating their ecological sensitivity. This method first of all emphasized the guiding theme of energy, the greatest stimulus for business and individuals due to the savings achieved. The 'green' themes of eco-construction and the other threads forming the fabric of a sustainable city were progressively interwoven.

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### Consuming less to live better

In every city, there are residents and businesses wanting to live and work differently, using less in

### Fact

In Brussels, the building sector is responsible for over 70% of energy consumption and 63% of CO<sub>2</sub> emissions.

resources, space, water or energy while enjoying the city and life to the full. These creative spirits are not interested in the sterile activity of spreading blame, but in innovation: it is with them that the guidelines for life in a sustainable city must be redefined.

It was a matter of interest for the architect Inès Camacho in 2007: *'I would very much have liked to try living in a passive house before designing my project, but I couldn't find one... The most important thing is to allow people to try out this type of space [1].'* It is a matter of common sense for Éric Gobert, project manager of the passive offices of Aéropolis II: *'It's a matter of not building a building now that's already outdated [2]!'*





## Changing the hardware and the software

The policy chosen by the Region was to mobilise these women and men wanting to innovate by helping them to act concretely: financial aid, specialised technical support, training and information... but also the production of references, the creation of professional networks and associations, etc. It was necessary to work at the same time on the *hardware* – buildings, technical facilities, materials, etc., and on the *software*: information, the training of professionals, change in habits and modes of consumption, the maintenance of premises and facilities, etc. All these activities are described in the following pages..

From this perspective of stimulation, the organisation of several calls for proposals has allowed the emergence of exemplary initiatives distributed throughout the territory of the Region, from the scale of a building to that of neighbourhoods.

In this way the proliferation of good examples and their ‘snowball effect’ are changing Brussels in a more and more visible way.

This approach has shown that Brussels residents have a great capacity for adaptation. *‘We had extremely well-trained architects and engineers in Belgium, but they didn’t know it! To go from zero passive buildings in 2007 to more than 80,000 m<sup>2</sup> in 2009, not to mention the renovated buildings*

*(...) with nothing but our existing knowledge and local people and without large training campaigns, that demonstrates the ability of the market to do extraordinary things [3]!’*

**Brussels has progressed from zero passive buildings in 2007 to more than 80,000 m<sup>2</sup> built or planned in 2009.**

## Consolidating and generalising

The significant results booked in recent years have allowed the basis for major change to be created: Brussels has built a vision of the future and given itself the means to achieve it. A new Brussels, *made in green*, is ready to emerge.

The question then arises of extending these transformations: while demand must continue to be stimulated, it is also necessary to structure the offer of the professionals.

The Region is now establishing the major features of its activity for the years to come. How ?

- By making the management of its own public buildings exemplary;
- by developing regulations, such as the passive standard mandatory for any new construction as of 2015;
- by incorporating the sustainable neighbourhood dynamic into any urban development in Brussels;



- by developing ‘green’ economic networks through the Employment-Environment Alliance that will revitalise local employment;
- by planning for mobility that is respectful of the environment, based on active modes (walking, cycling, public transport), that limits use of the personal car.

**In 2015, the passive standard will be mandatory for all new constructions.**

Tomorrow, there may be better projects than others, buildings that are more beautiful than others, neighbourhoods that are more sustainable than others, but together they will give Brussels the momentum necessary for its transition toward a sustainable city.

[1] B. Deprez et al, *Vert Bruxelles! Architectures à suivre, Racine, Brussels, 2009, p.110.*

[2] *Ibidem, p.17.*

[3] *Extension du domaine du passif, in be.passive no. 02, January 2010.*





## Exemplary buildings : relaunching innovation

Over three years, 117 winning projects representing more than 265,000 m<sup>2</sup> have been selected by the Calls for Proposals for Exemplary Buildings. These include hundreds of homes, offices, schools and child care centres, a funeral home, etc., totalling over 18.5 million euros in subsidies.

### Relaunching innovation

Observers acknowledge that Brussels has been deficient in high-quality architecture for too long. Property development has favoured architectural conservatism and short-term yield [1]. The architectural, environmental and sanitary quality of the buildings has suffered greatly.

Rather than counting on the occasional production of some building and making a 'media event' of it, and in line with its method of starting from needs and initiatives in the field, the Region has organised three Calls for Proposals for Exemplary Buildings to financially encourage integrated eco-design approaches [2]. It has defined four objectives for applicant designers: energy performance, the choice of eco-construction measures, architectural quality and technical and financial reproducibility (see opposite).

### Trends and results

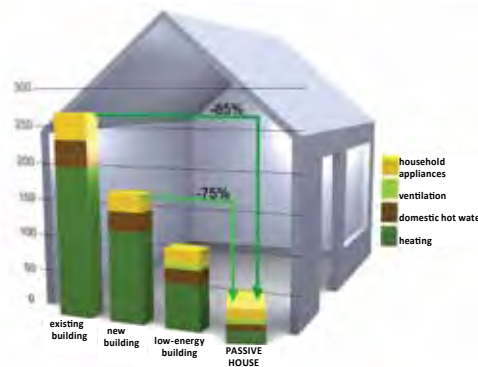
Over three years, 117 winning projects representing more than 265,000 m<sup>2</sup> have been selected by the Calls for Proposals for Exemplary Buildings. These include hundreds of collective and individual homes, offices, schools and child care centres, a funeral home, etc., totalling over 18.5 million euros in subsidies.

Despite the financial crisis of 2008, we note that housing (in particular public housing) is taking up a growing portion of these projects, which seems vital given the significant housing shortage in Brussels.

These calls for proposals have also heralded the advent of the passive standard, with hundreds of residences (new and renovated), several schools and office buildings, totalling 81,000 m<sup>2</sup>, to be built by 2013. Over 400 homes have also undergone low or very low energy renovation.

The Exemplary Buildings account for more than 16%

of construction annually: this is as if all of Brussels built 100% ecologically for one entire day each week. Taken together, these exemplary buildings allow millions of litres of oil to be saved and emissions of over 13,000 tonnes of CO<sub>2</sub> to be avoided each year!

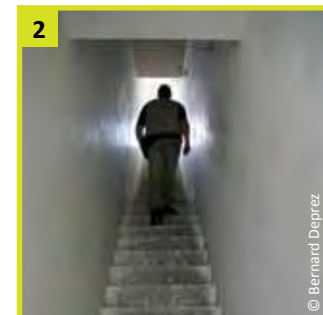


### Four simple requirements for Exemplary Buildings (BatEx)

- (1) Projects must be very economical in energy, with the passive standard as a reference for new constructions and the low and very low energy standard for renovation.
- (2) Projects favour eco-design in the choice of materials, respect for natural cycles (in particular for rainwater) and biodiversity, the sanitary quality of spaces, their adaptation to forms of eco-mobility, etc.
- (3) Projects have high architectural quality and are well integrated into the existing building stock. They also have good visibility.
- (4) Projects must be simple and reproducible from the technical and financial point of view: not high-tech solutions, but concepts and materials with acceptable pay-back time.



1 L'Espoir passive houses, arch. Carnoy;



2 Passive houses, arch. Camacho;

3 Caméléon Shop, arch. Wittock;

4 Passive offices, arch. LD2/Lahon & Partners;

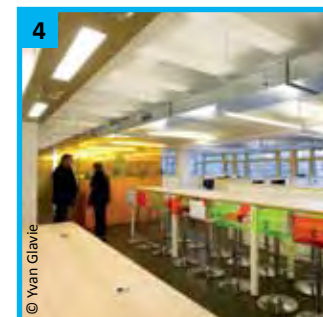
5 Arch. G. Bedoret;

6 Passive low-cost housing, arch. B-Architecten;

7 Mundo-b offices, arch. AAA;

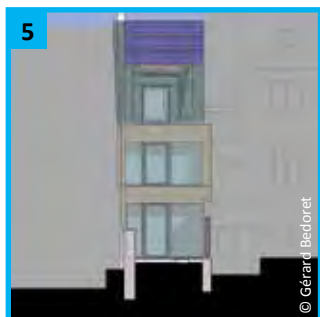
8 Midi-Suède passive apartments, arch. Urban Platform;

9 Savonnerie passive renovation, arch. MDW architects.





Number of winners	2007	2008	2009	total
individual housing	11	11	11	33
collective housing	10	10	18	38
offices/shops	11	6	4	21
facilities	10	7	8	25
	42	34	41	117
Planned surface area, m <sup>2</sup>	2007	2008	2009	total
individual housing	2.523	2.888	2.332	7.743
collective housing	28.269	28.786	24.538	81.593
offices/shops	66.340	19.649	15.093	101.082
facilities	32.750	23.963	18.933	75.466
	129.702	75.286	60.896	265.884
Distribution of subsidies	2007	2008	2009	total %
individual housing	3	4	6	4
collective housing	26	35	52	36
offices/shops	37	30	18	29
facilities	34	31	24	31
	42	34	41	117
Number of residences	2007	2008	2009	total
new passive	86	58	196	340
passive renovated	3	9	1	13
new low-energy	168	9	-	177
low-energy renovated	17	204	35	256
	274	280	232	786



© Gérard Bedoret

'My house is a bit like a laboratory; of course, for me that means an additional investment of time in design, layout of the details, and specifications, but that will undoubtedly go more quickly in the following projects...'  
Gérard Bedoret, architect in Uccle



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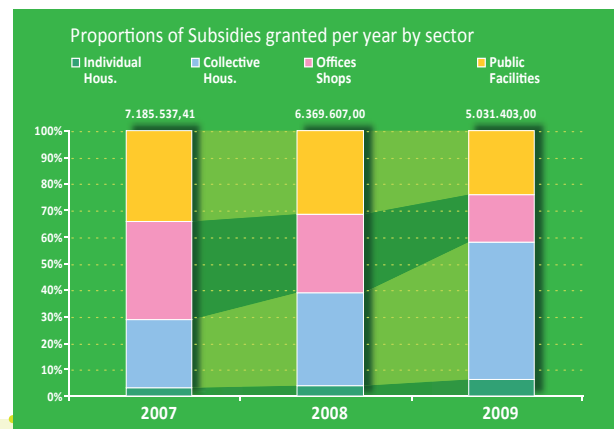


© Yan Glavie



© MDW-architectes

Exemplary buildings allow emission of over 13,000 tonnes of CO<sub>2</sub> to be avoided!



### Stimulating professionals, making skills grow

Individuals, public works contractors, architects, but also engineers, consulting firms and businesses have all been challenged to consider their projects according to quality criteria that are still uncommon in Brussels and around the world.

Fifty-three percent of the individual projects have had as contracting clients architects wanting to implement these new concepts in their own homes, and notably to test the passive concept. It can be said that they have taken on the role of pioneers.

A call for tender incorporated into the selection process allowed a number of consulting firms – responsible for the technical analysis of the projects selected – to assimilate the new quality criteria in depth. Brussels Environment also called upon these experts to monitor the winning projects, allowing the principles of eco-design and eco-construction to be propagated even further.

The jury, composed of representatives from universities and public administrations, was able to assess the projects' qualities in terms not only of architecture and town planning, but also with regard to their technical and financial aspects. Ultimately, being chosen as an 'Exemplary Building winner' constituted a kind of quality label explicitly sought after by those involved in the property market [3].

### New constructions : all passive in 2015

The Calls for Exemplary Buildings have also served as a test bench; with more than 81,000 m<sup>2</sup> of passive constructions built or under construction, they have provided confirmation that the passive standard is fully accessible and does not lead to major increased costs in residential buildings, schools or offices, in new construction and sometimes even in renovations.

This standard reduces the heating energy needed to 15 kWh/m<sup>2</sup>/yr, versus 150 for a standard structure, allowing the use of a conventional heating system to be avoided. This standard of performance is made possible by a high level of insulation and airtightness, along with ventilation for comfort equipped with a heat exchanger.

Thus the Brussels Government has confidently committed itself to making all new public construction compliant with the passive standard as of 2010. This rule will also be applied to all new private construction as of 2015.

### Fact

In a passive building, the need for heating energy is only 15 kWh/m<sup>2</sup> per year, versus 150 for a standard structure, i.e. 10 times less. A heating system therefore non longer necessary.

[1] M. Cohen, *A Bruxelles, près de chez nous, L'architecture dans les contrats de quartier*, 2007, Brussels-Capital Region.  
[2] B. Deprez et al, *Vert Bruxelles! Architectures à suivre*, Racine 2009; *Bruxelles passif en 2015*, in *be.passive* 02, 20  
[3] Interview with Mme Sophie Le Clercq (JCX-IMMO), in *be.passive* 02, p.12, 2009.



# Exemplary structures and eco-renovations

*'Now I think that I could no longer do anything other than low energy or passive design, because I no longer have a motivation to use old techniques.'*

## Two passive duplex housing units

Rue Wauters, 17 - Schaerbeek

Inès Camacho, arch., [www.inescamacho.com](http://www.inescamacho.com)

Inès Camacho, architect and contracting client: *'I understood that my project was close to the passive criteria, even if it had never been designed as such. I submitted my file, and then I spent six months transforming my specifications file. It was a bit through naiveté, through innocence, that I went into this adventure. But now I think that I could no longer do anything other than low energy or passive designs, because I no longer have a motivation to use old techniques. Old smelly things no longer interes me [1]!'*

This project has now been awarded several architectural prizes.

Area: 313 m<sup>2</sup>

Heating energy: 12 and 14 kWh/m<sup>2</sup> per year

Specific features: eco-materials, heat exchanger and earth tube, airtightness n50= 0.57 vol/h, rainwater cistern, photovoltaic cells

[1] Vert Bruxelles! Architectures à suivre, Racine, 2009, p.18.



## Very low energy renovation of offices and extension of 5 passive housing units

42 Rue de la Loi, Etterbeek

Synergy Int'l, [www.synergy-international.com](http://www.synergy-international.com)

For Eric De Keuleneer, contracting client (Credibe SA), the experience is *"extremely rewarding despite the difficulty in remaining in the building during the works. All we have seen are builders who like a job well done!"*

*"From my point of view, we have met a threefold challenge: maintaining and improving a fine building on Rue de la Loi, renovating profitably and comfortably without having to install air conditioning, and finally proving that the construction of housing on Rue de la Loi is justified. [2]"*

The project implements an original system of mixed steel/wood prefabrication for the construction of passive housing units on the existing roof.

Area: 1850/571 m<sup>2</sup>,

Heating energy: 27/12 kWh/m<sup>2</sup>.yr;

Specific features: heat exchanger, airtightness n50= 0.60 vol/hr, green roofs, prefabrication, solar thermal and photovoltaic power

[2] Interview in *be.passive* 04, June 2010, p. 20.



