STRATEGY TO REDUCE THE ENVIRONMENTAL IMPACT OF EXISTING BUILDINGS IN THE BRUSSELS CAPITAL REGION BY 2030-2050

Introduction: The building sector from the perspective of international requirements and the Region's environmental ambitions

Considerable potential to reduce greenhouse gas emissions …

The following figures give a sense of this potential ([1]):

- *56%: the percentage of greenhouse gases directly emitted by the building sector in 2015;*
- *573,276: the number of housing units in Brussels (2015);*
- *39,607: the number of social housing units in Brussels (2015);*
- *34% and 26%: the respective percentages of houses and apartments in the least energy-efficient class (G);*
- *40%: the proportion of housing built before 1945;*
- *30%: the percentage of buildings without insulation.*

… and European objectives designed to tackle climate change

80-95% by 2050: this is the long-term reduction objective set by the European Union, compared to 1990 levels.

40%: this is the European reduction objective for 2030.

31%: the European Effort Sharing Regulation (excluding the ETS sector) has set this reduction effort for Belgium ([2]).

To guarantee this reduction, the new European governance rules require 'energy and climate' plans to be developed. In this context, each country must submit a strategy for the renovation of its building stock.

Further to the choices already made by the Region through its action plan for a circular economy, this strategy deliberately extends its scope beyond energy and direct greenhouse gas emissions to embrace all aspects of sustainability so that it is in line with the broad nature of the climate challenge. This comprehensive approach is emphasised throughout the strategy, which is why this document is termed the 'Strategy to reduce the environmental impact of existing buildings in the Brussels Capital Region'.

What is a sustainable building?

It is a building that has a very high energy efficiency performance and that also takes account of all environmental dimensions in the wider sense: site and project management; mobility; water; development of nature; physical and human environment; materials; well-being, comfort (including acoustic) and health.

https://www.guidebatimentdurable.brussels

[1] See the annex on residential buildings and the sources cited therein.
[2] This corresponds to a 35% reduction compared to 2005 levels, which is the reference year for burden sharing.

A new and necessarily ambitious strategy

For nearly 15 years, the Brussels Capital Region has been implementing calls for projects, measures and rules in the building sector in order to reduce the latter's impact: the energy challenge, PLAGE [Local action plan for energy management] calls for projects, 'exemplary buildings' calls for projects, energy incentives, the Brussels Air, Climate and Energy Management Code [Code bruxellois de l'air, du climat et de la maîtrise de l'énergie] and, two years ago, the Air, Climate and Energy Plan, with its longest chapter focusing on this sector.

So far the main ambitions have involved new construction and energy management within buildings, although renovation has not been ignored.

However, reducing the environmental impact of the Brussels building stock has not been the subject of a stand-alone strategy. In view of the objectives to be achieved, we must now apply the principle that, in the long term, there can no longer be any poor performing buildings in Brussels. It is irrelevant whether properties are owned or rented: put quite simply, occupying a real energy drain will no longer be tolerated. However, not all hope can be placed on the building envelope or systems: the behaviour within the building is decisive and energy sobriety is a must.

In order to drastically reduce the environmental impact of buildings, three main angles of attack must be fully pursued: increasing the rate of renovation, improving the quality of renovations and making rational use of energy within buildings.

The entire arsenal of public policies must also be deployed: documentation, communication, regulation, support, encouragement, financial assistance, innovation, etc.

However, achieving these objectives will only be truly feasible if the following two elements exist: clear and firm requirements that can raise the performance of the entire stock to a high level, and an unprecedented mobilisation of public and private finances.

I. Establish clear requirements with set deadlines

Increase and realise ambitions

The residential and service sectors are currently subject to a number of obligations designed to improve their performance: issuing an EPB certificate during a property transaction, requirements to be met in the event of work, and requirements concerning technical installations. Certain segments of the service sector are also subject to other constraints: producing a local plan for energy management, carrying out an energy audit and obligation to display the EPB certificate. An overview of these obligations and their scope can be found in the following table.

Current obligations	Residential sector	Service sector
EPB certificate	Provide the EPB certificate if a housing unit or office space in excess of 500 m² is sold or rented	
		Public authorities: display the 'public building' certificate (actual consumption) every year
EPB work - renovations	Major renovations treated as new-build: limit the energy need for heating and the primary energy consumption, insulate walls, limit thermal bridges and the risk of overheating, install meters for technical installations Renovation of part of the building envelope: insulate the walls in question and ventilate	
Technical installations	Periodic inspection and acceptance of new heating installations by approved professionals	
		Requirements concerning sizing, insulation, metering, partitioning, etc., and obligations to service and inspect air-conditioning installations
Environmental permit audit		Major consumers according to the environmental permit regulations: conduct an energy audit and implement the recommendations with a payback time of less than five years.
PLAGE		Owners or occupiers of large property complexes (100,000 m²): produce an action plan to reduce consumption by 10%

Table 1: Main energy obligations imposed on the residential and service sectors

By 2050 all Brussels buildings must be energy efficient.

Fiche No 1 on energy performance requirements and obligations for buildings sets out the regulatory framework for ensuring that the building stock meets this objective.

The importance and complexity of the residential sector in the Brussels Region

92% of buildings in Brussels are residential buildings.

55% of housing units in the Brussels Capital Region are apartments.

60% of housing units are occupied by tenants.

Binding targets for the residential sector

The general objective for the residential sector is ambitious, realistic and rational in terms of both cost and sustainability: an average of 100 kWh/m²/year by 2050, as recommended by the Interfederal Energy Pact [Pacte énergétique interfédéral] for the residential sector, seems to be a fair and achievable target. The 'cost-optimal' study of residential buildings, which assesses the economic impact of various energy objectives, also confirms the relevance of this objective ([3]).

There are sound arguments for not having a tougher objective: (1) the current state of buildings and the impossibility, for a significant part of the stock, of achieving the performance of a passive building; (2) the amount of investment needed to achieve this type of performance, balanced against the often underestimated impact of the behaviour within the building; (3) the material reality and environmental impact of this investment and any sophisticated technological solutions, which must also be balanced against the importance of changes in behaviour in terms of how buildings are occupied.

The introduction made it clear that the general objective can be achieved only if a minimum level of performance is required for all buildings. The residential sector will be driven towards the appropriate level of performance by imposing obligations at regular intervals to carry out energy-saving work in order to achieve the level required for the type of building concerned by 2050.

Five deadlines have been set, although, quite clearly, buildings that achieve their objective before the final deadline will be exempt from carrying out work by the interim deadlines. This system requires an EPB certificate to be issued for every building, whether or not it is the subject of a transaction. This system also requires certificates of impeccable quality; the work currently being carried out on the approval of certifiers aims to achieve this objective.

The EPB certificate will be tailored to show all the recommendations needed so that all potential energy savings within the building can be made. Furthermore, if, despite all the recommendations made in the EPB certificate, the objective set for the type of building cannot be achieved, the objective of implementing all the recommendations will be set for the building (see Fiche No 14 on the roadmap).

While initially focusing on energy, the EPB certificate will include sustainability criteria in the medium term, and its recommendations will also be adapted in line with the gradual phasing out of fossil fuels to heat buildings; this is an objective fully covered by Fiche No 10 on renewable heat.

[3] The key messages of the study are set out in the annex to this document.

Jointly owned buildings will be subject to a two-part obligation: one covering the building, for which the joint owners will be responsible, and the other covering the private parts, for which their individual owners will be responsible.

Rules to be met by category in the service sector

The Interfederal Energy Pact has set the bar very high: by 2050 the service sector must aim to achieve an energy-neutral building stock in terms of heating, production of domestic hot water, cooling and lighting.

However, from small shops situated on the ground floor of houses to office blocks, and from sports facilities to hospitals, the service sector covers some very different situations and must therefore be approached using an appropriate sectoral breakdown.

Given the chosen segmentation, the following are therefore envisaged: imposing a system of obligations similar to the residential sector; extending the scope or reinforcing the objective of the local action plan for energy management imposed on large property complexes if they are considered relevant following evaluation of the measure; extending the payback time on investments required as a result of the energy audit recommendations imposed on major energy consumers as part of their environmental permit.

Reducing the overall environmental impact of the building stock

In accordance with the strategy's general environmental approach, renovations cannot be limited to improving the energy performance of buildings: they must form part of a framework allowing all the environmental impacts of the building sector to be reduced. The energy performance requirements must therefore be mirrored by sustainability requirements, with methods and deadlines to be determined as resources are developed. This is the subject of Fiche No 2.

Key role of public authorities in speeding up renovation work

As shown in Fiche No 3, public authorities can play an important role by setting an example: the Brussels Air, Climate and Energy Management Code requires them to drive the property market towards excellent environmental and energy performance, by meeting a minimum performance level in the property purchases and rentals of regional authorities or by taking account of the occupation cost in the choices made by local authorities during property transactions.

The case for all public authorities to be subject to energy performance and sustainability requirements by 2040 will be examined. Sustainability clauses may be proposed in this respect, which authorities can insert in their specifications for design or work contracts. Certain specific measures are already planned to support regional and local public authorities in this effort: the NRClick and SolarClick programmes, which are covered in more detail in the 'support' chapter, are intended to ensure that a significant proportion of the public building stock has lower energy consumption and uses local energy production where possible.

Public housing, which will be covered by the system of obligations referred to above, will also be required to achieve excellent energy performance during major renovation work; the management contract of the SLRB [Brussels Capital Region housing association] will be revised along these lines.

Whether in the residential sector or in the service sector, the acceptability of such rules and requirements depends on the establishment of specific and reliable funding and support measures at all the decision-making stages of a renovation project, and on simplifying the applicable regulatory and administrative framework. This is the subject of the following chapters.

Fuel poverty in figures

In 2015, approximately 15% of Belgian households had to spend too much of their income on energy (measured fuel poverty).

A further 4% of households restricted their consumption (hidden fuel poverty).

It is no surprise that those on the lowest incomes, tenants, single households, in particular single women and women over the age of 65, and single-parent families are those most affected.

(Source: Baromètre de la précarité énergétique 2017 [Energy Poverty Barometer], Fondation Roi Baudouin)

A transition accessible to vulnerable households

Fuel poverty affects all three regions of the country. In Brussels, measured fuel poverty was 13.4% in 2015.

Improving the energy and environmental performance of the building stock may arouse fears of significant rent increases. One of the key measures for guaranteeing access to decent housing for all is to control these potential increases. As explained in Fiche No 4, this risk and the ways of overcoming it will therefore be carefully examined.

A recent report by the Fondation Roi Baudouin analysed the social housing situation and concluded as follows with regard to the Brussels Region: 44% of social housing units must be regarded as high energy consumers ([4]). Under its management contract, the SLRB must therefore apply the 'treated as new-build' renovation performance level to every major renovation of social housing.

The housing stock managed by social housing agencies will in any event be driven towards a high performance level in line with the system of obligations introduced for the residential sector.

The acceptability of the performance requirements imposed by this strategy naturally depends on the establishment of funding and support measures that have, at their very core, the specific financial assistance that must be provided to vulnerable households.

[4] Agnès Mathieu; Isis Consult (2017) *Coûts et avantages sociétaux de la lutte contre la précarité énergétique au sein du parc de logements sociaux (étude réalisée à la demande de la Plateforme de lutte contre la précarité énergétique)*.

II. Fund the transition of existing buildings to sustainability

Huge investment will be required to achieve this transition. The state of the building stock, as mentioned above, and the cost of extensive work mean that tens of billions of euro will be needed to achieve a stock of sustainable buildings.

Many households quite simply do not have the funds needed to carry out such work and, more generally, a renovation strategy cannot have the effect of impoverishing the Brussels population. The financial assistance must therefore be in line with the ambitions pursued by this strategy.

Clearly, there are already financial assistance mechanisms designed to encourage energy-saving work to be carried out: the Prêt Vert Bruxellois and energy incentives are prime examples of these. However, these mechanisms must be adapted to the new ambitions. As the Prêt Vert Bruxellois currently has a relatively low take-up rate, its attractiveness and accessibility will be reinforced: in the short term, this will involve opening up the mechanism to everyone and allowing the loan to be extended to investments ancillary to energy-saving work; in the medium term, other more significant adaptations are envisaged, such as extending the term of the loan and including incentives in the calculation of the amount to be repaid (Fiche No 8).

Low-interest funding

The Prêt Vert Bruxellois [Brussels Green Loan] is a low-interest loan (0-2%) offered to Brussels residents whose annual net taxable income does not exceed certain thresholds in order to pre-finance energy renovation work on housing.

The Prêt Vert Bruxellois is currently available in two forms: firstly, a personal loan offered by Crédal and, secondly, a mortgage provided by the Fonds du Logement.

The energy incentive system will be revised in the light of the system of obligations that is being introduced. It will also be extended to support the production of heat and electricity through renewable sources. In the longer term, all the incentives for (local and regional) buildings will be examined to ensure that they are complementary and consistent, and that they correspond with the requirements imposed in terms of other aspects of sustainability (Fiche No 7 'Revise the energy incentive mechanism').

In the short term, work will continue to be funded in the main through an incentive mechanism, which should give way, at least in part, to other mechanisms in the longer term.

It would be unrealistic to imagine that the public budget alone could support this financial effort. All funding levers must therefore be used: mobilisation of community savings, attractive banking products, tax incentives, third-party investments, participatory funding, activation of European funds, etc. These levers are mentioned in Fiche No 5 on innovative funding mechanisms, Fiche No 6 on taxation and Fiche No 9 on European funding.

Mobilisation of community savings: a vital resource in funding renovation

This idea has already been highlighted by the Regional Air, Climate and Energy Plan, as a considerable amount of money is sitting in bank accounts earning little interest. According to the latest available data, this resource stands at EUR 260 billion in Belgium.

These savings can be used in a variety of ways for renovation projects: issue of green bonds, coupled with public intervention to limit the risks; establishment of community cooperatives with regional participation and participatory funding, where necessary. All these options will be explored in the near future.

Taxation: a very powerful lever

As a highly effective incentive for encouraging virtuous decisions, the option of tax deductions must be analysed without delay. This can take a number of very different forms.

As highlighted by the Air, Climate and Energy Plan, adjusting property taxation is an interesting idea. The Finance Ministry Circular of 22 February 2010 quite rightly suspended the increase in cadastral income following energy-saving work. A further step could be to release part of the sum used to pay property tax for carrying out renovation work. Likewise, reducing registration fees in the event of energy renovations would no doubt form a valuable incentive.

In addition to property taxation, other options could be fruitfully explored, such as reducing death duties provided that energy renovations are begun.

Establishment of funding mechanisms based on energy performance

In association with a community cooperative and in order to support public authorities or, more generally, help any entity starting a renovation project, third-party investments or energy performance contracts may prove interesting. Such mechanisms have not so far revealed their full potential. The conditions assisting their roll-out must be examined without delay, such as the clustering of projects or the establishment of contacts able to provide appropriate legal, accounting and tax advice. The objective pursued through such facilitation measures is to drive the market towards taking responsibility for work with a longer return on investment.

Involvement of the banking sector in urban renovation

The banking sector must become a fully-fledged partner in urban renovation. It is in a position to offer vital solutions to the funding needs of households, in particular through low-interest loans, which would usefully complement the Prêt Vert Bruxellois.

Use of regional or European funds

Currently underutilised in the Brussels sustainable renovation sector, European programmes offer numerous funding opportunities to support projects to decarbonise the building stock. It is time to use the necessary resources in terms of skills and time to fully exploit these significant honey pots.

Horizon 2020

EUR 79 billion: this is the amount allocated by the European Union to the EU Research and Innovation Programme for 2014-2020.

III. Support before, during and after the renovation process

Support is the key to a successful transition to sustainable buildings.

Individuals and developers, designers and contractors, joint owners and municipalities, everyone has a part to play, and everyone must be able to receive personalised assistance, at all stages of a renovation process, for each of its aspects: technical, administrative and financial.

Developed by the Region over a number of years – as shown by the following table – this multidimensional support will be considerably reinforced at all levels.

	What support?	**For whom?**
HOMEGRADE	This is a support structure for individuals, which provides information on acoustics, energy, housing and renovation. One of its key objectives is to encourage Brussels households to reduce their energy consumption, in terms of both their homes and their behaviour, through the following actions: • a permanent offer of information and advice to individuals on rational use of energy, bio-construction (environmentally friendly materials, green roofs, etc.), renewable energy, regulations and work to improve energy and environmental performance; • technical, administrative and financial support for households, which particularly covers the following aspects: - behaviour and management of installations (heating, domestic hot water, standby consumption, ventilation, etc.); - through a simplified diagnosis (quick scan), identification of renovation work that is easy to carry out (roof, windows, heating, ventilation); - small jobs (installation of thermostatic valves, insulation of pipes, etc.) that can be carried out and checked, where necessary, with information on their impact on consumption; - production of a technical and economic report assessing the cost-effectiveness of the work envisaged, as well as help with accessing funding through the various credit and financial advice mechanisms, in particular the Prêt Vert Bruxellois for which the non-profit association is the front office; - help with defining specifications and finding a contractor; - information on gas and electricity bills.	Individuals
RÉSEAU HABITAT [HOUSING NETWORK]	This is a network of nine Brussels associations subsidised by the Region, which are active in urban renovation and support aimed at engaging inhabitants in the work to revitalise their districts. The aim of this network is to encourage renovation through actions such as the following: - distribution of information on the various rules applicable to housing in the Brussels Capital Region (Brussels Housing Code [Code Bruxellois du Logement], RRU [Regional Planning Regulations], EPB, etc.) and on municipal and regional aid (incentives, green loan, taxation) and the estimation of their amounts; - technical and administrative advice, and raising awareness of the rational use of energy;	Individuals

	- diagnosis of priority work; - analysis of quotations and technical documents; - training of target audiences in renovation techniques. These services are provided through hotlines, home visits, community events and other awareness-raising events.	
ANIMATIONS ÉNERGIE [ENERGY INFORMATION EVENTS]	These are **information events that raise awareness about energy-saving actions** not requiring any major investment or loss of comfort, with particular focus on those who are vulnerable.	Individuals
NRCLICK/ SOLARCLICK	These two regional support programmes (technical and financial support) involve reducing energy consumption within buildings (NRClick) and producing energy from photovoltaic panels (SolarClick).	Regional and local public authorities
LOCAL EPB AGENTS	These are agents appointed to ensure compliance with the EPB procedure in simple renovation work carried out under a subsidy granted by the Region.	Municipalities
FACILITATORS	These are free advice services provided by experts in energy and bio-construction, recognised for their expertise gained in numerous projects both in Brussels and abroad. These Facilitators have the task of helping developers and building managers with the management of energy consumption, rational use of energy and promotion of renewable energy, at any stage of a project. To ensure full coverage of the issues of energy and bio-construction, in both renovation and new construction, the unique service of the **Facilitateur Bâtiment Durable** ([5]) [Sustainable Building Facilitator] has been set up.	Developers, designers, building managers
EPB HELPDESKS	These offer technical support to those involved in EPB (certifiers, heating professionals and EPB advisers).	EPB professionals
PACK ÉNERGIE [ENERGY PACK]	This is **coaching** designed to support the use of specific energy measures when developing or renovating buildings in the business and non-market sectors. It is currently being provided by the BRUXEO, UCM, Santhea and Comeos organisations to their target audiences.	SMEs, businesses, non-market organisations
LABEL ENTREPRISE ÉCODYNAMIQUE [ECODYNAMIC ENTERPRISE LABEL]	This is **free official recognition** granted by the Region to public and private organisations that implement environmental management.	Private, public and voluntary sectors

[5] www.bruxellesenvironnement.be/Facilitateur

FORMATIONS « BÂTIMENT » et « ÉNERGIE » ['BUILDING' AND 'ENERGY' TRAINING]	This firstly involves **statutory training** that teaches professionals in the construction sector who are active on the Brussels market about the statutory requirements. This training is a mandatory prerequisite for the granting of approval to carry out certain trades (service sector certifier, approved boiler engineers, energy auditors involved with the environmental permit, etc.) ([6]). Secondly, this involves **voluntary training** in the concepts and techniques of high performing buildings, for which the energy and environmental requirements go beyond what is required by the regulations. For most professionals, this voluntary training can be accessed without any specialist knowledge in the subject concerned, so that as wide a range of professionals as possible can be reached. In addition to the training, **seminars** are organised to provide information on the subjects of sustainable building and to allow the networking of professionals.	Developers and designers
GUIDE BÂTIMENT DURABLE [SUSTAINABLE BUILDING GUIDE]	This is a **dynamic technical reference framework** ([7]) on sustainable building, which is intended to support the design and construction of buildings with high energy efficiency and environmental performance, while also taking account of the quality of life of occupants and economic feasibility.	Developers and designers
PARTNERSHIPS WITH THE CONSTRUCTION SECTOR	These are partnerships developed with certain stakeholders in the construction sector in order to encourage the move towards circular economy and sustainable building practices (CCBC, Cluster Écobuild, CDR-Construction, EFP, CSTC, etc.) in various areas such as innovation, training, business support, etc.	Designers, contractors, jobseekers

Table 2: Main support measures implemented or supported by the Region

Segmentations and tools to be re-examined

Individuals, professionals: these generic terms cover a variety of situations.

From an apartment in a large jointly owned building to a detached house, and from the family wanting to grow to older people, there is a very wide range of situations. From the developer to the designer, and from the building manager to the contractor, needs vary considerably.

The needs of individuals and professionals are currently segmented. However, these target audiences and their needs should be analysed in more detail so that the decision-making processes involved in a major renovation project can be more accurately identified. Fiche No 12 covers this measure as it concerns studying the approaches and behaviour of Brussels individuals and professionals in order to further encourage renovation.

[6] www.bruxellesenvironnement.be/formations
[7] www.bruxellesenvironnement.be/guide_batiment_durable

Individuals, guided at every stage

1. A single contact

Which work for which performance? In what order should this work be tackled? Which financial aid for which work? Which administrative procedures are necessary for a major renovation? How can the quality of work be ensured?

There are so many questions when deciding to embark on a renovation project. Everyone must be able to find answers in the support offer, which is covered by Fiche No 13.

The renovation process needs to be as simple as possible, with a single contact to meet the many needs. As with other models that have already been developed around Europe, providing constantly evolving support will involve setting up a one-stop-shop covering all aspects of the process. This one-stop-shop must be easily accessible: one per municipality seems to be the best solution.

It will be divided into two main sections: a completely free information service offering information on financial aid, current regulations and technical aspects, and a paid support service offering assistance at any stage, from diagnosis to acceptance of the work. Emphasis will be placed on a deliberately dynamic approach: a 'marketing' service will be specifically created to raise awareness of the one-stop-shop and its services.

The technical aspects of a renovation are particularly difficult to grasp. If personalised support is not provided, an individual may soon feel overwhelmed by the multitude of choices to be made. The 'roadmap' tool referred to below will provide the necessary information and clarification.

2. A roadmap to achieve the performance target

This tool does not lack ambition as it aims to provide information on the extent of the work needed to achieve the target and increased property value at the end of the work, ensure the energy consistency of the renovation process while meeting the needs expressed by the owner, and avoid unhelpful blockages in the event of a phased renovation. Fiche No 14 describes this tool in detail.

The roadmap will consist of a personalised renovation plan supplementing the EPB certificate. It will be required for any renovation needing planning permission, and will be recommended by the one-stop-shop in other cases. Depending on the scenario, the renovation plan will therefore be produced by the client's architect or by the architect provided by the one-stop-shop. Whether a total renovation or a sequential approach is involved, the plan will be based on a full diagnosis of the building in energy, urban and, more broadly, environmental terms (such as acoustics) and will take account of the owner's needs and wishes.

3. Information provided at the right time

The measures established to incentivise and support renovation are not yet sufficiently well-known among the general public, and the energy performance of a property remains a characteristic that is often overlooked: notaries, architects and estate agents have a role to play in distributing useful information on the various incentives and support available and in raising public awareness of this subject. This strategy will also use these stakeholders, as explained in Fiche No 15.

Community initiatives: a collective approach to sustainability issues

With examples such as local currencies, collective composting, car sharing and grouped housing, community initiatives for a more sustainable society are on the increase. They have huge potential to reduce the environmental footprint of the Brussels building stock, and are the subject of a specific fiche (Fiche No 16): community events designed to raise awareness of the rational use of a building, grouped purchasing of sustainable materials and renovation work carried out at district level must be promoted and supported through financial aid and specific support from the one-stop-shop referred to above. Particular attention will be paid to self-supply in multi-family buildings.

Rational use of buildings: a subject in itself

As an absolutely vital aspect that is complementary to renovation, the behaviour within a building must be treated as an entirely separate issue. To a large extent, it determines whether regional objectives in terms of reducing greenhouse gas emissions will be achieved.

The result displayed by the energy performance certificate is theoretical and based on standardised behaviour. A significant disparity therefore sometimes exists between this theoretical performance and the actual consumption within the building: a rebound effect and poor adoption of technologies need to be combated, which is the subject of Fiche No 17.

In broad terms, the general public needs to be made more aware of their energy consumption within a building. As has happened with water, when they receive their energy bill, households will be shown a comparison between their consumption and the average consumption in the residential sector. Eventually, energy bills will be issued more frequently; they will be sent monthly, allowing Brussels residents to graphically monitor the development of their consumption.

Improving the performance of the Brussels building stock also raises the question of the adoption of technologies within buildings. Poor use of these technologies sometimes results in higher consumption than necessary within an energy-efficient building. It can also have a harmful impact on health (as in the case of a ventilation system not being maintained). Support for users of high performing buildings will therefore be reinforced through two measures: the financial assistance of associations that provide this support in public housing, and the establishment of a platform for exchanges between the various stakeholders, coordinated by Bruxelles Environnement [Brussels Environmental Authority].

Self-renovation: a reality that must not be neglected

In order to cut costs and retain full control of the work, some households take on the renovation of their housing themselves. What is the extent of this phenomenon? What training should be given to the professional supporting such households in this approach? How can quality work be guaranteed in such a situation? Fiche No 18 proposes to study these issues in more depth.

