Brussels Strategic Platform on housing retrofit

IRHiS project

Integrated approach to support and develop economic activities in the Brussels Renovation sector of Housing including Socio-economic concerns

D4 Analysis of the different existing/potential financial solutions for a housing retrofitting project and suggestions to improve the current situation

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## Glossary

<table>
<thead>
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<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Aggregator</td>
<td>In a third-party investing mechanism for building renovation, the aggregator combines different projects of renovation in one single tender (generally a public tender) in order to reduce the transaction costs for the candidate-investor by sharing its risk on several buildings/projects with different profiles.</td>
</tr>
<tr>
<td>Belesco</td>
<td>Belgian federation of ESCOs</td>
</tr>
<tr>
<td>BAU</td>
<td>Business As Usual. The reference scenario used to compare and quantify the performances of the implemented measures.</td>
</tr>
<tr>
<td>BCR</td>
<td>Brussels-Capital Region</td>
</tr>
<tr>
<td>CR-EPC</td>
<td>Complete Retrofit Energy Performance Contract</td>
</tr>
<tr>
<td>EPC</td>
<td>Energy Performance Contract / Contract. An EPC is a “contractual agreement between the beneficiary and the provider of an energy efficiency improvement measure, verified and monitored during the whole term of the contract, where investments (work, supply or service) in that measure are paid for in relation to a contractually agreed level of energy efficiency improvement or other agreed energy performance criterion, such as financial savings” (Energy Efficiency Directive 2012/27/EU)</td>
</tr>
<tr>
<td>ES</td>
<td>Energy services</td>
</tr>
<tr>
<td>ESCO</td>
<td>Energy Service Company</td>
</tr>
<tr>
<td>Facilitator</td>
<td>Third-party investing mechanisms are complex and rely deeply on legal aspects (cf. the mechanism is essentially based on a contractual agreement between the investor and the client). The facilitator is the actor who will inform and advise the client about these aspects, or even, supply standard contract models.</td>
</tr>
<tr>
<td>Fedesco</td>
<td>Belgian Federal third-party financer for the renovation of federal buildings</td>
</tr>
<tr>
<td>GHG</td>
<td>Greenhouse Gas</td>
</tr>
</tbody>
</table>
| Intracting    | Refers to contracts that are not covered by the rules of public procurements according to the Community case-law. Two conditions have to be fulfilled:  
- the co-contractor is fully controlled by the same public authorities as the applicant  
- services of the co-contractor are essentially targeting public demand. It is also called ‘in house’ contract, or ‘integrated services’ contract. (http://www.marche-public.fr/Marches-publics/Definitions/Entrees/Inhouse.htm) |
| INFINITE Solutions | INnovative FIaNancIng for Local SusTainable Energy Solutions European research project financed in the framework of the IEE programme and aiming at supporting energy efficiency (EE) and renewable energy (RES) projects and in particular energy-efficiency upgrades in public and private buildings via innovative financing instruments rather than grants in the countries which will benefit from the EU Cohesion Policy 2014-2020 and which will need to implement the new Energy Efficiency Directive. Energy Cities is the |
coordinator of the project. The BCR is the sole Belgian entity involved in the project in order to ‘upgrade’ its Brussels Green Loan scheme.

**IPMVP**
International Performance Measurement and Verification Protocol
It is a protocol developed by an American engineers association, aiming at measuring and verifying the assessed energy savings after the implementation of energy efficient measures according to a standard method. It has been officially adopted in France and is the reference used by Fedesco for its projects.

**M&E**
Monitoring and evaluation

**M&EPC**
Maintenance and Energy Performance Contract

**PPP**
Public-Private Partnership

**SHA**
Social Housing Agency
A SHA is an intermediary between a landlord and his/her tenant. The owner accepts to rent his/her property at a lower price and entrusts the SHA to manage the property in his/her name. In compensation, the SHA manages the rental agreement, guarantees a monthly loan even if the property is free from occupation, maintains the property, etc.

**Transparence project**
EU research project on “Increasing transparency of energy service markets” supported by the EU program “Intelligent Energy Europe”

**Third financing**
Mechanism aiming at providing financial means for a project according to its characteristics and the investor profile, such as banks are doing with traditional credits. In its more elaborated forms, the third-party financer (TPF) will offer a complete financial package with all financing sources available for the investor (grants, soft loans, traditional bank credits, etc.) in order to increase his/her self-financing capacity.

**Third investment**
Mechanism aiming at financing a building energy efficient retrofit by a third party (not the owner)
- who is paid back during a contractual period, at least partially via a ‘loan’ on energy savings generated by this retrofit and
- who guarantees contractually the building energy efficiency improvement (via an ‘Energy Performance Contracting’ for example).

These third investors could come:
- from the supply side (thermic retrofit company) and act as an ‘operating’ Third Investing Company or
- from the demand side (owners consulting) and act as a ‘delegate project manager’ Third Investing Company such as Fedesco for Belgian federal entities

**TPF**
Third-party financer/financing

**TPI**
Third-party investor/investing

**Revolving fund**
A revolving fund is an amount of money that exists in order to finance something, but from which any loans must be replaced in order that the full amount is available again (Cambridge Dictionaries online)

**Subordinated loan**
A subordinated loan is specific kind of loan for which the financer accepts to be repaid after other creditors in case of default of the beneficiary.
Introduction

1. Brussels context

Sustainable buildings and building retrofit have become priorities in the Brussels-Capital Region. In a city-region, buildings have indeed a huge impact on:

- the global regional energy consumption (in 2011, buildings accounted for 70% of the regional energy consumption, with 37.5% or 7.734 GWh PCI related to the residential sector and 33.1% or 6.843 GWh PCI to the tertiary and commercial sectors\(^1\)),
- GHG emissions (69% of the Brussels direct GHG emissions in 2010 were emitted by residential and tertiary buildings for heating purpose\(^2\))
- and waste generation.

Moreover, the region is currently almost completely dependent from the other regions for its building materials and components supply, its energy supply (95% of the regional energy consumed is imported\(^3\)) and waste treatment or disposal.