## Very low energy renovation of 180 low-cost Florair housing units

Av. G. De Greef - Jette (1958)

Ph. Ségui, architect

Vincent Schurs, contracting client (Foyer Jettois): *'We're going to insulate the whole building, install new insulating double-glazed windows, install real ventilation, etc. (...) Taking account of more and more parameters, such as the thermal bridges, specific structural features, etc., it remains difficult to go below the bar of 30 kWh/m<sup>2</sup> per year on average for heating. In ventilation, for example, we will probably use C and D systems with sensor regulation; that seems to us to be the best compromise at the moment between guaranteeing comfort and reducing heating needs and costs [2].'*

While improving the comfort of the tenants, the energy refurbishment going from 200 to 30kWh/m<sup>2</sup>.yr will provide an annual saving of 840,000 kWh, or 210 tonnes of CO<sub>2</sub>.

Area: 18,200 m<sup>2</sup>

Heating energy: 30 kWh/m<sup>2</sup>.yr

Specific features: C/D ventilation, airtightness n50= 0.80 vol/h, exterior insulation, eco-mobility amenities, rainwater cistern

[2] Interview in *be.passive* 04, June 2010, p.85.





## 14 passive duplex housing units for newly-arrived families

Association L'Espoir - Rue Fin - Molenbeek

<http://espoirmolenbeek.blogspot.com>

Damien Carnoy, arch.,

Joséphine Mucabucyana and Lahoussine Fadel, members of the association L'Espoir: *'We've organised little parties for the children to get to know each other because afterwards, we're going to form a co-ownership and we will have to live together and manage the building [3]'*. Lorella Pazienza, of the non-profit organisation Bonnevie: *'the needs of the families that emerged during the project definition workshops are the bases for the sustainable development. Some members followed training as energy coordinators to be able to inform the neighbourhood residents. They took part in the energy challenge that the Region organises each year. They explain how to save energy through small actions and without much expense [3]'*.

Area : 1833 m<sup>2</sup>

Heating energy : 14 kWh/m<sup>2</sup>.yr

Specific features : first 4-storey wooden structure in Brussels, eco-materials, heat exchanger, airtightness n50= 0.60 vol/h, rainwater cistern, heat collectors and green roof

[3] Vert Bruxelles! Architectures à suivre, Racine, 2009, p.137.

See also p.16.



All the eco-exemplary winning projects are described in detail in Vert Bruxelles! Architectures à suivre...

(Racine, 2009) and mapped on the site

[www.bruxellesenvironnement.be](http://www.bruxellesenvironnement.be)

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## Passive offices

Av. Urbain Britsiers - Schaerbeek

Architectes Associés, [www.architectesassocies.be](http://www.architectesassocies.be)

Sabine Leribaux and Marc Lacour, Architectes Associés: *'when we won the competition for the Aéropolis offices, we convinced the contracting client to work with the passive system. But when you talk about a sustainable building, it's not just energy consumption that counts; there is also the choice of materials. Here we considered the roof, the choice of insulation, and especially the façade (...). Aéropolis is only 2 to 4% more expensive than a standard building, while the structure and the modulation of the offices are in line with what is being done in the European Quarter today, with everything that clients demand [4]'*.

Area : 7388 m<sup>2</sup>

Heating energy : 7.4 kWh/m<sup>2</sup>.yr

Specific features : reinforced concrete structure and airtight shell in wood/metal structure around a patio, FSC wood, heat exchanger and earth tube, airtightness n50= 0.60 vol/h, night cooling, rainwater cistern

[4] Vert Bruxelles! Architectures à suivre, Racine, 2009, p.56.



## Passive renovation of a house

Rue des Archives, 28 - Watermael-Boisfort

Raphaël Tilman, arch., [www.low-a.be](http://www.low-a.be)

Hélène and Raphaël, architects and contracting clients: *'we started the project with an objective already realised by others: low-energy renovation. In the course of our research, we realised that the final objective could be much more ambitious and went for achieving the first passive renovation in Brussels [5]'*.

The heating savings are equivalent to 4.9 tonne equivalents of CO<sub>2</sub> per year. Living in houses comparable in all respects to that of Hélène and Raphaël, the neighbours are also very interested...

Area : 150 m<sup>2</sup>

Heating energy : 15 kWh/m<sup>2</sup>.yr

Specific features : eco-materials, heat exchanger, airtightness n50= 0.52 vol/hr, heat collectors

[5] [www.passeursdenergie.be](http://www.passeursdenergie.be)



## Exemplary buildings for all

In a Region that is going to face a real demographic boom and has a deficiency in low-cost housing, sustainable housing for all is a major challenge. And it's being met.

### Exemplary buildings for all, maybe not!

The housing needs in the Brussels-Capital Region are significant. **Only 11% of housing is public, including 8% low-cost housing, while 32,000 households are currently enrolled on the waiting lists of the low-cost housing associations.** But demographic trends are leading to a predictable growth of 150,000 new residents by 2020. *'The land reserves in Brussels are dwindling. According to estimates, almost 60,000 housing units must be provided in the next ten years. A real challenge!'* explains Denis Grimberghs, President of the Brussels Regional Development Agency [Société de Développement de la Région de Bruxelles-Capitale, SDRB].

It is heartening, then, to note that the participation of public housing associations in the BatEx (Exemplary Buildings) activities has greatly surpassed expectations. In the 2007 to 2009 calls for proposals, 313 housing units were designed in the private sector versus 473 in the public sector, **or 60%**. Even more encouraging: the most disadvantaged municipalities in the Region turned out to be the most active in the design and construction of eco-social housing. These public activities are supported by various bodies: the Public Service Housing Associations [Sociétés Immobilières de Service Public, SISP], the Brussels Regional Development Agency (SDRB) and the municipalities through Sustainable Neighbourhood contracts.

### Sustainable building for the most disadvantaged first

Energy performance is a way to combat the increasing vulnerability of recipients of social benefits, for whom a growing portion of income is devoted to heating and electricity expenses. In public housing, **it frequently happens that the charges exceed the rent.** If nothing is done within the next ten to fifteen years, the public housing

associations fear that the most vulnerable households will be unable to pay their energy bills [1].

This is why the tenants' union was pleased by the interest of public developers and wrote that *'passive housing is also good for the 'proles'! (...)* *Building these passive low-cost housing units, with the enthusiasm it generates, signifies the return of a time not so long ago when low-cost housing served as an example for architectural innovation* [2].'

Energy performance is a way to combat the increasing vulnerability of recipients of social benefits, for whom a growing portion of income is devoted to heating and electricity expenses.

### Thinking in terms of overall cost of occupation

Like any innovative architecture, the first passive projects are in some cases slightly more expensive than a conventional structure. But this additional cost is compensated by the energy savings, all the more rapidly as oil prices rise. **For tenants, it is the overall cost of occupation, the rent and expenses, that count.**

All housing construction or renovations carried out by public or comparable bodies (SDRB and SISP), for which implementation depends financially on the Region, should be planned along the lines of energy quality, following the rationale of the lowest cost of occupation for the inhabitant.

### Fact

Demographic trends predict an increase by 150,000 new residents by 2020.



- 1 Anderlecht, arch. Délices Architectes;
- 2 Molenbeek, arch. B-Architecten;
- 3 Jette, arch. A2M;
- 4 Nede-Over-Hembeek, arch. P. Blondel;
- 5 Forest, arch. B612 Architectes & Partners;
- 6 Ixelles, arch. R2D2 Architectes.

### Exemplary buildings: an opportunity for the municipalities to go further

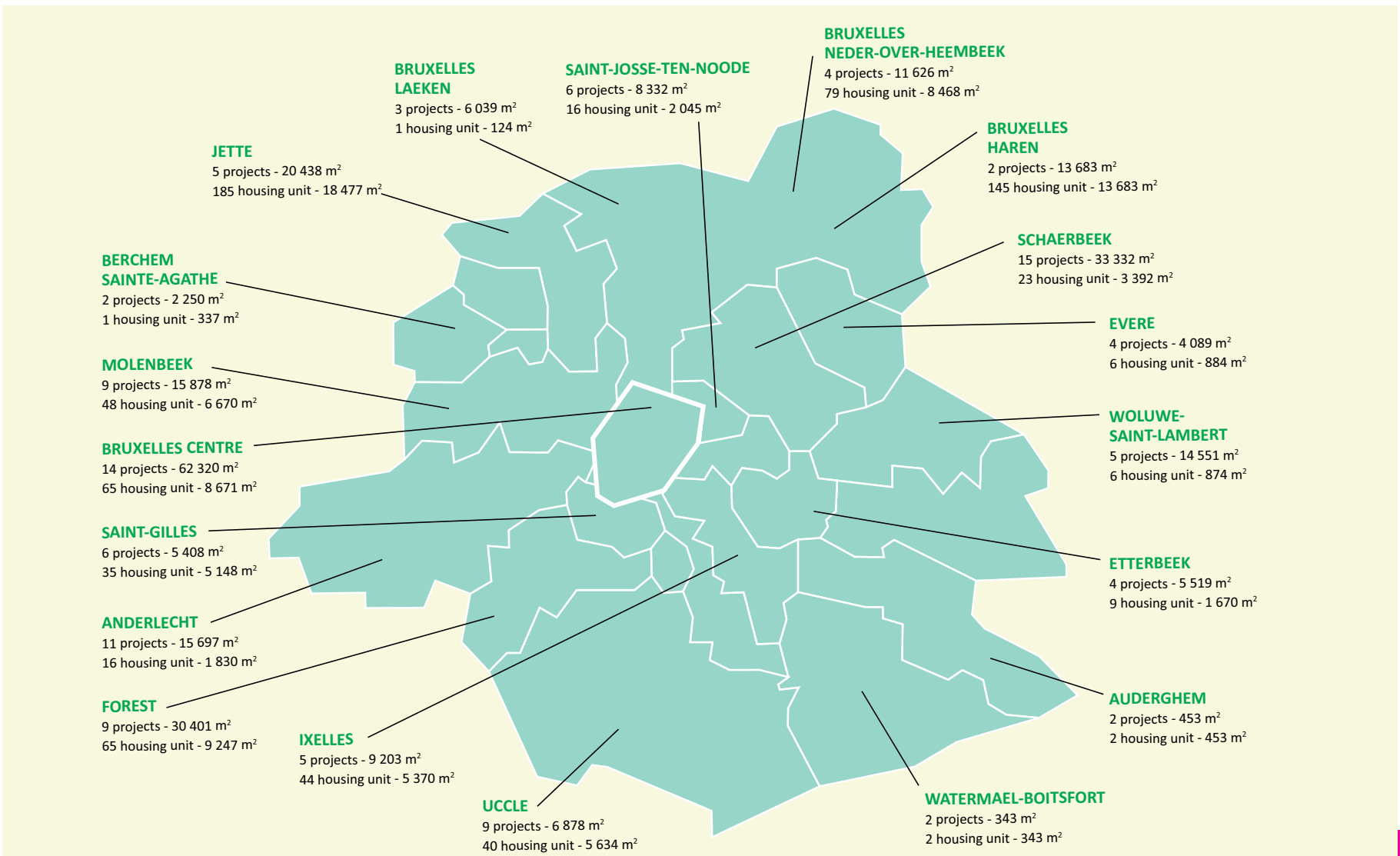
For Vincent Degrune, Project manager in the Molenbeek municipality in charge of following up a worksite of 12 passive low-cost housing units, the initial project was *'driven by the desire of the municipality to carry out a low energy project; it was only afterwards that it became apparent that the passive standard was possible.'* The impetus of BatEx allowed 'more global environmental performance, through simple measures' to be put into practice.

It contributes to a broader vision of building economics that takes account of time and the plasticity of projects: *'one must try to make structures that can be kept as long as possible, so that they can be disassembled and made into something else if needed. It is important to design new buildings that will be easy to renovate; for that, simplicity of the structure is important: open plans, and as few load-bearing structures as possible. And special techniques that are left apparent so that they can be easily modified, as they evolve very quickly.'*

[1] Alter-Echos no. 246, February 2008, *Le logement social se met au vert*, [www.alterechos.be](http://www.alterechos.be).

[2] Le Soir, 25/03/2008, Leprince, P., *Le passif, c'est bon aussi pour les proles*.





Housing by sector	2007	2008	2009	total
individual housing	11	11	11	33
private housing	170	47	63	280
public housing	93	222	158	473
	274	280	232	786

## A different kind of building is possible!

# The exemplary role of public buildings

As of 2010, any new public project must comply with the passive standard : this is the commitment of the Brussels Government.

### The public authorities must set an example

The public authorities have a vital role to play in the effort to reduce CO<sub>2</sub> emissions. On the one hand, they must set an example of proper measures and practices to be adopted.

On the other hand, because of their economic weight, they have a direct impact on the results of the policy conducted. In Belgium, in fact, public purchasing amounts to 15% of the Gross Domestic Product (GDP). The Brussels-Capital Region alone generates 20% of the national GDP, and a large number of local, regional, community, federal, European, and international public institutions are concentrated there. The weight of public purchasing there is therefore enormous [1].

In the building sector, this is manifested by the establishment of environmental management when the buildings are not undergoing renovation and by observance of energy performance and eco-construction criteria during renovation or new construction.

### Surpassing the current regulations

An 'exemplary role' means that the public authorities have to impose requirements on themselves exceeding the current regulations. In recent years, municipalities such as Schaerbeek, Jette and Anderlecht have committed themselves to carrying out their new construction programmes under the passive system. As for the government, it has agreed that any new public project will comply with the passive standard as of 2010.

Moreover, there is presently a general conversion to the passive standard by the major public players in social property development in Brussels; after having contributed together 60% of the housing projects in the Calls for Exemplary Buildings, the Brussels Regional Development Agency (SDRB) and

the Brussels Regional Housing Authority (Société du Logement de la Région de Bruxelles-Capitale, SLRB), which is the umbrella organisation for the 33 Public Service Housing Associations in Brussels, have decided that starting in 2010, **all their new constructions will be carried out according to the passive standard, with low energy being required in renovation.**

The public corporations that produce housing in Brussels have decided that starting in 2010 all their new constructions will be carried out according to the passive standard, with low energy being in renovation.

These standards have also become the norm for construction activities related to Sustainable Neighbourhood contracts.

As a symbol of these public commitments, the Region decided as of 2008 to install its Brussels

Environment administration on the Tour & Taxis site in a few years, in what will be, at 16,250 m<sup>2</sup>, the largest passive office building in Europe.