Indoor air quality: a health issue that must be highlighted more clearly

The general public is still not fully aware that indoor air is much more polluted than outdoor air. Construction products and materials (such as insulation) and inadequate ventilation are principally to blame. We spend the vast majority of our time in enclosed spaces, so this is a major problem. Increased awareness, availability of information and diagnosis tools, and regulation of product use in enclosed public spaces are some of the solutions set out in Fiche No 19.

Extensive and simplified support for various professional audiences

The support must cover all the various profiles and needs of professional audiences.

Some sectors already have specific support measures in place: construction professionals receive assistance from the CSTC [Scientific and Technical Construction Centre] and the CCBC [Brussels Capital Construction Confederation]; professionals approved under the regulations on the energy performance of buildings have access to a dedicated technical support service. Property managers and small and medium-sized enterprises also have access to specific support.

Indoor environments and their pollutants

Volatile organic compounds, formaldehyde, carbon monoxide, particles and nitrogen oxides are the most common indoor pollutants. They are associated with serious health risks (respiratory disease, allergies and cancers).

Other professionals can use the services of the Facilitateur Bâtiment Durable, which offers specific support and a range of useful information on the sustainable renovation of buildings.

1. *A one-stop-shop for professionals*

The aim of the measure, which is described in Fiche No 20, is simple: to make the Facilitateur Bâtiment Durable service into a one-stop-shop meeting the various needs of professionals. The services offered by the Facilitateur will therefore be extended to also include quick scans, assistance with drafting applications, assistance with setting up a renovation project, and so on.

Another new and important element is the 'marketing' task entrusted to this service: using instruments such as solar mapping and EPB certificates, this service will be permitted to contact professionals in order to encourage them to undertake the renovation of their property.

2. *Small and medium-sized enterprises and the non-market sector must not be neglected*

Energy bills are a source of concern for many self-employed workers, associations, and small and medium-sized enterprises. As a result, the Region is already assisting this sector through a specific support measure: free and personalised coaching known as the Pack Énergie. Access is also available to the general support schemes for developers: the general sustainability advice service (Facilitateur Bâtiment Durable) and the environmental management label (Label Entreprise Écodynamique).

Assessing, integrating and extending measures: this is the objective of Fiche No 21 on support for businesses, SMEs and shops.

easyCOPRO

easyCOPRO is a project intended to encourage the energy renovation of jointly owned buildings by providing tools such as model energy performance contracts and specifications. It involves several Brussels stakeholders, such as the cooperative Energiris, the energy company easyCogen, the consultancy Ph. Deplasse & associés, the property manager Managimm and Bruxelles Environnement.

The Pack Énergie will be assessed and adapted so that it becomes a genuine lever for renovation, through 'renovation' advisers rather than energy advisers, and so that it is consistent with the Facilitateur Bâtiment Durable service. The advisers appointed following Pack Énergie calls for projects will be integrated within the Facilitateur service so that each adviser uses the same tools and services.

The Label Entreprise Écodynamique will be extended to the energy renovation of buildings.

3. Jointly owned buildings: a challenge to be tackled without delay

With multiple occupiers in one building and a majority of accommodation occupied by tenants, jointly owned buildings epitomise the main obstacles to a renovation scheme. The complexity of the decision-making process and the short-term mandate of property managers also discourage the undertaking of major renovations. Jointly owned buildings merit special attention, which is why they have their own fiche (Fiche No 22).

Jointly owned buildings will benefit from a dedicated support service: the Facilitateur Copropriété [Jointly Owned Building Facilitator] will guide joint owners through the various administrative, financial and technical procedures. Specific tools will be developed, based around a unique web interface.

Municipalities will need support in their transition measures

In terms of reducing the environmental footprint, much is expected of local authorities. Due to their closeness to the population, they represent a very important level for action. Many of them are already part of the Agenda 21 approach. However, municipalities have few tools to meet these expectations: introducing energy accounting in their area and an action plan aimed at reducing energy consumption, particularly in the building sector, requires specific resources and skills.

Without doubt, SolarClick and NRClick, which are covered by Fiche No 3 on the exemplary role of public authorities, are already excellent regional initiatives allowing municipalities to benefit from the energy produced by photovoltaic panels and energy-saving work. In this respect, special attention must be paid to school buildings, which in some cases are in a worrying condition: the assessment of the NRClick programme will form an opportunity to review the support for local schools in terms of improving their buildings, in collaboration with the proposed Facilitateur École [School Facilitator] service.

Work must also be carried out on empowering municipalities in this area: establishing a network of local officials working in the area of energy and the environment, managed by Bruxelles Environnement, will allow them to exchange advice and best practice, and jointly develop solutions to common problems. Fiche No 23 on support for municipalities details this measure.

Learning about sustainability for every stakeholder in a renovation process

Technologies and requirements are constantly developing towards more sustainability; the very concept of buildings is in flux. As they move from fixed to modular in the near future, they must include the sustainability constraint in each of their components. Designers and contractors will no longer have the same work as before.

Continuing training must include technological developments in sustainable construction, which should also be an integral part of curricula for all construction trades. Collaboration with the French Community and the Flemish Community will be established in this respect (Fiche No 23).

Specific communication on the various measures taken by the Region

Meeting the requirements imposed by the Region in terms of the performance of Brussels buildings and using the various tools and support offered by the Region to its citizens to meet those requirements will not be possible without a communication campaign setting out the context, recalling the objectives and establishing the link between the various measures of the strategy: this is the subject of Fiche No 25.

IV. Simplify the lives of clients

A single record for residential buildings

Within Bruxelles Environnement alone, a large amount of data and information on residential buildings are collected: EPB certificates, certificates of inspection or acceptance of heating installations and energy incentives, and, beyond the issue of energy, soil certificates and environmental permits. There is also the data and information collected by other authorities, such as cadastral data and planning permissions. In the long term, these will be supplemented by the roadmap, data on materials and, potentially, data on the building's modularity.

This is vital information, albeit limited at the moment. Centralising such data via a single platform will significantly facilitate the renovation process, and, beyond that, contacts and procedures with the authorities concerned. This single platform is the 'passeport logement' [Housing Passport] (Fiche No 26). It will initially contain the data collected by Bruxelles Environnement, but, as this initial prototype is developed, the desirability and feasibility of its extension to data held by other authorities will be examined.

Urban legislation in line with the regional ambition for renovation

The Region has already put sustainability at the heart of its urban legislation: the Brussels Planning Code [Code bruxellois pour l'aménagement du territoire] refers to the sustainable development of the Region, the economical use of its resources and the improvement of the energy performance of its buildings.

Authorising or prohibiting certain work is not, however, in line with the regional desire to promote sustainable renovation. Ensuring that the rules applicable to the outside insulation of the front façade are flexible is, for example, one of the essential changes to be made to achieve the Region's overall performance objective. Removing certain work from the list of work subject to planning permission is an issue that must also be raised and assessed. As already recommended by the Air, Climate and Energy Plan, an interinstitutional working group will soon be set up to propose revisions to the urban regulations (Fiche No 27).

Long-awaited simplification of procedures

The multiple procedures and financial incentives and the administrative complexity of each mechanism are undoubtedly a major obstacle to renovation.

As already mentioned in the chapter entitled 'Fund the transition of existing buildings to sustainability', the complementary nature of the various financial incentives for renovation and the development of simplified interfaces will be examined (see in particular Fiche No 7 'Revise the energy incentive mechanism').

Incentives	Objective	Type of work		Authority concerned
Renovation	Improve the health, safety and basic comfort of housing.	Stability Roof Humidity Dry rot Ventilation Electricity Gas Acoustics	Insulation Cladding Heating Stairs Rainwater etc.	Bruxelles Urbanisme et Patrimoine
Energy	Improve the performance of the building and its equipment	Study/Audit Insulation/Ventilation Heat		Bruxelles Environnement
Façades	Improve the street façade	Rendering, cleaning, etc.		Bruxelles Urbanisme et Patrimoine
Heritage property	Restore unprotected heritage property	Various		Bruxelles Urbanisme et Patrimoine
Municipal	Encourage work within the municipal area	Various (e.g. rainwater tank)		Municipality

Table 3: Incentives for the renovation of buildings in the Brussels Capital Region

As mentioned in relation to the 'passeport logement', centralising information is one of the keys to administrative simplification. A platform will be set up, which will have all the documents required for a planning permission procedure. A single interface will inform citizens about all the procedures and formalities to be carried out in a renovation process and about the financial aid that they can access for this purpose.

V. Document, assess and innovate

Place regional action on a solid footing that is constantly assessed

Whenever a large-scale transformation process begins, there are many uncertainties and grey areas. The proposed strategy is based on our current knowledge, and we therefore need to examine and further study many issues and parameters: the actual state of Brussels buildings and the precise consumption of certain sub-segments; the development of technologies and their adoption by the various stakeholders; collective awareness of the need for society to consume fewer resources, and the needs of professionals and individuals in this transition.

Whether it is a question of implementing alternative funding mechanisms, promoting collective action through cooperatives or including other aspects of sustainability in the regulatory framework, it is these studies that will enable us to gauge the usefulness of certain solutions. The fiches therefore highlight the need to closely examine the various parameters that may influence the proposed models in the medium or long term.

By assessing the measures implemented through this strategy, we will be able to refine or alter the approaches as necessary. Indicators must therefore be carefully defined in relation to the resources, work, results, efficiency, effectiveness or impact of the measures. One of the fiches therefore concerns the need to document the Brussels building stock and the impact of the regional action on this stock (Fiche No 28).

Innovation to give an overview of sustainability

The process will be necessarily iterative, and innovative initiatives will ensure better performance with fewer impacts and increased comfort at a lower cost.

As indicated in Fiche No 29, an innovation laboratory (RenoLab) will be set up as a link between all stakeholders in the construction sector in order to share and encourage innovative practices. Over and above energy performance, innovation involves taking an overview of all the sustainability aspects of a building in order to consider its environmental impact. In this respect, the regional action is completely novel as it has, for some time already, been studying the reduction of this impact from all angles through the Guide Bâtiment Durable: energy, site and building management, mobility, materials, human and physical environment, water, comfort (acoustic in particular), well-being and health are all themes covered by the Guide. This must be continually updated with new practices and techniques (Fiche No 32).

Two specific issues have also seen particularly innovative developments: reducing the impact of construction materials, and the modular design of buildings.

Analysing the environmental impact of materials throughout their life cycle is the aim of TOTEM [Tool to Optimise the Total Environmental impact of Materials], which is covered by Fiche No 30.

With regard to the circular economy objectives in the area of construction, BAMB is a project that is aiming to radically change our view of buildings, by including the dimensions of ‘reversibility’ and reuse of materials. Fiche No 31 explains the next steps in this project.

Following a period of experimentation and encouragement, it will be considered whether making TOTEM and the sustainable building reference framework binding in major renovation work will be useful.

From demolition to dismantling and reuse

> ***A considerable amount of waste***
>
> Construction and demolition waste (CDW) apparently accounts for around 30% of all waste (in tonnes per year) generated by the Region.

According to the CSTC, statistics for Belgium reveal that around 5% of the building stock is in such a state that an acceptable level of performance cannot be achieved following renovation ([8]).

Given its impact, demolition must, however, remain an absolute exception. In the light of the regional circular economy objectives, demolition should be permitted only if it is intended as a source of materials, and not waste. The question of demolition, which is assessed by Fiche No 33 and which is closely linked to the circular economy, must therefore be dealt with in a way that maximises reuse of equipment and materials: any dismantling will therefore be subject to an inventory of reusable items and prior evidence of its need.

However, demolition also and in particular raises the question of the certification of materials for reuse: the feasibility of a binding certificate for each item that is potentially reusable must therefore be quickly studied. Reusing construction materials could drastically reduce construction waste (Fiche No 34).

[8] https://www.cstc.be/homepage/index.cfm?cat=publications&sub=bbri-contact&pag=Contact49&art=731

VI. Commit everyone to a more sustainable city

The objective of reducing greenhouse gas emissions by 80%, or the factor 4 as it is sometimes known, requires an unprecedented mobilisation of all stakeholders. The measures in this strategy therefore involve everyone: public authorities and organisations, citizens, businesses, associations, federations, research centres, schools, etc.

The following graph clearly shows the need for such a mobilisation.

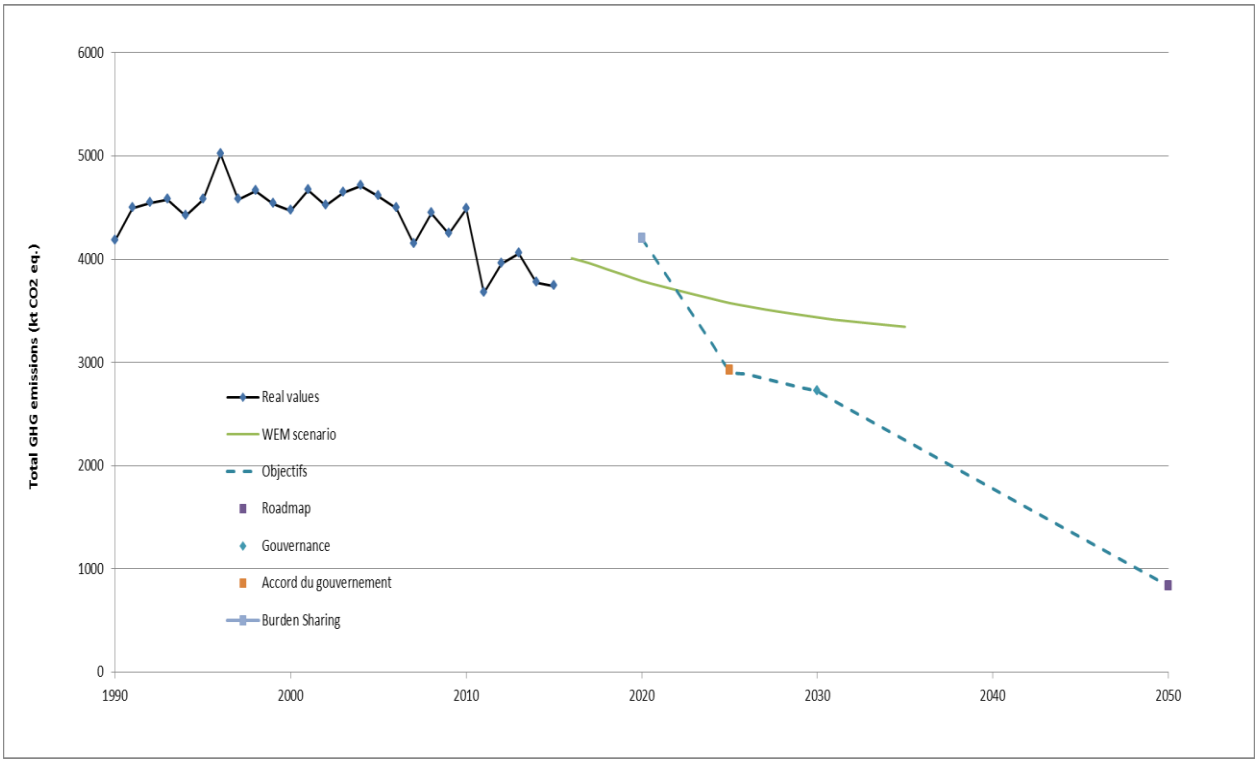

Figure 1: Path to achieving the 80% reduction objective by 2050
(WEM scenario: 'With Existing Measures' in a standard situation)

[Key to above graphic:]

Objectifs	Objectives
Gouvernance	Governance
Accord du gouvernement	Government agreement

The objective has been set and the priority sectors are known: the building sector is the largest emitter of greenhouse gases in Brussels. In addition to this effort, and without exporting our pollution elsewhere, the Region's environmental footprint needs to be considerably reduced. A building stock that consumes much less energy and produces more energy locally is one of the key steps to a resilient, more sustainable and also more desirable urban structure: improving the energy and environmental performance of buildings guarantees a genuine improvement in comfort within those buildings.

The Region must now determine the approaches that it intends to favour in order to encourage and support this transition so that it is fair and accepted, and achieves its objectives. This is why this strategy has been produced: use all possible sources of funding and set sufficient mandatory targets to ensure the credibility of its ambition; support, train and assist all stakeholders, simplify procedures for them and allow them to exchange best practices; provide information on all measures; constantly assess and innovate.

It is through all these measures that the transition to a sustainable building stock will be achieved and will genuinely ensure a better quality of life for everyone.

Annex: Residential buildings in Brussels

1. Current situation

The Brussels Capital Region is an urban region covering 162 km². Although the space available per inhabitant exceeds the average in other European capitals, it is much lower than in the other two regions of the country.

With 1,191,604 inhabitants on 1 January 2017, the Region has never been so densely populated, and its period of population growth that began in the 2000s is continuing.

The residential sector: a priority target

The building stock in Brussels mostly consists of residential buildings. In 2016, 92% of buildings were residential.

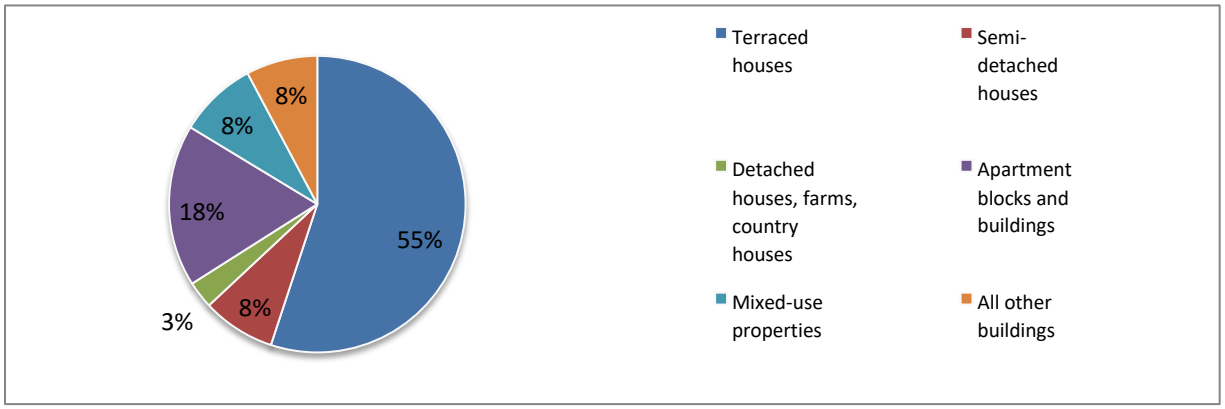

Figure 1: Composition of the building sector
Source: Economie – Statistics Belgium [Economy – Statistics Belgium] (dated 23/06/2017)

The final energy consumption of the residential sector in 2015 was 7,313 GWh, including all types of housing and all energy vectors. This sector is the largest energy consumer.

Residential	7,312.79
Service	6,966.14
Transport	4,142.16
Industry	708.33
Non-energy ([9])	250.85

Table 1: Final energy consumption by sector (GWh – 2015)

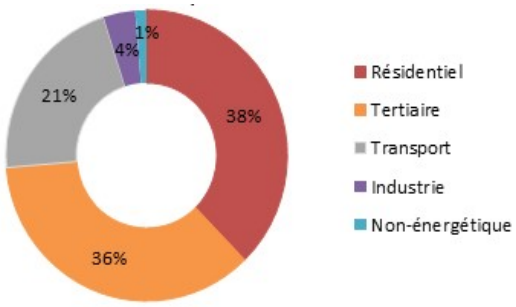

Figure 2: Final energy consumption by sector (GWh – 2015)

[9] The non-energy sector uses fuels (petroleum products and gas) as raw materials to manufacture non-energy products (plastics, fertilisers, bitumen, fats, solvents, etc.).

[Key to above graphic:]

Résidentiel	Residential
Tertiaire	Service
Transport	Transport
Industrie	Industry
Non-énergétique	Non-energy

A gradual reduction in the total final energy consumption of the residential sector in the Brussels Capital Region was observed between 2005 and 2015, amounting to -20%. This trend was mainly due to the reduced consumption of fossil fuels (petroleum products and, to a lesser extent, coal), as illustrated in Figure 3.

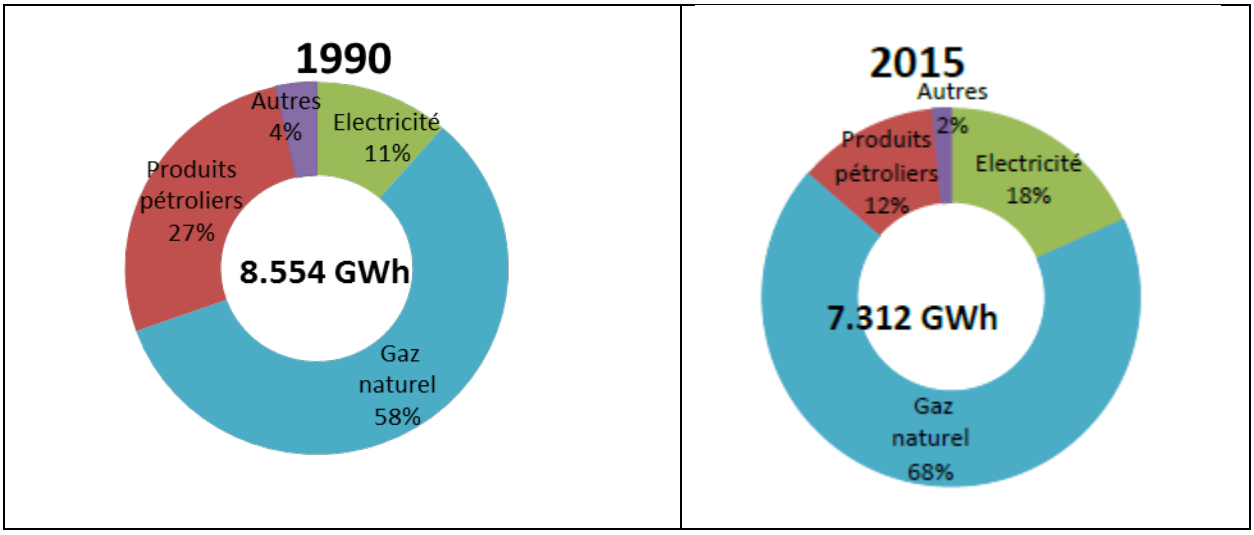

Figure 3: Comparison of the breakdown of the residential sector's final energy consumption by energy vector between 1990 and 2015
Source: Bilan énergétique [Energy Balance]

[Key to above graphic:]

Produits pétroliers	Petroleum products
Autres	Other
Electricité	Electricity
Gaz naturel	Natural gas

The breakdown of consumption by energy vector also shows an increase in the share of electricity in the total consumption (+6% since 1990).

Mainly houses

According to the Belgian Land Registry [Administration du Cadastre, de l'Enregistrement et des Domaines], there was a total of 573,276 housing units (occupied and unoccupied) in the Brussels Capital Region on 1 January 2017.

The residential stock mainly consists of terraced houses (60%), with apartment blocks accounting for 19% (according to the 2016 data).

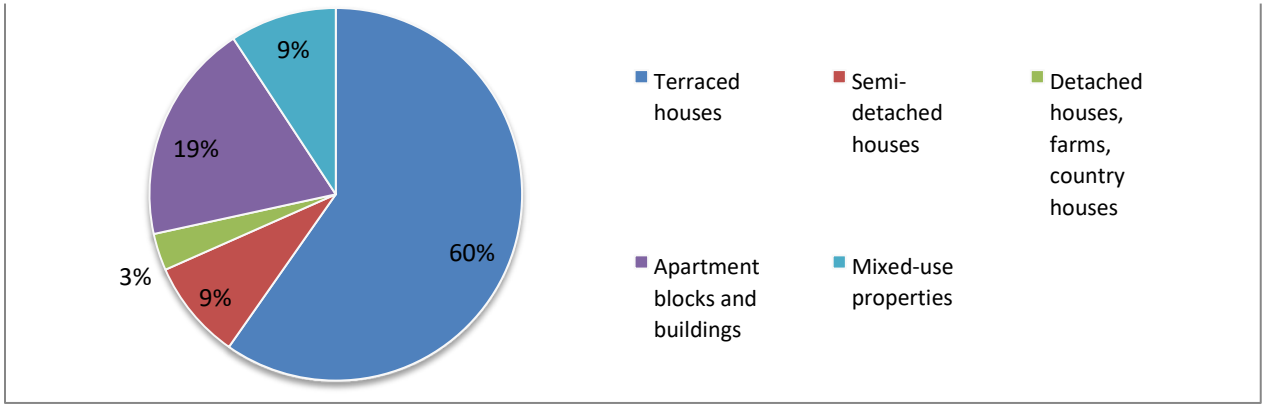

Figure 4: Residential building stock 2016 (Source: Economie – Statistics Belgium (dated 23/06/2017))

The majority of households in apartments

Just over half of Brussels households live in apartments, which are located in large or small apartment blocks.

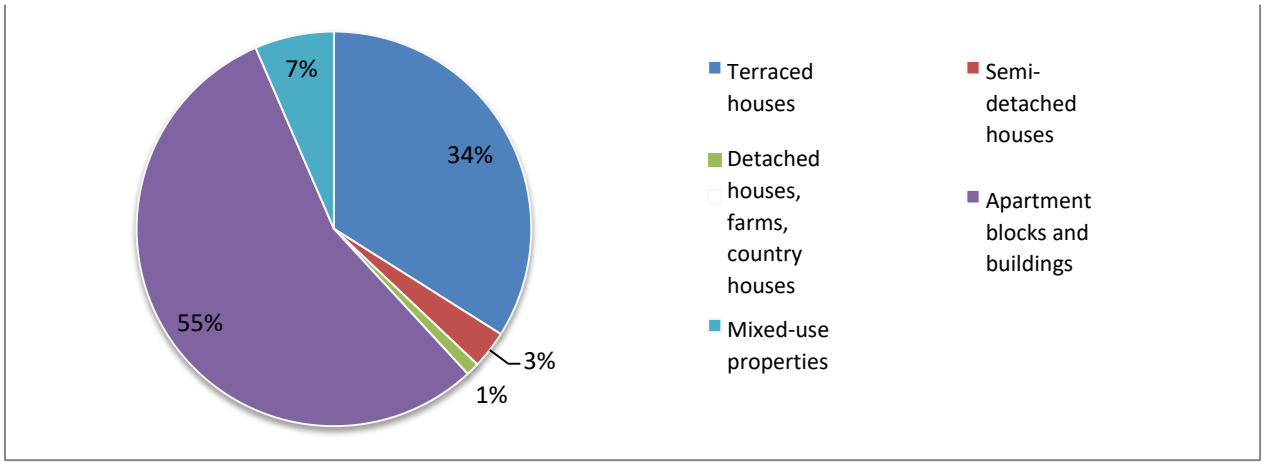

Figure 5: Households in the Brussels Capital Region in 2016 (Source: Economie – Statistics Belgium (dated 23/06/2017))

Old building stock

92% of residential buildings date from pre-1970.