Belgian building stock is old (78% of Brussels dwellings have been built before 1970\(^4\)) and with low (energy) performances. There are therefore a real potential to improve the situation and respect regional obligations and engagements induced by the successive European directives on Energy, Energy Performance of Buildings and Renewable Energies and the last Energy Efficient Directive 2012/27/EC and strategies (e.g. the European 20-20-20 strategy) aiming at tackling climate change and energy dependency to depleting non-renewable and generally imported resources. These regulations, transposed at both national and regional levels, have indeed lots of implications for the building sector.

The Brussels-Capital Region has committed itself to reduce its GES emissions by 30% compared to the 1990 level by 2025 (cf. Covenant of Mayors signed by the region in 2010). To reach this goal, the building sector will have to double or triple deep renovation projects for all kind of buildings, tertiary, commercial as residential ones.

Deep thermal renovation could also help reducing another growing preoccupation since the energy market liberalisation and the expected grow in future energy prices: the energy poverty. Synergies are also expected with the reduction of pollutants emissions (cf. heating systems are an important

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\(^{1}\) IBGE, 2013


\(^{3}\) Gouvernement de la Région de Bruxelles-Capitale, Troisième Plan d’Action en Efficacité Energétique

\(^{4}\) Gouvernement de la Région de Bruxelles-Capitale, Troisième Plan d’Action en Efficacité Energétique
source of acidifying substances: 34% of the BCR total in 2011; of PM10: 24% of the BCR total in 2011; of ozone precursors: 23% of the BCR total in 2010)\(^5\) and improvement of air quality.

There are however several barriers to the realisation of this improvement potential. Financing of the necessary investments in an adverse socio-economic context, market fragmentation and insufficient awareness and knowledge about the stakes and implications of improved energy efficiency of buildings and other sustainable concerns (cf. societal and private interests not aligned) are identified as major issues that will have to be overcome rapidly to be able to reach the fixed targets.

This is why this fourth work package of the IRHiS project is dedicated to the issue of potential development of alternative financial mechanisms that could offer an integrated and adequate solution for building owners to realise ambitious energy/sustainable renovations. Special attention will be paid on the residential sector, given its importance for the BCR and on potential synergies with social objectives such as tackling energy poverty or reducing the global costs of housing.

2. Methodology and approach

A large literature review has been carried out including scientific articles but also position papers, administrative and work documents. The work has been completed by attendance to specific colloquia and symposia.

Multiple contacts have been taken with different stakeholders (‘experts’) to gather data and complementary inputs from the field (e.g. Ismaël Daoud - Energiris, Olivier Renard – Lampiris-Isol), and several deeper interviews, based on specific semi-directive questionnaire, have been organised face-to-face in January and February 2015, with:

- Christophe Madam (General director, Fedesco),
- Pascal Hendrickx (Director, Sophia Group),
- Perrine Ethuin (Coordinator of the Brussels Green Loan project in the Infinite Solutions research project, IBGE-BIM),
- Serge Maes (Coordinator, Energy House centrum).

The report is divided into two parts.

The first one is dedicated to the confrontation of the existing situation in the BCR as regards financial solutions and technical supports for sustainable housing renovation compared to what is required.

The second one studies alternative mechanisms that could better match the needs that are not, or not adequately, fulfilled yet. These alternative mechanisms cover:

- initiatives aiming at mobilising complementary funds from the private sector and/or from European funds, like the German KfW mechanism and the Lithuanian JESSICA holding fund,
- as well as third-party financing / third-party investing mechanisms like the UK Green Deal, the PACE mechanism developed in the USA or the mechanism based on an Energy Performance Contract.
Chapter I: Current situation as regards financing and public supports for housing renovation in the BCR

In this chapter, a review of the main existing mechanisms traditionally used by dwelling owners/tenants to renovate their housing will be carried out, including the different public supports.

However, given that most solutions/supports are different depending on the ownership patterns (private or public owner, individual owner or not, status of owner-occupier/landlord/tenant, dwelling rented via a SHO, etc.) and type of dwelling/measure concerned (individual dwelling or collective part of an apartment building, house or apartment in an apartment building), a first point will shortly highlight main characteristics of the Brussels housing market.

The second point will focus on existing financial mechanisms and supports (financial as well as technical) available for candidates to housing renovation in the BCR. The distinction will be made, if appropriate, according to the ownership pattern of type of housing concerned.

The third point will focus not only on the requirements of candidate-renovators as regards financial means from a micro perspective related directly to the renovation project itself but also at the macro level given the regional objectives related to different environmental stakes and their potential impact on the Brussels housing sector.

Finally, considerations gathered in points two and three will be confronted in point four in order to identify the ‘good practices’ and ‘shortcomings’ of the existing financial mechanisms and technical supports compared to what is needed to fulfil both micro and macro requirements for housing renovation in the BCR. This will give us the starting point to analyse what should be improved and what elements are already satisfactorily and should be kept in a new scheme/mechanism.

1. Ownership patterns in the BCR

Access to financial sources and possibilities to renovate a dwelling depends greatly on the ownership pattern. In the Brussels-Capital Region, the housing sector can be divided into the public market, including social housing companies but also other dwellings owned by public entities such as municipalities or CPAS/OCMW, and the private market.

In January 2014, BCR residential sector covered 548,345 dwellings and 161,771 residential buildings (hosting 92% of the Brussels dwellings, the remaining 8% being hosted in commercial or other buildings).
The Brussels private housing market is characterised by:

- a high share of rented dwellings (60% on average) mostly present in the private sector;
- the public social housing sector accounts for 7% on average of the Brussels dwelling stock;
- a majority of attached-houses in the residential buildings but that are not especially owned or occupied by a single household: many houses are subdivided into two or more apartments and form small condominiums or ‘maisons de rapport’;
- apartments represent the majority of Brussels dwellings (52% of dwellings are in apartment buildings which does not include apartments in multi-family houses, commercial or other buildings) and also the great majority of the rented dwellings;
- the great majority of dwelling owners are individuals with few properties (they are not professionals of the real estate sector and lack of technical competencies);
- 3,000 dwellings on average, from both public and private sectors, are rented through Social Housing Agencies (SHAs).