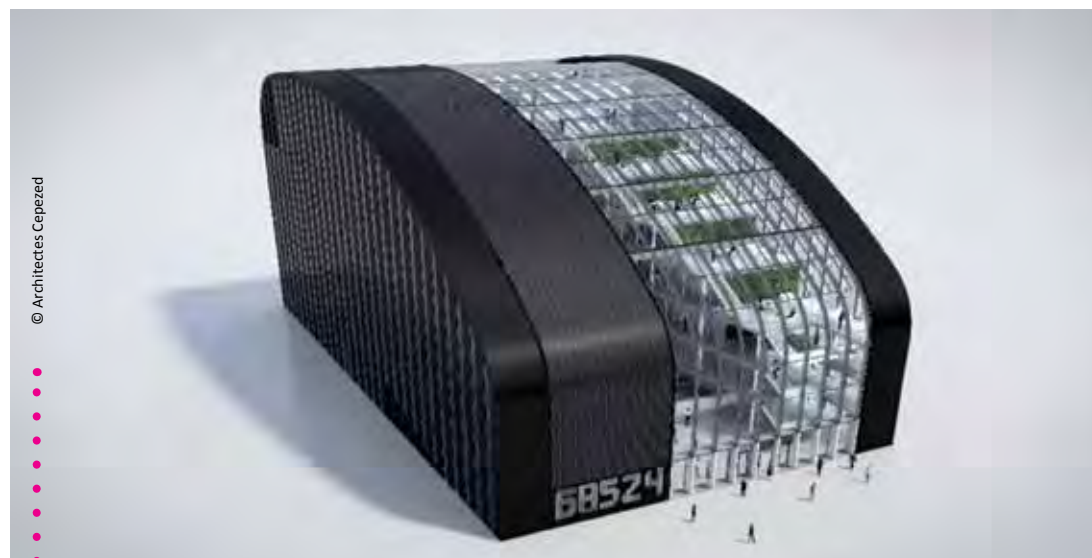
### Reducing consumption in existing buildings

For most public buildings, that will not be renovated soon, the Region has developed Local Action Plans for Energy Management (Plans Locaux d'Actions pour la Gestion Énergétique, P.L.A.G.E.). This involves a number of measures allowing energy consumption to be reduced and the awareness of the occupants to be raised. These measures allow administration personnel in particular to be trained.

### Fact

In Belgium, public purchasing represents 15 % of the Gross Domestic Product (GDP).

[1] Vers une Région bruxelloise sobre en carbone à l'horizon 2025, Brussels-Capital Region, March 2010



The future passive offices of Brussels Environment



## Five hospitals have implemented their P.L.A.G.E. since 2007

These are the Erasme hospital, the Saint-Luc University Clinics, the Brugmann University Hospital Centre (Victor Horta and Paul Brien sites) and the Iris Sud Hospitals (Joseph Bracops site). After three years, the results obtained by these hospitals are extremely encouraging: stabilisation of electrical consumption and reduction in heating needs, in contrast to the continuous growth of the preceding years.

The estimate of the overall expenses avoided is over 2 million euros per year.



© Paul Brien

## P.L.A.G.E projects

In the public sector, Local Action Plans for Energy Management develop a coherent and coordinated set of measures. They allow the potential for energy savings and priorities for action to be identified, and the occupants' awareness to be raised with regard to proper behaviour.

In this framework, the Region supports the major proprietors of public buildings in developing their experience for 3 years, to the extent of 50 to 100% of the expenses incurred. To date, these calls for proposals have involved 15 municipalities, 5 major hospitals, 2 collective housing organisations and the schools of the mandatory education system.

More info on

[www.bruxellesenvironnement.be/professionnels/](http://www.bruxellesenvironnement.be/professionnels/)



Efficacité énergétique et économies financières: un PLAGE au sein de votre institution

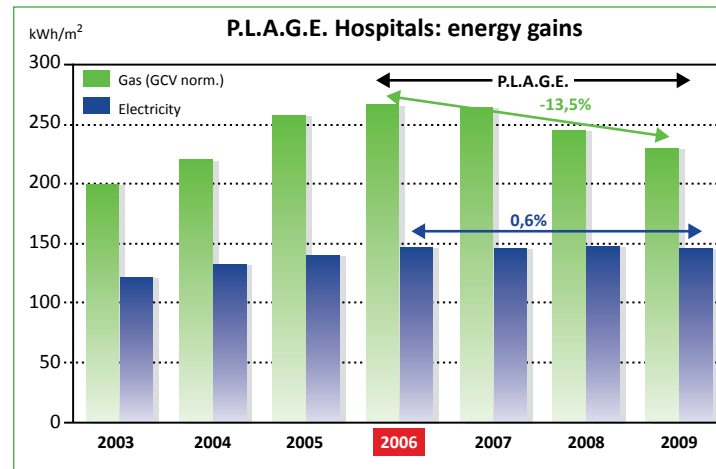
Manuel PLAGE - Description des objectifs

BRUXELLES ENVIRONNEMENT

"Exemplary" child-care centre projects are multiplying, as shown here on Rue du Gulden Bodem in Molenbeek.



© Architectes AZM



Variation in consumption (electricity and gas, kWh/m<sup>2</sup>) of the five P.L.A.G.E. hospitals; kWh GCV for gas normalised on the basis of 16.5/16.5 degree-days

## The first seven municipalities have adhered to P.L.A.G.E. projects since 2005

These are Anderlecht, Berchem-Ste-Agathe, Ixelles, Molenbeek-St-Jean, Schaerbeek, St-Gilles and Watermael-Boisfort.

Seventy public buildings have allowed over 11 MWh of energy to be saved, or more than 2500 tonnes of CO<sub>2</sub>. Or, an expense of € 1,326,000 in the annual budget of the first 7 municipalities to participate in a PLAGE has been avoided.

The administration of Molenbeek-Saint-Jean gave priority to 9 buildings representing 51% of the total gas consumption and 62% of the total consumption of municipal buildings. These 9 buildings showed an overall reduction of 16% in normalised fuel consumption between 2005 and 2008.



In Watermael-Boitsfort, the consumption of public buildings decreased by 20% in 2008 compared to 2004, the equivalent of a savings of € 140,000 on the annual expenses for consumption, which means that the emission of 588 tonnes of CO<sub>2</sub> avoided.

# Aid and incentives : changing Brussels one house at a time

Over 6 years, more than 110,000 energy subsidies have been granted for a total amount of more than 65 million euros.

The number of subsidies granted went from 1840 in 2004 to 23,239 in 2009.

## Building at the forefront

Residential and tertiary buildings use over 70% of the energy consumed in Brussels. They are responsible for 63% of greenhouse gas emissions, almost 40% of NOx emissions and almost 25% of particulate emissions in the Region. And a few years ago, Brussel's building stock, like the Belgian building stock in general, was one of the most energy-consuming in Europe.

For this reason, the Region has instituted an active policy to change this situation. Two complementary approaches have been initiated.

A new system of subsidies has encouraged individuals and businesses to renovate their buildings to better insulate and equip them. These subsidies have made innovative materials, technologies and work in renovation as well as new construction more accessible. And Brussels residents have responded positively to the incentive: the number of subsidies granted went from 1840 in 2004 to 23,239 in 2009.

**But having the desire to renovate or build sustainably is not enough; it is necessary to have the knowledge and advice needed to master the new techniques and materials, which are constantly changing.** This is why specialised facilitators guide the applicants through their projects (see box opposite).

## The construction sector revitalised

This active policy has a positive economic effect. In addition to stimulating demand, the market for construction professionals has been revitalised through the use of new materials, new training and new trades. The Region also encourages the development of trials and experimentation, contributing to the facilitation of innovations in the building sector..



'The subsidies will allow us to insulate the house in three stages until the passive standard is achieved, i.e. that, the house will do without radiators!'

Olivier Alexandre, Schaerbeek  
<http://vimeo.com/4043490>

## SUBSIDIES : a complete range of financial incentives

The Brussels-Capital Region offers a set of 'Energy' subsidies intended for individuals, the collective housing sector and the industrial and tertiary sectors. They cover procedures such as an energy audit, insulation, the installation of super-insulating glazing, high-performance boilers, ventilation, etc.

Specific aid supports new construction to the passive (heating demand  $\leq 15$  kWh/m<sup>2</sup>yr) standard and renovation to the low energy (heating demand  $\leq 60$  kWh/m<sup>2</sup>yr) or very low energy (heating demand  $\leq 30$  kWh/m<sup>2</sup>yr) level.

**Combined with other municipal or federal subsidies**, they are very popular: over 6 years, more than 110,000 subsidies have been allocated, for a total amount of over € 65 million, 80% of this going to individuals.

The rationale of the subsidies aims to offer all or part of the over-investment necessary to carry out work attaining a high level of energy performance, while incorporating eco-construction criteria. Social criteria are also progressively being introduced to favour low-income households.

For more information:  
[www.bruxellesenvironnement.be/primeenergie](http://www.bruxellesenvironnement.be/primeenergie)

## FACILITATORS: supporting and ensuring innovation in construction

Facilitators are experts who guide professionals, institutions and businesses free of charge. These specialists are selected through calls for tenders. Their mission consists of providing free advice and guidance to project sponsors in technical matters relating to the areas of energy and eco-design, on the level of both buildings and their facilities and neighbourhoods. They also organise seminars, visits or trips, etc. **Facilitators are accessible by calling the freephone number 0800.85.775.**

For more information:  
[www.bruxellesenvironnement.be](http://www.bruxellesenvironnement.be) > [Les facilitateurs](#)

## A boost for the market

Starting from the near absence of a photovoltaics sector in Brussels in 2004, the Government decided to strongly support the installation of solar collectors by special subsidies and a favourable buyback rate for the electricity produced. The boost in the market was quickly felt, to the point that it contributed to standardising and reducing prices. The Region has now reduced the subsidies, as this type of system has become sufficiently attractive without the aid of investment.

'*The boom continues*', reads the headline on the first page of the newspaper **Le Soir**. '*Demand has exploded (...) the number of installations has more than doubled between August 2009 and June 2010, going from 7332 to 16,856 units. And since November 2008 (2274 units) this quantity has even gone up by a factor of eight. A real success.*' (**Le Soir**, 23 July 2010)

**The subsidy system has thus demonstrated its utility by allowing the emergence and stabilisation of a sustainable line of business in renewable energy production.**





**Renewable Energies Facilitator for Large Systems:** advises any business or institution with sizable heating needs wanting access to affordable energy.

**Cogeneration Energy Facilitator:** advises any business or institution with sizable heating and electricity needs.

**Tertiary and Industrial Sector Energy Facilitator:** advises any business or non-residential buildings.

**Sustainable Neighbourhoods Facilitator:** provides advice and guidance to property promoters, architects, developers, public authorities and associations who would like to establish sustainable neighbourhood projects in Brussels.

**Energy Facilitator for Collective Housing:** advises owners and managers of residential buildings who want to improve their energy performance in both common and private areas.

**Eco-Construction Facilitator:** advises any professional involved in the design and construction of a building who wants to be mindful of the environment and the well-being of its occupants.

**Paper Facilitator:** advises businesses in their efforts to reduce paper consumption.

**The EPB service for architects:** advises architects active in the Brussels Region and answers questions concerning the Ordinance on Energy Performance and Indoor Climate of Buildings (EPB), which took effect in July 2008.



### The Passive House Platform

The Region supports independent associations such as the **Passive House Platform non-profit organisation** (Plateforme Maison Passive asbl, PMP) [1], to which it entrusts the guidance of project sponsors as well as technical verification of the files for subsidies of passive construction or low or very low energy renovation. Since 2007, 263 files have been handled in Brussels: **77 housing units renovated as low-energy, 4 housing units renovated to the passive standard and 182 new passive housing units.**

The PMP also organises numerous training sessions for professionals, visits to passive projects, etc.

In 2009, it launched **be.passive**, a magazine dedicated to passive architecture [2].



[1] [www.maisonpassive.be](http://www.maisonpassive.be) and [www.passiefhuisplatform.be](http://www.passiefhuisplatform.be)  
[2] [www.bepassive.be](http://www.bepassive.be)

A different kind of building is possible!

# Economy, employment and environment: a new alliance

While the demand for construction of sustainable buildings soars in Brussels, it is the supply segment that must be supported at present.

## The Employment-Environment Alliance (Alliance Emploi-Environnement)

The construction sector has a total turnover of 900 million euros per year. In 2009, it employed 25,500 workers in Brussels, including 5600 employees, 6000 self-employed persons and 13,900 workers. It is therefore a major sector of activity, in which professional skills are rapidly developing. **New trades are appearing, capable of providing a response suited to the significant demand for low-skilled jobs in Brussels.**

The construction sector employs more than 25,000 people in Brussels.

While the demand for construction of sustainable buildings is soaring in Brussels, the supply segment must at present be supported, while allowing low-skilled persons to find fulfilling work. This is the aim of the Employment-Environment Alliance, which, in a participatory approach, brings together professional associations, unions, and those involved with the environment, economic stimulation and education. Using an open approach, the participants draft proposals for action together: a real alliance that supports and stimulates business while allowing workers, businesses and students to acquire knowledge and techniques that fulfil the energy and environmental requirements of very high performance buildings.

### Fact

While generating a 319 million euro turnover over three years, the Exemplary Buildings operation has created approximately 1250 jobs.



## The Ecobuild Cluster

The Region has entrusted the Brussels

Enterprise Agency (BEA) with the creation of an eco-construction cluster in Brussels. Its aim is to develop the sector as a solution for sustainable construction and renovation. The Cluster networks businesses active in the area and plays the role of an interface for them.

The Cluster now includes over 50 active members, whom it represents at trade exhibitions. It organises worksite visits, working groups and study trips in collaboration with the Eco-Construction and Cap 2020 clusters.

In its work on low-energy urban renovation, it cooperates with the Greenov network of European clusters.





## The institutions

In the area of construction and renovation of housing and eco-construction, two major participants work with Brussels Environment to improve the eco-excellence of the Brussels building stock: the Brussels Regional Housing Authority (SLRB) and the Brussels Regional Development Agency (SDRB).

### The professional Reference Centre for construction

In the framework of the employment plan for Brussels residents and the Contract for Economy and Employment (C2E), it operates thanks to a partnership between the construction sector and the public authorities. It aims to develop eco-construction and renewable energy trades to improve the employment potential of low-qualified workers.

The Reference Centre identifies educational needs and centralises the existing offer. Its work also encompasses networking and the consolidation of the initiatives underway. In partnership with people working in the field, it coordinates training on insulation, airtightness, eco-materials, photovoltaics, etc.

The Reference Centre has launched a study of trades in transition in the construction sector; that involves determining which are the needed trades, as well as the new trades and new skills to be acquired by construction professionals to be able to work in the sustainable sector. Carried out in collaboration with construction professionals, this study will serve, among other things, to orient and prioritise training needs in the construction sector.

### Businesses are getting involved!

The 'Ecodynamic Company' label is granted to businesses that develop measures supporting sustainable management.

The label takes into account various aspects: the management of energy, waste, travel, interior air quality, noise reduction, etc. This label expresses the determination of these businesses and organisations to take an innovative approach over the long term.



### The Brussels Regional Housing Authority (SLRB)

The SLRB [1] is in charge of low-cost housing. The local companies, called Public Service Housing Companies (SISP), are under its supervision.

As a long-term investor, the SLRB has made sustainable development a priority of its 2010 – 2014 strategic plan. It has assigned itself the aim of supporting the SISPs in adopting an approach to development that respects the environment and contributes to reducing CO<sub>2</sub> emissions. **Since 2010, all SLRB projects are striving to be exemplary with regard to energy: all new construction must at a minimum comply with the passive standard, and any major renovation must comply with the very low energy standard.** This exemplary policy reduces the expenses of the tenants and has very beneficial social and economic impacts.