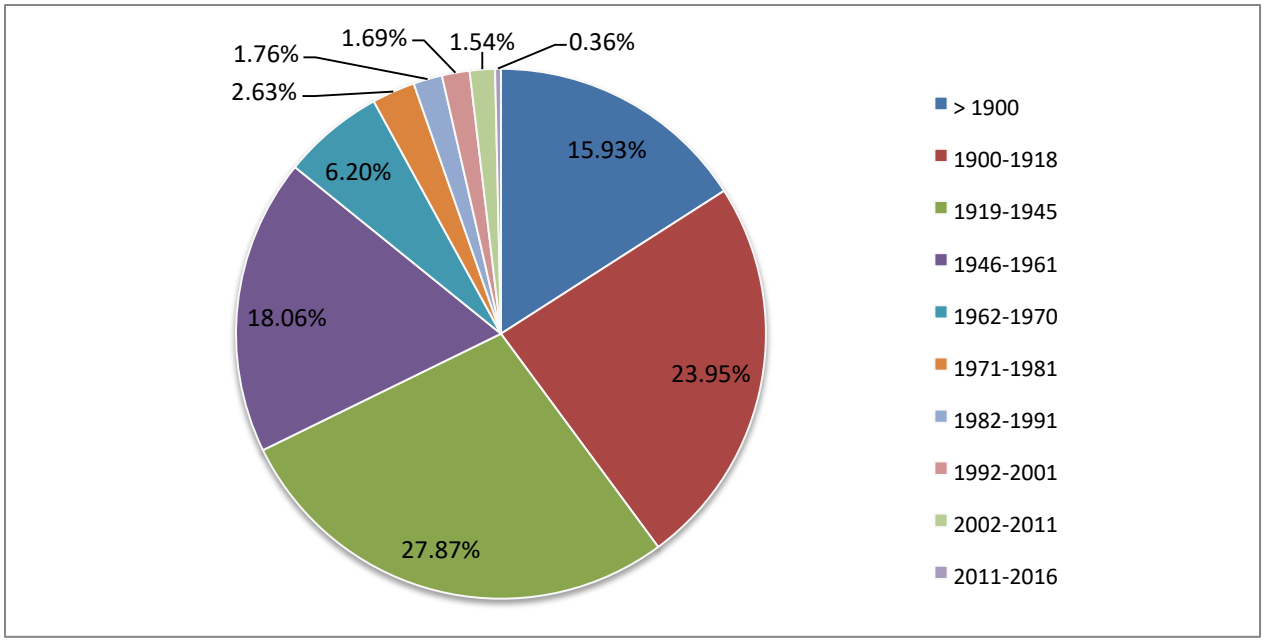

Figure 6: Breakdown of construction periods in the residential building stock
Source: Economie – Statistics Belgium (dated 23/06/2017)

A low natural renovation rate

A couple of comments must be made: (1) the figures for construction and renovation relate to planning permission that has been granted, but this does not necessarily result in work; (2) with regard to renovation, the figures cited do not include renovations carried out without planning permission. The lack of this important information prevents us having a full picture of the situation.

However, the known figures show that the current renovation rate is low; the renovation rate with planning permission is less than 1%.

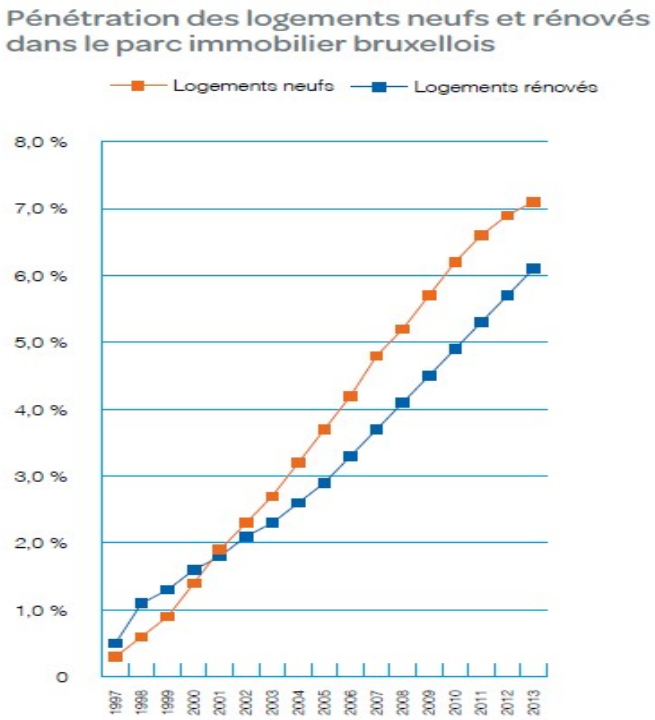

Figure 7: Extent of new and renovated housing in the Brussels building stock
Sources: Cross-referencing of housing/office and planning permission data – IBSA [Brussels Institute for Statistics and Analysis] data processed by BE [Bruxelles Environnement]

[Key to above graphic:]

Pénétration des logements neufs et rénovés dans le parc immobilier bruxellois	Extent of new and renovated housing in the Brussels building stock
Logements neufs	New housing
Logements rénovés	Renovated housing

Few owners

The share of owner-occupied housing has steadily increased in the Brussels Capital Region since 1961, but is still well behind the national average. The breakdown of tenants/owners in Brussels is 60%/40%.

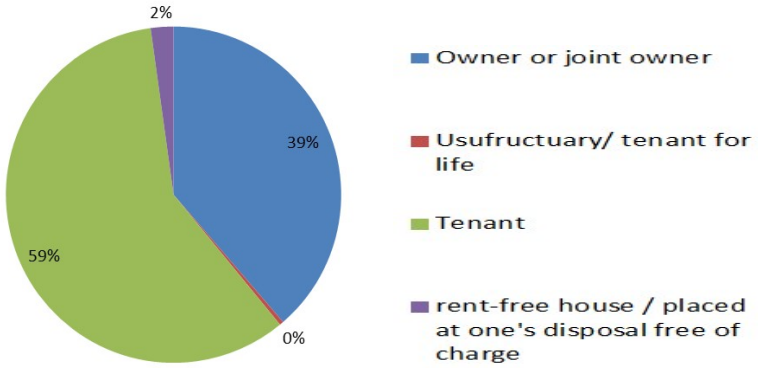

Figure 8: Share of owner-occupied housing – 2010
Source: ECS study on household consumption

According to the rental observatory ([10]), 94% of rental properties in Brussels are located in multi-dwelling buildings (apartments (90%) and student accommodation (4%)), with 6% in single-family houses.

Poorly insulated housing

The study on household consumption indicates the insulation rate for various parts of dwellings, as illustrated by the following figures:

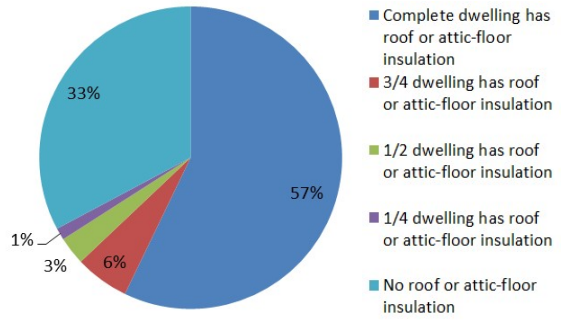

Figure 9: Share of housing with a roof insulation system in 2010
Source: ECS study on household consumption

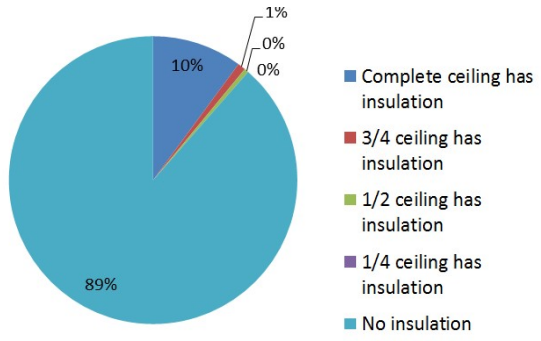

Figure 10: Share of housing with a ceiling insulation system in 2010
Source: ECS study on household consumption

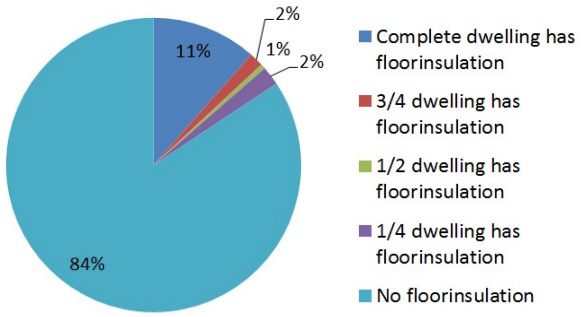

Figure 11: Share of housing with a floor insulation system in 2010
Source: ECS study on household consumption

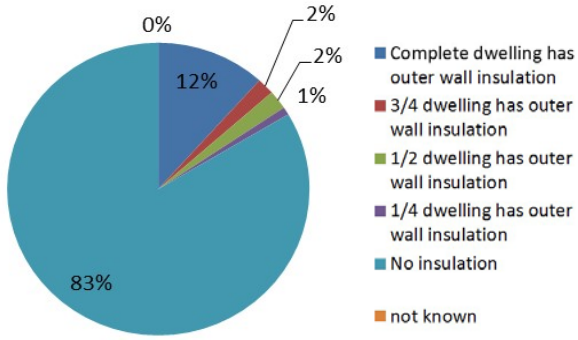

Figure 12: Share of housing with an outer wall insulation system in 2010
Source: ECS study on household consumption

These graphs show that the Brussels building stock is very poorly insulated. 30% of buildings have no insulation at all. The rest mainly have roof insulation, but ceiling/floor and outer wall insulation is very limited (83% not insulated).

Gas is a significant heat source

Figure 13 shows the final energy consumption of Brussels housing broken down by use; the energy vectors are grouped into fuels and electricity. The various domestic uses are primary heating, specific electricity

[10] http://ibsa.brussels/fichiers/publications/dossiers-du-barometre/DB21_observatoire_des_loyers.pdf

(i.e. electricity for household appliances, IT, etc.), cooking of food, production of domestic hot water and space heating.

The consumption of fuels (and heat) is much higher (5,974 GWh, 82% of the total) than the consumption of electricity (1,340 GWh, 18%). Looking at the uses, the most significant by far is heating of buildings using fossil fuels (gas, heating oil) and heat. The electricity generated is mainly consumed by 'specific electricity' (powering of household appliances, IT, lighting, etc.). As regards the cooking of food, gas is used slightly more than electricity.

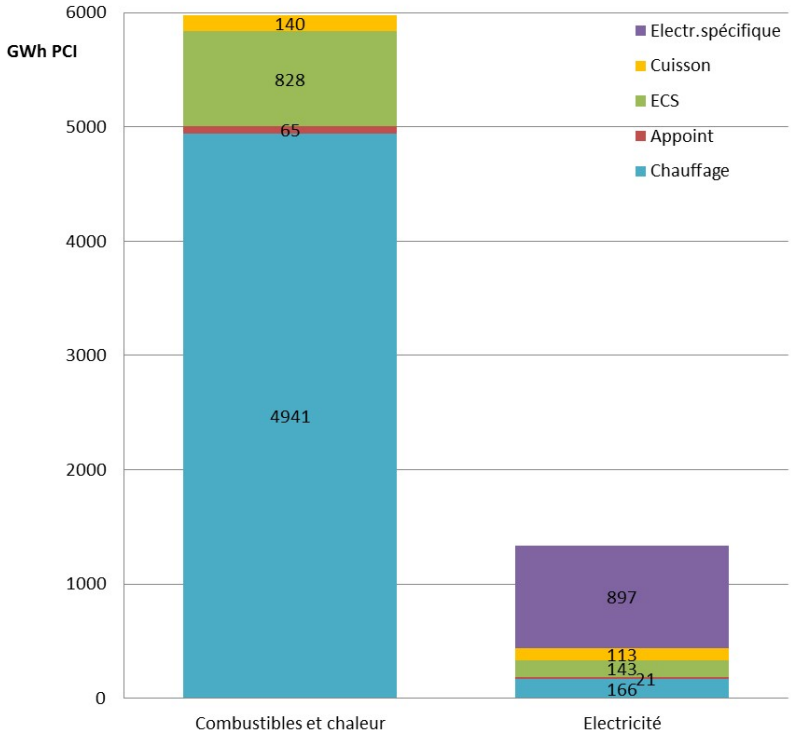

Figure 13: Final energy consumption of the residential sector in the Brussels Capital Region by energy vector and by use in 2015
Source: Bilan énergétique

[Key to above graphic:]

GWh PCI	GWh NCV
Electr. spécifique	Specific electricity
Cuisson	Cooking
ECS	DHW
Appoint	Space heating
Chauffage	Heating
Combustibles et chaleur	Fuels and heat
Electricité	Electricity

The following figure shows an increase in the penetration of natural gas and electricity.

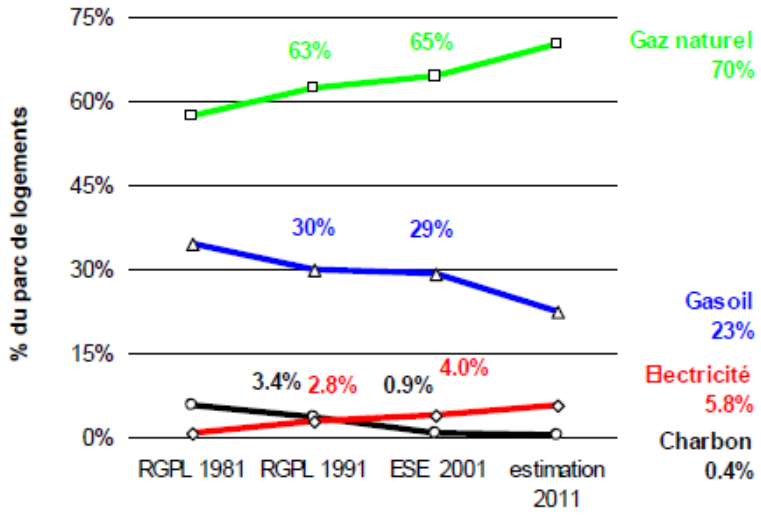

Figure 14: Change in the breakdown of occupied housing stock by type of energy vector used for the main heating Sources: DGSIE [Directorate-General for Statistics and Economic Information] – Recensements généraux de la population et du logement (RGPL) [General population and housing censuses], Enquête socio-économique (ESE 2001) [Socioeconomic survey], ICEDD [Institute for Sustainable Development Advice and Studies] (2011 estimate), Observatoire de l'Habitat de la Région de Bruxelles-Capitale [Housing Observatory for the Brussels Capital Region] – Observatoire des loyers [Rental observatory] 2008, 2010 and 2011 surveys

[Key to above graphic:]

% du parc de logements	% of housing stock
Gaz naturel	Natural gas
Gasoil	Heating oil
Electricité	Electricity
Charbon	Coal

Central heating has become the norm

Four types of housing were identified in the DGSIE's general socioeconomic survey in 2001 (ESE 2001): houses with central or space heating and apartments with central or space heating. The following figure illustrates the breakdown of the housing stock by type of housing, heating and energy vector for heating. The estimated percentage of central heating in 2011 was 85%.

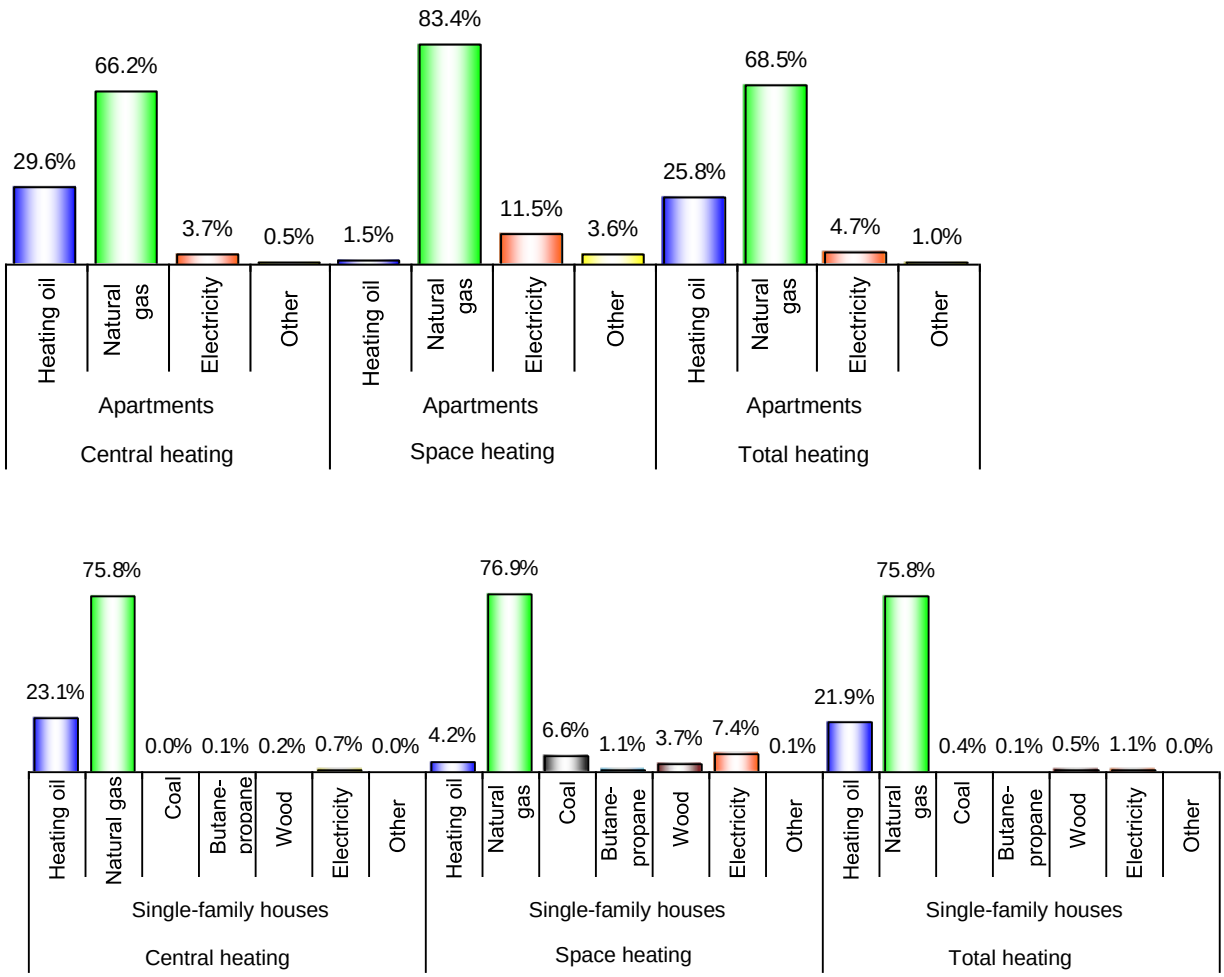

Figure 15: Breakdown of heating energy consumption in 2011 by type of housing, heating and energy ((Sources: ICEDD estimate)

With regard to the breakdown of energy vectors by size of housing, it is clear that butane-propane and electricity tend to be used in the smallest housing units. Natural gas and, in particular, heating oil are used in medium to large housing units. Coal, which is very limited, tends to be used in small to medium housing units (35-54 m² and 55-84 m²) ([11]).

2. Cost-optimal study 2017 for residential buildings

Aim and general conclusion of the study

This study assessed the economic impact of various energy objectives applied to the existing residential stock in the Brussels Capital Region.

The four energy objectives in question were:

[11] Source: ECS, 2011.

- a level of primary energy consumption corresponding to an 80% reduction in the initial consumption in each case under consideration;
- a level of primary energy consumption based on the energy pact requirements, i.e. an energy consumption of 100 kWh/m²/year;
- a level of primary energy consumption corresponding to the current requirements for new residential buildings;
- a level of primary energy consumption corresponding to the current requirements for residential buildings undergoing a 'treated as new-build' renovation, in addition to the requirements applicable to major renovations of residential buildings.

The study assessed jointly owned buildings and terraced houses (possibly with retail space on the ground floor), which account for 96% of new construction in the Brussels Capital Region. There were 11 types of housing, including listed houses and houses subject to architectural constraints, such as insulation on the outside of the front façade not being possible.

Various configurations were assessed for each of these types in order to determine the combinations achieving the specified objectives and their short-term and long-term financial impact.

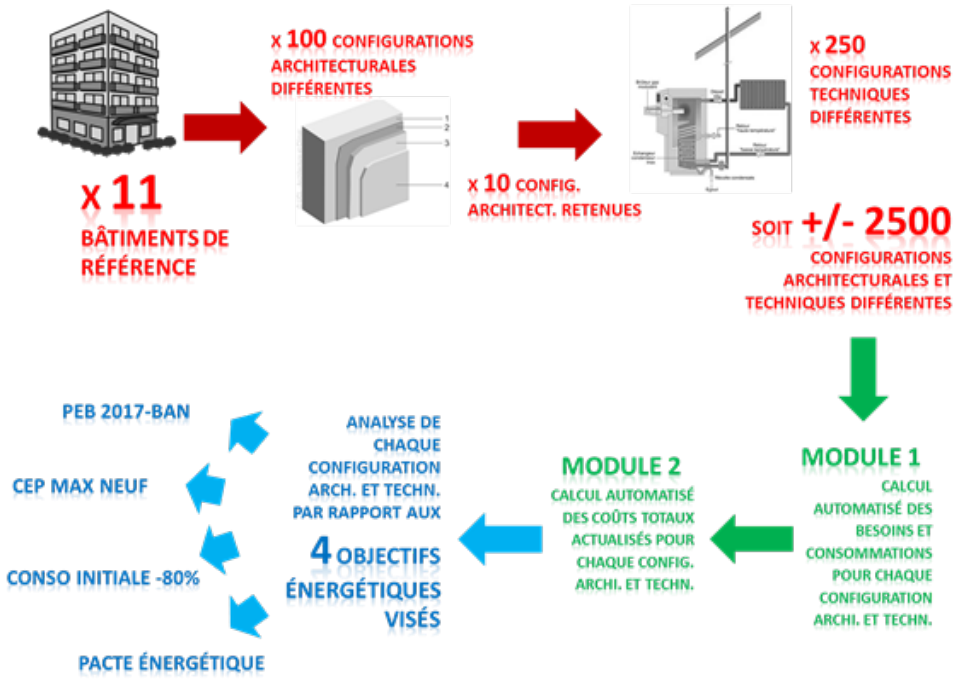

Figure 16: Methodology followed by the cost-optimal study

[Key to above graphic:]

BÂTIMENTS DE RÉFÉRENCE	REFERENCE BUILDINGS
CONFIGURATIONS ARCHITECTURALES DIFFÉRENTES	DIFFERENT ARCHITECTURAL CONFIGURATIONS
CONFIG. ARCHITECT. RETENUES	SELECTED ARCHITECTURAL CONFIGURATIONS
CONFIGURATIONS TECHNIQUES DIFFÉRENTES	DIFFERENT TECHNICAL CONFIGURATIONS

CONFIGURATIONS ARCHITECTURALES ET TECHNIQUES DIFFÉRENTES	I.E. … DIFFERENT ARCHITECTURAL AND TECHNICAL CONFIGURATIONS
PEB 2017-BAN	EPB 2017-BUILDINGS TREATED AS NEW-BUILD
CEP MAX NEUF	MAXIMUM PRIMARY ENERGY CONSUMPTION FOR NEW BUILDINGS
CONSO INITIALE -80%	INITIAL CONSUMPTION -80%
PACTE ÉNERGÉTIQUE	ENERGY PACT
ANALYSE DE CHAQUE CONFIGURATION ARCH. ET TECHN. PAR RAPPORT AUX 4 OBJECTIFS ÉNERGÉTIQUES VISÉS	ASSESSMENT OF EACH ARCHITECTURAL AND TECHNICAL CONFIGURATION WITH REGARD TO THE 4 ENERGY OBJECTIVES IN QUESTION
MODULE 1/2	MODULE ½
CALCUL AUTOMATISÉ DES COÛTS TOTAUX ACTUALISÉS POUR CHAQUE CONFIG. ARCH. ET TECHN.	AUTOMATED CALCULATION OF DISCOUNTED TOTAL COST FOR EACH ARCHITECTURAL AND TECHNICAL CONFIGURATION
CALCUL AUTOMATISÉ DES BESOINS ET CONSOMMATIONS POUR CHAQUE CONFIGURATION ARCH. ET TECHN.	AUTOMATED CALCULATION OF NEEDS AND CONSUMPTION FOR EACH ARCHITECTURAL AND TECHNICAL CONFIGURATION

The study concluded that the energy objective set by the Interfederal Energy Pact for the residential sector results, on average, in short-term and long-term financial impacts that are at or close to the optimal cost (i.e. that they achieve a cost-optimal balance between the investments involved and the energy costs saved). This ambitious objective is therefore realistic.