2. ‘Traditional’ financing sources for housing renovation

According to the profile of the owner, traditional sources of financing cover:

- own funds,
- debt,
- public financial supports.

2.1. Own funds

2.1.1. Sources

For individuals, own funds are made of their respective savings and revenues and their capacity to benefit from family (and friends) support.

As regards non-individuals, they could dedicate a part of their benefit or reserves. They have also the possibility to increase their own funds thanks to a new equity issue, or by increasing the number of available shares in a cooperative.

2.1.2. Complementary sources

Direct public support via grants and subsidies is one possibility to increase own funds of investors. Point 3 summarises main Brussels grants that are available for housing renovation.

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6 More details are available in Meyer, 2013
2.2. Debt – ‘traditional’ third financing

2.2.1. All kind of owners

If own funds are not sufficient and the investment judged valuable (according to investor’s interests such as profitability on short term, comfort improvement, facility of implementation, etc.), a loan could be contracted from banks or financial institutions to finance housing renovation works.

Two kinds of credit are mainly available for this purpose: a credit associated to/include in a mortgage or a consumption credit. The first one is only accessible when contracting a mortgage but is taken on a long term (traditionally between 15 and 25 years), while the second one can be taken at any time but on a shorter period (generally maximum 7 years) and at a relative higher annual interest rate (on average 6-7% per year).

2.2.2. Non-individuals

Corporate bodies have also the possibility to mobilise extra financial means by issuing obligations.

2.3. Public financial supports

Main public supports to housing renovation are split between the national, the regional, and the municipal levels, according to the respective competences of each entity. With the sixth state reform, several federal instruments or mechanisms are now in the hands of the regional entities. However, seeing the relative youth of the transfer, most of them are still in a transition period waiting for their real uptake and transposition into the regional policy mix. This period of uncertainties will probably have a huge influence on the renovation market and will have to be solved quite rapidly to avoid durable drawbacks on activities.

Main public supports to housing renovation take the form of financial incentives or technical assistance, training and information campaign.

Following points will briefly described existing direct supports to housing renovation projects, as well as their major characteristics (e.g. level of competency, financing source, target, duration, access conditions, maximum support, etc.):

- grants (energy and renovation grants),
- fiscal incentives (tax deduction or reduced VAT), or
- easier access to credit via soft loans mechanism (Brussels Green Loan).

2.3.1. Grants

Grants related to housing renovation and energy efficient investments are designed at the regional level. Sometimes, municipalities offer supplementary local grants for the same kind of expenses.

2.3.1.1. Energy grants

These grants were set up in 2004 and are granted by the IBGE-BIM (Brussels environment administration). They target all kinds of building owners (public or private, individual or corporate
body, residential or not) or delegate representatives of owners (e.g. condominium association, delegate managers such as Social Housing Agency or real estate managers, etc.). Tenants are eligible if they have an agreement with the owner. Most of them are accessible to both new and existing buildings.

Grants are financed through a specific contribution on regional electricity and gas consumptions, levied by the regional distribution network manager (Sibelga) as part of its distribution costs (cf. public service obligations). Money is collected by energy suppliers and on the energy bills and paid back to the regional Energy Fund.

Up to now, the other energy carriers do not contribute to this financing.

On the period 2012-2014, 30,158 demands on 35,536 have been granted for a cumulative budget of roughly 37,680,000€ (11,336 million € in 2012, 14,741 million € in 2013 and 11,602 million € in 2014), which gives an average amount per demand of 1,250€. The great majority of beneficiaries, more than 90% on average for the period, are individuals (see Figure 1), even if non-particulars (e.g. condominiums for common parts of the building) covers gradually a more important share of the annual budget (20% in 2012, 30% in 2013 and 50% in 2014).

**Figure 1**: Number of Brussels energy grants (left) and amount granted (right) for individuals and non-individuals for the period 2012-2014

A maximum budget is available annually for energy grants and is quite often exhausted before the end of the year, even in current circumstances with a low rate of renovation works.

Grants are paid several months after work completion, so that they have to be pre-financed by the owners.

Since 2011, a social component has been integrated in the scheme with higher grants for low income households and for dwellings that are rented via a Social Housing Agency (SHA). Another sustainable criteria makes the grant higher for solutions using renewable materials (e.g. for insulation, for external woodworks, etc.). To be eligible a minimum energy efficiency rate has to be achieved on the renovation works and works have to be carried out by registered professionals. There are however no control or guarantee on the performance really achieved on site.

Eligibility conditions, grant levels and types of investment covered by the scheme evolve quite often according to market conditions, budget availability and policy priorities.
Some municipalities grant a complementary premium for energy saving investments.

In 2015, energy grants may be paid to a third-party via an order to pay. It is considered as an exceptional procedure generating a longer delay for treatment. The demand has still to be introduced by the owner or the tenant with the agreement of the owner.\textsuperscript{7}

### 2.3.1.2. Housing renovation grant

Renovation grants exist for a long time in the Brussels-Capital Region (1998) and are distributed by the Brussels administration in charge of spatial and urban planning. They mainly target interventions on housing structure or interior in order to fulfil with current requirements as regards stability, security, healthiness, comfort and space.

The target is specifically individuals, owners-occupiers of dwellings or owners who rent their dwelling via a SHA, and dwellings older than 30 years. Condominiums are therefore not eligible.

Support is limited to maximum 30%-70% of the (capped) budget allocated to the renovation works, according to household’s revenue (higher intervention for lower revenue) and dwelling situation (higher intervention for specific intervention areas). No grant is available for households having a revenue higher than a certain level (67.050,72€ in 2014) and whose dwelling is not situated in a specific intervention area.

Grants are paid after works completion and control by the administrative services but an advance may be granted earlier (maximum 90% of the grant).

### 2.3.1.3. Façade renovation

Since 2002, this grant is specifically allocated for restauration works targeting the street façade (repair, cleaning, and protection against humidity or graffiti) of old buildings (at least 25 year old) with a majority of dwellings (at least 2/3). As the housing renovation grant, it is distributed by the Brussels administration in charge of spatial and urban planning.