The SLRB aims to reduce the cost of occupying housing, i.e. the sum of the rent and the energy charges. All housing construction or renovation carried out by regional public bodies must follow the rationale of the lowest cost of occupation for the future occupant. This principle applies to specification of the energy quality of the works to be performed as well as the criteria for allocation in public contracts and in existing regulations for obtaining regional financial assistance. The SLRB is also working on an energy cadastre of its assets to improve their management and maintenance over the years.



### The Brussels Regional Development Agency (SDRB)

The SDRB [1] is active in the area of economic expansion and urban renovation. To keep residents in or bring them back to the Region, it produces housing for residents with moderate incomes in neighbourhoods characterised by a shortage of residential constructions, in a public-private partnership.

The SDRB has become a public pioneer with regard to sustainable construction.



Besides the energy performance of the projects, which fulfils the passive standards in new construction or very low energy in renovation, demanding ecological criteria are implemented in water management, the choice of materials, 'soft' mobility and the respect for biodiversity.

On Rue de Suède, the SDRB was responsible for building and marketing of the first passive apartment building in the Brussels-Capital Region. This experience demonstrated the need to inform buyers on this type of housing, the specific features of the facilities and the necessity of adapting certain habits. To this effect, the SDRB has published a brochure entitled 'Living in sustainable housing' ('Habiter un logement durable') [2].

[1] [www.slr.be](http://www.slr.be)

[2] to obtain the brochure : [info@sdrb.be](mailto:info@sdrb.be)

# Catalysts for existing neighbourhoods

Brussels has chosen to establish a strategy to create sustainable neighbourhoods, whether it is a matter of old neighbourhoods or wasteland to be transformed, renovating buildings or initiating new ways of living together.

### 'Sustainable neighbourhood' activities

Nowadays, the idea of 'sustainable neighbourhoods' is rather overworked and encompasses very diverse realities. All cities want to have their eco-neighbourhood, and many of them think of it as a 'green' promotional operation, under the banners of ecology and high-tech. The Brussels-Capital Region has chosen another approach: in view of the amount of wasteland dotted around on its territory, but also to improve life in its existing neighbourhoods, it has established a strategy to create sustainable neighbourhoods, whether new or old.

### Acting in existing neighbourhoods

Starting from the principle that the existing neighbourhoods are and always will be the essence of the urban fabric, the Region has launched a call for proposals to the residents, to create a dynamic for transformation in the area. The rationale for this call for proposals is **that creation of a sustainable neighbourhood relies on a public initiative** from people who live in and use the neighbourhood. Together, they take action on various issues: energy savings, waste reduction, rational consumption, air quality, more carefully considered use of space, highlighting the natural heritage, reinforcement of social cohesion, etc. On this basis, participants implement projects and take part in specific activities to raise the awareness of as many residents as possible with regard to these issues.

### A 'range of services'

Thanks to a 'range of services' offered by Brussels Environment (meetings, training visits, activities, etc.), the knowledge of the residents is extended thanks to the introduction to new techniques (roof insulation, maintenance of a cistern, project management, etc.).

On the neighbourhood scale, the operation creates a grassroots dynamic and combines initiatives to produce effective action and real changes in behaviours: the creation of collective gardens and vegetable gardens, exchange networks, collective buying groups, local exchange systems, etc.

Thanks to five pilot groups supported each year and a 'Sustainable Neighbourhoods Newsletter' that makes their activities known, the fabric of sustainable neighbourhoods is rapidly expanding from municipality to municipality.

### Winning neighbourhoods 2008-2009

Auderghem: **Ensemble, vivons mieux à Pinoy**, <http://siteduquartierpinoy.be>

Forest: **Cité Forest Vert**, [www.citeforestvert.be](http://www.citeforestvert.be)

Ixelles: **Durabl'XL**, [www.eauwaterzone.be/Durabl\\_XL](http://www.eauwaterzone.be/Durabl_XL)

Saint-Gilles: **Ba-O-Bab 81**, [www.baobab81.org](http://www.baobab81.org)

Schaerbeek: **Helmet, Quartier durable**, [www.helmetquartierdurable.be/](http://www.helmetquartierdurable.be/)

### Winning neighbourhoods 2009-2010

Molenbeek: **MolenBabbel**, <http://molenbabbel.wordpress.com>

Woluwé-Saint-Pierre: **Chant d'oiseau**,

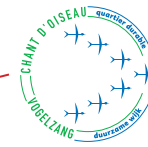
Etterbeek: **Broebel'Air**, [www.broebelair.be](http://www.broebelair.be)

Schaerbeek: **Terdelt sur son 21**, [www.terdelt.be](http://www.terdelt.be)

Uccle: **Oxy-durable**, [www.oxy-durable.be](http://www.oxy-durable.be)







**DURABL'XL**

### The objectives of the 'Sustainable Neighbourhoods' calls for proposals

- To generate and support grassroots initiatives through projects for and by the residents
- To give rise to projects throughout the Brussels area
- To reduce the ecological footprint of a neighbourhood while improving its liveability

### The Charter of the existing Sustainable Neighbourhoods

- Rationalise consumption
- Move around differently
- Live in a densely populated, active neighbourhood
- Highlight natural heritage and biodiversity
- Preserve natural resources
- Promote sustainable construction
- Save energy
- Reduce waste
- Live better

### The offer of Brussels Environment

Each time Calls for Proposals are issued, Brussels Environment makes available to the winning projects for one year :

- An organiser for each of the five neighbourhoods
- Follow-up of the coordination of the neighbourhoods and organisers
- A range of services including nine awareness-raising and training activities
- A budget of € 12,500 for projects of collective interest
- Various communications tools



© Lise Frenéo - Cité Forest Vert



© ERUasbl - Durabl'XL



© ERUasbl - Terdelt

# The sustainable puzzle is progressively put together

Occupation of wasteland by collective activities and collective housing projects: initiatives are developing and aim to develop real sustainable niches in the urban fabric.

## The precursors of the eco-neighbourhood: eco-participatory housing projects

For a different kind of neighbourhood to be possible, different kinds of projects must emerge, implementing the principles of neighbourhood relationship ecology. This is what has inspired exemplary projects such as the 14 housing units of the Association L'Espoir [1] in Molenbeek, the Biplan shared housing project of 6 housing units [2] in Haren-Brussels or the Brutopia [3] project of 27 housing units and 4 shops in Forest.

## Recovery of wasteland by residents

In another type of participatory project, on the edge of industrial wastelands or in abandoned vacant land within neighbourhoods, residents, committees and associations work to redevelop various forms of urban agriculture and vegetable gardens [4]. Special types of leases allow this land to be temporarily occupied and activities related to sustainable food, gardening, composting, beekeeping, etc., to be developed.

On the banks of Tour & Taxis, thanks to a temporary lease, the non-profit organisation Le Début des Haricots [5] is operating a collective garden to recreate a relationship between local producers and their urban environment. It is also a matter of reclaiming the city, or its margins, while producing

a part of its food in a healthy way. With the support of Brussels Environment, the association is collaborating along these lines with RABAD [6], a network of participants and projects to promote sustainable food in the Brussels-Capital Region.

At Neder-Over-Heembeek, the 'Urban Farm' is a rural organic agricultural operation. Directly and through a short food chain, it provides Brussels households with fresh produce in the form of baskets of vegetables. This is a Collective Buying Group (Groupe d'Achat Solidaire, GASAP). The project also allows unqualified young people to be introduced to and trained in agricultural jobs and garden maintenance.

Since 1998, in partnership with the municipalities, Brussels Environment has established free training in composting. This contributes greatly to reducing the amount of organic and garden waste in waste bins. Thirty-seven percent of Brussels households have a garden; these generate no less than 30,000 tonnes of green waste per year.

- [1] <http://espoirmolenbeek.blogspot.com>
- [2] <http://claude-rener.blogspot.com>
- [3] <http://utopiabrussels.wordpress.com/>
- [4] <http://jardinsdebruxelles.blogspot.com/>
- [5] [www.haricots.org](http://www.haricots.org)
- [6] <http://fr.observ.be/rabad.php>





### Association L'Espoir - Molenbeek

Thanks to the Housing Fund (Fond du Logement), Coordination and Initiatives for Refugees and Foreigners (Coordination et Initiatives pour Réfugiés et Étrangers, CIRE), the Bonnevie nonprofit organisation and the municipality of Molenbeek, 14 newly-arrived low-income families have participated in the design of their own passive eco-built apartment building.

**The social objective was to allow recipients to put their welfare benefits to good use in their housing rather than enriching slumlords.**

This extraordinary project shows that economic fragility is not a hindrance. It is innovative in a number of aspects: after identifying energy performance as a requirement for wellbeing, the association organised an architecture competition and training sessions in energy or co-ownership, etc. Inspired by organisations originating in the United States, it also signed a charter for the creation of a Community Land Trust that manages and develops property intended to be sold or rented to low-income households.

<http://espoirmolenbeek.blogspot.com>  
and <http://bonnevie.vgc.be>

### Brutopia participatory housing – Forest

The Brutopia project was born of a common desire of Forest residents: to live in Brussels in a collective, ecological and responsible way. Brutopia aims to promote sustainable settlement, combined with 'soft' mobility. A non-profit organisation was created to buy a site and construct a building of 27 apartments.

**'Brutopia currently brings together about fifty people, including young adults as well as older people, and single people as well as couples.**

Some have young children and are looking for a larger dwelling, while others want to move just because their offspring have left home. There are as many Dutch- as French-speakers.

<http://utopiabrussels.wordpress.com/>

### Biplan participatory housing – Haren

A 2008 winner of the 'Exemplary Buildings' call for proposals, this worksite offers six passive eco-built apartments organised as clustered participatory housing.

The economies of scale made on the land, construction, technical facilities and heating charges allow the project to be enriched with spaces that no household would really be able to afford separately: **the issue here is thus a quality of life possible together, but impossible alone.**

<http://clauderener.blogspot.com>  
<http://architecture durable.be>

*'After eco-construction and energy efficiency, we became interested in the way to live differently so as to emit as little CO<sub>2</sub> as possible into the atmosphere (...), in the impact of the building in a much more participatory vision, where one starts from the principle that together, economies of scale and operation can be made.'* [1]

Project manager : Claude Rener

[1] Vert Bruxelles!, ibidem, p.135.

**The network of Brussels masters composters is presently made up of over 350 volunteers.**



# Signing a contract with sustainability

**Sustainable Neighbourhood contracts aiming to revitalise old and precarious neighbourhoods have included a transversal environmental aspect since 2010.**

## Why Sustainable Neighbourhood contracts?

Like many other cities, Brussels has greatly changed during the past century. After a period of urban growth, it has been reconfigured mainly by the decline of industry and the phenomenon of peri-urbanisation that started in the 60s [1]. The massive transformation of old neighbourhoods into monofunctional zones fuelled several public opposition fronts of citizens opposed to the commodification of the city and property speculation.

Resulting from the workings of the free market, these socioeconomic and urban mutations caused social and territorial divisions and resulted in the appearance of weakened neighbourhoods [2]. **The Region has defined a priority zone in which neighbourhood revitalisation programmes are concentrated (EDRLR: Espace de Développement Renforcé du Logement et de la Rénovation - Area for Enhanced Development in Housing and Renovation).**

## A public activity incorporating the participation of residents

While many cities demolish to rebuild, the Region chose in 1993 to renovate and enhance its neighbourhoods through operations [3] focused in time (4 years) and space (a neighbourhood): Neighbourhood contracts.

It established methods for initiating dialogue with the residents, as overall improvement of the quality of life necessarily presupposes 'coordinated action on housing, transport, culture and local services. Even though the participation of the residents may encompass very different realities, everyone agrees that it should allow the residents to participate effectively in the enterprise of urban renovation by giving them appropriate tools and pertinent information.' [4]

The various types of participation, which are constantly evolving [5], are a major feature of any sustainable policy, and in particular of Sustainable Neighbourhood contracts, incorporating environmental criteria and economic measures supporting the social economy.

## Acting where market forces are inadequate

Contracts allow the Region and the Municipalities to carry out programmes coproduced with experts and residents' assemblies, to alleviate the lack of infrastructures and to increase the stock of low-cost rental housing. They also aim to improve the living environment of the residents through concrete achievements, such as the development of public areas and parks.

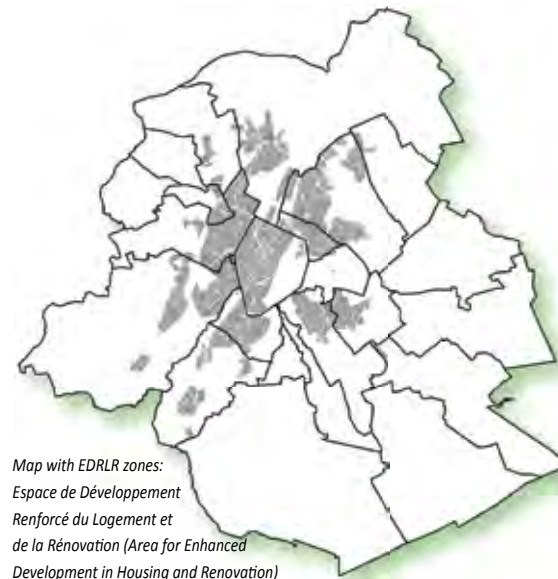
The contracts bring together a broad range of activities against social vulnerability and inadequate housing, led by a number of associations: Réseau Habitat, including Renovas in Schaerbeek, Habitat et Rénovation in Ixelles, Convivence/Samenleven in the City of Brussels, etc.

The contracts rebuild local cohesion and allow the residents to reclaim their neighbourhood. They allow intervention in areas and situations deemed too complex or unprofitable by the private market.

Between 1994 and 2008, 52 Neighbourhood contracts were launched, allowing one thousand municipal housing units to be developed.

## Environmental pilot projects

Since 2010, a regional ordinance has reformed the system, henceforward called 'Sustainable Neighbourhoods Contracts'. This involves not only the incorporation of requirements with regard to the energy and environmental excellence of buildings



Map with EDRLR zones: Espace de Développement Renforcé du Logement et de la Rénovation (Area for Enhanced Development in Housing and Renovation)

(passive and very low energy), but also development of pilot projects integrating all aspects of sustainability within moderate-income neighbourhoods in an innovative way.

In the socioeconomic area, this consists in addition of developing new environmental trades in construction, work integration enterprises, etc.

**In 2010 and 2011, 8 new Sustainable Neighbourhood contracts have been selected, totalling more than € 120,000,000 of sustainable investment:**

- "Canal-Midi" in Anderlecht,
- "Masui" in the City of Brussels,
- "Liedekerke" in Saint-Josse,
- "Jardin aux Fleurs" in the City of Brussels,
- "Coteaux Josaphat" in Schaerbeek,
- "Koekelberg Historique",
- "Scheut" in Anderlecht.



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© Bernard Deprez

Sustainable Neighbourhood contracts rebuild local cohesion and allow residents to reclaim their neighbourhood.