In detail

1. For each objective in question, the minimum financial investment needed (discounted total cost) to achieve the objective is in the main lower than the discounted total cost of the reference scenario. In other words, in the long term (30 years) and without taking account of the investor's financial capacity, it is clearly worthwhile investing in energy saving measures.
2. The energy objective set by the Interfederal Energy Pact for the residential sector is the one that allows a discounted total cost close to, if not at, the optimal cost to be achieved. Unsurprisingly, the objective of 100 kWh/m²/year has a higher discounted total cost for houses subject to more architectural constraints. The installation of systems generating renewable energy is therefore essential. Also unsurprisingly, the discounted total cost of the objective set by the Pact is higher than the optimal cost for multi-family buildings.
3. Extrapolating the results to the regional level (using a weighted average for each type) unequivocally shows that the discounted total cost is very close to the optimal cost for an objective of 100 kWh/m²/year.
4. To achieve this objective, the (over-)investment (i.e. the short-term financial impact) in single-family houses does not exceed EUR 200/m².
5. This investment is obviously higher for multi-family buildings, for a range of reasons: window surface areas are proportionally larger, architectural solutions are more limited and the renewable potential per living area is clearly much lower.

6. The following approaches are often cost-optimal.

a. For single-family houses

- Insulation of the walls and floor slab with values close to those currently imposed by the EPB regulations
- Insulation of the roof with a more ambitious value than that currently imposed ([12])
- Replacement of existing frames with 'low-energy' type frames ([13])
- Improvement of air tightness ([14])

b. For apartments

- A level of insulation of the façade and the floor slab above the garage or ground in accordance with the current regulations ([15]) (0.24 W/m^2.K)
- Replacement of existing frames with 'standard' type windows ([16]) (Uw of 1.8) or even triple-glazed windows (particularly for apartments without a roof or floor slab above the garage or ground).
- For apartments under the roof, a high level of insulation of the roof is clearly desirable ([17]) (U value = +/-0.12 W/m^2.K, even with higher primary energy consumption levels).

7. In terms of the technical measures to be favoured, traditional technologies such as condensing gas boilers and controlled ventilation systems often remain cost-optimal.

8. Systems generating renewable energy must be favoured where energy objectives that are more ambitious than the Energy Pact are to be met. These systems are also needed to meet the objective of 100 kWh/m²/year in the case of houses subject to significant architectural constraints (listed houses or houses where the outside of the front façade cannot be insulated).

[12] (U = +/-0.12 W/m^2.K)
[13] (Uw = +/-1.8 W/m^2.K)
[14] With n50 values varying between 1 and 3.
[15] 0.24 W/m^2.K
[16] Uw of 1.8
[17] U value = +/-0.12 W/m^2.K, even with higher primary energy consumption levels.

ACTION FICHES

I. ENERGY PERFORMANCE AND SUSTAINABILITY REQUIREMENTS

1.	Strengthen energy performance requirements and obligations for buildings
Category of measure	**Regulation**
Target audience(s)	Owner-occupiers and landlords
Type(s) of building concerned	All
Objective of the measure	Drive the building stock towards a minimum level of energy performance by 2050
Description of the measure	**1. <u>Residential sector (houses and apartments)</u>** Currently, except in the case of treated as new-build renovations, the energy performance requirements applicable to renovations subject to planning permission apply to each element considered separately (walls undergoing work and ventilation). To achieve the regional greenhouse gas reduction objectives, a global indicator must now be used: primary energy consumption. Energy-saving work must also be made mandatory. The following must occur, based on a mandatory EPB certificate for all housing, regardless of whether a transaction takes place. (a) Legislation must be drafted and implemented that requires work to be carried out in five stages to achieve a minimum performance level by 2050. This minimum level will be defined by type, taking into account any heritage building constraints. Owners will choose the measures to be carried out from among the priority measures recommended by the EPB certificate. By each deadline set by the legislation, owners must prove that the work has been correctly carried out. Buildings that achieve this minimum level more quickly will be exempt from the obligation to carry out work by the set deadlines. Buildings that cannot achieve the objective set for their type by the end of the five recommendations made in the EPB certificate will be subject to the performance level that can be achieved through these priority recommendations. With regard to multi-family buildings, the obligations will apply at apartment and building level. The roof, façades and other common parts will be tackled through a mandatory report specifically produced for this purpose, which will be based on all the recommendations made in the EPB certificates for the common parts. The joint owners will be responsible for implementing the recommendations applicable to the common parts. The energy incentive system will be adapted so that it encourages owners to carry out their work as quickly as possible and to work together (through an additional incentive that is granted if work is combined). (b) A minimum energy performance level must be imposed for major renovations of social housing, as explained in the fiche on the exemplary role of public authorities.

<table>
<tr><td></td><td colspan="2">2. <u>Service sector</u>

The service sector is currently subject to three binding measures: the primary energy consumption requirement applicable to the entire service sector for new units and treated as new-build renovations; the Local action plan for energy management (PLAGE), and the energy audit (linked to the environmental permit or to be carried out by ‘large companies’ within the meaning of the legislation).

The following must occur in order to drive the service sector towards energy-neutral buildings by 2050.

(a) The sector must be appropriately segmented so that sub-sectoral measures can be defined.

(b) With regard to this segmentation, the relevance of the following measures must be assessed:

• extending the scope of the PLAGE (by reducing the minimum floor area at which the measure is applied and by increasing the objective);

• reducing the expected payback time for the mandatory implementation of audit recommendations in relation to major energy consumers;

• introducing a mandatory system of work to be carried out by certain deadlines, similar to the system established for the residential sector.

(c) The COBRACE [Brussels Air, Climate and Energy Management Code] provision requiring regional public authorities to purchase or lease only energy-efficient buildings, in order to meet the undertaking made in the Energy Pact on the energy neutrality of public buildings by 2040, must be implemented. The provision requiring local public authorities to take account of the occupancy cost of a building during any property transaction will also be implemented.

(d) The appropriateness of setting a performance or consumption objective to be achieved by 2040 must be considered for public authorities that are owner-occupiers.</td></tr>
<tr><td>Other stakeholders</td><td colspan="2">Municipalities, Bruxelles Urbanisme et Patrimoine (BUP) [Brussels public planning and heritage service], Inspection du logement [Housing inspectorate], Homegrade and Réseau Habitat [Housing Network], Facilitateur Bâtiment Durable [Sustainable Building Facilitator]</td></tr>
<tr><td rowspan="5">Interim objectives for the residential sector</td><td>Period</td><td>Description</td></tr>
<tr><td>2021 Objective</td><td>Adoption of the regulatory framework.</td></tr>
<tr><td>2030 Objective</td><td>Deadline for one of the mandatory measures, at the individual’s choice.</td></tr>
<tr><td>2035 Objective</td><td>Deadline for the second of the five mandatory measures, at the individual’s choice.</td></tr>
<tr><td>2040 Objective</td><td>Deadline for the third of the five mandatory measures, at the individual’s choice.</td></tr>
</table>

	2045 Objective	Deadline for the fourth of the five mandatory measures, at the individual's choice.
	2050 Objective	Deadline for the fifth of the five mandatory measures, at the individual's choice. All buildings achieve the energy performance required for their segment.
Interim objectives for the service sector	**Period**	**Description**
	2020/2021 Objective	Definition of the sector segmentation. Definition of regulatory guidance. Stabilisation of a method for calculating energy performance. Adoption of an implementing decree for public authorities.
	2022/2023 Objective	Assessment of PLAGE 1 and determination of its development potential. Adoption of implementing decrees laying down measures and requirements to be achieved.
	2030 Objective	Start of deadlines for meeting requirements in certified service sector buildings (according to chosen segmentation).
	2040 Objective	Achievement of performance level required for public buildings, according to chosen segmentation.
	2050 Objective	Achievement of performance level required for service sector buildings, according to chosen segmentation.
Prior measures – Regional Air, Climate and Energy Plan (PACE) measures	N/A	
Interaction with other fiches	Fiche No 2 - Establish sustainability requirements and obligations for buildings Fiche No 7 - Revise the energy incentive mechanism Fiche No 13 - Set up a one-stop-shop to support individuals Fiche No 14 - Create a roadmap for residential buildings Fiche No 20 - Set up a one-stop-shop to support professionals Fiche No 26 - Create a housing passport	

2.	Establish sustainability requirements and obligations for buildings	
Category of measure	**Regulation**	
Target audience(s)	Property owners	
Type(s) of building concerned	All	
Objective of the measure	Drive the building stock towards a minimum level of sustainability by 2050	
Description of the measure	Over and above their direct energy consumption, buildings have a potentially considerable environmental impact, particularly in terms of their consumption of resources and indirect emissions. Sustainable buildings are not therefore just low-energy buildings: they are also buildings that encourage the development of biodiversity on their plot of land, that make a positive contribution to the management of the water cycle, and that take account of the health and comfort of their users, while limiting the use of primary resources throughout their life cycle. Regulations on the sustainability of buildings, which will complement the energy performance regulations, will be drafted and implemented according to the following principles. - Public clients will be required to use the sustainable building reference framework in order to compare the sustainability variants of an initial design. - As the themes in the reference framework mature, the regulations will impose minimum 'performance' levels. The themes of materials (TOTEM), circular design (level of reversibility and adaptability/flexibility), acoustics, water, etc. will be prioritised. - These requirements will differ according to the type/size of building and type of renovation. - Once defined, the sustainability requirements will apply when the work required by Fiche No 1 'Strengthen energy performance requirements and obligations for buildings' is carried out. - They will initially apply to public authorities and will therefore be included in the technical clauses of their specifications. - They will then be applied to the private sector, according to the type and size of buildings.	
Other stakeholders	Bruxelles Urbanisme et Patrimoine (BUP) [Brussels public planning and heritage service], Homegrade and Réseau Habitat [Housing Network], clients and designers, Facilitateur Bâtiment Durable [Sustainable Building Facilitator], CityDev, SLRB [Brussels Capital Region housing association], Beliris, etc.	
Interim objectives	**Period**	**Description**

	Period 1 Objective (2019-2024)	Minimum performance levels for the priority themes (materials, acoustics, water, etc.) are determined and applied to public projects.
	2030 Objective	Public projects use the sustainable building reference framework. Regulations on the sustainability of buildings are drafted.
	2040 Objective	Renovation projects for public buildings meet the requirements defined in the regulations.
	2050 Objective	Renovation projects for buildings meet the requirements defined in the regulations.
Prior measures – Regional Air, Climate and Energy Plan (PACE) measures	N/A	
Interaction with other fiches	Fiche No 1 - Strengthen energy performance requirements and obligations for buildings Fiche No 7 - Revise the energy incentive mechanism Fiche No 13 - Set up a one-stop-shop to support individuals Fiche No 14 - Create a roadmap for residential buildings Fiche No 29 - Set up a renovation laboratory: RenoLab Fiche No 30 - Promote and develop the TOTEM technical tool for materials Fiche No 31 - Promote and develop technical tools for the circular design of buildings Fiche No 32 - Promote and develop technical tools for the sustainability assessment of buildings	

3.	Reinforce the exemplary role of public authorities
Category of measure	**Regulation, support**
Target audience(s)	Public authorities (within the meaning of the COBRACE [Brussels Air, Climate and Energy Management Code])
Type(s) of building concerned	All
Objective of the measure	Encourage public authorities to set an example in terms of energy and sustainability in buildings
Description of the measure	As already indicated in the COBRACE and in the Air, Climate and Energy Plan, the example that public authorities can set is a key driver in the transition to a sustainable office stock, which will be utilised as follows. **1. <u>Strengthening of the EPB requirements for public authority buildings undergoing major renovation</u>** Under Article 2.4.2 of the COBRACE, 'the government shall take the necessary steps to ensure that new buildings and existing buildings undergoing major renovation work, which are occupied or intended to be occupied by public authorities, play an exemplary role in terms of energy and environmental performance. It shall therefore lay down stricter EPB requirements than those applicable to other buildings, and may also take account of opportunities to generate energy from renewable sources'. With regard to existing buildings, this provision will be the subject of an implementing decree which will stipulate that, in accordance with the new Energy Performance of Buildings Directive, 30% of the energy consumed in public buildings undergoing a major renovation that involves replacing all the technical installations will be covered on site or nearby by the generation of renewable energy or high-efficiency cogeneration. In the longer term (2030), public buildings will be subject to requirements based on an environmental impact assessment of their materials carried out using TOTEM, referred to in the fiche on sustainability requirements and obligations. These requirements will then be extended to other aspects of the sustainability of buildings. **2. <u>Improvement of the energy performance of social housing buildings</u>** Any major renovation carried out by a social housing association (SISP – Société Immobilière de Service Public) or the SLRB [Brussels Capital Region housing association] must immediately achieve the final objective set for the type of building concerned (in accordance with Fiche No 1 'Strengthen energy performance requirements and obligations for buildings'). This obligation will be included in the management contracts of the SLRB and the SISPs. **3. <u>Purchase and leasing of energy-efficient buildings by public authorities</u>** The COBRACE requires regional authorities to limit their property transactions to buildings with high energy-efficiency performance (insofar as that is consistent with cost-effectiveness, economic feasibility, wider sustainability, technical suitability and sufficient

competition) and local authorities to take account of the occupancy cost of a building during any property purchase or lease.

As indicated in Fiche No 1 'Strengthen energy performance requirements and obligations for buildings', this article will soon be the subject of an implementing decree.

4. <u>Continuation of the NRClick 2020 and SolarClick programmes</u>

The NRClick 2020 and SolarClick programmes provide support to the Brussels regional and local public authorities for the energy renovation of their buildings and for the generation of renewable energy through photovoltaic installations.

The first implementation phase of these two programmes ends in 2021 when they will be fully assessed in order to review their progress, with the following aspects in particular being considered:

- cost-effectiveness and value for money;
- scope of the two programmes and feasibility/advisability of expanding the work (work on the building envelope) and equipment (appropriate renewable energy installations in the urban environment other than photovoltaic panels, such as solar heating and heat pumps) included in the services offered, or the target audience;
- method of funding these programmes: for 2016 to 2020, both programmes are being funded by the Brussels climate fund to avoid any impact on energy prices; it should be noted that, from 2019, the green certificates of SolarClick installations that are already operational will also be added to the climate fund;
- development of the exploitable potential and expansion of the selection criteria for eligible sites (e.g. extending SolarClick to parking structures);
- offer of innovative funding sources for investments made under NRClick (EIB loan, third-party investment, etc.).

This assessment will determine how these programmes will continue.

Special attention will be paid to school buildings, which are partly covered by the NRClick programme (which includes local schools), in particular through a collaboration between Perspective and Bruxelles Environnement, in order to improve their energy and environmental performance.

5. <u>Assessment of the mandatory Local action plan for energy management (PLAGE)</u>

In line with Fiche No 1 'Strengthen energy performance requirements and obligations for buildings', the Local action plan for energy management, which must be established by public authorities that own or occupy a building stock with a floor area in excess of 50,000 m², will be assessed at the end of the first period of application. At this point, the advisability of reducing the minimum floor area and/or increasing the objective for reducing energy consumption will be examined.

6. <u>Requirement for a 100% green electricity supply</u>

In addition to the measures indicated in this chapter for the medium-to-long term, and as specified in the Regional Air, Climate and Energy Plan (Action 84), Brussels regional authorities will be required to secure a 100% green electricity supply in the very short term

<table>
<tr><td></td><td colspan="2">(it should be noted that almost all local authorities already have 100% green electricity supplies via Interfin). A government circular will therefore require the various regional administrative services (including ministerial offices) and public interest organisations to secure a 100% green electricity supply (covered by guarantees of origin) when they renew an electricity supply contract. Given this new obligation, the possibility of extending the green electricity central purchasing body Interfin (managed by Sibelga, which has public green electricity supply contracts with most of the Brussels local authorities) to the regional public authorities will be examined.

7. <u>Exemplary role of public contracts</u>

Public clients will be provided with sustainable technical clauses for the specifications of service contracts covering the appointment of a designer (architect or design team) and with sustainable clauses for the specifications of work contracts.

8. <u>Taking account of sustainability in renovations</u>

In accordance with Fiche No 2 ‘Establish sustainability requirements and obligations for buildings’, public authorities will be required to use the sustainable building reference framework in the medium term in order to compare renovation variants. In the longer term and as the themes mature, levels of sustainability will be imposed, before these requirements are extended to the private sector.</td></tr>
<tr><td>Other stakeholders</td><td colspan="2">Public authorities

Sibelga (NRClick and SolarClick, Interfin central purchasing body)

Contractors and designers (see Fiche No 31 ‘Promote and develop technical tools for the circular design of buildings’)</td></tr>
<tr><td rowspan="5">Interim objectives</td><td>Period</td><td>Description</td></tr>
<tr><td>Strategy Period 1 (2019-2024)</td><td>All regional and local public authorities secure green electricity supplies.

The implementing decree on the purchase and leasing of energy-efficient buildings by public authorities is adopted.

Sustainability clauses are included in public construction contracts.</td></tr>
<tr><td>2030 Objective</td><td>Renovations of public buildings are subject to material sustainability requirements based on TOTEM.</td></tr>
<tr><td>2040 Objective</td><td>Public buildings are energy-neutral.

Renovations of public buildings are subject to requirements involving various aspects of the building’s sustainability, determined on the basis of a previously established or recognised energy and environmental performance assessment system for buildings.</td></tr>
<tr><td>2050 Objective</td><td></td></tr>
<tr><td>Prior measures – Regional Air, Climate</td><td colspan="2">NRClick:

- Climate Fiche I-8 - Formation of a regional ESCO targeted at Brussels regional and local authorities in order to support energy efficiency</td></tr>
</table>

and Energy Plan (PACE) measures	- PACE: Action 26 - Form a regional ESCO
	SolarClick:
	- Climate Fiche I-7 - Regional project to install photovoltaic panels on the buildings of Brussels public authorities
	- PACE: Action 82 - Draw up a plan to exploit the solar potential of the roofs of public buildings
	PACE
	- Measure 10 - Gradually renovate public buildings and improve their energy management
	  - Action 22 - Ensure that the occupancy cost is taken into account in public buildings
	- Measure 11 - Apply 'Sustainable Building' certification to public building projects
	  - Action 25 - Support the efforts of public authorities to achieve high energy efficiency performance
	  - Action 83 - Require part of the energy consumption in public buildings to be covered by the generation of renewable energy
	  - Action 84 - Require Brussels authorities to secure 100% green electricity supplies
	- Climate Fiche I-11 - Support for investment in renewables for Brussels public housing

Interaction with other fiches	Fiche No 1 - Strengthen energy performance requirements and obligations for buildings Fiche No 2 - Establish sustainability requirements and obligations for buildings Fiche No 20 - Set up a one-stop-shop to support professionals

4.	Increase the energy efficiency of the rental housing stock, while guaranteeing the right to housing	
Category of measure	**Regulation**	
Target audience(s)	Owners of rental accommodation	
Type(s) of building concerned	Residential buildings	
Objective of the measure	- Prevent the rental of housing regarded as thermal sieves. - Increase the energy efficiency and renovation rate of the rental housing stock - Combat fuel poverty, as many vulnerable people are renters.	
Description of the measure	In addition to the measures designed to overcome the lack of financial resources, such as the energy incentives and Prêt Vert Bruxellois, the rental stock will also be covered by the following three measures, all of which are designed to allow everyone access to an energy-efficient building: **1. <u>Study whether increasing the overall energy performance of the housing stock will result in rent rises and how to manage this situation</u>**, in order to guarantee everyone access to housing, particularly vulnerable people; at the end of the study, analyse the changes to be made to the rent scale. **2. <u>Prevent the rental of housing that does not meet energy efficiency and health criteria and/or a minimum level of energy performance</u>** This objective will be achieved by generally requiring work to be carried out by certain deadlines and ensuring a minimum level of performance, whether buildings are sold or rented (see Fiche No 1 'Strengthen energy performance requirements and obligations for buildings'). **3. <u>Implement an ambitious programme of renovation of the social housing stock</u>** Improvement of the energy performance of social housing buildings is covered by Fiche No 1 'Strengthen energy performance requirements and obligations for buildings' and Fiche No 3 'Reinforce the exemplary role of public authorities'.	
Other stakeholders	Bruxelles Logement; SISPs [social housing associations]; Conseil consultatif du logement [Advisory Council on Housing]; SLRB [Brussels Capital Region housing association]	
Interim objectives	**Period**	**Description**
	Strategy Period 1 (2019-2024)	The risk of rent rises and ways to manage these are identified.
	2030 Objective	The first measure imposed in accordance with Fiche No 1 'Strengthen energy performance requirements and obligations for buildings' is applied to the entire rental stock.
	2050 Objective	Very high energy performance of the entire rental housing stock.

Prior measures – Regional Air, Climate and Energy Plan (PACE) measures	Measure 62 - Cushion the short-term effects of fuel poverty
Interaction with other fiches	Fiche No 1 - Strengthen energy performance requirements and obligations for buildings Fiche No 7 - Revise the energy incentive mechanism Fiche No 8 - Revise the Prêt Vert Bruxellois Fiche No 13 - Set up a one-stop-shop to support individuals Fiche No 17 - Raise awareness of how to sustainably occupy residential buildings Fiche No 19 - Take account of the health aspect in buildings

II. FUNDING AND INCENTIVES

5.	Develop innovative funding mechanisms
Category of measure	**Innovation, Funding**
Target audience(s)	Individuals, professionals
Type(s) of building concerned	All
Objective of the measure	Facilitate access to investment in renovation
Description of the measure	Renovating all the building stock will involve a very significant cost and all sources of funding will be used: **4. <u>Encourage the development and formation of Energy Service Companies (ESCOs), possibly coupled with public funding</u>** As already indicated in the Air, Climate and Energy Plan, the Region intends to adopt an ESCO development strategy. A study to be shortly carried out by Bruxelles Environnement will further research the potential to roll out ESCOs and energy performance contracts (EPCs) in the Brussels Capital Region. Investors naturally go for the most profitable investments, such as the renewal and control of HVAC equipment. Given the significant reductions in consumption associated with such investments, measures with longer payback times will therefore be more difficult to implement. As a result, the role of public authorities is to steer the EPC market towards more ambitious programmes and a comprehensive approach to energy-saving investments, while maintaining an overall return that is acceptable to investors. The following measures will therefore be adopted: • **Promote the concept of ESCOs and EPCs** - Set up a Facilitateur de Marché [Market Facilitator] service that will support the formation of ESCOs and the use of EPCs in order to create positive conditions for the emergence of ESCOs. - Set up a Facilitateur de Projets [Project Facilitator] service to help entities draft EPCs and choose appropriate ESCOs. This facilitation service will also act as a demand aggregator in order to limit the expenditure of ESCOs on research and project marketing. • **Remove administrative and legal constraints** - Provide model special specifications and model EPCs. - Create a specific public legal vehicle to support public building managers who apply for EPCs with establishing a funding solution and to offer tax and accounting advice in the renovation programme. • **Remove economic constraints** - Analyse whether forms of interacting should be established for public buildings so that the financial savings made on energy bills can be obtained and re-injected into new energy-saving work.

- Reduce funding risks in order to steer ESCOs towards a comprehensive approach to energy renovation:
  - establishment of a regional revolving fund aimed at ESCOs in order to facilitate access to capital, provided that the project has a comprehensive approach;
  - alternative funding mechanisms so that environmentally important investments with a long payback time are included in the programme.

- **Remove technical constraints**
  - Train those involved at all levels and with all types of skills (technical training, contractual arrangements, performance measurement).
  - Create a cluster of Brussels enterprises in order to help them win large-scale public EPCs.

5. <u>Mobilise community savings</u>

The establishment of a mechanism for mobilising sources of private funding (coupled with public funding) will be studied, such as the issue of green bonds aimed at the energy renovation of the Brussels building stock. A partly revolving fund, which could be used to develop ESCOs among other aims, could also be created in the next few years. The financial intervention of the public sector will also involve providing loan guarantees and funding investments with a long payback time.

6. <u>Mobilise European and regional public funds</u>

There are already several funds available and operating at the European and regional levels. Support with mobilising these funding programmes may be of interest to those involved in renovation, for example by combining renovation projects and obtaining guarantees for EIB loans. This aspect is considered in more depth in Fiche No 5 on European funding.

7. <u>Mobilise the banking sector through the promotion of low-interest loans</u>

Bank loans form a cornerstone of our economic funding model and will therefore play a vital role in the large-scale energy renovation process. At this stage, the sector will be consulted in order to precisely define what the banks and other investors (particularly public investors) can bring to renovation, for example by developing energy-efficiency loans (as an alternative to the Prêt Vert Bruxellois).

8. <u>Encourage the development of community cooperatives and third-party investments</u>

Community cooperatives encourage local investment in local projects, which facilitates local acceptance and adoption of investments made by local people. These cooperatives respond to the desire for transparency and offer the opportunity to mobilise community savings for the benefit of renovation projects. The societal goal of many of these cooperatives also means that they can generally accept a longer-term financial return, if this is counterbalanced by significant social and environmental benefits.

The call for cooperative members allows:

<table>
<tr><td></td><td colspan="2">

a target audience without a renovation or investment project involving a renewable energy installation to fund the energy transition;
a target audience without sufficient funds to carry out their renovation or investment project involving a renewable energy installation.