Targeted beneficiaries are numerous: owners-occupiers, landlords, tenants, SHAs, property managers, several non-profit making associations. Works have to be carried out by registered professionals. The grant covers 30% to 85% of the global cost of works according to building situation and households’ revenue.

### 2.3.2. Fiscal incentives

Two main measures related to taxation are used to favour housing renovation works: a VAT rebate and a tax reduction on the personal income tax.

#### 2.3.2.1. VAT rebate on renovation works

The federal government decided several years ago to reduce the VAT rate from 21% to 6% on renovation works for dwellings older than 5 years. This decision has been extended regularly but an adaptation is planned for next year: to benefit from the VAT rebate, the dwelling will have to be older than 10 years.

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Rebate is granted according that the final user (dwelling owner or tenant, several residence establishments such as care and retirement facilities) is directly invoiced for those works.

**2.3.2.2. Tax reduction on the personal income tax (national)**

Different investments in energy efficiency of dwellings were eligible for a reduction on the personal income tax. However, since 2011, the number of eligible investments has been drastically reduced and the rest of eligible investments in 2014 (roof insulation and reports from former investments) are subject to the sixth state reform.

In the transition period (until competencies are really transferred to regions), a reduction of 30% on the global cost of works are granted for a maximum of 3.010€ per dwelling. This advantage comes at least 2 or 3 years after works completion.

**2.3.3. Easier access to credit – soft loans**

Beside financial supports that increase own funds of investors in renovation works, they are also public supports aiming at facilitating access to credit and debt. The mechanism of soft loan generally consists in granting credits at a preferential interest rate, this interest rate being partially supported by (dedicated) public budget.

**2.3.3.1. Brussels Green Loan**

The Brussels-Capital Region set up in 2007 its Brussels Green Loan (former Brussels Social Green Loan) that is managed by the Brussels environmental administration (IBGE-BIM) in collaboration with a professional financial entity, CREDAL, selected via a public tendering.

The soft loan mechanism combines low interest credits with a regional Guarantee Fund (in case of no repayment) and regional energy grants (which are ‘pre-financed’). It is accessible by inhabitants of the BCR only.

An initial funding of 114.000€ was dedicated to set up the mechanism, with 26.000€ for the constitution of the Guarantee Fund. The mechanism is now financed annually by both regional budget (+/- 24.000€ for the Guarantee Fund and +/- 100.000€ granted via Guarantee Fund to the financial partner for the running costs of the scheme) and the energy fund (+/- 200.000€ dedicated to the subsidisation of interest loans) mainly fed by a regional contribution on gas and electricity consumptions collected by energy providers on bills.

The annual available budget for loans is therefore limited (e.g. 360.000€ in 2011). Zero interest loan are granted to private housing owners and tenants (with an agreement of the landlord) with low or medium income, for different measures aiming at improving the energy efficiency of the dwelling (e.g. wall and roof insulation, high-performance double-glazing, controlled mechanical ventilation) or its equipment (e.g. performant boiler or water heater, thermic regulation).

Conditions are similar to a consumption credit, meaning that individuals could borrow from 500€ on maximum 18 months up to 20.000 € on maximum 84 months (7 years)\(^8\). Another possibility is to opt for a credit opening to liberate the available amount in several ‘slices’ according to the needs (e.g. bill invoices).

\(^8\) Borrowing 20.000€ without interest on maximum 7 years represents a monthly repayment of minimum 238€.
Brussels inhabitants may apply for the loan via the Energy Houses (6 entities on the BCR territory since 2013) where all kind of information on energy efficient housing renovation are made available, as well as technical advices from experts and administrative support, or directly via CREDAL, the financial partner.

Initial objective of granting 500 loans per year was by far not reached. In reality, only 500 loans were granted in 5 years, and practically no tenant applied for such a loan.

2.3.3.2. Energy performance credit of the Brussels Housing Fund

The Brussels Housing Fund grants mortgage financing with subsidised interest loan to low income households wanting to buy their own dwelling in the BCR.

The Fund has also the possibility to grant these beneficiaries with a zero interest loan to improve the energy performance of their dwelling via the Energy performance credit. A maximum of 25,000€ may be lent for maximum 25 years.

2.3.3.3. Fund to Reduce the Global cost of Energy

The FRGE is a national mechanism set up in 2006 (a public limited company subsidiary of the Federal Holding and Investment Company). Its operational costs are covered by the federal budget, while the soft loans activities are financed through the emission of nominative obligations or through a loan up to maximum 100,000,000€, with a state guarantee.

The new regional government decided recently to reform these entities and to close the six energy houses by the end of 2015. Competencies and services granted by these energy houses should be integrated in other existing entities (notably CPAS-OCMW) but no decision has been taken yet.

Disneur, 2005

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9 The new regional government decided recently to reform these entities and to close the six energy houses by the end of 2015. Competencies and services granted by these energy houses should be integrated in other existing entities (notably CPAS-OCMW) but no decision has been taken yet.

10 Disneur, 2005
It aims at granting low interest (2%) or zero interest loans to low income households (owners and tenants) to improve the energy efficiency of their dwelling. The Fund requires a local entity to be involved as the ‘entry point’ to grant the loans, which was a condition not yet fulfilled in the BCR in 2011, while several local entities were already working with the Fund in Flanders and Wallonia. Recently, two Brussels entities were recognised as FRGE entities\textsuperscript{11}: the CPAS-OCMW of Molenbeek-Saint-Jean and the non-profit association RenovaS\textsuperscript{12} in Schaerbeek.

The Fund grants a maximum of 10,000€ per household on a maximum duration of 5 years. For low income households, FRGE entities have also to provide technical or administrative support.