### Sustainable Neighbourhood contracts

Since the 90s, the 'revitalisation' of old neighbourhoods has combined measures for urban renovation and social measures to combat social vulnerability and enhance social cohesion. It involves reducing the disparities in development noted between the old fragile neighbourhoods (especially around the canal) and the rest of the regional territory, progressively seen as a threat to the attractiveness of the city. As a reaction to property speculation – Brusselization – urban renovation is designed as the protection and enhancement of what exists with the aim of supporting the population living there. **It involves developing actions that are local and participatory.** This participation results from the development of democratic convictions that are asserting themselves in daily life and is a response to the demand of residents to be able to participate directly in decision-making. This participation is a means of re-establishing trust between citizens and local authorities, as a complement to traditional structures of representation.

### The Sustainable Neighbourhoods Facilitator

He/she collaborates in studies related to Neighbourhood contracts to determine their environmental aspects. He/she thus complements the socioeconomic measures and citizen participation processes. He/she also guides the consulting offices responsible for scheduling activities in new Neighbourhood contracts, to specify the sustainable aspects of their projects with them.



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© Marie-Françoise Plissart - Région de Bruxelles-Capitale



© Bruxelles Environnement

### The duration and location of Sustainable Neighbourhood contracts

The Neighbourhood contract is a plan of action limited in time (4 years + 2 years of finalisation) and defined within a clearly delimited boundary. It is concluded between the Region and the Municipality concerned by the area defined in the contract. It determines a programme of activities to be carried out within a limited budget. General meetings of the neighbourhood residents are held during the implementation of the process.

Between 1994 and 2008, 52 Neighbourhood contracts were launched, covering the entire EDRLR and allowing a thousand municipal housing units to be built.

### A fertile ground for social and architectural innovation

Neighbourhood contracts have allowed a number of interesting and innovative architectural projects to be carried out, as the book [1] and exhibition devoted to them in 2006 show. **Several exemplary buildings – low-cost housing, neighbourhood facilities, etc. – have seen the light of day under Neighbourhood contracts.** For young architects, this is often a first opportunity to prove themselves.

[1] M. Cohen, *A Bruxelles, près de chez vous – L'architecture dans les contrats de quartier*, Photos by Marie-Françoise Plissart – MRBC Publishing – DRU, 2006.

[2] Corijn, E. Vloebberghs, *Bruxelles!*, VUB Press 2009, p.118.

[3] *Dix ans d'action sociale urbaine – Contrats de ville – Contrats logement*, SPPIC, Brussels, 2009.

[4] F. Thiry, *Régénération urbaine. Belgique*, Europe, in A+, no. 182, Brussels 2003.

[5] M. Berger, *Bruxelles à l'épreuve de la participation – Les contrats de quartier en exercices*, DRU, Brussels 2008; photographs, P. Beugnies.

# Recultivating the post-industrial city

In an area as urbanised and limited by its institutional borders as Brussels, every project is from this point on related to others in terms of mobility, density, collective facilities, etc.

## A sustainable future for Brussels' wastelands

Brussels has too often lacked an overall, shared urban vision. In order for high-quality projects to be developed there, public authorities and investors must have a clearer and better defined idea of the future that the Region wants for its territory. In an area as urbanised and limited by its institutional borders as Brussels, every project is from this point on related to others in terms of mobility, density, collective facilities, etc.

The Regional Development Plan (RDP) has identified 14 key zones [1] that form property reserves that the Region intends to manage carefully. The Regional Land Use Plan (Plan régional d'Affectation des Sols - PRAS) has also identified 14 Zones of Regional Interest (Zones d'Intérêt Régional [2] - ZIR) with a significant potential for reconversion. These are mainly neighbourhoods located around the major train stations. Planning tools such as master plans (schémas directeurs - SD) allow the broad outlines to be used for the development of the key zones and ZIRs to be defined. These master plans are prepared by consulting firms in consultation with the residents concerned.

## Incorporating sustainable neighbourhood principles into all urban developments

Until recently, most traditional development plans incorporated the environment and the principles of sustainability rather poorly. The new

Regional Development Plan has been revised to take them into account of these and become the Regional Sustainable Development Plan (Plan Régional de Développement Durable - PRDD). **Since its government approval in 2009, the Region is requiring that any urban development be carried out in line with sustainable neighbourhood principles.** To specify these, the Region has marked out the path with a series of studies. It has also charged the Sustainable Neighbourhoods Facilitator with developing a Sustainable Neighbourhoods Guide [3], which sets out the principles of their design in nine points. This document serves as a basis for work with professionals, architects, town planners and developers.

The idea is to design a city with a balanced territorial network, attentive to the preservation of the biodiversity of its hinterland, fossil energy resources and ultimately the climate, and capable of integrating its residents into processes of participation and decision-making. To these ends, the Sustainable Neighbourhoods Facilitator meets with project sponsors to assist them in specifying their sustainable features. He organises specialised seminars and develops tools to contribute to the emergence of a new vision of property and new practices.

The Agency for Urban Development (Agence de Développement Territorial - ADT) collaborates with the Facilitator so that the development of Brussels' wastelands can be as compliant as possible with sustainable neighbourhood principles.



*It is a matter of designing a city with a balanced territorial network.*

[1] See map opposite

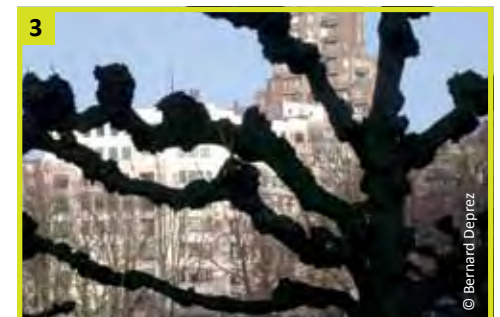
[2] See map opposite

[3] [www.bruxellesenvironnement.be](http://www.bruxellesenvironnement.be)

[4] Alain Cluzet, *Ville libérale, ville durable?* ed. De l'Aube, 2007.

## Neighbourhoods to live in, not showcases to see

The methods of the past are inadequate to respond to the present demographic and economic pressures or the environmental challenges and the demand for urban quality. For the French town planner Alain Cluzet, 'The sustainable city is not only new in its capacity to regenerate, to recycle itself continuously without leaving behind wastelands and various types of pollution. It is not a showcase to visit. It is a city that extends (...) by rhizomes along development corridors generously equipped with major public transport [4].'





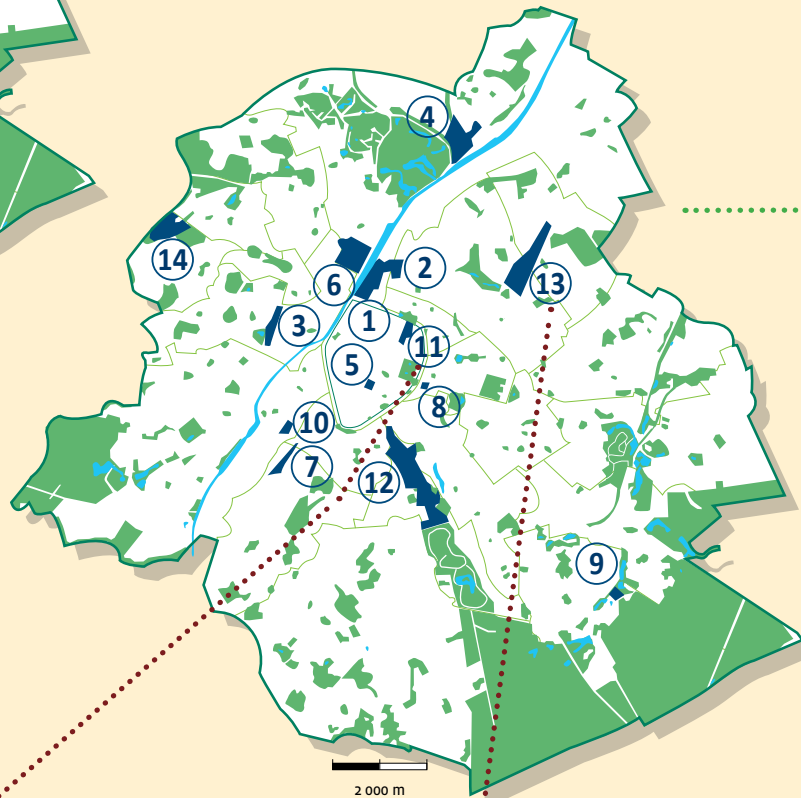
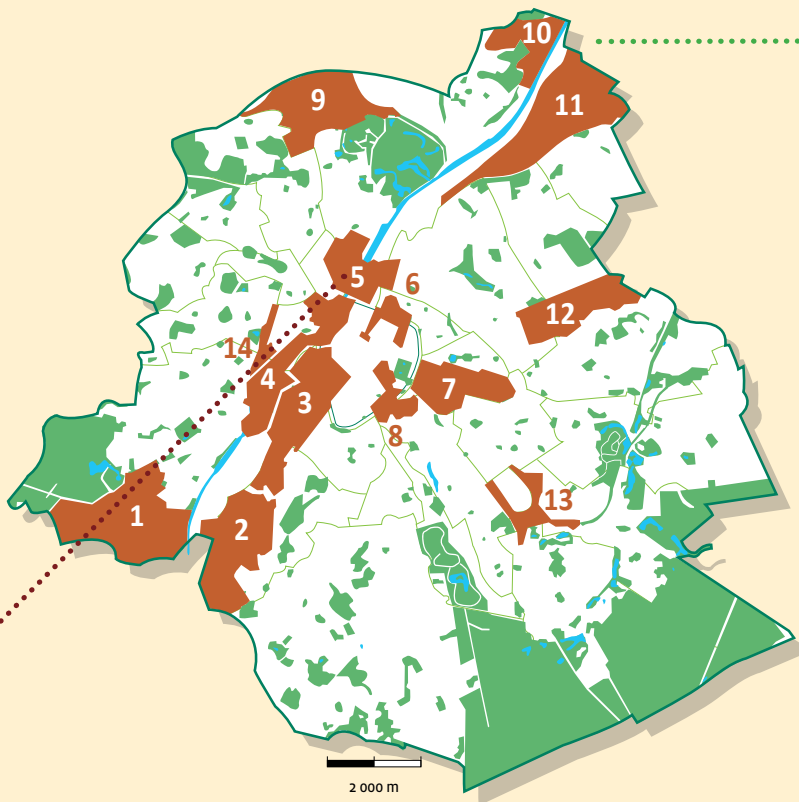


## 1] the Key Zones

- (1) Erasme
- (2) Forest
- (3) Midi
- (4) Canal
- (5) Tour & Taxis
- (6) Botanique
- (7) Europe
- (8) Toison d'Or
- (9) Heysel
- (10) Hôpital militaire  
[Military Hospital]
- (11) Schaerbeek-training
- (12) RTBF-VRT
- (13) Delta
- (14) Gare de l'Ouest  
[West Station]

## [2] The Zones of Regional Interest (ZIR)

- (1) Heliport
- (2) Gaucheret
- (3) Gare de l'Ouest  
[West Station]
- (4) Pont Van Praet
- (5) Prince Albert
- (6) Tour & Taxis
- (7) Van Volxem
- (8) Champ de Mars
- (9) Charle-Albert
- (10) Ecole vétérinaire  
[Veterinary School]
- (11) Cité administrative  
[Administrative Complex]
- (12) Avenue Louise
- (13) Gare Josaphat
- (14) Porte de la ville  
[City Gate]



- 1 and 2 Tour & Taxis Site
- 3 View of Ixelles
- 4 Cité administrative de l'Etat  
[Government Administration Complex]
- 5 Josaphat Site



# New sustainable neighbourhoods

Energising and revitalising existing neighbourhoods, certainly. But the Region also wants to see new sustainable neighbourhoods appear in urban wastelands, allowing innovative overall projects to emerge.

## The Rue du Tivoli Sustainable Neighbourhood in Laeken

The Brussels Regional Development Agency (SDRB), the owner since 2010 of the entire Tivoli wasteland in Laeken, is developing a Sustainable Neighbourhood there. The development of the site is designed as a mixed project including housing and economic activities, local facilities and local businesses. On 5 blocks (4.7 ha), over 500 new housing units are planned. On the edge of the Tour & Taxis site, commercial spaces are intended for businesses related to the green economy, through the Greenbizz project financed in the framework of the ERDF. The re-urbanisation of this extensive area should contribute to revitalising the adjacent neighbourhoods.

## A transversal design

Starting from the development plan developed by the ms-a consulting firm, the Sustainable Neighbourhoods Facilitator guided the SDRB in the study of plans and development of the prescriptive documents. At the SDRB, working groups were formed to plan the various aspects of the future sustainable neighbourhood: energy, the coexistence of the various functions, social diversity, environmental management, mobility, local facilities, management of waste and water and participation.

All the projects of the SDRB are henceforth compliant with the passive standard for new building, or very low energy for renovation. Cogeneration has also become a standard, and the SDRB is studying the possibility of creating an urban heating plant in collaboration with the Tour & Taxis project (see opposite).

With regard to mobility, the project will stimulate all forms of 'soft' mobility: public transport, bicycles, car sharing, etc. Biodiversity and water management are also to be taken into account in construction and in the public spaces.

## Promoting participation

It is vital to establish informative and participatory processes that enrich the projects and build ties with the surrounding neighbourhoods. The project provides for a large public space, a neighbourhood garden organised around plane trees classified as 'protected trees', a composting area and vegetable gardens. Community spaces are planned to stimulate social contacts.

It is important to implement informative and participatory processes that enhance the projects and build ties with the surrounding neighbourhoods.

*'By promoting social diversity and the complementary nature of functions, the SDRB wants to maintain the economic activity of the urban fabric while fulfilling the needs of the residents in terms of housing.'*  
Denis Grimberghs, President of the SDRB

## A new sustainable neighbourhood in Forest

The new Bervoets sustainable neighbourhood that is being designed will include 239 housing units laid out in an allotment designed according to the criteria of sustainable development. The 108 duplexes, 19 houses and 112 flats distributed over 9 buildings, as well as 12 small studios for craftspeople, guarantee the diversity of the neighbourhood. They will be laid out around three tree-lined public spaces. All this will contribute to the conviviality of this new housing estate. Heat production (heat and hot water) will be provided by a cogeneration plant that will also generate electricity, thus guaranteeing optimal energy efficiency.

Water management is also very important in this project, located at the bottom of a valley. The buildings are thus equipped with storm water tanks located on the roofs (because of the proximity of the water table) and green roofs.





## Tour & Taxis : a major site in the centre of the city

Linking the North Sea to the south of the country, the Canal in Brussels makes you feel a bit as if you are on the coast. It is also a major economic centre, as 350 SMEs use it for the transit of over 53% of the merchandise transported to Brussels. The Tour & Taxis Site is spread over 45 ha. After the departure of the customs operations, it was the subject of a number of reallocation projects. Its area and its location in the city centre and on the edge of the Canal make it an attractive urban centre.