The Region wants to support this type of structure by contributing to the capital of cooperatives or by offering public guarantees, for example through low-interest loans.
</td></tr>
<tr><td>Other stakeholders</td><td colspan="2">Banks and private investment companies, ESCOs, community cooperatives, regional bodies managing funds, Finance.Brussels, hub.brussels, Facilitateur Bâtiment Durable [Sustainable Building Facilitator], etc.</td></tr>
<tr><td rowspan="4">Interim objectives</td><td>Period</td><td>Description</td></tr>
<tr><td>Strategy Period 1 (2019-2024)</td><td>Revolving funds specifically for renovation are created.
The Facilitateur de Marché and the Facilitateur de Projet are set up.</td></tr>
<tr><td>2030 Objective</td><td>The ESCO market is active and responsible for ambitious renovation projects.</td></tr>
<tr><td>2050 Objective</td><td>N/A</td></tr>
<tr><td>Prior measures – Regional Air, Climate and Energy Plan (PACE) measures</td><td colspan="2">Measure 13 - Facilitate access to funding for projects conducted by public authorities via an ESCO</td></tr>
<tr><td>Interaction with other fiches</td><td colspan="2">Fiche No 5 - Develop innovative funding mechanisms
Fiche No 7 - Revise the energy incentive mechanism
Fiche No 9 - Grasp the funding opportunities offered by European programmes
Fiche No 13 - Set up a one-stop-shop to support individuals
Fiche No 16 - Support community cooperatives and initiatives
Fiche No 20 - Set up a one-stop-shop to support professionals
Fiche No 21 - Support businesses/SMEs/shops
Fiche No 25 - Create a communication campaign on the environmental impact reduction strategy and a sustainable renovation toolbox</td></tr>
</table>

6.	Create tax incentives to encourage the energy renovation of the housing stock
Category of measure	**Funding, Regulation**
Target audience(s)	Owners, whether or not occupiers
Type(s) of building concerned	Residential buildings
Objective of the measure	Encourage owners to renovate their housing in order to improve its energy performance
Description of the measure	**1. <u>Reform property taxation</u>** (a) <u>In the short and medium term</u>: a change of owner (whether due to a sale, gift or inheritance) is a key moment for carrying out renovation work. The property taxation regime will be adapted to encourage investments at these key times (for more information on these key moments, see Fiche No 15 on opportunities). In any event, this work is required by the system of obligations described in Fiche No 1 on energy performance requirements and obligations for buildings. The envisaged measures are as follows. • **A reduction in registration fees**, **gift taxes and/or inheritance taxes** provided that appropriate energy-saving work is carried out within a certain timescale. This measure underlines the importance of the service in charge of these taxes being transferred to the Region. It is intended that this service will be effectively taken over by the Region from 2021. • **A temporary exemption from, or reduction in, property withholding tax** in the event of an ambitious energy renovation (for example, where several recommendations in the EPB certificate are carried out at the same time). These measures must be examined with regard to all the financial incentives introduced to encourage energy-saving work and the requirements and obligations referred to in Fiche No 1. (b) <u>In the medium and long term</u>: cooperation will be established with other entities and the federal authority (through a working group led by Bruxelles Fiscalité for the Brussels Region) in order to undertake a comprehensive tax reform consistent with the energy performance ambitions of the various regions. **2. <u>Introduce innovative tax incentives</u>** Innovative tax mechanisms will be introduced to encourage citizens to use some of their savings or income for the energy renovation of their homes, at a cost acceptable to public finances. These mechanisms may take the form of tax relief on 'renovation savings', as occurs with pension savings. The tax relief on those savings may depend upon a renovation invoice being submitted, and the use of those savings for other purposes may be penalised by the refund of the tax relief received.
Other stakeholders	Bruxelles Fiscalité; SPF Finances [Federal Public Service for Finance]; local authorities

	Period	Description
Interim objectives	Strategy Period 1 (2019-2024)	Introduction of the tax incentives covered by this measure.
	2030 Objective	Significant use of the new tax incentives by owners.
	2050 Objective	Introduction of a cadastral income and property withholding tax system that incorporates the energy performance of buildings.
Prior measures – Regional Air, Climate and Energy Plan (PACE) measures	Measure 8 - As part of the reform of property taxation, take account of the building's energy performance criteria	
Interaction with other fiches	Fiche No 1 - Strengthen energy performance requirements and obligations for buildings Fiche No 5 - Develop innovative funding mechanisms Fiche No 7 - Revise the energy incentive mechanism Fiche No 15 - Grasp the opportunities to improve the energy performance of buildings that arise at key moments in the life of a building and its inhabitants	

7.	Revise the energy incentive mechanism
Category of measure	**Funding**
Target audience(s)	Everyone (individuals, public and private sectors)
Type(s) of building concerned	All
Objective of the measure	Financially support energy renovation work on the Region's building stock
Description of the measure	The system of energy incentives must change significantly so that, firstly, it is in line with the targets to reduce greenhouse gas emissions by 2030 and 2050 and so that, secondly, it enables a renovation of the building stock that integrates aspects of sustainable building other than energy in order to reduce the overall environmental impact. **1. <u>In the short term: determine how the incentive system, and in particular the following elements, should change</u>** • The incentive system must tie in with the obligations to renovate the residential stock. Incentives will be accessible if work is carried out at least one year before the deadlines set in Fiche No 1 'Strengthen energy performance requirements and obligations for buildings', with the amounts granted being increased where several priority measures are carried out at the same time. An incentive will in particular be granted where an architect draws up a renovation plan (see Fiche No 14 'Create a roadmap for residential buildings'). • The formalities for individuals must be simplified by creating a single entry point for all available incentives and by standardising the conditions of eligibility across the various mechanisms with regard to work rewarded by one or another system. • The amounts to be provided so that vulnerable households can meet the requirements described in Fiche No 1 must be determined. • Additional incentives must be established for joint renovation work carried out in one or more buildings. • Financial assistance for joint owners and landlords must be increased. It must be determined whether an additional incentive should be granted to property managers to encourage them to adopt a renovation process, and also to landlords (see Fiche No 22 'Support jointly owned buildings'). • An indexed incentive must be introduced for sustainability work that is added to energy-saving work: o combined work that involves both energy and acoustics; o 'productive roofs' that are pre-insulated (green roofs, garden roofs, roofs with solar panels, etc.); o use of environmentally friendly materials in work on the building envelope. This additional premium will be based on TOTEM (see TOTEM Fiche) being used.

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An incentive must be established for air-to-air heat pumps, together with an indexed incentive for heat pumps where the pump compressor is powered by photovoltaic panels.
An incentive for BIPV (Building-Integrated PhotoVoltaics) must be established.
Consideration must be given to the coherence of the incentive mechanism with the energy pact objectives (phasing out of fossil fuels by 2050) and, in the short term, the replacement of heating oil and coal-fired boilers.

2. <u>In the medium term</u>

A comprehensive study analysing the incentive system (target audiences, amounts, work, etc.) must be conducted to ensure a coherent and effective funding framework, particularly in relation to the new funding mechanisms (Fiche No 5) and taxation (Fiche No 6). In this context, consideration will be given to a new breakdown of the incentive system for buildings, to ensure that the incentives are more complementary and can fully play their inherent role (regional incentives, local incentives, etc.).
Sustainability incentives based on the sustainable building reference framework must be introduced, and the possibility of using the climate fund to finance incentives must be assessed.

</td></tr>
<tr><td>Other stakeholders</td><td colspan="2">Bruxelles Urbanisme et Patrimoine (BUP) [Brussels public planning and heritage service], municipalities</td></tr>
<tr><td rowspan="4">Interim objectives</td><td>Period</td><td>Description</td></tr>
<tr><td>Strategy Period 1 (2019-2024)</td><td>The incentive budget is exhausted.
An additional incentive is offered for certain sustainability work.
A single entry point for all the various incentives is created.</td></tr>
<tr><td>2030 Objective</td><td>An incentive system is established that is easy to access, motivational and in line with the requirements laid down, and that takes account of the sustainability aspects of buildings based on the sustainable building reference framework.</td></tr>
<tr><td>2050 Objective</td><td>An incentive system is established that is in line with the decarbonisation objectives of the energy pact.</td></tr>
<tr><td>Prior measures – Regional Air, Climate and Energy Plan (PACE) measures</td><td colspan="2">Measure 9 - Improve and reinforce the financial incentives</td></tr>
<tr><td>Interaction with other fiches</td><td colspan="2">Fiche No 1 - Strengthen energy performance requirements and obligations for buildings
Fiche No 2 - Establish sustainability requirements and obligations for buildings
Fiche No 5 - Develop innovative funding mechanisms</td></tr>
</table>

	Fiche No 6 - Create tax incentives to encourage the energy renovation of the housing stock Fiche No 10 - Support the roll-out of renewable heat in the Brussels Capital Region Fiche No 11 - Support the roll-out of renewable electricity in the Brussels Capital Region Fiche No 13 - Set up a one-stop-shop to support individuals Fiche No 14 - Create a roadmap for residential buildings Fiche No 20 - Set up a one-stop-shop to support professionals

8.	Revise the Prêt Vert Bruxellois
Category of measure	**Funding**
Target audience(s)	Individuals (tenants, landlords and owner-occupiers)
Type(s) of building concerned	Residential buildings
Objective of the measure	Increase the accessibility and attractiveness of the low-interest loan managed by the public sector for energy improvement work on residential buildings. The objective is to root the Prêt Vert Bruxellois (PVB) [Brussels Green Loan] in a firmly user-oriented and tailored approach.
Description of the measure	The Prêt Vert Bruxellois is a financial incentive established by the Region in 2008 to support energy-saving investments in housing. In practical terms, it is a low-interest loan (0-2%) offered to Brussels residents whose annual net taxable income does not exceed certain thresholds in order to pre-finance energy renovation work on housing. The PVB is currently available in two forms: firstly, a personal loan offered by Crédal and, secondly, a mortgage provided by the Fonds du Logement. The product's attractiveness mainly lies in the fact that the PVB framework can be adapted to the renovation work actually planned by applicants (e.g. increase in eligible amounts) and that a low interest rate is always available. Various operational measures have been identified in this respect. **1. <u>In the short term</u>** - In the communication aimed at the public, ensure that only one operator is visible. - In the near future, consider simplifying the PVB and opening it up to all Brussels individuals at a fixed rate of 1%, while possibly keeping an income threshold for accessing the PVB. Under certain conditions, keep a 0% rate for a vulnerable target audience. - Simplify and adapt the verification processes in order to reduce the application handling times. In this respect, hand over the applicant as early as possible in the process to the banking operator in order to obtain the PVB. - Authorise 'associated' investments that do not involve energy saving but that are needed in order to implement the energy efficiency investment. This involves differentiating between the technical and administrative conditions of the PVB and the energy incentive conditions, and keeping only the guarantee associated with the level of energy efficiency of the investment. This approach also involves simplifying the steps to be taken by the applicant and the latter's support. **2. <u>In the medium term (at the time of a new call for projects)</u>** - Update the mechanism for funding the financial operator (currently Crédal) – or financial operators – so that this is directly proportional to the number of loans, while incorporating the support needed for those who are vulnerable. The banking operator funds its PVB work at the market interest rate, which is reimbursed by the

<table>
<tr><td></td><td colspan="2">Region. The operating subsidy is used for the work of specifically supporting the most vulnerable, and must therefore be based on the applications submitted by them.
- Adapt the fixed rate according to changes in the average market rate in order to balance the public spending budget associated with the PVB.
- Include the amount of the incentives in the calculation of the amount to be repaid in order to reduce this amount. The amount of the incentives is therefore paid directly to the banking operator. This system enables the applicant to submit a single form for the PVB and incentives.
- Ensure the energy consistency of the planned work by making the loan conditional on the completion of measures identified in the EPB certificate 3.0 or the future roadmap (see Fiche No 1 ‘Strengthen energy performance requirements and obligations for buildings’ and Fiche No 14 on the roadmap).
- Increase the loan amount, which allows major renovations to be undertaken.
- Consider postponing repayment of the PVB (1-2 years) in certain situations so that this additional cost is not incurred at the time when the property is purchased, which is a critical juncture for purchasers.
- Extend the repayment period so that the monthly repayment amount is as close as possible to the financial savings generated by the investment.
- Analyse the possibility of expanding the target audience to certain categories of legal person (property managers, etc.).
- In tandem with the income categories, link the granting of a 0% rate to the energy effort made (energy performance higher than the standards associated with incentives, change of energy class, use of environmentally friendly materials, etc.).
3. <u>Communication</u>
In tandem with mass communication, experience has shown the need to develop specific communication. The product will be promoted in the following ways.
- Through the support service for individuals.
- Bruxelles Environnement will also develop an online loan simulation tool for the PVB. This tool could eventually be extended to financial products of the low-interest loan type, intended for the energy improvement of buildings.</td></tr>
<tr><td>Other stakeholders</td><td colspan="2">Homegrade, Réseau Habitat [Housing Network], Crédal, Fonds du Logement, property professionals (architects, contractors, notaries, estate agents, property managers, etc.), funding/credit agencies, etc.</td></tr>
<tr><td rowspan="2">Interim objectives</td><td>Period</td><td>Description</td></tr>
<tr><td>Strategy Period 1 (2019-2024)</td><td>The PVB is launched in line with the operational measures identified in the short term (a single visible operator, opening up to everyone, simplification of the verification processes, etc.).</td></tr>
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	2030 Objective	The PVB is adapted in the ways considered appropriate in the longer term (inclusion of incentives in the amount to be repaid, update of the mechanism for funding the banking operator, extension of the repayment period, etc.).
	2050 Objective	
Prior measures – Regional Air, Climate and Energy Plan (PACE) measures	Measure 6 - Extend the loan system to investments in energy efficiency and renewable sources of energy	
Interaction with other fiches	Fiche No 5 - Develop innovative funding mechanisms Fiche No 7 - Revise the energy incentive mechanism Fiche No 13 - Set up a one-stop-shop to support individuals Fiche No 14 - Create a roadmap for residential buildings Fiche No 15 - Grasp the opportunities to improve the energy performance of buildings that arise at key moments in the life of a building and its inhabitants Fiche No 25 - Create a communication campaign on the environmental impact reduction strategy and a sustainable renovation toolbox	

9.	Grasp the funding opportunities offered by European programmes
Category of measure	**Funding**
Target audience(s)	All
Type(s) of building concerned	All
Objective of the measure	Participate in calls for projects, mainly European, in order to obtain funding to launch innovative projects involving the sustainable renovation of Brussels buildings and to develop the network of European partners (exchange of best practices, etc.).
Description of the measure	Numerous European programmes (ERDF and Interreg, Horizon 2020, LIFE, etc.) exist to fund European projects in areas of interest to Bruxelles Environnement, in particular sustainable renovation. Bamb, Innovate, easyCOPRO, Domino, etc. are some of the sustainable building projects coordinated or led by Bruxelles Environnement and funded by European programmes, mainly the Horizon 2020 programme. The use of these programmes or the inclusion of Brussels initiatives in calls for projects may be of considerable help in implementing an ambitious strategy to reduce the impact of the Brussels building stock. By way of example, the following calls should be investigated: 'Decarbonisation of the EU building stock: innovative approaches and affordable solutions changing the market for buildings renovation', 'Integrated home renovation services', 'Stimulating demand for sustainable energy skills in the construction sector', 'Upgrading smartness of existing buildings through innovations for legacy equipment', 'Next-generation of Energy Performance Assessment and Certification', 'Supporting public authorities to implement the Energy Union'. However, this investigation requires considerable resources in terms of time and skills, as it particularly involves the following actions: monitoring of programmes and calls for projects, identification of interesting and interested partners, development and maintenance of the network of partners, development and monitoring of projects, financial and administrative reporting. The Region therefore undertakes to ramp up the search for interesting European funds and calls for projects and, as a result, to provide the means and resources needed for this purpose.
Stakeholders/Funds concerned	**ERDF:** - SPRB [Brussels Regional Public Service] (National Contact Point): http://be.brussels/a-propos-de-la-region/bruxelles-internationale/feder-obtenir-une-aide-europeenne **Interreg (North-West Europe):** - Interreg Secretariat: http://www.nweurope.eu/

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- National Contact Point (SPRB): http://www.nweurope.eu/contact-us/contact-points/
Horizon 2020:
- European Commission (via participant portal):
https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/lc-sc3-ee-16-2018-2019-2020.html
- National Contact Point for Brussels: http://www.ncpbrussels.be
Life:
- European Commission – DG Environment:
http://ec.europa.eu/environment/life/index.htm
ELENA – European Local ENergy Assistance:
- https://www.eib.org/en/products/advising/elena/
- European Investment Bank and European Commission via H2020.
This list is not exhaustive. Each programme has its own specific features and its own rules for accessing funding, repayment rates and even reporting.
</td></tr>
<tr><td>Interim objectives</td><td>
<table>
<tr><th>Period</th><th>Description</th></tr>
<tr><td>2019-2021</td><td>EUR 240,000/year of additional European funding (excluding EIB loan).</td></tr>
<tr><td>2021-2025</td><td>EUR 800,000/year of additional European funding (excluding EIB loan).</td></tr>
<tr><td>2025-2030</td><td>EUR 1,000,000/year of additional European funding (excluding EIB loan).</td></tr>
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<tr><td>Prior measures – Regional Air, Climate and Energy Plan (PACE) measures</td><td>N/A</td></tr>
<tr><td>Interaction with other fiches</td><td>Fiche No 5 - Develop innovative funding mechanisms</td></tr>
</table>

10.	Support the roll-out of renewable heat in the Brussels Capital Region
Category of measure	**Incentive, Regulation**
Target audience(s)	Individuals and service sector
Type(s) of building concerned	All
Objective of the measure	Roll out renewable energies in the Brussels Capital Region
Description of the measure	Developing renewable heat will help to reduce greenhouse gas emissions and pollutants and increase the generation of renewable energy (and therefore increase energy self-sufficiency). The roll-outs of renewable heat and renewable electricity are also interlinked (renewable electricity can be used to generate renewable heat). **1. <u>Implementation of a plan to phase out heating oil and coal-fired boilers</u>** • As a first step, an incentive to remove <u>heating oil</u> boilers will be introduced. This will depend on the installation of a high performing heating system (heat pump, high performing condensing gas boiler, gas cogeneration), possibly combined with solar thermal, and is due to be available between 2021 and 2025. This will involve an additional incentive for replacing the old installation, which will only apply to the heating oil boiler and not to the tank (as the latter is already subject to legal obligations connected with the environmental permit or where there is a suspicion of soil pollution, both for the residential sector and for the service sector). • In order to meet the Energy Pact objective of phasing out heating oil, a ban on installing new <u>heating oil</u> boilers is due to enter into force in 2025, at which point the incentive will no longer be available. • With regard to <u>coal</u>, a ban on installing new coal-fired boilers is due to enter into force in 2021. **2. <u>Extension of the scope of energy incentives for air-to-air heat pumps</u>** Air-to-air heat pumps offer good potential in the urban context: they are easy to install, even in an apartment; they perform better in towns and cities (due to the higher temperatures in urban environments), and they can be easily installed on roofs or façades. An initial measure is therefore to include air-to-air heat pumps in the energy incentive scheme. However, this incentive will depend on achieving a minimum theoretical performance level with the pump, having the air-to-air heat pump installed by a certified installer, and having a minimum level of insulation in the building envelope (EPB level). It will be available to both the residential sector and the service sector. In addition to heat, some heat pumps can also produce cooling in summer. Such heat pumps are currently excluded from the incentive scheme. As the insulation levels of buildings increase, and as predicted temperatures rise, the production of cooling will become increasingly important. It is therefore also proposed to include this type of heat pump in the energy incentive scheme, in the medium term and subject to conditions.

<table>
<tr><td></td><td colspan="2">3. <u>Reinforcement of the support for heat pumps</u>

The ‘heat pump’ support will offer the general public free expertise on heat pumps, allowing those wanting to move away from fossil fuels to obtain reliable information on an alternative. Heat pumps are not as well recognised as other heating systems and other renewable technologies such as photovoltaics, although they are an important solution for well-insulated buildings.

The support will help the target audience with choosing the most appropriate heat pump technology and its sizing, with the regulations that must be observed, with existing incentives and choosing an installer, and so on.

4. <u>Ban on installing new wood-fired boilers</u>

This measure primarily concerns the issue of air quality in Brussels. From 2021, the installation of new heating installations using wood or one of its derivatives will no longer be authorised.</td></tr>
<tr><td>Other stakeholders</td><td colspan="2">Homegrade and Réseau Habitat [Housing Network], Facilitateur Bâtiment Durable [Sustainable Building Facilitator]</td></tr>
<tr><td rowspan="4">Interim objectives</td><td>Period</td><td>Description</td></tr>
<tr><td>2019-2024 Objective</td><td>Introduction of incentives.</td></tr>
<tr><td>2030 Objective</td><td>Significant increase (by +X%) in the generation of renewable heat in the Brussels Capital Region.</td></tr>
<tr><td>2050 Objective</td><td>Fossil fuels (coal, heating oil and gas) no longer used to heat the Brussels building stock.</td></tr>
<tr><td>Interaction with other fiches</td><td colspan="2">Fiche No 7 - Revise the energy incentive mechanism

Fiche No 13 - Set up a one-stop-shop to support individuals

Fiche No 20 - Set up a one-stop-shop to support professionals</td></tr>
</table>

11.	Support the roll-out of renewable electricity in the Brussels Capital Region	
Category of measure	**Incentive, Support**	
Target audience(s)	All	
Type(s) of building concerned	All	
Objective of the measure	Roll out renewable energies in the Brussels Capital Region	
Description of the measure	Renewable electricity is currently assisted through green certificates. Photovoltaic panels are also being rolled out under the SolarClick support programme aimed at regional and local public authorities and other mechanisms funded by the Climate Fund that are in the process of being implemented. As explained in Fiche No 3 'Reinforce the exemplary role of public authorities', the possibility of extending this programme will be assessed at the end of the first implementation period. In addition to these measures, the roll-out of renewable electricity will be boosted by support and financial assistance for BIPV (Building-Integrated PhotoVoltaics). **1. <u>Develop better financial assistance for BIPV</u>** BIPV is a photovoltaic technology that is integrated into buildings. It replaces conventional construction materials and generates energy while playing the various roles of the materials replaced (sealing, insulation, solar protection, aesthetics, etc.). It therefore takes full advantage of the solar potential of a building (façades and building elements), which is even more relevant in an urban context where the height of certain buildings has been favoured over their footprint. BIPV also fully integrates into more complex architectures and designs, which conventional photovoltaics do not. At the point of investment, BIPV always costs more than the construction materials that it replaces, but it does become cost-effective after a few years. For all these reasons, it seems advisable to develop a financial assistance mechanism for this technology, possibly as part of the green certificate scheme. This financial assistance could be boosted by granting a larger number of green certificates for the renewable electricity generated by BIPV. **2. <u>Improve the support for BIPV</u>** BIPV is also an important technology for certain heritage buildings because it replaces construction materials while offering design characteristics that photovoltaics do not have. BIPV has more potential and could be included in many urban development projects. Improving support will allow this technology to be better promoted to the general public and will help beneficiaries to choose the appropriate BIPV (in replacement for any construction materials, etc.).	
Other stakeholders	BUP, Homegrade, Facilitateur Bâtiment Durable [Sustainable Building Facilitator], Brugel [Brussels energy market regulator]	
Interim objectives	**Period**	**Description**

	Strategy Period 1 (2019-2024)	A legal framework is developed to increase the number of BIPV installations in the Brussels Capital Region.
	2030 Objective	BIPV significantly contribute to the objective of generating [500 GWh] of renewable electricity and heat in the Brussels Capital Region.
	2050 Objective	BIPV significantly contribute to achieving an 80% reduction in greenhouse gas emissions compared to 1990.
Prior measures – Regional Air, Climate and Energy Plan (PACE) measures	N/A	
Interaction with other fiches	Fiche No 3 - Reinforce the exemplary role of public authorities Fiche No 13 - Set up a one-stop-shop to support individuals Fiche No 20 - Set up a one-stop-shop to support professionals	

III. SUPPORT FOR VARIOUS TARGET AUDIENCES

12.	Exploit the decision-making factors involved in renovation	
Category of measure	**Incentive**	
Target audience(s)	Individuals & professionals	
Type(s) of building concerned	All	
Objective of the measure	Exploit the decision-making factors leading to renovation work being carried out	
Description of the measure	Bruxelles Environnement generally promotes renovation using technical and economic arguments. However, it is accepted that such arguments are not always sufficient to convince people to undertake a renovation process. Bruxelles Environnement therefore wants to adapt its existing tools to this situation and possibly introduce new tools in order to encourage individuals and professionals to undertake an extensive renovation process, based on a careful and rigorous analysis of the decision-making levers and target audiences.	
Other stakeholders	Homegrade and Réseau Habitat [Housing Network], Facilitateur Bâtiment Durable [Sustainable Building Facilitator]	
Interim objectives	**Period**	**Description**
	Strategy Period 1 (2019-2024)	Existing tools are audited and adapted and new tools are introduced to encourage renovation.
	2030 Objective	The rate of use of the various tools is significantly increased.
	2050 Objective	
Prior measures – Regional Air, Climate and Energy Plan (PACE) measures	N/A	
Interaction with other fiches	All	

13.	Set up a one-stop-shop to support individuals
Category of measure	**Support**
Target audience(s)	Individuals (owners and occupiers)
Type(s) of building concerned	Residential buildings (single-family buildings and small jointly owned buildings)
Objectives of the measure	1. **Boost the (sustainable) renovation** of Brussels housing by informing residents of the challenges, advantages and potential involved in renovating their housing, by explaining all the stages and prerequisites of a coherent and energy-efficient renovation process, and by offering a range of support services intended to facilitate the client's journey through this process. 2. **Generalise responsible behaviour** in terms of the rational use of natural resources (in particular energy resources), especially in the context of using housing.
Description of the measure	Individuals are currently supported in their sustainable renovations by Homegrade and the Réseau Habitat [Housing Network]. This support can be increased in particular by building on the strengths of current regional operators. In order to achieve the regional objectives in terms of reducing the environmental impact of buildings, this support must be significantly increased. This will involve two main elements: supporting the sustainable renovation of housing, and raising awareness of the rational use of energy in housing. **1. <u>Supporting the sustainable renovation process</u>** The first aim of the support services is to facilitate the process for individual clients. A One-Stop-Shop (OSS) will be set up, within which individuals can obtain full information and carry out all the administrative and technical steps required for their project. This OSS will offer a range of services responding to the main issues and problems that a client may encounter during a renovation process, in particular: a. Information service: - advantages of a renovation (increased comfort, added value, savings, etc.); - regulatory aspects (planning, housing, EPB, etc.); - technical aspects ('roadmap': level of ambition and consistency with regional policy, best practices, etc.); - financial help (incentives, pre-financing, taxation, etc.); - energy and climate policy and regional ambition; - indoor air pollution, etc. b. Support services: These will be provided by Homegrade and/or the Réseau Habitat depending on the specific nature of their services. - diagnosis and/or roadmap produced by an architect: home visit (advice on renovation, attention paid to indoor air pollution, etc.); - business plan assistance (renovation budget, priorities and funding);