With the 6\textsuperscript{th} state reform, the FRGE will be restructured and completely regionalised. The transfer of competencies to the regions is effective since 1\textsuperscript{st} January 2015. According to the third Brussels Energy Efficiency Action Plan, Energy Houses were expected to endorse the role of regional entities for the FRGE. However, these are currently under restructuring by the new regional government. The new form of the Energy Houses should be available by the fall.\textsuperscript{13}

2.3.4. Market mechanisms

The most famous market mechanisms concern GHG emissions. In the EU, main GHG emitters have been committed to quotas of emissions and reduction objectives. The global mechanism is based on tradable emission certificates. However, diffuse GHG emitters such as the building and transport sector have not been included in this EU-wide market mechanism. National or local initiatives have developed the concept to foster the market development of renewable energies or energy efficiency measures.

2.3.4.1. Energy efficiency

Contrarily to France with its white certificate mechanism, Belgium did not adopt a market mechanism to support energy efficiency investments in buildings. This position was reiterated in the Belgian notification to the European Commission concerning the transposition of article 7 of the European Energy Efficiency directive 2012/27/EC aiming at implementing a mandatory mechanism at the member state level to reduce annually the energy consumption by 1,5%, via an obligation on energy suppliers / distributors or via alternative mechanism(s). Belgium has chosen for the alternative mechanisms.

However, long before this directive, the Flemish region set up an obligation on the distribution network operators to reduce their clients’ energy consumption by 1,5% compared to the volume of energy sold the year before, with no related market mechanism. No similar obligation was adopted at the BCR level but since 2001\textsuperscript{14}, the regional distribution network operator Sibelga is in charge of several public service obligations such as including a contribution on gas and electricity consumptions to feed the regional Energy Fund. This regional fund serves notably to finance energy grants and other measures like the Brussels Green Loan (see point 3.3.1).

\textsuperscript{11} [http://www.frce.be/contact.php](http://www.frce.be/contact.php)
\textsuperscript{12} Interface between regional and municipal initiatives targeting urban revitalisation, member of the Housing Network (see point 4.1.3)
\textsuperscript{13} Interview with S. Maes (Coordinator Energy House Centre) in February 2015
\textsuperscript{14} Art 16 of the Brussels government decree of 19/07/2001
### 2.3.4.2. Renewable energies

Concerning renewable energies, all three regions decided to organise a market mechanism of green certificates, based on an obligation (quota) for electricity suppliers to guarantee that a certain percentage of the electricity they sell on the territory to their eligible clients is coming from a renewable energy production unit or a ‘quality CHP’\(^{15}\) unit (green electricity). The annual quota progresses each year to reach 12.1% in 2025 (see Table 1).

The guarantee is obtained via the green certificates (produced or purchased). One green certificate is granted each time that a certified production unit avoids the emission of 217kg of CO\(_2\) emissions compared to the reference production unit.

<table>
<thead>
<tr>
<th>Year</th>
<th>Quota of green electricity</th>
<th>Year</th>
<th>Quota of green electricity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>3.5%</td>
<td>2019</td>
<td>7.2%</td>
</tr>
<tr>
<td>2014</td>
<td>3.8%</td>
<td>2020</td>
<td>8.0%</td>
</tr>
<tr>
<td>2015</td>
<td>4.5%</td>
<td>2021</td>
<td>8.8%</td>
</tr>
<tr>
<td>2016</td>
<td>5.1%</td>
<td>2022</td>
<td>9.5%</td>
</tr>
<tr>
<td>2017</td>
<td>5.8%</td>
<td>2023</td>
<td>10.3%</td>
</tr>
<tr>
<td>2018</td>
<td>6.5%</td>
<td>2024</td>
<td>11.11%</td>
</tr>
</tbody>
</table>

Source: Brugel

A financial penalty of 100€ is foreseen for each certificate lacking to reach the annual quota. The Brussels green certificate market is quite stable these last years, with an average price of 85€ per certificate\(^{16}\).

### 2.3.5. Other financial supports

#### 2.3.5.1. BATEX

BATEX is a competition organised on an annual basis and aiming at rewarding selected projects with a grant of maximum of 100€/m\(^2\) of floor area. Selection criteria consider energy efficiency and a more global approach of sustainability of buildings (cf. the 4 selection criteria: low energy consumption, lowest environmental impact, technical and economic feasibility, architectural quality).

Targeted buildings are those of the residential (individual or community, private or public) and tertiary sectors.

This mechanism is a transitional support for global renovation projects with the objective of collecting good practices, favouring the emergence or pilot and demonstration projects. A follow-up of building performances is organised on a five year period.

This competition will end in 2017 given the introduction of the new mandatory regional standards for building construction and renovation in 2020.

\(^{15}\) Combined heat and power unit that are more efficient (at least 5%) than the separate production of electricity and heat with the reference technologies.

\(^{16}\) Brugel website, accessed in March 2015
2.3.5.2. 4 year plans for social housing companies (regional)

Needs for renovation in the public social housing sector is huge, while social housing companies are facing a sharp reduction of the financial means due notably to the general trend of impoverishment of their beneficiaries.

Several years ago, the BCR launched a renovation and construction programme for social housing companies based on the succession of four-year plans. These plans combine for renovation projects a direct financial support (50% of the work cost of selected project) and a zero interest loan (covering the other 50% work cost of the selected projects).

2.4. Existing administrative and technical supports

Housing renovation is often complex technically but also as regards regulation (e.g. urban planning rules) and sustainability concerns. Even in the building sector, professionals are not always aware of some potential improvements in their way of working or of new technics or technologies. This is a real important aspect of the technical support to more sustainable housing renovations and Brussels initiatives in that field are numerous.

However, our focus is set more on the candidate-renovator and the following points will only summarise briefly the potential technical and administrative supports available for them in the BCR.

These supports are mainly subdivided into two categories: those targeting individuals and those targeting professionals (e.g. real estate managers, property managers, social housing companies, etc.).

2.4.1. For individuals

2.4.1.1. Curbain

The Curbain (or Centre Urbain – Stadswinkel) is an association aiming at informing Brussels inhabitants, administrations, associations and field operators (e.g. SHAs, Housing Network) about all issues related to housing and city renovation, urban planning, etc. Technical support and advices are granted to individuals, training and conferences are organised and field diagnostics can be carried out by a team of 12 qualified advisers.