The renovation of the Entrepôt Royal and the Sheds has been widely adopted by Brussels residents. Numerous cultural events there welcome more than 700,000 visitors per year.

## The Tour & Taxis development project

The Canal neighbourhood is presently undergoing a major urban transformation. In 2009, the Region adopted a development plan (ms-a consulting firm) for this large 45 ha site, after the owner, Project T&T SA, submitted a permit application for the development of a 'sustainable city neighbourhood' mixed project. This project provides for the construction of 1000 to 2000 housing units, shops, offices, services, and public facilities, 'all developed around three main themes: a revitalised heritage, sustainable communities and water.' The projects envisaged involve 600 to 700 million euros.

## Major urban sustainability issues

Tour & Taxis is a strategic site for Brussels and sustainability issues are numerous there, as it is surrounded by densely built moderate-income neighbourhoods. The Region wants to provide the surrounding neighbourhoods with a large urban public park of over 10 ha accessible to the residents. There is at present an extreme lack of parks, and it could be connected to the adjacent park running alongside the Line 28 railway line.

In its Guide to sustainable neighbourhoods, the Region envisages the development of these new neighbourhoods on the basis of service exchanges

The Region wants to provide the surrounding neighbourhoods with a large public park of over 10 ha, accessible to the residents.

## Brussels Environment establishes its headquarters at Tour & Taxis

With 16,250 m<sup>2</sup> in office space and an atrium, this will be the largest passive office project in Europe, and even in the world. The future administrative headquarters is developing a concept inspired by the 'box in a box' principle. While keeping a simple and compact volume, the architects of CEPEZED have split the floors of offices down the middle, creating a long flaring rift into which the natural light coming from a large south-oriented glazed roof pours abundantly.

with the existing adjacent neighbourhoods, notably with the nearby operation at Tivoli.

The master plan provides for functional diversity, with 40% of the functions being allocated to housing, 40% to economic activities and 20% to urban facilities.

To reduce the risk of 'ghettoisation', housing planning must ensure socioeconomic diversity, with a distribution of public, regulated and unregulated housing. The master plan provides for a minimum of 20% low-cost housing and a minimum of 30% moderate-income housing. It thus contributes to the objective set by the Region to reach 15% public housing by 2020.

Finally, at present, the public transport mobility offering is inadequate and there is a high risk of too much reliance on the car, which would put excessive pressure on the neighbourhoods. The new neighbourhood should be linked to the northern quarter of Brussels by one or two new tram and bus lines that will use a new bridge over the canal reserved for active modes of transport (public transport, bicycle, pedestrians).



Green space projects are an essential aspect of developing the image of the neighbourhood. A 10 ha public park, a real 'backbone' running from the north to the south of the site, will constitute the space around which all activities will be centred. This will be the largest urban park created in Brussels since the 19th century!

# Europe and the Urbain Loi project

To be exemplary on both the regional and European scale, Brussels aims to enhance its expertise and its international reputation for sustainable urban practices.

## A project to develop the European Quarter

The European Commission and Parliament advocate demanding environmental measures. The Parliament has requested that public authorities

regional and European scale, Brussels thus aims to enhance its expertise and its international reputation for sustainable urban practices. In March 2009, at the end of the process, the draft design of the architectural firm of Christian de Portzamparc, a partner in the ARUP consulting firm, was chosen.

## The passive standard anticipates European regulations

- The Members of the European Parliament have already declared themselves in favour of minimum prescriptions for performance for new



be exemplary, notably in terms of the energy performance of buildings and urban developments. For new buildings, the European Union is in fact proposing stricter energy requirements starting from 2020, when 'almost zero energy' will be the standard [1].

## The master plan and the Urbain Loi project

The master plan adopted in April 2008 aims to make the European Quarter an 'exemplary eco-neighbourhood'. The ambition is significant for the Commission and the 27,000 European officials occupying more than 50 buildings (800,000 m<sup>2</sup>) in the quarter.

This is why the Brussels-Capital Region organised an international competition for the redevelopment of the Rue de la Loi, the principal headquarters of the Commission and its Brussels business centre. Mindful of its duty to be exemplary on both the

A major event for our capital, this urban transformation will begin very soon and extend over a long period of time. The project should provide a touch of diversity in an area now 96% devoted to offices. It will allow the construction of 110,000 m<sup>2</sup> of housing, but also 240,000 m<sup>2</sup> of additional offices (principally intended for the European Commission, which wants to group together its personnel in a less fragmented built environment), thus reducing to 87.5% the predominance of the tertiary sector.

[1] [www.europarl.europa.eu/news/expert/infopress](http://www.europarl.europa.eu/news/expert/infopress)

[2] INI/2007/2106: 19/12/2007 – EP: decision of the committee responsible, 1st reading/single reading on [www.europarl.europa.eu](http://www.europarl.europa.eu)

[3] Position of the European Parliament, 23/4/09 (EP-PE\_TC1-COD(2008)0223)

- and renovated buildings. They have requested the Commission to 'propose a binding provision according to which all new buildings requiring a heating and/or cooling system should observe the passive housing standards or the equivalent standards for non-residential buildings starting from 2011 [2]'.  
In the framework of the revision of the Directive on the energy performance of buildings, the Parliament also declared itself in favour of buildings in which the net energy consumption is zero. In particular, the Member States must ensure that 'by 31 December 2018 at the latest, all new buildings are buildings in which the net energy consumption is at least zero [3]'.  
The Zero Carbon Project at Urbain Loi is thus also a laboratory for the future development of the Brussels regulatory framework.





The recommendation of the European Union to produce 'zero energy' buildings will apply as of 2018.

- **The environmental and sustainability issues of the Urbain Loi Project**
- In collaboration with the Sustainable Neighbourhoods Facilitator and the Passive Platform, the Christian de Portzamparc architectural firm and the ARUP consulting firm have defined the environmental objectives set for the Urbain Loi project.



### Toward a 'zero carbon' Rue de la Loi

- The environmental concept proposes a 'zero carbon' quarter. The buildings there will minimise their energy needs by complying with the passive standard, and the balance of energy necessary will be offset by renewable energy generation, on-site or elsewhere. Other measures involve water management, roofs, urban gardens, etc.
- These provisions comply with the regional policy declaration specifying that all public building projects must fulfil the passive standard criteria in 2010, and that this requirement will be applied to all buildings, private or public, in 2015.
- On the other hand, the recommendation of the European Union to produce 'zero energy' buildings will be applicable as of 2018, i.e. within the time period for development of the Urbain Loi project.



- The project involves a process of integrated development. It will include the renovation of a number of office spaces into housing, multiple demolitions and reconstructions in significantly larger sizes, the exchange of construction rights between different owners, the adoption of an efficient and tenable mobility plan, etc.
- It is a challenge for all the private operators called upon to reconcile their own interests with the public interest. It is also an issue for the Commission : aside from its understandable interest in streamlining its own activity by constructing a very large building (230,000 m<sup>2</sup>), it is the only party able to be a driving force in town planning in the long term.



# Reducing environmental pollution

**Building construction and renovation, town planning and the development of the area are central tools in creating a sustainable city. But the quality of life in a city must also be maintained by reducing environmental pollution and optimising the assets of the city: multiplicity of functions, reduced travel, cultural and leisure opportunities.**

Noise management, the quality of the air, water and soil, etc. The reduction of pollution constitutes part of a policy of sustainability, of course. Here too, Brussels is hard at work. Here are a few examples...

### Mobility:

#### IRIS 2 wants to get Brussels moving

With only 37% of users walking, riding bicycles or using public transport, with 6 vehicles for every 10 inhabitants and almost 225,000 cars entering the capital each day, Brussels is experiencing significant pressure from vehicles. The IRIS 2 plan aims to reduce the impact of the car on urban mobility by favouring alternate, less polluting, methods of travel.

But things are already changing. The share of the car in the distribution of methods of transport has decreased in Brussels; it has gone from 44.7% in 2005 to 40.8% in 2008. At the same time, the number of users of public transport has increased by 80% and the number of cyclists has multiplied by a factor of three.

#### The Noise Plan

Cities are generally noisy, and Brussels is no exception. The principal nuisances are due to the various modes of transport. In 2009, the Brussels Government adopted a second plan to combat noise. This provides for a series of measures aiming to reduce noise from road traffic, and nine provisions of the plan aim specifically to reduce the noise impact of traffic.

**Noise will henceforth be taken into account in granting environmental permits** (technical facilities, hotels, restaurants and cafes, etc.) [1]. A 'least noise' policy will be implemented in the public transport of the STIB and agreements will be concluded between the Region and the SNCB to reduce railway noise pollution [2]. The Region continuously monitors air traffic noise pollution, as well as observance of the Brussels standards and

makes an on-line claims service available to the population flown over.

[1] 43% of the complaints registered by Brussels Environment are related to air-conditioning facilities (E. Corijn, E. Vloeberghs, Bruxelles!, VUB Press 20009, p.93)

[2] STIB: Société des Transports Intercommunaux Bruxellois (Brussels Intercommunal Transport Company); SNCB: Société Nationale des Chemins de fer Belge (Belgian National Railway Company)

#### Trailblazing regulation of electromagnetic radiation

The Region has established very specific regulations with regard to electromagnetic radiation. This is a topical issue, with the multiplication of radiation sources related to mobile telephones, wifi, etc., and the emergence of new syndromes such as electrohypersensitivity (EHS).

**The Region applies the precautionary principle in this respect. Relying on a standard recommended by the Superior Health Council (Conseil Supérieur de la Santé - CSS), it limits electromagnetic radiation in any location accessible to the public to 3 V/m.**

This regulation simultaneously encompasses the protection of persons and the operation of telephone networks.

Innovative feature: any emitting facility is checked upstream by an environmental permit procedure; inspection of excesses also exists downstream.

#### Rehabilitating/re-inhabiting the post-industrial landscape of Brussels

The Brussels-Capital Region can pride itself on a rich industrial past. Unfortunately, a number of sites – notably located along the Brussels-Charleroi Canal – have been contaminated over time by highly polluting activities. They continue to have harmful consequences today. Those responsible for this pollution are too often unknown or no longer in a position to clean up these sites.

The Region is undergoing expansion in the service sector: it needs expansion zones for developing

The share of the automobile has decreased, principally in favour of public transport, the use of which has increased by 80%.







housing, facilities and activities. It must therefore encourage the treatment of polluted soils to allow other activities to be carried out there.

The Region has very strict regulations on treatment of polluted soil. Property sales or transactions generate an obligation to manage or treat pollution present in the soil. In some cases, historic pollution of the soil can create obstacles to developing new projects. This is why the Region has established the Greenfields Calls for Proposals.

### The Brussels Greenfields Call for Proposals

Inspired by an experiment in Quebec, Brussels Greenfields aims to support the treatment of polluted sites around the canal for projects generating economic activity and jobs. The Region subsidises part of the cleanup expenses **for reinvestment projects on the contaminated sites**. Moreover, project sponsors benefit from integrated support from various Brussels organisations for cleanup and the initiation of economic activities.

The objective of the Region is to revitalise redevelopment of this waste land by alleviating the inevitable costs of pollution abatement. This also allows it to be involved in the remediation treatments implemented in its territory.

This project is co-financed by the ERDF (European Regional Development Fund) and the Brussels-

Capital Region for an amount of 15 million euros in the framework of the 2007-2013 operating programme.

### The soil status inventory

Brussels Environment has also gathered a set of archives that have allowed it to draw up a history of sites, the activities that have been carried out on them, and their presumed pollution. **The soil status inventory currently includes approximately 17,000 sites that are polluted or presumed to be, representing 8% of the regional territory.** Most sites are concentrated near the canal and the North-Midi railway junction. But polluted sites are also located at the core of the city, in the neighbourhoods. One of the characteristics of Brussels is in fact that residential and business functions are interwoven. The inventory will be supplemented by information from future environmental permits and soil analyses.

[1] 43% of the complaints registered by Brussels Environment are related to air-conditioning facilities (E. Corijn, E. Vloeberghs, Bruxelles!, VUB Press 20009, p.93)

[2] STIB : Société des Transports Intercommunaux Bruxellois (Brussels Intercommunal Transport Company); SNCB : Société Nationale des Chemins de fer Belge (Belgian National Railway Company)

### Brussels Greenfields : a transversal project

Not only does the Brussels Greenfields plan establish conditions for the sustainable remediation of soils, it also aims for the economic redevelopment of the wasteland treated.

In addition, it encourages eco-construction and measures favouring biodiversity and the preservation of the natural heritage.

By following up on the environmental permits, Brussels Environment will also be able to take preventive action against any new form of pollution.

Brussels Greenfields is collaborating with a number of representatives from the public sector, private participants, professional associations, unions, experts, etc.

Brussels Greenfields aims to support treatment of polluted sites around the canal for projects generating economic activity and jobs.



© Bruxelles Environnement



© Bernard Deprez



# Changing behaviour

The construction and renovation of buildings and architecture are important, but they are not the only things that make a sustainable city. The way people live in and experience the city must also undergo profound change.

The Region's environmental policy is based on a conviction, which has already been expressed in the transformation of buildings: environmental change cannot be achieved without a significant degree of involvement on the part of the public. **It is the combined effect of our purchasing, consumption, transport, and eating patterns that create a city that is more or less sustainable.** Dozens of schemes undertaken by groups of inhabitants or third-sector organisations are helping to gradually transform Brussels. The Region supports these schemes.

### Eating patterns: 60,000 'sustainable' meals served in canteens in Brussels

In 1960, a typical grocer's shop had 2,000 different products on sale. Today, a supermarket offers more than 15,000! Wherever food is sold you can find products from all four corners of the globe, and a huge range of fruit and vegetables is available at every season of the year. Nowadays we no longer find it surprising to eat strawberries and tomatoes at Christmas time, apples from New Zealand, or green beans from Kenya.

Unfortunately, these changes have increased the pressure that our choices place on the environment: food accounts for 30% of our environmental impact. This is why the Region has launched the 'sustainable canteen' campaign, which is proving increasingly successful. The idea was to persuade large catering organisations which provide meals for institutions (schools, companies, government bodies) to produce meals with a lower environmental impact: **less meat, fruit and vegetables which are in season and as local as possible, all originating from producers who care about the environment.** With the participation of large catering organisations, more than 60,000 meals are already being served daily that meet the sustainability criteria!

### The Energy Challenge: an effective undertaking

In 2005, Brussels began introducing schemes to support and educate the people of Brussels regarding energy saving in buildings. One of these schemes, the Energy Challenge, offers households a fun and socially responsible way of playing a serious part in the battle against climate change. It encourages them to make major reductions to their energy consumption simply by changing certain daily habits, and hence without the need for any financial investment. With this aim in mind, each household that participates in the Energy Challenge identifies concrete actions that they commit to carrying out. Ultimately, they save an average of 380 euros per year.