	- administrative assistance (planning, incentives, etc.); - structuring of the work request (writing of specifications); - identification and selection of a contractor (via a contractor search database/website and a comparative analysis of quotations); - supervision of work (by an architect); - technical and legal assistance, particularly in the event of a dispute; - acceptance of work (in connection with an EPB certificate); - support for the renovation of (small) jointly owned buildings; - identification of temporary rehousing solutions. c. 'Marketing' services: The support services will pro-actively conduct specific campaigns aimed at informing people about themselves and offering their services, particularly their 'all-inclusive' renovation services (by assuming the project management of the renovation). d. 'Collective projects' service: This service will support the organisation of 'grouped renovations' by block or district in order to reduce the support and project management costs. Building trust between these services and the population is vital to their success. The support services must therefore convince people of the quality of their services, their availability, their impartiality and their closeness. Providing 'local contacts' who are close to (but independent from) the local planning services will meet this last criterion. These contacts will particularly rely on the current Réseau Habitat. At regional level, a 'coordinating entity' based around Homegrade will manage the expertise, share experiences, analyse trends and undertake a process of continuous improvement. This coordinating entity will organise the information flows, make recommendations, provide feedback to the supervisory authorities and ensure the quality of the services. The information services will be free of charge. The price of the support services will depend on their nature, but the support must be accessible to vulnerable households (through '*pro deo*' architects, for example). **2. <u>Supporting the use of buildings</u>** This support involves informing people about 'best practices' within a building, and can take the following forms: - 'Rational Use of Energy' home visits (e.g. setting of thermostats, ventilation, etc.); - energy information events; - awareness-raising campaigns; - entertainment during public events (games, workshops, fun activities, etc.); - support for users of buildings with high energy-efficiency performance. The definition of objectives, priorities and indicators will allow changes in attitude to be measured and actions to be adapted to the defined priorities and target audiences.
Other stakeholders	Bruxelles Urbanisme et Patrimoine (BUP) [Brussels public planning and heritage service], Homegrade, Réseau Habitat [Housing Network], construction professionals (architects,

<table>
<tr><td></td><td colspan="2">contractors, training centres, etc.), funding/credit agencies, (future) private partners offering similar or associated services (estate agencies, training organisations, etc.).</td></tr>
<tr><td rowspan="4">Interim objectives</td><td>Period</td><td>Description</td></tr>
<tr><td>Strategy Period 1 (2019-2024)</td><td>15% of housing provided with support.</td></tr>
<tr><td>2030 Objective</td><td>30% of housing provided with support.</td></tr>
<tr><td>2050 Objective</td><td>90% of housing provided with support.</td></tr>
<tr><td>Prior measures – Regional Air, Climate and Energy Plan (PACE) measures</td><td colspan="2">Measure 14 - Consolidate the pro-active support for individuals via the Maison de l’énergie in cooperation with other actors on the ground</td></tr>
<tr><td>Interaction with other fiches</td><td colspan="2">Fiche No 1 - Strengthen energy performance requirements and obligations for buildings
Fiche No 2 - Establish sustainability requirements and obligations for buildings
Fiche No 5 - Develop innovative funding mechanisms
Fiche No 6 - Create tax incentives to encourage the energy renovation of the housing stock
Fiche No 7 - Revise the energy incentive mechanism
Fiche No 12 - Exploit the decision-making factors involved in renovation
Fiche No 14 - Create a roadmap for residential buildings
Fiche No 15 - Grasp the opportunities to improve the energy performance of buildings that arise at key moments in the life of a building and its inhabitants
Fiche No 16 - Support community cooperatives and initiatives
Fiche No 22 - Support jointly owned buildings
Fiche No 26 - Create a housing passport
Fiche No 27 - Simplify the energy-efficiency regulations for buildings</td></tr>
</table>

14.	Create a roadmap for residential buildings
Category of measure	**Regulation**
Target audience(s)	Owner-occupiers and landlords
Type(s) of building concerned	Residential buildings
Objective of the measure	Clarify and explain the steps needed to meet the requirements imposed
Description of the measure	In order to provide owners with clear and relevant information on the renovation process needed to achieve the minimum performance level required by 2050 (see Fiche on requirements and obligations), a tool will be created: the roadmap. This will consist of two parts: - an EPB certificate 3.0; - a renovation plan. **1. <u>An EPB certificate for all</u>** All owners, regardless of any transaction, will have to complete the certification process 3.0. The aim will not be to make three recommendations as with the current certification, but to indicate the technical measures to be implemented in order to achieve the overall energy performance objective set (by type) by the Brussels Capital Region as part of the renovation strategy. This certification 3.0 will also provide the opportunity to establish an integrated EPB calculation method (which will end the distinction between 'EPB work' and 'EPB certificate' methods). In the longer term, the certification will incorporate broader criteria than energy efficiency associated with the sustainability of buildings, in particular acoustic considerations (see Fiche No 2 'Establish sustainability requirements and obligations for buildings'). **2. <u>Mandatory renovation plan in the case of planning permission</u>** In addition to the certificate 3.0, a renovation plan will be produced for the work and will be mandatory in the case of planning permission requiring the assistance of an architect. This will also be promoted as part of the support for individuals in order to ensure the energy consistency of the work, even if planning permission is not required. The renovation plan will be based on the certificate 3.0 referred to above and will be in line with the requirements set out in Fiche No 1 'Strengthen energy performance requirements and obligations for buildings'. Produced with a building professional authorised to draw up such renovation plans, it will cover the actual context of the building. The renovation plan will be produced in two main stages and will contain the following. - The **initial diagnosis:** it will be vital to have an accurate diagnosis before the work is started. This diagnosis will comprise five parts, namely:

1. an audit of the building's physical condition;
2. a study of the urban/heritage dimension;
3. an analysis of the energy dimension;
4. an analysis of other environmental components, such as acoustics;
5. an assessment of the building's actual use at the time when the diagnosis is made.

- A **list of work** to be carried out in the long term. This will comprise all the work that, starting from the building's initial performance, will allow the performance objective set for the building to be achieved (see Section 1). The renovation plan must also incorporate the client's wishes and renovation project, as well as the information obtained from the building's diagnosis (stage 1). If, during the initial diagnosis, asbestos is detected in the building, the plan will include specific recommendations in this respect and will set out the rules to be followed where this asbestos is to be removed.

The renovation plan will propose a comprehensive or sequential approach.

A comprehensive renovation, which comprises all the work needed to achieve the set energy objectives, will always be favoured. It is the most efficient solution in energy and economic terms, and is generally more reliable for achieving the objectives.

However, a programme of work in stages (phased renovation) may also be proposed if this is what the client wants. This type of staggered programme must therefore take account of the service life of the various building elements and equipment. A phased renovation process allows the investments to be spread out over time, while achieving the required energy performance within the building's life cycle. In this scenario, the renovation plan will take particular account of the lock-in risks. Successive limited renovations that are carried out without a comprehensive view of the building's improvement must be prevented from having a lock-in effect, thereby preventing a long-term objective consistent with the Region's objectives from being achieved. The premature installation of renewable energy generation measures must also be avoided.

The programme of work will be accompanied by a financial study covering the cost of the work, the client's financial capacity and the financial aid that can be claimed.

The renovation plan will be produced by an architect. As indicated above, if planning permission is not needed for the work, the support service for individuals will provide an architect where this is requested by clients. This assistance is particularly important as an architect can provide perspective on the figures in the certificate in the light of the information obtained on the actual occupation of the housing.

In recommending a programme of work, an architect can raise awareness of, and suggest action on, the following aspects:

- *energy considerations*: reduction of energy consumption and in particular the difference between the energy performance achieved under the personalised renovation plan and the energy performance objective set by the Brussels Capital Region;

<table>
<tr><td></td><td colspan="2">- well-being of occupants: increase in thermal comfort (in winter and in summer) and acoustic comfort, indoor air quality and associated health aspects;
- economic aspects: improvement of the overall quality of the client's property, possibly including an estimate of the 'green value' that increases the property value after renovation, consideration of the investment capacity and provision of information on financial support instruments, reduction of energy bills, study of the phasing of renovation work, etc.;
- other subjects such as accessibility (the elderly, people with reduced mobility), adaptability of the housing, and fit between how the building functions following renovation and users' demands and behaviour.
The certificate 3.0 and the renovation plan will form part of the passport for each housing unit.</td></tr>
<tr><td>Other stakeholders</td><td colspan="2">Bruxelles Urbanisme et Patrimoine (BUP) [Brussels public planning and heritage service], Homegrade and Réseau Habitat [Housing Network], architects</td></tr>
<tr><td rowspan="5">Interim objectives</td><td>Period</td><td>Description</td></tr>
<tr><td>Strategy Period 1 (2019-2024)</td><td>Introduction of the certificate 3.0.</td></tr>
<tr><td>2024-2030 Period</td><td>A certificate 3.0 is required for everyone.
Mandatory renovation plan in the case of planning permission.</td></tr>
<tr><td>From 2030</td><td>Sustainability criteria are included in the certificate 3.0 and renovation plan.</td></tr>
<tr><td>From 2040</td><td></td></tr>
<tr><td>Prior measures – Regional Air, Climate and Energy Plan (PACE) measures</td><td colspan="2">N/A</td></tr>
<tr><td>Interaction with other fiches</td><td colspan="2">Fiche No 1 - Strengthen energy performance requirements and obligations for buildings
Fiche No 2 - Establish sustainability requirements and obligations for buildings
Fiche No 13 - Set up a one-stop-shop to support individuals
Fiche No 26 - Create a housing passport</td></tr>
</table>

15.	Grasp the opportunities to improve the energy performance of buildings that arise at key moments in the life of a building and its inhabitants
Category of measure	**Support, Communication, Awareness-raising, Training, Funding, Regulation**
Target audience(s)	Individuals
Type(s) of building concerned	Residential buildings
Objective of the measure	Prompt the decision to renovate a building at key moments in the life of the building and its inhabitants; encourage individuals to consider improving the energy performance of the building during any renovation project undertaken for reasons other than energy efficiency.
Description of the measure	The aim of this measure is to encourage individuals to grasp the various opportunities and key moments that arise in order to comprehensively renovate their building or include energy efficiency work in their renovation projects undertaken for other reasons. It is vital to raise the target public's awareness of these opportunities as far ahead as possible so that they can plan this work – particularly in financial terms – and undertake a coherent and robust renovation project. The measure also aims to utilise relays who can distil the appropriate information on sustainability and support for individuals at the time of renovations. This measure consists of various priorities that each involve a number of actions. **1. <u>Awareness-raising/communication/training priority</u>** • Make the various stakeholders involved at these key moments, such as those interacting with the target audience (notaries, architects, insurers, banks, etc.), aware of the challenges involved in the Brussels renovation strategy and of the importance, in societal, environmental and commercial terms, of convincing households to improve the energy efficiency of their housing by grasping these opportunities. • Provide them with the tools and training needed so that they can fully play this information and awareness-raising role. **2. <u>Funding priority</u>** • Establish a clear link between these key moments (purchase, inheritance) and the various funding mechanisms and property taxation so that the funds needed for energy performance improvement work can be mobilised. • Introduce 'lifetime comfort' contracts where energy-saving work is jointly planned by the occupant and the owner, and carried out during the senior citizen's lifetime. **3. <u>Regulatory priority</u>** Examine whether it is necessary/appropriate for professionals (notaries, insurers, banks) to be placed under an information obligation in order to implement the awareness-

<table>
<tr><td></td><td colspan="2">raising/communication priority, and introduce such an obligation if it is considered necessary.</td></tr>
<tr><td>Other stakeholders</td><td colspan="2">Insurers, banks, notaries, estate agencies</td></tr>
<tr><td rowspan="4">Interim objectives</td><td>Period</td><td>Description</td></tr>
<tr><td>Strategy Period 1 (2019-2024)</td><td>All stakeholders involved at these key moments, such as those interacting with the target audience, must play an active role in terms of informing and raising the awareness of this audience ahead of the key moments identified above, in order to convince individuals to improve the energy efficiency of their housing by grasping these opportunities</td></tr>
<tr><td>2030 Objective</td><td>Energy improvements/renovations of buildings are increased at the key moments identified above using the tools provided to the relays.</td></tr>
<tr><td>2050 Objective</td><td>Systematic energy improvements/renovations of buildings are carried out at the key moments identified above.</td></tr>
<tr><td>Prior measures – Regional Air, Climate and Energy Plan (PACE) measures</td><td colspan="2">N/A</td></tr>
<tr><td>Interaction with other fiches</td><td colspan="2">Fiche No 5 - Develop innovative funding mechanisms
Fiche No 6 - Create tax incentives to encourage the energy renovation of the housing stock
Fiche No 13 - Set up a one-stop-shop to support individuals
Fiche No 20 - Set up a one-stop-shop to support professionals
Fiche No 25 - Create a communication campaign on the environmental impact reduction strategy and a sustainable renovation toolbox
Fiche No 24 - Train professionals</td></tr>
</table>

16.	Support community cooperatives and initiatives
Category of measure	**Support, Funding**
Target audience(s)	Individuals & professionals
Type(s) of building concerned	Residential buildings
Objective of the measure	Foster/encourage/support community initiatives in order to boost the sustainable renovation sector
Description of the measure	Given the emergence of initiatives such as grouped purchasing, maker networks, DIY and cooperatives, the advisability of the following measures will be analysed: **1. <u>Support for community sustainable renovation initiatives</u>** a. Support for the organisation of grouped purchasing of sustainable work or sustainable materials: Bruxelles Environnement can offer financial aid for a purchasing manager, support via Homegrade, etc. b. Personalised sustainable renovation support by district (minimum of five homes) and associated financial support: this subsidy would supplement other existing aid. c. Granting of financial aid for supported self-renovation by district and sharing of tools (training, charge for the rental of tools, etc. or support via Homegrade or the Réseau Habitat [Housing Network]). d. Organisation of events concerning the rational use of energy in a building and, more broadly, the use of a sustainable building. **2. <u>Support for community initiatives in the renewable energy sector</u>** Following a pilot project intended to test collective self-consumption in a multi-family building, and if this pilot project proves successful, a legislative framework on collective self-consumption will be introduced to allow the redistribution of energy generated using collective installations in housing. The issue of funding community energy efficiency and renewable energy initiatives is already being studied. **3. <u>Support for cooperatives in the sustainable renovation sector</u>** Support for cooperatives in the Brussels Capital Region is centrally provided by the organisation COOPCITY (http://coopcity.be/), with the participation of hub.brussels and Innoviris. To overcome the lack of financial and human resources that often characterises this type of initiative, Bruxelles Environnement wants to strengthen this support by assisting these cooperatives through the regional support services for individuals and professionals active in the renovation sector (Homegrade, Facilitateurs, etc.). This strengthening of support is also mentioned in Fiche No 13 'Set up a one-stop-shop to support individuals', through the 'Collective projects' service.

	Bruxelles Environnement will also develop a model energy performance contract to be concluded by third-party investors and clients.	
Other stakeholders	Bruxelles Environnement, COOPCITY, Innoviris, hub.brussels	
Interim objectives	**Period**	**Description**
	Strategy Period 1 (2019-2024)	Community initiatives involving sustainable renovation or the installation of RES systems benefit from specific support.
	2030 Objective	Cooperatives benefit from funding mechanisms.
	2050 Objective	
Prior measures – Regional Air, Climate and Energy Plan (PACE) measures	Measure 7 - Study and promote the establishment of alternative funding systems (and in particular Action 18 - Unblock community savings). Measure 45 - Promote community participation and a cross-cutting approach Measure 62 - Cushion the short-term effects of fuel poverty (Action 162 - Support community initiatives involving joint energy purchasing)	
Interaction with other fiches	Fiche No 5 - Develop innovative funding mechanisms Fiche No 7 - Revise the energy incentive mechanism Fiche No 17 - Raise awareness of how to sustainably occupy residential buildings	

17.	Raise awareness of how to sustainably occupy residential buildings
Category of measure	**Support**
Target audience(s)	All
Type(s) of building concerned	Residential buildings
Objective of the measure	1. Support the occupation of high environmental performance buildings in order to, firstly, meet the comfort needs of their occupants and, secondly, allow these buildings to achieve their optimum performance level. 2. More generally, raise everyone's awareness of how the way that they occupy a building impacts on their energy consumption, regardless of the building's energy performance.
Description of the measure	The measure has two parts: (1) actions specifically aimed at high environmental performance (HEP) buildings; and (2) an action more broadly concerning the occupation of buildings. **1. <u>HEP residential buildings</u>** Two important findings justify the measure: (1) there is a sometimes significant difference between actual consumption and theoretical consumption; (2) inappropriate use of technologies installed in an HEP building can adversely affect the health of its occupants. (a) <u>Increase the resources of experienced operators on the ground that propose methods to support HEP housing</u> Through subsidies, the Region will support experienced associations on the ground that develop methods to support users of HEP housing, such as the Réseau Habitat [Housing Network]. Support for HEP buildings requires actions throughout the renovation process in order to empower inhabitants and make them aware of the rational use of energy. A relay will be established between these associations and designers/builders through the coordination role played by Bruxelles Environnement. The expertise and tools currently provided by the Réseau Habitat, which are mainly used for regional public housing, will be made available to all stakeholders (opensource). Following an assessment, the Réseau Habitat may be given the role of 'bridge' to other stakeholders such as municipalities, public social assistance centres, housing associations or social housing agencies, or even the private sector. Following this 'pilot' period supported by the Region, an independent support structure may be considered. (b) <u>Create a 'usage' exchange platform coordinated by Bruxelles Environnement</u> A network of stakeholders – designers, contractors, developers, managers, operators on the ground, support workers and users – will be formed to ensure that information on the occupation of buildings is circulated and shared and that, in the long term, the design of buildings is improved. This action has two parts:

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Create a ‘usage’ exchange platform to be coordinated by BE: in this context, BE will assume the role of contact point for professionals and will therefore act as a relay to the construction sector, Facilitateurs, CSTC [Scientific and Technical Construction Centre], CNC [National Construction Confederation], etc. BE will also share knowledge through public events and tools (BATIBOUW [trade fair for construction, renovation and home improvement], Salon de l’énergie [energy trade fair], Salon de la copropriété [trade fair for jointly owned buildings], etc.). This platform will also be a forum for discussions on the ‘regulation of usage’, particularly in HEP housing (e.g. obligation to maintain ventilation systems, as is currently the case with heating systems).
Organise seminars and exchanges with existing training structures: specific interactive training intended for professionals, and awareness-raising or training events for people in contact with users of HEP buildings (managers, local authority staff, public social assistance centres, etc.).

2. <u>All residential buildings</u>

In addition to supporting individuals to ensure their rational use of energy (see Fiche No 13 ‘Set up a one-stop-shop to support individuals’), the advisability of developing a scale of actual consumption based on energy bills will be examined so that occupants can see where they sit in relation to the average and make the necessary efforts to lead a more energy-efficient life. Energy information events and awareness-raising actions in relation to the rational use of energy already exist and will be maintained.

To start with, the following information will be added to energy bills:

regional average consumption, as occurs with water consumption, so that people can see where they sit in relation to this average;
monitoring of monthly consumption, with a warning system as well.

</td></tr>
<tr><td>Other stakeholders</td><td>
(1) Professional networks: architects, design offices, contractors (CCBC [Brussels Capital Construction Confederation], Ecobuild Cluster), CSTC, training centres, BE guides, PMP, Ceraa, Brugel, Sibelga and energy providers

(2) Associative networks: Réseau Habitat [Housing Network], Homegrade, tenants’ association, owners

(3) Public: individual occupiers
</td></tr>
<tr><td>Interim objectives</td><td>
<table>
<tr><th>Period</th><th>Description</th></tr>
<tr><td>Strategy Period 1 (2019-2024)</td><td>Associations that invest in support for public HEP buildings are subsidised. A support service for the use of public HEP buildings is potentially set up.

The ‘usage’ exchange platform within BE, which is responsible for coordinating initiatives and relaying information, is created and goes live. Biennial meetings between stakeholders are organised.</td></tr>
<tr><td>2030 Objective</td><td>BE training and regulations take more account of usage.</td></tr>
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</td></tr>
</table>

		Measures aimed at raising awareness of usage and involving the training sector in the field of construction (CDR Construction, CSTC, Réseau enseignement qualifiant [Vocational training network], etc.) are implemented. Regulatory measures, practices and new standards incorporating usage are adopted.
	2050 Objective	The average actual consumption of the residential stock is less than its theoretical consumption (as set by the Fiche on energy performance requirements and obligations).
Prior measures – Regional Air, Climate and Energy Plan (PACE) measures	N/A	
Interaction with other fiches	Fiche No 13 - Set up a one-stop-shop to support individuals Fiche No 20 - Set up a one-stop-shop to support professionals Fiche No 25 - Create a communication campaign on the environmental impact reduction strategy and a sustainable renovation toolbox	

18.	Support assisted sustainable self-renovations	
Category of measure	**Support**	
Target audience(s)	Individuals	
Type(s) of building concerned	Residential buildings	
Objective of the measure	Support individual owners who want to carry out sustainable self-renovations	
Description of the measure	The precise number of self-renovations is not known, but this practice is fairly widespread. Participative projects are also growing in popularity as they allow good procedures to be exchanged: a willing and voluntary workforce in exchange for experience acquired on these projects. These practices may offer part of the answer to the considerable need for renovation funding and to the financial limitations faced by many households. Self-renovations can take various forms depending on the roles assigned to the owner and the professional assisting the project. The quantity and quality of self-renovations is not currently assessed. 1. The first action will therefore be to study this practice in collaboration with stakeholders. 2. Depending on the study's findings, the subsequent actions will aim to ensure the energy consistency of work carried out through an 'assisted self-renovation': • develop the tools needed to assist these owners; • train contractors in this new position of project assistant; • where necessary, provide adequate financial support for certain energy-saving work carried out with appropriate technical support (contractor, another construction professional, specific non-profit association) by adapting the energy incentive system.	
Other stakeholders	Homegrade, Réseau Habitat [Housing Network], CCBC [Brussels Capital Construction Confederation], CDR Construction	
Interim objectives	**Period**	**Description**
	Strategy Period 1 (2019-2024)	Tools (workshops, legal tools, etc.) are offered to individuals who want to carry out an assisted self-renovation.
	2030 Objective	A network of assisted self-renovation stakeholders becomes operational.
	2050 Objective	
Prior measures – Regional Air, Climate	N/A	

and Energy Plan (PACE) measures	
Interaction with other fiches	Fiche No 1 - Strengthen energy performance requirements and obligations for buildings Fiche No 2 - Establish sustainability requirements and obligations for buildings Fiche No 7 - Revise the energy incentive mechanism Fiche No 9 - Grasp the funding opportunities offered by European programmes Fiche No 13 - Set up a one-stop-shop to support individuals Fiche No 16 - Support community cooperatives and initiatives

19.	Take account of the health aspect in buildings
Category of measure	**Support, Communication, Regulation**
Target audience(s)	All
Type(s) of building concerned	Residential buildings
Objective of the measure	Raise awareness of the impact of using construction products and materials that are too polluting
Description of the measure	Time spent in enclosed spaces – on average 70-90% of our time (whether at home, at work, in places of education, on means of transport, etc.) – is a public health concern. Contamination problems, where identified, can be linked to the buildings themselves (materials containing toxic products, insufficient ventilation, etc.), their occupation (inappropriate behaviour, insufficient ventilation, etc.) or a combination of these factors. **1. <u>Facilitate access to information on indoor air quality</u>** In order to provide everyone with information on health issues in buildings, the following actions will be taken: • Distribution of information aimed at ensuring that indoor air quality and its health impacts, particularly on the vulnerable (young children, etc.), are taken into account right from the start of a renovation project; materials and products that have a label guaranteeing a low emission of pollutants will in particular be publicised. • Reinforcement of advice on the issue of indoor air quality in measures to support individuals and construction professionals. • Promotion and improvement of the 'health' part of the Guide Bâtiment Durable [Sustainable Building Guide]. • Analysis of training programmes and tools available for construction professionals. • Update and enhancement of existing tools (e.g. SQuATte tool [used by doctors to identify any links between a health problem and indoor air pollution], ventilation, etc.). • Provision of an online tool for the general public to self-diagnose indoor air quality in housing, as is proposed in France. • Promotion of visits by the CRIPI [Regional indoor air pollution unit] at the request of a doctor and radon screening. **2. <u>Regulate the use of high-polluting materials and products</u>** • Assessment of the adoption of regulations for public authorities on the use of materials and products with a label guaranteeing a low emission of chemical pollutants, by including them in the technical clauses of appropriate specifications

<table>
<tr><td></td><td colspan="2">(see Fiche No 32 ‘Promote and develop technical tools for the sustainability assessment of buildings’).
• Extension of the scope of the central purchasing body set up for Brussels public authorities in order to facilitate access to low-polluting products/materials.
• Assessment of the EPB regulations to determine the correspondence between their ventilation obligations and indoor air quality, and, where applicable, amendment of these regulations (see Fiche No 1 ‘Strengthen energy performance requirements and obligations for buildings’).</td></tr>
<tr><td>Other stakeholders</td><td colspan="2">People in charge of renovating social housing (social housing associations, municipalities, public social assistance centres), Homegrade, Réseau Habitat [Housing Network], Inspection Régionale du Logement [Regional Housing Inspectorate]</td></tr>
<tr><td rowspan="4">Interim objectives</td><td>Period</td><td>Description</td></tr>
<tr><td>Strategy Period 1 (2019-2024)</td><td>All stakeholders involved at key moments play an active role in terms of informing and raising the awareness of the public in order to highlight the link between buildings and health and convince the public of the advisability of renovating.</td></tr>
<tr><td>2030 Objective</td><td>Public authorities use renovation products/materials with a label guaranteeing a low emission of chemical pollutants.</td></tr>
<tr><td>2050 Objective</td><td>Any material used during a renovation is compatible with health aspects.
The indoor air quality of all buildings is guaranteed.</td></tr>
<tr><td>Prior measures – Regional Air, Climate and Energy Plan (PACE) measures</td><td colspan="2">Measure 52 - Improve air quality measures and monitoring
Measure 53 - Reinforce indoor air pollution diagnostic and remediation services
Measure 54 - Develop and ensure scientific and medical surveillance of the impact of air pollution on health
Measure 55 - Inform and raise the awareness of health and social work professionals
Measure 56 - Raise public awareness of the importance of good air quality</td></tr>
<tr><td>Interaction with other fiches</td><td colspan="2">Fiche No 1 - Strengthen energy performance requirements and obligations for buildings
Fiche No 2 - Establish sustainability requirements and obligations for buildings
Fiche No 3 - Reinforce the exemplary role of public authorities
Fiche No 13 - Set up a one-stop-shop to support individuals
Fiche No 15 - Grasp the opportunities to improve the energy performance of buildings that arise at key moments in the life of a building and its inhabitants
Fiche No 17 - Raise awareness of how to sustainably occupy residential buildings
Fiche No 20 - Set up a one-stop-shop to support professionals</td></tr>
</table>

	Fiche No 32 - Promote and develop technical tools for the sustainability assessment of buildings

20.	Set up a one-stop-shop to support professionals
Category of measure	**Support**
Target audience(s)	Developers, designers and building managers
Type(s) of building concerned	Service sector buildings and multi-family buildings
Objective of the measure	Offer an integrated facilitation service to all professionals and building managers in their process of sustainably renovating and improving the energy efficiency of their buildings.
Description of the measure	The Facilitateur Bâtiment Durable [Sustainable Building Facilitator] service offers ad hoc advice to developers and building managers and provides the information needed for their sustainable renovation projects. This service will be reinforced so that it becomes the single entry point to sustainable renovation (energy, water, mobility, acoustics, etc.). **1. <u>Reinforce the Facilitateur Bâtiment Durable service</u>** The target audience of the Facilitateur Bâtiment Durable service will be expanded to include joint owners and Pack Énergie [Energy Pack] federations (which are currently the non-market federations CBENM, UCM, Santhea and Comeos). The Facilitateur Bâtiment Durable service will incorporate the Facilitateur Copropriétés [Jointly Owned Building Facilitator] service and Pack Énergie advisers. The services provided and subjects covered by the Facilitateur will be extended to include the following: • assistance with, and analysis of, buildings via quick scans; • assistance with setting up renovation projects and developing business plans; • assistance with choosing and selecting innovative funding solutions; • assistance with drafting requests for proposals, analysing quotations and selecting contractors; • assistance with using and maintaining technical installations (facility manager), including monitoring of installations. The Facilitateur service will be equipped with a digital interactive interface aimed at clients in order to facilitate communication, data exchange and follow-up with the applicant. Specific tools will be developed and made available on a single interface dedicated to the sustainable renovation of buildings. These tools will particularly concern the following: • estimation of the costs of renovation work and services; • information on, and estimation of, financial incentives and pre-financing; • estimation of energy savings; • support for the development of innovative energy performance contracts, and also support to facilitate the use of ESCO services.