2.4.1.2. Energy Houses

Set up in 2013, the 6 Energy Houses offer an integrated approach as regards technical and financial (cf. financial support thanks to the Brussels Green Loan) issues related to housing energy renovation.

The new regional government decided however to restructure these entities by the end of the year and it is not yet clear if the concept will be gathered and under which form.

2.4.1.3. Other entities or initiatives

Several other entities aim at providing individuals with technical advice and more or less administrative support for housing renovation (e.g. municipal renovation houses, the Housing Network, the Energy Guidance’s, etc.). Each of them targets a specific category of persons (e.g. inhabitants of the municipality, low income households, etc.).
2.4.2. For professionals

2.4.2.1. Facilitators

The Brussels environment administration (IBGE-BIM) has developed dedicated services to offer technical and administrative support to professionals of the building sector: the facilitators. In general, there is one ‘facilitator’ per technical issue such as cogeneration, or per clients’ segment (e.g. facilitator for condominiums).

Recently a transversal service for sustainable buildings has been set up and serves as entry point to the other specialised facilitators on issues related to building energy renovation. In collaboration with the Energy Houses, the facilitator service for sustainable buildings organises permanence dedicated to condominiums aspects.

A new facilitator service has also been set up targeting the social housing companies and their regional parent society, the SLRB\textsuperscript{17}.

2.4.2.2. PLAGE – social housing companies

The regional programme BruPLAGE\textsuperscript{18} aiming at providing energy advisers to different categories of large energy consumers in the public sector (e.g. schools, hospitals, municipalities) has been extended to the social housing sector in order to offer them a methodological and financial support to the improvement of their energy management.

3. Investment requirements for energy/sustainable housing renovation

While point 4 identifies existing financial solutions and technical supports, point 5 will identify what are the needs in terms of energy/sustainable renovation and what are the criteria favouring the realisation of the potential investment.

Requirements concern both a macro perspective with the region aiming at fulfilling its objectives and a micro perspective from the point of view of the building/dwelling owner who will have to decide to renovate (or not) his/her property and how.

3.1. Global objectives and regional commitments

European objectives as regards CO\textsubscript{2} emission reduction, decreasing energy dependency, renewable energy production have to be integrated and applied in the national objectives and policy mix of the different member states. Most of them have a regional component in Belgium seeing the sharing of competencies between the federal and regional levels.

Most important European objectives on energy are gathered in the 20-20-20-20 strategy (20% reduction on energy consumption, 20% increase in energy efficiency and 20% of energy production based on

\textsuperscript{17} Société du Logement de la Région de Bruxelles-Capitale : housing society of the BCR
\textsuperscript{18} PLAGE = Plan Local d’Action pour la Gestion de l’Energie – local action plan for energy management
renewable energy sources by 2020). The future European energy-climate ‘package’ targets for 2030 an energy efficiency improvement by 30%, a decrease of GHG emissions by 40% and an increasing share of renewable energies up to 27% in the production mix. The European Union set also another long term target with a global goal of an 80% to 95% of GHG emission reduction by 2050 compared with the reference level (1990). All these non-binding targets will have to be implanted at the BCR level too.

In addition, the BCR signed in 2010 the voluntary agreement of the “Covenant of Mayors” implying a commitment to go beyond the 20-20-20 European objectives. The BCR committed to reduce its GHG emissions by 30% compared to the 1990 level, at least in 2025. This target is integrated in regional official documents such as the ‘COBRACE’ or the ‘PRDD’.

Potentials to reach these targets have been analysed per sector. The building sector (both residential and tertiary sectors) has been identified as a key sector, especially in the BCR, where high potentials of both CO₂ emission reductions and energy savings could be achieved (cf. this sector accounts for more than 70% of the regional energy consumption and 92% of the indirect GHG emissions related to electricity consumption).

Within this sector, dwellings represent more or less 38% of the regional energy consumption, 46% of Brussels GHG emissions and 27% of the indirect GHG emissions generated by electricity production. Residential heating systems generate also on average 29% of the regional NOₓ emissions and 22% of the regional emissions of particles (PM10), which have important impacts on air quality.

Therefore, an annual rate of 3% of thermal renovation for Brussels buildings has been integrated as regional target in the ‘PRDD’ (which is not binding), extending the mandatory target for public buildings set in the European Energy Efficiency Directive (2012/27/EU) to the whole sector.

Considering that the Brussels housing stock amounts to 161,771 residential buildings in January 2014, fulfilling the 3% objective would consist in realising the energy / sustainable renovation of at least 4,800 residential buildings per year (or more than 14,000 dwellings).

### 3.2. Costs of Brussels energy renovations in the housing sector

Given the relative compactness of housing (cf. urban area with lot of apartment buildings and attached houses) and the predominance of natural gas as energy carrier for heating purposes, solutions to lower residential buildings energy consumption are rather costly, compared to financial means of main inhabitants. This is even accentuated with the addition of heritage concerns.

A study commissioned by the Brussels environment administration (IBGE-BIM) to Technum has assessed optimum costs for thermal building renovation, as well as costs for the technical optimum

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20 Plan Régional de Développement Durable - Regional Plan for Sustainable Development : orientation plan as regards urban planning in the BCR
21 IBGE-BIM, 2013
22 PRDD, p205
23 IBSA statistics 2014
solutions\textsuperscript{24}, without taking into account complementary costs related to non-energy renovation, such as finishing or heritage preservation concerns.

The chosen methodology consisted in the assessment of different architectural and technical solutions according to global\textsuperscript{25} discounted costs approach, excluding the inflation and public financial supports. To be cost-effective, selected measures have to be paid back on their assessed lifespan (building envelope = 30 years, equipment = 20 years).

For the residential sector, 4 building-types were defined: 2 for houses (HI-B is a small attached house with 3 floors; HI-C is a bigger attached house, “maison de maître”, with 3 floors) and 2 for apartment buildings (AP-B is a small attached apartment building with 3 to 4 apartments, one per floor, with a separated heating system per apartment; AP-C is a bigger 3 façade apartment building with 20 apartments, on average 4 apartments per floor, with a central heating system).