### Providing information to help people take action

The Region has also made a big effort to provide information to the public. The Brussels Environment website has seen a large rise in traffic, and now receives more than 50,000 visitors per month. Ranging from widely distributed leaflets to technical information sheets, many different publications containing information and practical advice

### Fact

In 1960, a grocer offered 2,000 different products. Today, a supermarket offers more than 15,000! Food contributes 30% of our environmental impact.

are available to the general public, both on the website and in various paper versions (see insert).

Every year, around 20,000 people attend the Festival of the Environment.

Furthermore, thematic campaigns whose primary focus is on encouraging people to adopt good habits, raise public awareness and help support policy actions.

### Infrared thermography

Another information tool is the generation of infra-red thermographic images of the roofs of all the buildings in the Region. The aim of this is to provide an indication of heat loss through roofs, and hence to demonstrate the advantage of increasing the energy efficiency of buildings in Brussels. The resultant map is available on the Internet [1]







*« Je suis devenu un animateur énergie »*

FAITES-VOUS PLAISIR EN RÉDUISANT VOS FACTURES. INSCRIVEZ-VOUS AUJOURD'HUI AU DÉFI ÉNERGIE

*« Nous participons au Défi Énergie depuis 2007. Avec ma compagne, nous avons un peu fait attention à tout, comme, par exemple, ne pas laisser les appareils en veille, remplacer petit à petit nos lampes traditionnelles en lampes économiques, ne pas chauffer l'appartement quand nous sommes absents, etc. Finalement, je suis devenu « animateur énergie » ! J'ai encouragé 23 amis, voisins et collègues de travail à mieux gérer leur consommation d'énergie. Avec les enfants dont je m'occupe, j'ai réalisé un petit film vidéo de 6 minutes sur le climat. Cela a très bien marché, ils aiment super-énormément. Et la chaîne continue... »*

CHACUN GÈRE SON COMPTE QUAND ON EST PLUS D'UN MILLION DE BRUXELLOIS

Inscrivez-vous  
www.defi-energie.be  
0800/85.301



## Stepping on the GAS for a sustainable food supply!

In February 2006, collective buying groups (GASs) were set up in Brussels, arising from a desire to recreate direct links with local farmers and craft workers. Their objectives were to regain a healthy and sustainable food supply, deriving from outside the agro-industrial network, and avoiding environmental damage. They also wanted to set up short supply networks based on the local economy. There are now several GASs in Brussels, and new groups are beginning to form.

For more information see:  
[www.gas-bxl.collectifs.net](http://www.gas-bxl.collectifs.net)

## The Energy Challenge for schools

The objective of the challenge was to encourage and help schools within the Brussels-Capital region to lower their energy consumption. This was achieved simply by providing information by means of theme-based tips and teaching tools regarding good energy-saving habits and simple changes to the school environment that can be carried out by the schools themselves.

For more information: [www.defi-energie.be](http://www.defi-energie.be)



*'We are simply writing to let you know that we have received a credit of more than 500 euros for our gas consumption. This is equivalent to a 38% reduction in our consumption, and it was achieved without a great deal of effort. We think that this significant drop in our consumption is due to:*

- careful management of our heating system (19° etc.)
- turning off our radiators as early as possible in the spring
- turning our radiators back on again as late as possible this autumn.'

**A family who took part in the Energy Challenge**

## Social Guidance on Energy

Energy poverty – the situation of being unable to pay for the energy needed to maintain a basic standard of living – affects an estimated 9% of the population, and is not confined to those on benefits.

This type of poverty also has consequences for public health (higher risk of infection, higher mortality rate, etc.) and for government spending, in particular since it is the responsibility of the public welfare centres (CPASs) to pay part of the energy bills.

**In Molenbeek, a poll of 3,102 people living in social housing showed that energy charges represent 40% of the rent on average, with bills often exceeding €120 per month for a very modest level of comfort.**

In 2007, the energy unit of the CPAS in Etterbeek handled 757 cases, ranging from simply providing information to monitoring, giving guidance on energy use, getting bills corrected and giving financial assistance, while the City of Brussels CPAS arranged 156 payment plans for electricity and 152 for gas [2].

The aim of Social Guidance on Energy is to help disadvantaged households to reduce energy consumption in their homes while maintaining the same level of comfort. In 2008, a study carried out on the monthly consumption levels of 49 households showed that **53% of households had reduced their heating consumption by between 10 and 50%, and 39% had reduced their electricity consumption by anything from 5 to over 25%** [3].

*'Since receiving the help of an energy adviser, I have learnt good habits which help lower my energy consumption. I no longer need the assistance of social services in order to pay my bill.'* Boujemaa Dahmani (Saint-Gilles)

[1] [www.brusselsevennement.be/thermographie](http://www.brusselsevennement.be/thermographie)

[2] Changement d'échelle: le logement collectif et social, in **be.passive** 01, 2009, p.49, [www.bepassive.be](http://www.bepassive.be);

[3] Summary of the pilot study carried out in 2006/2007 by Perspective Consulting for Brussels Environment, 10.12.2007.

# Brussels : green city, nature city

Parkland, woods, the forest of Soignes, private gardens, cemeteries, sports grounds, fields, vegetable gardens and so on represent half of the Region's territory. A wealth of biodiversity exists there which must be protected. This is vital to the quality of life and sustainability of a large city.

Brussels has an exceptional natural heritage and urban green spaces, making it one of the greenest cities in Europe. Brussels Environment manages a large proportion of the capital's green spaces, totalling 2 210 hectares : 400 hectares of parkland, 1,685 hectares of woodland, and 125 hectares of nature reserves. **The management of these areas aims to reflect all of their various functions : recreational, educational, ecological and as parts of the landscape.** The agency encourages the involvement of local people and users of the parks and gardens in both the design or renovation of areas, and their maintenance. It also sets an example in its ecological management approach, using no pesticides whatsoever, encouraging wild flowers and indigenous species, maintaining pond banks in a more natural state, refraining from removing dead trees from woodland, and installing shelters for a wide range of animals.

The green spaces are also biotopes for a wealth of biodiversity : almost 800 different species of plants, and 45 species of mammals, including 17 species of bats, 92 species of nesting birds, and so on.

Brussels is also a town of rivers, but the culverting of the Rivers Senne and Maelbeek and the partial culverting of the River Woluwe have left little trace of this.

## The Green Trail

The Green Trail, which is an integral part of the Green Network, is a route of **more than 60 km which allows pedestrians and cyclists to explore the Region. It passes through numerous parks and nature conservation areas.**

## Special Areas of Conservation (Natura 2000)

There are three of these natural habitat zones in the Brussels-Capital region, protected by the Natura 2000 scheme : the forest of Soignes, the adjacent

wooded areas, and the Woluwe valley ; the woods and some of the semi-wild meadows in the south of Brussels ; and the woodlands and several marshy and wooded areas in the Molenbeek valley. The Region is in the process of setting up a Brussels Ecological Network.

## The Green Network

The Green Network aims to create green spaces where they are lacking and to link all of these spaces together in the most user-friendly way possible. This is achieved by various means, including planting vegetation along the main access routes into the city, planting trees along city streets, improving pavements and cycle paths, and making use of watercourses and their banks, railway tracks and existing 'green avenues'.

These various initiatives help preserve and develop biodiversity, so that the Green Network plays an ecological role, for example by enabling species to move from one green space to another.

## The Blue Network

The territory of Brussels is slowly changing : there are more buildings, fewer permeable surfaces, more roads, and so on. Certain areas, such as the centre of Brussels or Ixelles, have ground imperme-

ability levels of more than 80%. Recent floods have reminded the inhabitants of Brussels that water management is a highly topical issue.

Despite urbanisation, the water cycle and the quality of surface water must be safeguarded. In addition, water needs to be made more visible and present in our urban landscapes. The Blue Network programme, managed by Brussels Environment, aims to restore the continuity and quality of watercourses and ponds, while the Rain Plan is intended to combat the negative consequences of the spread of non-porous hard surfacing in the city.

**Finally, the two regional water purification plants, in the north and south of Brussels, treat wastewater which ends up in the mains drainage network.**

Alterations have been carried out in order to separate clean water from wastewater, to restore river flows, to supply ponds and marshy areas with fresh water, and to reduce the amount of water treated in the purification plants. As a result, surface water quality is improving, and this together with the changes made to watercourse and pond banks is helping to regenerate aquatic ecosystems and increase their biodiversity..



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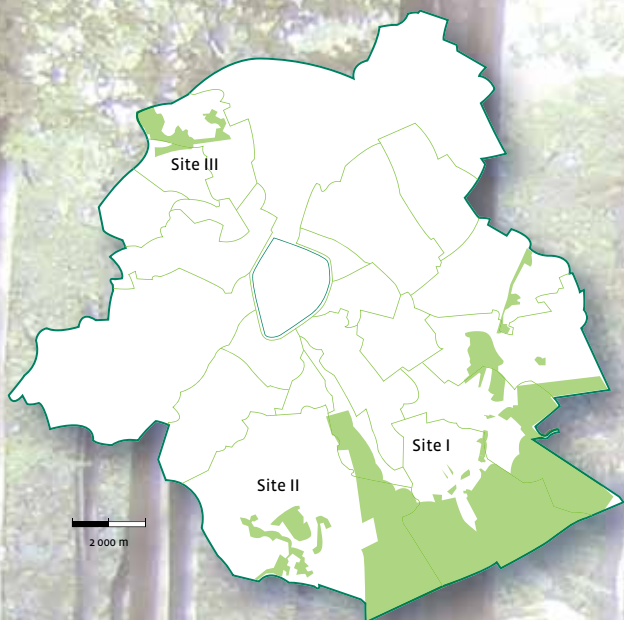


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The three Natura 2000 zones of Brussels.



### Fact

Brussels harbours a wealth of biodiversity: almost 800 species of plants and 45 species of mammals, including 17 species of bats, 92 species of breeding birds, etc.

### Playgrounds

Brussels Environment has drawn up a map of more than 300 playgrounds and sports fields belonging to municipalities and to the Region. This map shows the playgrounds and facilities available in a given neighbourhood.

[www.bruxellesenvironnement.be/particuliers](http://www.bruxellesenvironnement.be/particuliers)  
> carte des espaces verts



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### Water in the Regional Planning Regulations

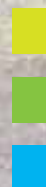
New requirements have been incorporated into the Regional Planning Regulations (RRU) on planning permission, in particular by requiring new structures to have rainwater collection tanks and green roofs. The public authorities are also in the process of revising their practices with regard to the planning of public spaces.

### The Grey Network and the Rain Plan

Given the aging condition of its drainage network, it is not surprising that the Region suffers from periodic flooding and burst river banks in the valleys. To decrease the risk (and seriousness) of rainwater flooding, the Region has chosen to supplement the current network of stormwater basins with an ecological system for managing rainwater across the territory.

### The four objectives of the Rain Plan

1. To reduce the impact and halt the spread of non-porous hard surfacing.
2. To redesign the Grey Network – the Region's drainage network – in particular by means of collector sewers and stormwater basins.
3. To redevelop the Blue Network so that rainwater is channelled away optimally.
4. To prevent the construction of infrastructure in areas at risk of flooding.





## Brussels = sustainable? The Green City Index

Brussels aims to improve the quality of life in the various areas of the city by means of an ambitious regional policy, keeping people living in the city, attracting new residents, and developing new economic networks. This policy has already won it recognition as one of the greenest cities in Europe.



### Brussels: the strengths of a multi-capital City-Region!

Brussels is a front-ranking city, in particular due to its position as the seat of European institutions and decision-making bodies. Its international role has grown over the years. Brussels is also home to NATO and other public and private international bodies, making it a highly attractive location for the national economy.

The city which is the capital of Europe, Belgium, the French Community and Flanders has also been a region in its own right since the first regional elections of 18 June 1989, with a high degree of legislative autonomy, including with regard to environmental issues.

### An attractive, cosmopolitan and growing urban region

Positioned at the heart of one of Europe's most dynamic economic regions, comparable to Greater London, the Dutch Randstad area or the Ruhr region of Germany, the Brussels-Capital Region has all the characteristics of a city on a 'human scale'.

Around one-tenth of the Belgian population is concentrated in an area of 162 km<sup>2</sup> (0.5% of Belgium's total territory): 1,048,491 inhabitants in 2008. With its 680,000 jobs, it is estimated that Brussels contributes 19.7% [1] of Belgian GDP. Its economic activity is associated with its administrative role (international, European, federal, and Community), finance, and business services. After Luxembourg City, Brussels is second in Europe in terms of economic productivity [2]. **But few of the jobs created by this growth are held by the Region's inhabitants: unemployment is at the highest level of any of the three Regions in the country, and affects more than 20% of the total labour force.**

The population density of the heavily urbanised Brussels region is higher than that of the other

regions. The urban layout of Brussels, a legacy of the 19th century, with its concentric boulevards (the Small, Middle and Greater 'Rings') and tram lines, makes it a fairly compact and accessible city.

Current demographic trends suggest that the population will grow by 150,000 between now and 2020. This is mainly due to new arrivals, who fall into two categories: expatriates, who comprise about 13% of the population, are characterised by their high purchasing power, come to work for large administrative bodies, and use the city in an intensive manner; and a marginal group, which likewise represents about 13% of the population and has considerably less purchasing power.

### The risk of polarisation

Brussels needs to respond to the drawbacks associated with its status as a capital of multiple entities. As in many other cities, the more prosperous tend to leave the centre in order to live in the more or less distant surrounding areas which are regarded as more pleasant. Every day, 379,000 commuters enter Brussels (mostly by car) – 53% of the workforce [3].

This situation also means that 45% of the wealth produced in Brussels is transferred to the other two regions; in addition, there is the rent paid by 60% of tenants in Brussels to landlords who themselves live in the other regions. The average income in Brussels is 15% lower than the average for Belgium as a whole, while the cost of living is 4% higher[3].

Paradoxically then, Brussels' increase in wealth has undermined its financial security [3]: **there is a disparity between the wealth produced in the Region and the financial resources available for it to use.** Thus great inequalities have arisen in terms of incomes, training, access to housing and in other respects. Social polarisation is manifested in abrupt differences between different parts of the

territory. Certain areas have become very poor. The city suffers from a persistent shortage of affordable housing. Much of the building stock is old, and absorbs a large part of local people's income. Skills levels among unemployed people in Brussels are low, and the rate of unemployment among young people is especially alarming [4]. The business press has stressed this point, describing Brussels as a Region which started out rich, but has ended up being poor on arrival.

### An environmental plan for Brussels

Certain cities, such as Curitiba, Fribourg and Stockholm, have been successful in fostering positive social dynamics based around an environmental plan. Even more than elsewhere, an ambitious environmental policy is the means by which Brussels plans to improve the quality of life in its various districts, in order to keep people living there, to attract new residents and develop new economic networks.

### Fact

With its 680,000 jobs, it is estimated that Brussels contributes 19.7% of the Belgian GDP.





## Priority issues faced by Brussels

Brussels' infrastructure is still based around the car, which is both a source of nuisance and a safety risk. The motorised city has erased the natural topography of valleys and slopes.