<table>
<tr><td></td><td colspan="2">2. <u>Develop marketing</u>

At the same time as developing the Facilitateur Bâtiment Durable service, active marketing needs to be carried out among Brussels professionals to encourage them to undertake a proper energy management process with regard to their buildings. This marketing must be carried out using other Bruxelles Environnement products such as solar mapping, energy incentives or energy performance certificates.</td></tr>
<tr><td>Other stakeholders</td><td colspan="2">Facilitateur Bâtiment Durable, Homegrade, Réseau Habitat [Housing Network], APERe [Association promoting renewable energies], hub.brussels, Bruxelles Urbanisme et Patrimoine (BUP) [Brussels public planning and heritage service], federations (UCM, Comeos, Santhea, CBENM, CCBC, etc.)</td></tr>
<tr><td rowspan="4">Interim objectives</td><td>Period</td><td>Description</td></tr>
<tr><td>Strategy Period 1 (2019-2024)</td><td>The one-stop-shop is set up.</td></tr>
<tr><td>2030 Objective</td><td>Calls on the services of the Facilitateur will have significantly increased.</td></tr>
<tr><td>2050 Objective</td><td>All professionals concerned use the Facilitateur Bâtiment Durable service to obtain support.</td></tr>
<tr><td>Prior measures – Regional Air, Climate and Energy Plan (PACE) measures</td><td colspan="2">Measure 15 - Consolidate the sustainable building support for developers and building managers</td></tr>
<tr><td>Interaction with other fiches</td><td colspan="2">Fiche No 1 - Strengthen energy performance requirements and obligations for buildings

Fiche No 2 - Establish sustainability requirements and obligations for buildings

Fiche No 21 - Support businesses/SMEs/shops

Fiche No 22 - Support jointly owned buildings

Fiche No 23 - Support municipalities

Fiche No 30 - Promote and develop the TOTEM technical tool for materials

Fiche No 31 - Promote and develop technical tools for the circular design of buildings

Fiche No 32 - Promote and develop technical tools for the sustainability assessment of buildings</td></tr>
</table>

21.	Support businesses/SMEs/shops
Category of measure	**Support**
Target audience(s)	SMEs/micro-enterprises, service sector
Type(s) of building concerned	Service sector buildings
Objective of the measure	Support businesses, SMEs and shops in their sustainable renovation and energy-saving processes
Description of the measure	The support for the service sector in terms of energy and sustainability is based on three main measures: **1. <u>Provision of energy advisers within business federations</u>** A sectoral approach has been adopted within the service sector through the 'Pack Énergie' [Energy Pack] project. This provides, within various federations, energy advisers who encourage energy efficiency and the development of an internal energy policy. Through a subsidy granted for four years, these energy advisers develop an awareness-raising policy, coaching programme and monitoring of specific investment measures to reduce energy consumption. The Pack Énergie project is currently helping to support energy advisers within the SME sector (UCM), non-market sector (CBENM), retail sector (Comeos) and healthcare sector (Santhea). The Pack Énergie project will be assessed by 2021 in order to determine: - the role and actions to be taken within sectors currently supported by the project; - the support measures needed to increase the renovation rate. The next call for projects will replace the energy advisers with renovation advisers. **2. <u>Consistency with the Facilitateur Bâtiment Durable [Sustainable Building Facilitator] service</u>** To ensure consistency between the Pack Énergie project and the support already provided through the Facilitateur Bâtiment Durable service, the current Pack Énergie advisers and those appointed following the second call for projects will become an integral part of the Facilitateur Bâtiment Durable service and will therefore use the same tools. The advisers to the various sectors will retain their independence in terms of communicating with their members (e.g. they will use their own graphic charts, but with the support of the Region). **3. <u>Label Entreprise Écodynamique [Ecodynamic Enterprise Label]</u>** The Label Entreprise Écodynamique already requires compliance with the EPB regulations for technical installations, and certificates for public buildings. Among other aspects, it promises good behaviour in terms of rational use of energy, green energy supplies and

<table>
<tr><td></td><td colspan="2">building insulation. It refers to guides and tools that can help businesses in their approaches, such as the Guide Bâtiment Durable [Sustainable Building Guide].

In the near future it will include an energy renovation criterion for buildings.

Energy renovation to achieve very high performance and, more generally, energy efficiency will therefore be further encouraged through the label. The energy advisers will be able to support businesses in their work to obtain this label.</td></tr>
<tr><td>Other stakeholders</td><td colspan="2">Facilitateur Bâtiment Durable, business federations</td></tr>
<tr><td rowspan="4">Interim objectives</td><td>Period</td><td>Description</td></tr>
<tr><td>Strategy Period 1 (2019-2024)</td><td>Second call for projects for the Pack Énergie, aimed at renovation</td></tr>
<tr><td>2030 Objective</td><td>Integrated vision of the Label Entreprise Écodynamique, Pack Énergie and EPB</td></tr>
<tr><td>2050 Objective</td><td></td></tr>
<tr><td>Prior measures – Regional Air, Climate and Energy Plan (PACE) measures</td><td colspan="2">Measure 15 - Consolidate the sustainable building support for developers and building managers

Measure 40 - Integrate good environmental practices within businesses</td></tr>
<tr><td>Interaction with other fiches</td><td colspan="2">Fiche No 1 - Strengthen energy performance requirements and obligations for buildings

Fiche No 2 - Establish sustainability requirements and obligations for buildings

Fiche No 5 - Develop innovative funding mechanisms

Fiche No 17 - Raise awareness of how to sustainably occupy residential buildings

Fiche No 20 - Set up a one-stop-shop to support professionals</td></tr>
</table>

22.	Support jointly owned buildings
Category of measure	**Support**
Target audience(s)	Joint owners (landlords and occupants), tenants in jointly owned buildings, property managers and building managers
Type(s) of building concerned	Residential buildings
Objective of the measure	Facilitate renovation processes in jointly owned buildings in Brussels
Description of the measure	To encourage the renovation of jointly owned buildings in the years ahead, an effective integrated service needs to be developed specifically for such buildings. **1. <u>Creation of a Facilitateur Copropriété [Jointly Owned Building Facilitator] service within the Facilitateur Bâtiment Durable [Sustainable Building Facilitator] service</u>** Existing services will be reinforced in particular by the creation of a Facilitateur Copropriété service, which will play a role at the key stages of a renovation process (choice of investments, acceptance of quotations, acceptance of work, etc.). This will be a multidisciplinary service (financial, legal, sociological, administrative, etc.). At each stage of the project, the service offer will be adapted to the precise needs (technical or administrative), while taking an overview of the renovation project. Existing tools will be adapted to the needs of joint owners (Homegrade calculator, model quotation, specification sheets, quick scans, audit checklists, model letters, specific guide on 'how to renovate a jointly owned building', etc.). This service will form an integral part of the Facilitateur Bâtiment Durable service and will also be accessible through Homegrade. The cooperation between Homegrade and the Facilitateur Bâtiment Durable service will therefore be reinforced so that there is an information flow between the two services, which will in particular allow joint owners to whom the Facilitateur could offer its advice to be identified. A specific web interface on the Bruxelles Environnement website may be established, which will provide joint owners with all the tools, products and services that they can use (see Fiche No 25 on the communication campaign and renovation toolbox). **2. <u>Communication campaigns</u>** More closely targeted communication campaigns will be launched, with the support of organisations and federations working with property managers and joint owners. These campaigns will particularly concern the following: • definition and clarification of the offer of the Facilitateur Bâtiment Durable service, including the Facilitateur Copropriété service; • development and promotion of the web interface.
Other stakeholders	Facilitateur Bâtiment Durable, Réseau Habitat [Housing Network], Homegrade, ABSA [Belgian association of property managers], UVS [Association of property managers], UFS [Association of property managers], SNPC [National association of owners and joint

	owners], easyCOPRO H2020, Bruxelles Logement, Ecobuild (Impulse), social housing agencies, etc.		
Interim objectives	**Period**	**Description**	
	Strategy Period 1 (2019-2024)	The Facilitateur Copropriété service is created.	
	2030 Objective	The Facilitateur Copropriété service is effective and supports at least 4% of jointly owned buildings per year. The collaboration with jointly owned building stakeholders is effective and flexible.	
	2050 Objective	Jointly owned buildings in Brussels are renovated.	
Prior measures – Regional Air, Climate and Energy Plan (PACE) measures	Measure 16 - Help joint owners to improve the energy efficiency of their buildings		
Interaction with other fiches	Fiche No 1 - Strengthen energy performance requirements and obligations for buildings Fiche No 2 - Establish sustainability requirements and obligations for buildings Fiche No 5 - Develop innovative funding mechanisms Fiche No 7 - Revise the energy incentive mechanism Fiche No 13 - Set up a one-stop-shop to support individuals Fiche No 20 - Set up a one-stop-shop to support professionals Fiche No 25 - Create a communication campaign on the environmental impact reduction strategy and a sustainable renovation toolbox		

23.	Support municipalities	
Category of measure	**Support**	
Target audience(s)	Municipalities	
Type(s) of building concerned	All	
Objective of the measure	Support municipalities with building renovation matters	
Description of the measure	In order to help municipalities to implement their local action plan for energy management (PLAGE), ensure consistency between the various support measures of municipalities (SolarClick, NRClick, network of EPB advisers, etc.) and encourage them to establish and implement an effective renovation strategy in their area, a municipality support network will be developed under the guidance of Bruxelles Environnement. This support will be split into two main parts: - support for municipalities in their work to renovate their own buildings; - support for local officials involved in planning permission procedures so that their skills are in line with the sustainability requirements (see Fiche No 2 'Establish sustainability requirements and obligations for buildings'). This network will allow: - information and best practices (procedures, methodologies, experimental results, new technologies, technical clauses, specifications, training, etc.) to be shared; - common needs in terms of tools or specific problems to be identified; - solutions to be proposed so that the potential energy savings and generation of renewable energy in buildings in the municipalities can be maximised; - municipalities to ensure their compliance with energy and climate measures taken by the regional authorities, through their consultation and clear, consistent and continual communication; - discussions to be held on the system of local incentives for buildings to ensure greater consistency with regional energy and sustainability objectives (see Fiche No 3 'Revise the energy incentive mechanism'). Consultations must be organised with municipalities to more clearly identify their needs. During this initial stage, the status of this new network will also need to be defined. These consultations will also provide the opportunity to discuss with municipalities the support role that they could play in the context of joint work by district.	
Other stakeholders	Municipalities, Brulocalis [Association supporting Brussels local authorities]	
Interim objectives	**Period**	**Description**

	Strategy Period 1 (2019-2024)	The joint network involving BE and the municipalities is created.
	2030 Objective	The municipalities and the region work together in a coordinated manner on the renovation of buildings.
	2050 Objective	
Prior measures – Regional Air, Climate and Energy Plan (PACE) measures	N/A	
Interaction with other fiches	Fiche No 1 - Strengthen energy performance requirements and obligations for buildings Fiche No 2 - Establish sustainability requirements and obligations for buildings Fiche No 3 - Reinforce the exemplary role of public authorities Fiche No 20 - Set up a one-stop-shop to support professionals	

24.	Train professionals
Category of measure	**Training**
Target audience(s)	Developers, designers and construction firms
Type(s) of building concerned	All
Objective of the measure	Train construction professionals in sustainable building
Description of the measure	Training for construction sector professionals who are active on the Brussels market, whether in terms of design or execution, must equip them with the necessary skills so that Brussels buildings are renovated in line with the environmental performance levels set by the Region. Professionals active on the Brussels market must therefore be able to access comprehensive and relevant training, acquire these skills right from the basic education level and maintain them throughout their career. **1. <u>Guide the content of basic construction training towards sustainable construction</u>** Basic construction training must allow every professional to acquire the skills base needed to understand sustainable renovation. In order to guide the curricula of this basic training, collaboration will be established with the French Community and the Flemish Community. The Facilitateur Formation [Training Facilitator] service will offer its technical skills in order to collaborate on adapting the content of courses intended for secondary vocational education and higher and university education students (architects, engineers, town planners, etc.) so that this content includes the new skills needed for sustainable construction/renovation. The Region has also set up a system of approval of professionals carrying out work covered by the regulations on the energy performance of buildings. The skills required for these approvals will be included in the training so that no additional training is needed to obtain these approvals. **2. <u>Adapt the curricula of continuing training</u>** Sustainable building technologies are constantly evolving, which means that, as well as adapting curricula, a continuing training offer incorporating these new technologies must be provided. Likewise, jobseekers must have access to the new skills required for sustainable renovation. Regular collaboration with the competent entities will therefore be established. Continuing training for the trainers will also be provided under this action. Collaboration with training operators (CDR Construction, CSTC [Scientific and Technical Construction Centre], CCBC [Brussels Capital Construction Confederation], etc.) will also be continued.

<table>
<tr><td></td><td colspan="2">3. <u>Provide information on the latest topics</u>
Professionals will be informed through a seminar offer, with the topics covering the latest technical and/or regulatory news and the Region’s sustainable renovation vision.</td></tr>
<tr><td>Other stakeholders</td><td colspan="2">Stakeholders and operators in education and training (French Community, Flemish Community, CDR Construction, Bruxelles Formation, EFPME, Actiris, architectural schools, universities, etc.)</td></tr>
<tr><td rowspan="4">Interim objectives</td><td>Period</td><td>Description</td></tr>
<tr><td>2024 Objective</td><td>Curricula for which the Region is responsible are adapted.</td></tr>
<tr><td>2030 Objective</td><td>The collaboration between the Region, the French Community and the Flemish Community is established.</td></tr>
<tr><td>2050 Objective</td><td>Training in the field of construction is consistent with the sustainable renovation vision of the Brussels Capital Region.</td></tr>
<tr><td>Regional Air, Climate and Energy Plan (PACE) measure</td><td colspan="2">Measure 19 - Reinforce sustainable building education and training</td></tr>
<tr><td>Interaction with other fiches</td><td colspan="2">Fiche No 1 - Strengthen energy performance requirements and obligations for buildings
Fiche No 2 - Establish sustainability requirements and obligations for buildings
Fiche No 20 - Set up a one-stop-shop to support professionals</td></tr>
</table>

<table>
<tr><th>25.</th><th colspan="2">Create a communication campaign on the environmental impact reduction strategy and a sustainable renovation toolbox</th></tr>
<tr><td>Category of measure</td><td colspan="2">Communication</td></tr>
<tr><td>Target audience(s)</td><td colspan="2">• Owners in the Brussels Capital Region (private and public sectors)
• Building professionals active in the Brussels Capital Region</td></tr>
<tr><td>Type(s) of building concerned</td><td colspan="2">All</td></tr>
<tr><td>Objective of the measure</td><td colspan="2">Communicate the objectives, requirements and actions forming part of the strategy to reduce the environmental impact of existing buildings. Promote tools intended for professionals and individuals.</td></tr>
<tr><td>Description of the measure</td><td colspan="2">The success of the measures adopted as part of the renovation strategy depends on specific and targeted communication campaigns with schedules adapted to the various measures.

In addition to these specific campaigns, the Region is keen to underline the fundamental importance of the strategy by developing a common thread between all the measures in order to reinforce the specific communication campaigns.

This ‘common thread’ campaign will be conducted over a period of four years, which will allow the campaign to have a real impact on the various target audiences. During this campaign, specific actions will be periodically highlighted, according to the identified needs. This campaign will also be regularly assessed.

As an extension to this campaign, the Bruxelles Environnement website will be adapted to include a ‘sustainable renovation toolbox’ (like the ‘ABC des démarches’ [ABC of Procedures] in the Walloon Region) in order to guide the various target audiences (individuals, joint owners, etc.) in the procedures that they need to complete (technical, financial, administrative, etc.). This sustainable renovation toolbox will include the necessary links to existing tools (Guide Bâtiment Durable [Sustainable Building Guide], TOTEM, etc.).</td></tr>
<tr><td>Other stakeholders</td><td colspan="2">Homegrade, Réseau Habitat [Housing Network], the 19 municipalities, organisations and federations of building professionals, regional authorities</td></tr>
<tr><td rowspan="4">Interim objectives</td><td>Period</td><td>Description</td></tr>
<tr><td>Strategy Period 1 (2019-2024)</td><td>Creation of an overarching campaign specifically for the strategy of renovating the Brussels building stock, including development of a logo specific to the strategy and the ambitions to renovate the building stock.

Creation of a sustainable renovation toolbox on the BE website.</td></tr>
<tr><td>2030 Objective</td><td rowspan="2">Adaptation of the renovation strategy communication campaigns to changes in the measures envisaged in this context.</td></tr>
<tr><td>2050 Objective</td></tr>
<tr><td>Prior measures – Regional Air, Climate</td><td colspan="2">NA</td></tr>
</table>

and Energy Plan (PACE) measures	
Interaction with other fiches	All the fiches

IV. ADMINISTRATIVE SIMPLIFICATION

26.	Create a housing passport
Category of measure	**Administrative Simplification**
Target audience(s)	Individuals
Type(s) of building concerned	Residential buildings
Objective of the measure	Simplify access to administrative documents for owners, authorities and other potential users such as building managers and professionals
Description of the measure	The **'housing passport' is a single digital platform** containing all the administrative and technical data (e.g. energy, soil pollution, etc.) of a building. It can be consulted by the owner (or people with authorisation, such as building professionals) and, depending on the documents, by the competent authority. It is intended to accompany the building throughout its life. The aim of this 'housing passport' is to simplify access to information on housing for both owners and authorities. The platform contains information on each housing unit, which can be accessed through the owner's user name or identity card. It may also contain links to a range of information on buildings and existing tools (incentives, planning permission/environmental permits, etc.). The passport is automatically created for each housing unit (as is the entry in the land register). It will be particularly useful on the occasion of property transactions (sale/purchase/inheritance/rental) or work (renovation, planning or permit applications, etc.) because each participant (e.g. notaries, building professionals) will be able to access the information on the housing unit, with the owner's consent. This platform can also be used to facilitate planning or permit applications, for example as a single entry point for the notification of work. In order to guarantee the authenticity of documents, a clear distinction will be made between documents validated by authorities and documents uploaded by the owner, architect or another participant. Multi-family buildings will have a building passport, which will be developed at a later date. The advisability of extending this tool to the service sector will be assessed. The passport offers several key benefits: - formal identification of a housing unit; - centralisation of all data and information on buildings (EPB certificate and roadmap, planning permission, environmental permit where applicable, soil certificate, land register data, etc.); - support with the correct use of the building (operating manual for the installations, periodic inspection certificates for the boiler, etc.). Eventually the passport will be used as a tool for checking certain administrative aspects, such as possession of an EPB certificate (or roadmap) during a transaction or the validity of maintenance certificates.

<table>
<tr><td></td><td colspan="2">The passport will also enable greater use of the building data and therefore improved targeting of measures and communications used by public authorities to achieve regional objectives.</td></tr>
<tr><td>Other stakeholders</td><td colspan="2">Bruxelles Urbanisme et Patrimoine (BUP) [Brussels public planning and heritage service], Land register: Bruxelles Fiscalité and SPF Finances [Federal Public Service for Finance] (heritage documentation), CIRB [Data Centre for the Brussels Capital Region]</td></tr>
<tr><td rowspan="4">Interim objectives</td><td>Period</td><td>Description</td></tr>
<tr><td>Strategy Period 1 (2019-2024)</td><td>Residential housing passport 1.0 – focus on energy.</td></tr>
<tr><td>2030 Objective</td><td>Residential housing passport X.0 – energy, environment.
Building passport (for multi-family buildings).
Non-residential passport 1.0 (if relevant).</td></tr>
<tr><td>2050 Objective</td><td>Every housing unit has a passport containing all the information on its technologies and use.
The housing passport is used as a single entry point for applications for incentives, planning permission, environmental permits, etc.</td></tr>
<tr><td>Prior measures – Regional Air, Climate and Energy Plan (PACE) measures</td><td colspan="2">N/A</td></tr>
<tr><td>Interaction with other fiches</td><td colspan="2">Fiche No 1 - Strengthen energy performance requirements and obligations for buildings
Fiche No 14 - Create a roadmap for residential buildings
Fiche No 27 - Simplify the energy-efficiency regulations for buildings
Fiche No 28 - Collect data and develop indicators</td></tr>
</table>

27.	Simplify the energy-efficiency regulations for buildings	
Category of measure	**Regulatory Simplification**	
Target audience(s)	All	
Type(s) of building concerned	All	
Objective of the measure	Modernise and simplify the existing legislative and regulatory arsenal	
Description of the measure	**1. <u>Set up an interinstitutional urban working group between BE/BUP/Municipalities</u>** Article 98 of the COBAT [Brussels Planning Code] determines which acts and work are subject to planning permission, to which the Decree of 13 November 2008 laying down the acts and work exempt from planning permission, approval by a planning official or involvement of an architect makes exceptions. The choice of work subject to planning permission does not currently take account of any potential difficulties in carrying out work or any health risks in the event of poor design. As a result, internal insulation does not need permission, although it generates more risks of moisture, condensation, mould and mechanical destruction of the bricks than external insulation. Furthermore, the conditions under which these acts and work are authorised are defined by the local and regional planning regulations. Certain rules of the Civil Code also define the constraints that apply to these acts and work (such as those in relation to party walls). These regulations and the Civil Code provisions are interpreted in different ways by local officials. The working group will have the task of re-assessing the work subject to planning permission and proposing a revision of the aforementioned Decree of 13 November 2008 and of the planning regulations. It will also propose a uniform and pragmatic interpretation of the Civil Code rules on party walls. Lastly, it will look at how to improve the procedures under the regulations on the energy performance of buildings, particularly in terms of simple renovations being subject to a procedure similar to that applied to major renovations. **2. <u>Set up a single entry point</u>** - Access to a single platform indicating the administrative procedures to be completed. - Single platform for submitting the required documents (to avoid people having to provide information that is already known by another authority, as is often the case with work commencement notifications).	
Other stakeholders	Bruxelles Urbanisme et Patrimoine (BUP) [Brussels public planning and heritage service], Municipalities, Brulocalis [Association supporting Brussels local authorities], EasyBrussels [Administrative simplification agency], CIRB [Data Centre for the Brussels Capital Region]	
Interim objectives	**Period**	**Description**

	2019-2024	The local and regional planning regulations and the Decree of 1 January 1996 are revised to encourage the sustainable renovation of buildings. All authorities switch to paper-free processes.
	2030	A single platform is set up for submitting the documents required for planning permission applications.
	2050	
Prior measures – Regional Air, Climate and Energy Plan (PACE) measures	Measure 1 - Remove obstacles to certain work aimed at improving the energy efficiency of buildings	
Interaction with other fiches	Fiche No 1 - Strengthen energy performance requirements and obligations for buildings Fiche No 23 - Support municipalities Fiche No 26 - Create a housing passport	

V. DOCUMENT, EXPERIMENT, INNOVATE

28.	Collect data and develop indicators
Category of measure	**Documentation**
Target audience(s)	All
Type(s) of building concerned	All
Objective of the measure	Better document Brussels buildings in terms of condition, type, occupation profile and consumption, predict the impact of certain measures and monitor the strategy's measures by establishing relevant indicators
Description of the measure	**1. <u>In order to refine the measures planned for improving the condition of Brussels buildings and reducing their environmental impact, a number of additional data will be collected and analysed:</u>** - Precise data on the condition of the Brussels building stock in order to know the number of renovated buildings (including those having undergone a simple renovation) and the number of buildings in the various age and use types (jointly owned buildings/single-family houses/apartments, construction by type of architectural period, etc.). These data will be collected from energy performance certificates, which will become mandatory as indicated in Fiche No 1 'Strengthen energy performance requirements and obligations for buildings'. Useful data may also be obtained from the 2021 census. Furthermore, in the long term, the centralisation of all information on buildings (land register, planning permission, environmental permits where applicable, etc.) will provide a comprehensive and detailed view of the residential sector. - Precise data on the consumption of certain service sub-sectors through specific surveys conducted as part of the energy balance in order to identify the need for additional measures. The energy audit obligation imposed on major energy consumers as part of the environmental permit also allows useful data to be collected from one part of the service sector. - More precise data on insecure and vulnerable households, and in particular on owners in insecure situations. - Data on demolitions-rebuilds (Fiche No 33). - Data on assisted self-renovations (Fiche No 18). - In connection with the regional circular economy plan and in collaboration with specialised operators (such as view.Brussels), a precise inventory of the workforce available to carry out the required work, and a prediction of how this workforce may change and the impact that the system of requirements described in Fiche No 1 may have on the cost of work. - In the longer term, data on circular flows in the construction sector and on construction materials, in association with TOTEM and promotion of the re-use of construction materials.