The cost-optimum solution (including renewable energy production) for the HI-B building would reduce its energy consumption (on the basis of the PEB calculation method) by 50%, decreasing from an initial annual energy consumption of 201 kWh/m\textsuperscript{2} to less than 100 kWh/m\textsuperscript{2}. The global discounted cost related to this investment reaches nearly 400€/m\textsuperscript{2}, with an initial investment for energy measures\textsuperscript{26} of 115 €/m\textsuperscript{2}.

Table 2 illustrates results for the HI-B and other types of residential buildings analysed. There is for each case a simulation integrating photovoltaic panels (green lines) and a simulation without them.

This study shows that there are huge potentials of primary energy savings (from minimum 46% up to 70%) in the Brussels residential sector associated with the cost optimality concept. However, even if these combinations refer to cost-optimal solutions, the extra cost that will have to be added to the non-thermal renovation works (e.g. refurbishment, finishing) are far from being insignificant, especially when considering large apartment buildings.

<table>
<thead>
<tr>
<th>Residential building types</th>
<th>Energy savings (based on kWh of primary energy saved)</th>
<th>Annual primary energy consumption after renovation (kWh/m\textsuperscript{2})</th>
<th>Global discounted cost (€/m\textsuperscript{2})</th>
<th>(extra) Initial investment (€/m\textsuperscript{2})</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI-B (without PV)</td>
<td>-50%</td>
<td>100</td>
<td>400</td>
<td>115</td>
</tr>
<tr>
<td></td>
<td>-46%</td>
<td>108</td>
<td>378</td>
<td>82</td>
</tr>
<tr>
<td>HI-C (without PV)</td>
<td>-68%</td>
<td>131</td>
<td>480</td>
<td>153</td>
</tr>
<tr>
<td></td>
<td>-70%</td>
<td>124</td>
<td>463</td>
<td>136</td>
</tr>
<tr>
<td>AP-B (without PV)</td>
<td>-68%</td>
<td>92</td>
<td>711</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>-16%</td>
<td>241</td>
<td>683</td>
<td>57</td>
</tr>
<tr>
<td>AP-C (without PV)</td>
<td>-69%</td>
<td>141</td>
<td>882</td>
<td>371</td>
</tr>
<tr>
<td></td>
<td>-63%</td>
<td>184</td>
<td>849</td>
<td>338</td>
</tr>
</tbody>
</table>

Table 2: Cost-optimum solutions identified for energy renovation of residential buildings within the BCR

Source: based on figures presented in the 3\textsuperscript{rd} NEEAP (annex B) report, BCR plan

\textsuperscript{24} Gouvernement de la Région de Bruxelles-Capitale, 2014
\textsuperscript{25} Initial investment cost + operating costs + annual expenses + maintenance costs + replacement costs + residual investment value (linear regression) + ‘dismantling’ and disposal costs
\textsuperscript{26} Complementary to a ‘classic’ renovation solution without thermal efficiency investments
The extra initial investment for cost-optimal energy solutions ranges between 57 €/m² up to 371 €/m² according to the housing type. For typical dwellings surface, this represents an extra investment of 3.500 to 18.550€ for a small dwelling (50m²), 3.990 to 25.970€ for a classical 70m², 5.700 to 37.100€ for a 100m² and 6.840 to 44.520€ for a 120m².

If an annual rate of 3% of deep energy renovation is applied to the Brussels housing stock (161.771 residential buildings in January 2014), this represents on average 3.800 residential buildings per year (more than 14.000 dwellings) or an annual investment reaching at least 56 M€ and up to 360 M€, without integrating non-energy related measures or audit costs. On a 21 years period (2015-2030), this amount ranges from 1,2 to 7,5 billion euros. Taking into account other complementary costs related to the renovation works, this amount could double or even triple.

Moreover, to reach the long-term regional target according to the Covenant of Mayors while demographic pressures act contradictorily, it is expected that, complementarily to measures targeting consumption behaviour, implementing measures going beyond these cost-optimal solutions or larger scale adoption of less ambitious energy renovations would be necessary too. Required investments could therefore become even more important.

4. Confrontation between existing financial solutions and technical supports and investment requirements

Confronting the existing solutions with criteria required for increasing the level of investment in deep energy or sustainable housing renovation highlights notably the shortcomings which represent a potential of improvement with alternative and innovative approaches or activities.

Determining the ‘good practices’ of existing solutions (aspects that are in accordance with needs) identifies the interesting points on which developing those new mechanisms or interesting points to integrate in them to better match the local specifications.

After a synthesis in Table 3, main positive and negative aspects will be discussed more specifically according to the Brussels context.

The focus is specifically set on the private housing sector and on individuals, given that it represents the great majority of the Brussels residential sector.

4.1. Synthesis table

Table 3: Identification of ‘good practices’ and shortcomings of existing financial solutions for housing renovation in the BCR

<table>
<thead>
<tr>
<th>In accordance with needs</th>
<th>Shortcomings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own funds</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• No related cost or guarantee</td>
</tr>
<tr>
<td></td>
<td>• Limited availability</td>
</tr>
</tbody>
</table>