Urbanisation has led to the gradual spread of non-porous hard surfacing throughout the city, leading to the culverting of rivers, the disappearance of rainwater seepage areas and problems with the drainage system in the event of heavy rainfall.

80% of the city was constructed well before energy concerns became an issue. Most of these buildings are old, small and compact. Renovating them is a costly business. Moreover, building land is becoming rare.

## The Green City Index [4]

This is an index which uses public statistics to evaluate the environmental policies of thirty European cities on the basis of thirty indicators relating to eight larger themes: environmental governance, water management, land and waste management, energy consumption, quality of buildings, transport, CO<sub>2</sub> emissions and air quality. The numerical data are interpreted in the light of each city's specific context, and combined into a single figure.

The study is sponsored by Siemens and performed by the Economist Intelligence Unit from the Economist magazine.

- [1] Summary note no. 7 *L'économie bruxelloise*, produced by the Universities for the Citizens' Forum of Brussels, 2009, [www.etatsgenerauxdebrussels.be](http://www.etatsgenerauxdebrussels.be)
- [2] BMR 2009, BAK Basel Economics, [www.metropolitanbrussels2018.eu](http://www.metropolitanbrussels2018.eu)
- [3] E. Corijn, E. Vloeberghs, *Bruxelles !*, VUBPress 2009, pp.82, p.120 and 152.
- [4] European Green City Index, *Assessing the environmental impact of Europe's major cities*. Economist Intelligence Unit, sponsored by Siemens, 2009, [www.siemens.com](http://www.siemens.com)
- [5] Atkearney Audit, 2008, [www.atkearney.com](http://www.atkearney.com)

Brussels is currently one of the five cities with the highest number of passive buildings, with more than 80,000 m<sup>2</sup> under construction. For the offices of the environmental administration, it will be constructing the largest tertiary sector passive building in Europe.

## Brussels ranks as the no. 1 sustainable city in Europe in terms of environmental policy!

Out of thirty European capitals, Brussels takes ninth place, ahead of Paris and London, in the European Green City Index [5].

**In particular, Brussels is in joint first place alongside Copenhagen for its environmental governance!**

The details of this ranking are explained below.

Brussels ranks **third for energy intensity** (CO<sub>2</sub>/GDP).

Brussels ranks **eighth for energy**: a support policy is needed in order to rectify a level of consumption which is still high, primarily due to the many old buildings.

Brussels is ranks **fourth for water management**, thanks to a low level of water consumption per inhabitant, the 6% reduction in losses from the network, and the establishment of water purification stations.

According to the consultants Atkearney Audits, Brussels is the **2nd best city worldwide in terms of information exchange, and is 3rd in terms of international relations** [5].

According to the 2010 ranking of consultants Mercer, Brussels is the **15th most pleasant city in the world in terms of quality of living**, well ahead of Paris or London.

Brussels ranks **number 1 for environmental governance**: the definition of environmental targets, the provision of information and incentives to both the general public and businesses, government schemes, and so on. The index especially emphasises the call for 'Sustainable Neighbourhood' projects.

Population:	1.05 million
GDP per head, PPP:	€ 49,554
CO <sub>2</sub> emissions per head:	3.91 tonnes
Energy consumption per head	86.88 gigajoules
Percentage of renewable energy consumed by the city:	0.58%
Total percentage of citizens walking, cycling or taking public transport of work:	37%
Annual water consumption per head:	54.04 m <sup>3</sup>
Share of waste recycled:	23.68%

Brussels ranks **seventh for transport**. Although the public transport network is insufficiently accessible outside the city centre, it would still have given Brussels 4th place if it had not been pushed down the ranking by large numbers of commuters driving to work and low numbers of cyclists and pedestrians.

Brussels ranks **fifth for its CO<sub>2</sub> emissions**: its figure of 3.9 tonnes per inhabitant is significantly better than the national average of 5.2 tonnes. Direct emissions of greenhouse gases in the Region fell by almost 4% between 1990 and 2007 (with a drop of 12% between 2004 and 2008), while the population of Brussels rose by almost 6%.

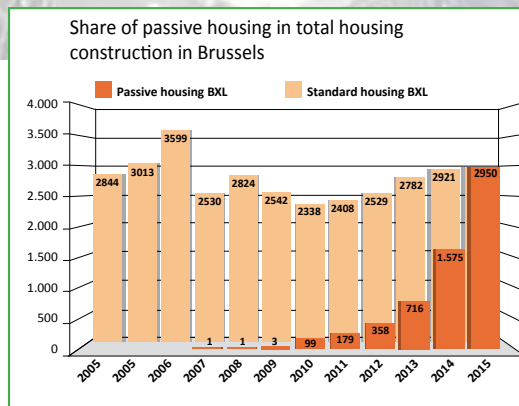
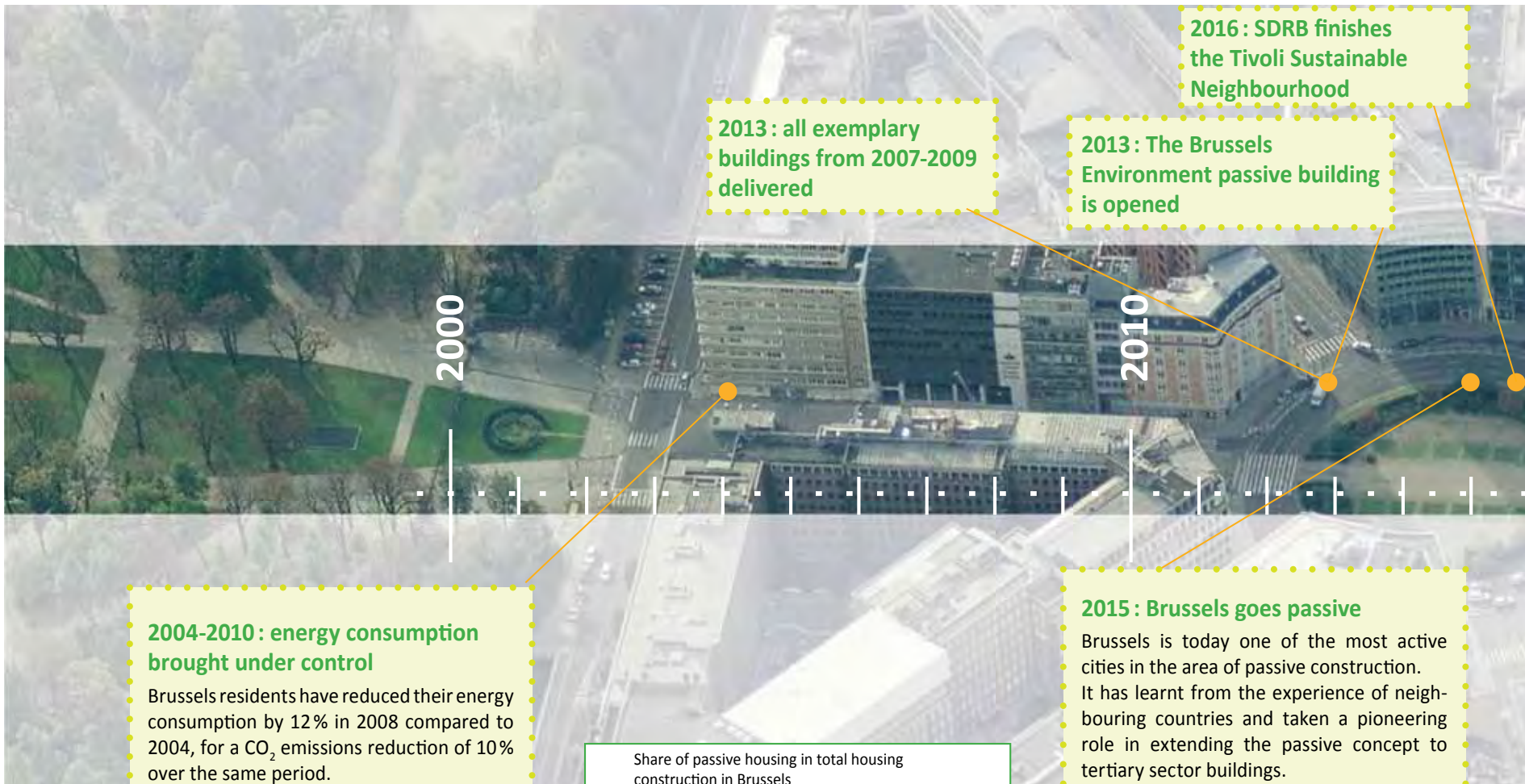




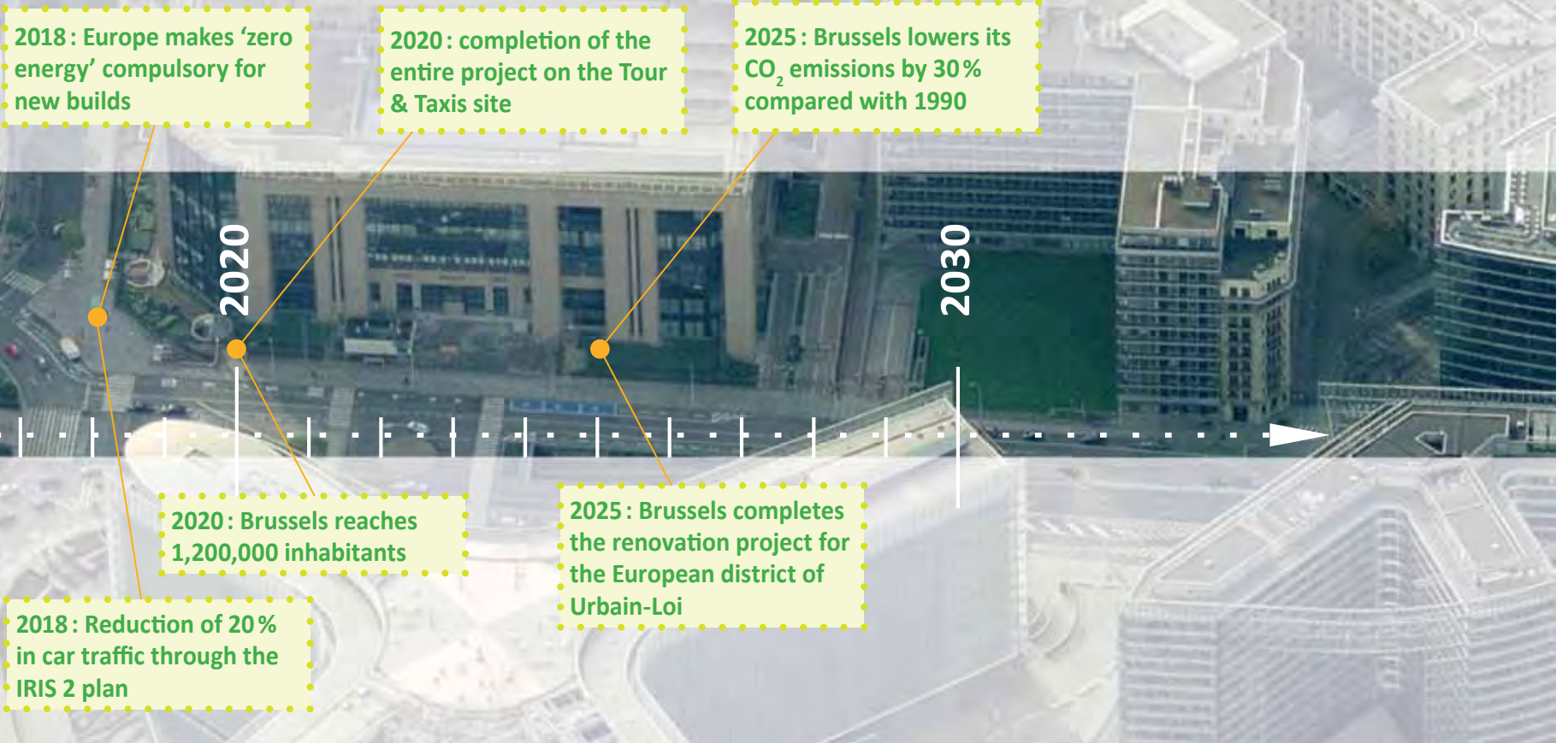
## A different city is possible

# Towards a sustainable city!

The policies implemented since 2004 have already raised Brussels to ninth position out of thirty in the ranking of sustainable European cities. Its ambition is to make further rapid progress in this area. The following is a schedule of the most symbolic events for the years ahead.







# An ambitious policy for Brussels

**The Brussels-Capital Region needs an ambitious sustainability policy.**

Since 2004, a change has been taking place in Brussels. The Region has turned to the city's inhabitants, businesses and institutions and invited them to help build their city of the future by getting involved in numerous projects covering all aspects of urban life. Brussels has transformed itself into a laboratory of urban sustainability.

But this is neither a simple nor an automatic process. In order to develop, Brussels needs ambitious political action. It has shown that it has the multi-faceted social and institutional conditions and natural environment and the capacity to use regulations so as to be both a green city and an open city.

Brussels needs to develop in order to provide the best possible conditions for receiving the 150,000 new inhabitants expected over the next ten years. It will do this by improving still further the quality of life which makes it such an attractive capital city, and in particular by creating new sustainable neighbourhoods which are simultaneously compact and accessible and have good facilities.

It will enhance the appearance of its rivers and green spaces in order to make them attractive to as many residents and other users of the city as possible.

It will develop new buildings and new ecologically efficient neighbourhoods, supporting the environmental sector and green construction in the process.

In existing areas, it will improve quality of life by renovating buildings and developing community facilities, green spaces and playgrounds, while protecting the inhabitants against the dominance of the car and the pressure from rising property prices. It will provide assistance and guidance to those who wish to reduce their energy consumption.

Brussels will remain mindful of its duty to set an example as a city, at both regional and European level, and will develop its expertise and international reputation as the emerging capital of best urban sustainability practice. The city's culture, its community dynamic and multicultural character, and the numerous actors at grass-roots level are all signs of a great capacity for change.

All of this gives us reason to press ahead with confidence towards our target of reducing greenhouse gas emissions by 30% between now and 2025 – and to think of Brussels' environment not just in abstract and purely statistical terms, but above all as a symbol of quality of life for all its inhabitants.



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# BRUSSELS



## from eco-building to sustainable city

The Brussels-Capital Region is assessing six years of policies devoted to the environment, energy and eco-construction. The objective is a realistic but determined evolution toward a sustainable city.

How? By favouring participatory methods: starting from people and their projects, allowing those who want to go further, then providing the means to allow everyone to follow suit. And also by establishing incentive policies intended to support the change. Finally, by adapting regulatory frameworks.

This book offers an overview of the measures taken in recent years on the scale of the building, the neighbourhood and the city. It is also an opportunity to recall the challenges of tomorrow.

Brussels, a sustainable European capital? This is the commitment that the Region made in 2009 in signing the Covenant of Mayors for the Climate.