<table>
<tr><td></td><td colspan="2">2. <u>In order to assess the implementation of the strategy and the need to adapt or supplement its measures, a dashboard of indicators will be established:</u>
- Indicators for monitoring the overall implementation of the strategy (number of measures implemented, renovation rate by sector, etc.).
- Specific indicators for monitoring the various measures (state of progress of each measure).
- Indicators for determining the impact of the measure in relation to its objectives (energy savings, number of stakeholders mobilised, etc. according to relevant criteria).
Furthermore, as part of the circular economy measures in relation to the construction sector, the dashboard on construction economics, created as part of the regional energy and climate plan in order to monitor the socioeconomic indicators of construction, must be continually improved. Where such a link is possible and relevant, the indicators developed as part of the renovation strategy may be used in the construction sector dashboard resulting from the regional energy and climate plan (in particular the building priority).</td></tr>
<tr><td>Other stakeholders</td><td colspan="2">Bruxelles Urbanisme et Patrimoine (BUP) [Brussels public planning and heritage service], Municipalities, IBSA [Brussels Institute for Statistics and Analysis], Bruxelles Fiscalité, etc.</td></tr>
<tr><td rowspan="4">Interim objectives</td><td>Period</td><td>Description</td></tr>
<tr><td>Strategy Period 1 (2019-2024)</td><td>The data from EPB certificates in the residential sector are collected and analysed.
The consumption data of specific sub-sectors in the context of the regional energy balance are collected and analysed.</td></tr>
<tr><td>2030 Objective</td><td>The Region has a comprehensive and accurate view of the residential sector by implementing the housing passport.</td></tr>
<tr><td>2050 Objective</td><td>The data on buildings and sustainable construction in the Brussels Capital Region are managed in a flexible and integrated manner.</td></tr>
<tr><td>Prior measures – Regional Air, Climate and Energy Plan (PACE) measures</td><td colspan="2">N/A</td></tr>
<tr><td>Interaction with other fiches</td><td colspan="2">All the fiches involve monitoring</td></tr>
</table>

29.	Set up a renovation laboratory: RenoLab
Category of measure	**Innovation, Support**
Target audience(s)	All audiences
Type(s) of building concerned	All
Objective of the measure	• Prove to the entire construction sector and building users that sustainable renovation is feasible. • Test and develop the tools made available and the technologies used in sustainable renovation.
Description of the measure	In order to help the construction sector to understand that a sustainable renovation incorporating circular economy principles is feasible, in the first instance specific projects need to be supported and observed. For that purpose, a laboratory for the sustainable renovation of Brussels buildings known as 'RenoLab' will be set up. This will carry out: a. calls for projects to test and develop existing tools in the renovation strategy and training in these tools (e.g. roadmap, circular design tool, sustainability assessment tool, etc.); b. calls for renovation projects on certain specific themes (materials, acoustics, circularity, etc.) or on the sustainability levels of renovation projects (e.g. small-scale renovations by individuals) in order to observe, analyse and disseminate new, unknown and innovative practices; c. actions aimed at specific target audiences, such as actions to increase the renovation of small jointly owned properties. This RenoLab will consist of a (continuous) management structure led by Bruxelles Environnement, which will establish the appropriate links between the various operators and actions, while highlighting innovative practices in the renovation sector. The various renovation operators will be brought within a network (like the Kennisplatform Renovatie in the Flemish Region) in order to share their experiences (best practices, innovations) in terms of working methods, models or implementation methods. Innovative and evidence-based experiences will be included in particular in the Guide Bâtiment Durable [Sustainable Building Guide] under its various themes: energy, acoustics, mobility, water, comfort and health, impact of the choice of materials, management of buildings during their use, support for occupants, circular economy, etc. (see Fiche No 32 'Promote and develop technical tools for the sustainability assessment of buildings'). In the long term, the results will also feed into the sustainability requirements (see Fiche No 2 'Establish sustainability requirements and obligations for buildings'). Project initiators will also be supported.
Other stakeholders	Designers, construction firms, public authorities, building users, Bruxelles Urbanisme et Patrimoine (BUP) [Brussels public planning and heritage service], etc.

	Period	Description
Interim objectives	Strategy Period 1 (2019-2024)	The RenoLab platform/laboratory is tested. Project initiators and designers are supported. Calls for projects are launched. Innovative practices are analysed. Operators are networked.
	2030 Objective	The RenoLab results are promoted. Thanks to the RenoLab, construction sector practices shift towards the sustainable renovation of Brussels buildings. The findings are incorporated in the Guide Bâtiment Durable (see the fiche on sustainability requirements).
	2050 Objective	
Prior measures – Regional Air, Climate and Energy Plan (PACE) measures	Measure 21 - Support innovation	
Interaction with other fiches	Fiche No 2 - Establish sustainability requirements and obligations for buildings Fiche No 30 - Promote and develop the TOTEM technical tool for materials Fiche No 31 - Promote and develop technical tools for the circular design of buildings Fiche No 32 - Promote and develop technical tools for the sustainability assessment of buildings	

30.	Promote and develop the TOTEM technical tool for materials
Category of measure	**Support (technical), Innovation**
Target audience(s)	Construction professionals
Type(s) of building concerned	All
Objective of the measure	Help construction professionals to understand, manage and even reduce the environmental impacts of buildings
Description of the measure	TOTEM ('Tool to Optimise the Total Environmental impact of Materials') is a method and a tool allowing designers to assess, compare and optimise the environmental performance of various elements in a building and therefore helping them to choose materials based on their impact throughout their life cycle: from the extraction of the raw materials to the dismantling of buildings, including all the interim stages (manufacture of construction products, transport, on-site use, maintenance during the building's period of use). **3. <u>TOTEM developments</u>** - TOTEM is currently based on generic data, which provide an indication of the 'average' impact of a standard construction material. As a result, no distinction is made between different manufacturers, production plants or production processes. Manufacturers of construction materials can declare their environmental impact data through an EPD (Environmental Product Declaration) in the B-EPD federal database (for more information, see www.b-epd.be). A specific measurement and calculation protocol and third-party verification guarantee the objectivity of the data contained in the B-EPD database. Future versions of TOTEM will connect the B-EPD database and the TOTEM materials library. - TOTEM assesses the environmental impact of building elements and buildings throughout their life cycle. In this first version of the tool, only heating consumption is taken into account via a simplified method that is based solely on the transmission losses of energy-inefficient walls. In the future, TOTEM will incorporate the EPB calculation method (or at least the results of those calculations) so that the energy consumption during the building's period of use is taken into account consistently and more accurately. - Given the expected growth in the use of BIM (Building Information Modelling) tools by the construction sector, the functions and capacity to import a digital model produced using a BIM module will be increased. - TOTEM's approach to renovation will be refined, in particular by taking account of the environmental impact of processing waste generated by materials removed from the building and disposed of during renovation work. Furthermore, the

	method must be expanded beyond the binary approach ('existing/maintained' status and 'new' status) in order to take full advantage of the re-use of materials. - In the future, TOTEM will also include the potential to re-use a building element, assemblies and fastenings in the life cycle analysis methodology in order to determine the overall environmental performance of the element (or building) in question. **4. <u>Roll-out of TOTEM</u>** **Short-term measures:** Voluntary measures aimed at encouraging effective use of TOTEM: - Measures to encourage and support the use of TOTEM (helpdesk, call for projects and other measures via RenoLab) will be implemented. - Feedback on use of the tool will be collected in order to improve the method and IT tool (managed via RenoLab). - For public and private clients, the use of TOTEM will be promoted in specifications for service contracts for the appointment of a designer. - With regard to the exemplary role to be played by public authorities and the implementation of Action 112 of the Air, Climate and Energy Plan, financial support (incentive, etc.) and/or intensive support will be provided for public building construction and renovation projects. **Medium-term measures:** - Exemplary role to be played by public clients: construction or renovation of a building > 1,000 m²: There will be an obligation to determine the design's environmental impact and to compare several variants in order to optimise the design. This comparison will be made at the level of the building elements (for example, the five building elements that have the most significant impact). No environmental impact limit will be imposed. - Consideration will be given to the feasibility and consequences of setting maximum environmental impact limits (new/renovation) and an in-depth study will determine how levels of requirement are to increase as 2050 draws nearer. This consideration and this in-depth study may lead to the development of new regulations incorporating a maximum overall environmental score and supplementary levels (reversibility, etc.). The analysis of the feasibility of setting such limits and their determination must be based on theoretical studies, feedback from the construction sector, and the results and a review of the obligation imposed on public clients (buildings > 1,000 m²) during the 2024-2030 period. It must also be supplemented by the benchmarking of the situation in neighbouring countries.
Other stakeholders	The other regions and the federal government (SPF Santé Publique [Federal Public Service for Public Health])

	Period	Description
Interim objectives	2019-2024 Period	1) The five key developments of TOTEM (method and IT tool) are made. 2) The mechanism requiring the comparison of design variants for public clients constructing or renovating a building > 1,000 m² (obligation to be imposed between 2025 and 2030) is established.
	2030 Objective	Public clients correctly and systematically impose the obligation to compare design variants for projects involving the new construction or renovation of buildings > 1,000 m².
	2040 Objective	Public clients comply with the environmental impact limits imposed. Clients correctly and systematically impose the obligation to compare design variants for projects involving the new construction or renovation of buildings > 1,000 m².
	2050 Objective	Clients comply with the environmental impact limits imposed.
Prior measures – Regional Air, Climate and Energy Plan (PACE) measures	Measure 20 - Develop technical references and tools to be made available to sustainable building professionals Measure 47 - Promote sustainable products	
Interaction with other fiches	Fiche No 2 - Establish sustainability requirements and obligations for buildings Fiche No 3 - Reinforce the exemplary role of public authorities Fiche No 7 - Revise the energy incentive mechanism Fiche No 29 - Set up a renovation laboratory: RenoLab Fiche No 32 - Promote and develop technical tools for the sustainability assessment of buildings	

31.	Promote and develop technical tools for the circular design of buildings
Category of measure	**Support (technical), Innovation**
Target audience(s)	Architects, clients, design offices, producers of materials, etc.
Type(s) of building concerned	All
Objective of the measure	With a view to a circular economy, help construction professionals to take account, throughout the life cycle of the building and its elements and materials, of re-use and the removable/reversible/modular design of buildings
Description of the measure	In order to develop a circular economy in the building sector, the Brussels Capital Region has committed to the H2020 BAMB ('Buildings As Material Banks') project, which aims to innovate in terms of renovation or new construction by regarding buildings as a bank of valuable materials. The main research priorities are: (1) the design of buildings incorporating the reversibility dimension; (2) the re-use of materials, and (3) the communication and exchange of information between the various stakeholders. The following measures will be taken with regard to this project: **1. <u>Continue the work begun within the BAMB project</u>** In the coming years, the Brussels Capital Region wants to encourage and continue the work to develop innovative solutions begun within the BAMB project in order to produce the following technical tools: - Materials Passports, which particularly require a computer interface (web platform) and databases to be developed. Materials Passports consist of a set of data describing, in practical terms, how to recover all or part of the value of the materials, taking into account the history of prior use and the context of the material concerned. - Tools aiding the design and assessment of the reversibility of buildings, in particular software to determine the transformation potential of an existing or new building (Transformation Capacity Tool) and to determine the re-use potential of materials in an existing or new building (Re-use Potential Tool), as well as the associated technical and scientific texts. - A protocol for implementing reversible design. - Decision support software allowing the assessment of the 'circularity' of buildings (Circular Building Assessment tool) based on a methodology for assessing the productivity of resources for new and existing buildings according to the choice of materials and design decisions. This ensures better design in terms of improving the re-use and transformation potential throughout the various life cycle phases of the building (design, construction, management and maintenance, renovation, dismantling), including environmental and financial assessment. This development work will be continued alongside the TOTEM developments.

<table>
<tr><td></td><td colspan="2">2. <u>Disseminate the tools and analyse their effective use</u>

These technical tools will be tested through the RenoLab (support with using the tools, ‘circular buildings’ call for projects, etc.) and, where applicable, supported through incentives, subsidies via a call for projects, and so on. These experiments will allow the tools to be adapted to the realities of the construction world, increase their renown and ensure that they are user friendly.

3. <u>Impose circular design/adaptability criteria on building projects</u>

As indicated in Fiche No 2 ‘Establish sustainability requirements and obligations for buildings’, discussions will lead to the development of regulations supplementing the EPB regulations that incorporate levels of ‘reversibility’ and ‘adaptability/flexibility’ for new building projects. These levels will apply when the work required by Fiche No 1 ‘Strengthen energy performance requirements and obligations for buildings’ is carried out.

In the shorter term, these levels will be included in the specifications of public clients in particular.</td></tr>
<tr><td>Other stakeholders</td><td colspan="2">The other regions for the links with TOTEM</td></tr>
<tr><td rowspan="4">Interim objectives</td><td>Period</td><td>Description</td></tr>
<tr><td>Strategy Period 1 (2019-2024)</td><td>The BAMB development work is carried out.

The tools are used within RenoLab.</td></tr>
<tr><td>2030 Objective</td><td>Levels of ‘reversibility’ and ‘adaptability/flexibility’ are imposed on public projects.</td></tr>
<tr><td>2050 Objective</td><td>Levels of ‘reversibility’ and ‘adaptability/flexibility’ are imposed on all projects.</td></tr>
<tr><td>Prior measures – Regional Air, Climate and Energy Plan (PACE) measures</td><td colspan="2">Measure 21 - Support innovation</td></tr>
<tr><td>Interaction with other fiches</td><td colspan="2">Fiche No 2 - Establish sustainability requirements and obligations for buildings

Fiche No 29 - Set up a renovation laboratory: RenoLab

Fiche No 30 - Promote and develop the TOTEM technical tool for materials

Fiche No 32 - Promote and develop technical tools for the sustainability assessment of buildings</td></tr>
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32.	Promote and develop technical tools for the sustainability assessment of buildings
Category of measure	**Support (technical)**
Target audience(s)	Clients and designers (architects and design offices)
Type(s) of building concerned	All
Objective of the measure	Help construction professionals to design and renovate as sustainably as possible
Description of the measure	The dissemination and use of cross-cutting sustainability tools and their gradual adoption by construction professionals will help to widen the field of view beyond energy consumption. **1. <u>Develop a sustainability reference framework</u>** A sustainability reference framework is a tool designed for construction professionals (architects, public and private clients, etc.) to help them design/renovate buildings more sustainably (guide, optimise and assess). It covers fields of research that are much wider than energy efficiency (such as acoustics, water management, air quality, etc.). Its aim is not just to define a sustainability objective in terms of performance, as it can also be used to compare variants of an initial design from the perspective of sustainability in order to achieve the best possible result. The reference framework will be developed for the purposes of housing, small office buildings, schools, care facilities and sports centres, and particularly for public clients who do not have any commercial interest in any international sustainability recognition and do not therefore use private labels such as BREEAM. Furthermore, future versions of this reference framework will aim to include the TOTEM results in the materials part, the EPB tool results in the energy part, and the BAMB tool results in the circularity part. **2. <u>Develop sustainability clauses for specifications</u>** The difficulty of drafting precise and effective clauses is one of the main obstacles to sustainable construction/renovation (particularly for public clients). The Region will therefore propose technical sustainability clauses to construction professionals for their specifications (including circularity). This measure may also involve supra-regional collaboration. Two types of technical clause will be proposed: 1. Clauses for the specifications of service contracts aimed at appointing a designer (architect or design team). These clauses will aim to include sustainability in the contract selection and award criteria, and in particular to require designers to assess and research the optimisation of their design. 2. Clauses for the specifications of work contracts.

	In the first instance, these clauses will be included in the descriptive 'technical requirements' of the work to be carried out, allowing the construction firm to submit a bid in figures without any doubt about the interpretation of the design and measures to be implemented. These clauses will also be incorporated in the 'execution clauses' specifying the conditions of execution of the work (on-site work), which the construction firm is also required to take into account when producing its bid. **3. <u>Update and add to the Guide Bâtiment Durable [Sustainable Building Guide]</u>** The Guide Bâtiment Durable provides designers with the technical information developed by design offices (outside experts) and the policy departments of Bruxelles Environnement. It complements the sustainability reference framework. The Guide proposes and describes the implementation of technical choices responding to the ambition defined and the criteria and measures selected by the sustainability reference framework. This Guide will be constantly updated and improved. At the same time, consideration will be given to developing this tool, particularly in terms of the advisability of including renovation work as such and reinforcing aspects associated with the choice of materials, re-use and reversible/modular design. **4. <u>Encourage the effective use of these tools (sustainability reference framework, sustainability clauses and Guide Bâtiment Durable)</u>** Measures to encourage and support the use of these tools (helpdesk, call for projects and other measures via RenoLab) will be implemented. Feedback regarding the use of these tools will be collected in order to improve them (through RenoLab). Lastly, with regard to the exemplary role to be played by public authorities, financial support (incentive, etc.) and/or intensive support will be provided for public building construction and renovation projects that use the system put in place for using the Guide Bâtiment Durable. **5. <u>Impose statutory sustainability levels</u>** As indicated in Fiche No 2 'Establish sustainability requirements and obligations for buildings', consideration will be given to developing new regulations to be implemented by 2030.	
Other stakeholders	The other regions for the reference framework and sustainability clauses	
Interim objectives	**Period**	**Description**
	Strategy Period 1 (2019-2024)	Implementation of measures 1, 2 and 3. For the Guide Bâtiment Durable: start of the implementation of measure 4.
	2030 Objective	Implementation of the conclusions of measure 5 and associated decisions.
	2050 Objective	Implementation of the conclusions of measure 5 and associated decisions.

Prior measures – Regional Air, Climate and Energy Plan (PACE) measures	Measure 5 - Introduce 'Sustainable Building' certification and labelling mechanisms Measure 20 - Develop technical references and tools to be made available to sustainable building professionals
Interaction with other fiches	Fiche No 2 - Establish sustainability requirements and obligations for buildings Fiche No 29 - Set up a renovation laboratory: RenoLab Fiche No 30 - Promote and develop the TOTEM technical tool for materials Fiche No 31 - Promote and develop technical tools for the circular design of buildings

33.	Establish a framework for the dismantling of buildings and make use of dismantled waste
Category of measure	**Support (technical), Regulation**
Target audience(s)	Clients (public and private) and building designers (architects and design offices)
Type(s) of building concerned	All
Objective of the measure	Reduce the environmental impact of building projects, in particular by preventing the impact being transferred from the energy sphere to other environmental dimensions
Description of the measure	Finding the best possible solution when choosing between a renovation and a demolition/rebuild requires technical, energy and environmental issues to be considered. According to the CSTC [Scientific and Technical Construction Centre], around 5% of the building stock is in such a state that renovation does not offer an acceptable result. This measure aims to establish a framework for demolition/rebuild projects in order to reduce their overall environmental impact, and to use such projects as levers to encourage a circular economy in the area of construction materials. **1. <u>Assess the extent of the demolition/rebuild phenomenon</u>** Applications for planning permission for demolition and demolition/rebuild work will be monitored. This action will allow the actual rate of demolition and demolition/rebuild projects to be determined. **2. <u>Quantify the overall environmental cost of a demolition/rebuild versus a renovation</u>** Bruxelles Environnement will develop a methodology to compare the environmental costs of a demolition/rebuild project and a renovation project. As suggested by the CSTC methodology, this BE methodology may involve three stages: • *Stage 1*: check whether the heritage rules or planning constraints prohibit full or partial demolition. • *Stage 2*: analyse the technical condition of the building, the required features (use of the space, fire safety, acoustic comfort, etc.) and the creation of value due to renovation or land clearance. • *Stage 3*: compare various renovation and demolition scenarios based on the investment cost and the overall environmental cost using TOTEM. The intention is to make this voluntary approach into a statutory obligation. Where applicable, the application for planning permission for demolition/rebuild work will have to be accompanied by the report on this comparative analysis. **3. <u>Draft and adopt a regulation that requires a pre-demolition inventory to be drawn up</u>** The application for planning permission for a demolition project will include an obligation to draw up a pre-demolition inventory in order to identify the various waste flows

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<tr><td></td><td colspan="2">produced on site and determine the appropriate waste stream. The main aims in this respect are to ensure that hazardous waste is appropriately managed and to encourage recycling and re-use as a result of a better understanding of the waste produced.

This obligation may be gradually implemented in stages, based on the floor area of the building to be demolished (e.g. initially required for buildings > 2,000 m², and subsequently required for buildings > 500 m²).

4. <u>Draft and adopt a regulation that will eventually require selective dismantling (via the environmental permit)</u>

Dismantling work will have to be organised in such a way that re-usable elements are actually dismantled and recovered so that they can be introduced into a re-use stream. This view therefore contrasts with a traditional demolition where the building elements are often destroyed all together, which prevents the re-use of materials and also limits the recycling options.

This measure will be implemented and monitored through minimum rates of materials received by recycling and re-use streams. The BAMB ‘Re-use Potential Tool’ may be used to determine this percentage.

Public authorities will initially be subject to this regulation, which will then be extended to major private projects.

This action will boost and promote re-use and recycling streams.</td></tr>
<tr><td>Other stakeholders</td><td colspan="2">Walloon Region, Flemish Region, federal government, Bruxelles Urbanisme et Patrimoine (BUP) [Brussels public planning and heritage service]</td></tr>
<tr><td rowspan="5">Interim objectives</td><td>Period</td><td>Description</td></tr>
<tr><td>2024 Objective</td><td>Pre-demolition inventories are drawn up for all public dismantling projects.</td></tr>
<tr><td>2030 Objective</td><td>Pre-demolition inventories are drawn up for all dismantling projects.</td></tr>
<tr><td>2040 Objective</td><td>When public buildings are dismantled, all materials are reintroduced into a re-use stream.</td></tr>
<tr><td>2050 Objective</td><td>When buildings are dismantled, all materials are reintroduced into a re-use stream.</td></tr>
<tr><td>Prior measures – Regional Air, Climate and Energy Plan (PACE) measures</td><td colspan="2">N/A</td></tr>
<tr><td>Interaction with other fiches</td><td colspan="2">Fiche No 2 - Establish sustainability requirements and obligations for buildings

Fiche No 30 - Promote and develop the TOTEM technical tool for materials

Fiche No 31 - Promote and develop technical tools for the circular design of buildings</td></tr>
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	Fiche No 34 - Develop a re-use stream for construction materials

34.	Develop a re-use stream for construction materials	
Category of measure	**Economic Stimulus, Regulation**	
Target audience(s)	Clients (public and private), building designers (architects and design offices), construction/dismantling firms, re-use operators (suppliers/resellers)	
Type(s) of building concerned	All	
Objective of the measure	Develop a re-use stream for construction materials	
Description of the measure	Two key characteristics of the Region are a highly active construction sector and almost no production of primary resources within the Brussels area. The construction sector generates 628,000 tonnes/year of waste, of which 91% is already selectively collected (inert waste, soil and stones, concrete, asphalt, bricks, etc.). There are currently very few re-use operations for these flows. Although the Brussels Capital Region will always be heavily dependent on energy and material imports, more efficient consumption of construction materials and improved internal flows will reduce this dependence and also the associated environmental impacts. Initially, a study will be conducted to define a strategy for the development of re-use streams for construction materials. This will test the stages proposed below and define an action plan. Depending on their nature, some of these actions will be carried out as part of the Regional Energy and Climate Plan or this strategy: • Identification of existing flows, streams, opportunities, operators and projects. • Identification of the type of support needed (technical, economic, etc.). • Identification of re-use materials for which certification is needed; analysis and, where necessary, establishment with the relevant operators of certification for re-use materials. • Inclusion of re-use in TOTEM. • Establishment of a framework for the dismantling of buildings and use of dismantled waste. • Development of a regulatory framework favourable to the re-use of materials: - Introduction of a minimum level of use of certain re-use materials in some public rebuilding contracts. - Introduction, in stages, of a minimum level of use of certain re-use materials in private rebuilding projects, depending on their size.	
Other stakeholders	hub.brussels, CSTC [Scientific and Technical Construction Centre], CCBC [Brussels Capital Construction Confederation]	
Interim objectives	**Period**	**Description**

	2024 Objective	Awareness of the re-use sector is raised.
	2030 Objective	Public buildings are subject to the regulation on re-use.
	2040 Objective	Large-scale buildings are subject to the regulation on the re-use of materials.
	2050 Objective	Medium-sized buildings are subject to the regulation on the re-use of materials.
Prior measures – Regional Air, Climate and Energy Plan (PACE) measures	N/A	
Interaction with other fiches	Fiche No 2 - Establish sustainability requirements and obligations for buildings Fiche No 33 - Establish a framework for the dismantling of buildings and make use of dismantled waste	