27 Average dwelling surface = 70m², minimum energy extra investment required = 57 €/m²
<table>
<thead>
<tr>
<th>Debt</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Consumption credit</strong></td>
<td>Spread the investment over time</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mortgage credit</strong></td>
<td>Spread the investment over time</td>
</tr>
<tr>
<td></td>
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<td></td>
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<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Public financial supports</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grants</strong></td>
<td>Reduce the global cost</td>
</tr>
<tr>
<td></td>
<td>Higher for lower income</td>
</tr>
<tr>
<td></td>
<td>Higher for more sustainable materials</td>
</tr>
<tr>
<td></td>
<td>Sometimes accessible for do-it-yourself</td>
</tr>
<tr>
<td></td>
<td>Transferability (energy grants, green certificates)</td>
</tr>
<tr>
<td></td>
<td>Generally ex post (no pre-financing)</td>
</tr>
<tr>
<td></td>
<td>High fragmentation: split according to issue / measure, multiple sources, heterogeneous access conditions</td>
</tr>
<tr>
<td></td>
<td>Administrative burdens</td>
</tr>
<tr>
<td></td>
<td>High variability over time</td>
</tr>
<tr>
<td><strong>Reduced VAT</strong></td>
<td>Reduce the global cost</td>
</tr>
<tr>
<td></td>
<td>Only for professionals</td>
</tr>
<tr>
<td></td>
<td>No distinction made according to income level or sustainability criteria</td>
</tr>
<tr>
<td><strong>Brussels Green Loan</strong></td>
<td>Spread the investment over time</td>
</tr>
<tr>
<td></td>
<td>No interest rate</td>
</tr>
<tr>
<td></td>
<td>Regional guarantee offered</td>
</tr>
<tr>
<td></td>
<td>Link with energy grants (pre-financed)</td>
</tr>
<tr>
<td></td>
<td>Technical support</td>
</tr>
<tr>
<td></td>
<td>Too short duration</td>
</tr>
<tr>
<td></td>
<td>Limited borrowing capacity</td>
</tr>
<tr>
<td></td>
<td>Limited maximum lent amount</td>
</tr>
<tr>
<td></td>
<td>Not accessible for all renovation projects / all types of owners</td>
</tr>
<tr>
<td><strong>Energy performance credit</strong></td>
<td>Spread the investment over time</td>
</tr>
<tr>
<td></td>
<td>Long duration</td>
</tr>
<tr>
<td></td>
<td>No interest rate</td>
</tr>
<tr>
<td></td>
<td>Only accessible to beneficiaries of the social mortgage credit</td>
</tr>
<tr>
<td><strong>FRGE</strong></td>
<td>Spread the investment over time</td>
</tr>
<tr>
<td></td>
<td>Low interest rate</td>
</tr>
<tr>
<td></td>
<td>Financed through public funds and issues of obligations (mobilisation of other financial sources)</td>
</tr>
<tr>
<td></td>
<td>6th state reform: no regional transposition yet</td>
</tr>
<tr>
<td></td>
<td>Too short duration</td>
</tr>
<tr>
<td></td>
<td>Limited borrowing capacity</td>
</tr>
<tr>
<td></td>
<td>Limited maximum lent amount</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Market mechanism</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Green certificates</strong></td>
<td>Long term vision</td>
</tr>
</tbody>
</table>
4.2. Discussion points

4.2.1. Lack of own financial means – Brussels context

The financial and economic crisis of these last years have an important impact on financial means available for building/dwelling owners, as well as the relative sharp increase in real estate prices (sale prices or loans), generated partially by these crisis (real estate has been considered has a “refuge” value for some investors) and by demographic concerns (cf. growth in population and number of households).

Financial resources of owners are therefore limited, mainly mobilised by the purchase charges or the loan. Energy efficient or sustainable renovation works have to compete with all other potential investments for the leaving budget and given that they are often realised in combination with other necessary renovation works\(^{28}\), the remaining available budget is generally scarce.

In the specific context of the Brussels-Capital Region, the situation is even more worrying seeing that the average income of inhabitants is lower than in the other region of the country. Moreover, 60% of the Brussels dwellings are rented. The great majority of them are owned by ‘small’ landlords (a person owning one rented dwelling only) for whom investments in his/her own dwelling will mostly prevail on investment in his/her rented dwelling (cf. the split incentive of renovation works between the investor bearing the costs and the occupier enjoying the benefits, also called the landlord-tenant dilemma).

Private buildings in co-property ownership (or condominiums) concentrate these two effects. Apartments are indeed sold at lower cost (cf. smaller size of the dwellings) than homes and thus more affordable for lower income households to become owners-occupiers. Apartments represent also the great majority of Brussels rented dwellings. This induces a complementary difficulty in the decision process of the condominium when trying to find a compromise between the divergent interests of the different owners profiles (new owner-occupier, owner-occupier without any mortgage credit, landlord with or without a running mortgage credit, etc.).

Another important share of Brussels rented dwellings are owned by public social housing companies (more or less 7% of the Brussels dwelling stock). With the growing impoverishment of their tenants\(^ {29}\), a regional mechanism has even been set up to compensate for the difference between the calculated

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\(^{28}\) De Keersmaecker, 2012

\(^{29}\) SLRB, 2014
loan and the real loan that tenants have to pay for. Without this regional subsidy, social housing companies would encounter too deep financial difficulties, even for simply managing and maintaining their building stock correctly.\textsuperscript{30}

As regards big private companies, building management and investments in energy efficiency or renewable energies are generally not part of their core of business, so that they will never increase their social capital by issuing equities only for that purpose. In addition, such kinds of investment are generally not set as a priority to allocate available funds (cf. lack of awareness and internal competencies, competing investments directly connected to the core of business, etc.).\textsuperscript{31}

\subsection*{4.2.2. Barriers related to borrowing practices}

Comparing the level of initial investment needed to reach a certain level of energy performance for dwellings and reduce their related CO\textsubscript{2} emissions, financial means of the great majority of owners are insufficient to support such a cost on their own.

Given that the great majority of Brussels owners are individuals, the only solution they have to finance their project is to borrow money from credit institutions (traditional banks or Brussels Green Loan via CREDAL).

\subsubsection*{4.2.2.1. Mortgage credits}

However, even if mortgage credits are available on the long term (15-25 years) and currently at an attractive cost,

\begin{itemize}
  \item the dwelling/building is taken as guarantee, which is not or difficulty applicable for common parts in condominiums;
  \item granted credits are limited in general to maximum 80\% of the property value or are penalised by higher interest rate;
  \item borrowing capacity and solvability of the client are assessed on the basis of his/her income and assets only.
\end{itemize}

\subsubsection*{4.2.2.2. Consumption credits}

Concerning consumption credits, they have a repayment period that is too short to finance ambitious energy works such as roof and wall insulation (that would need at least a credit on 10 to 15 years given their longer return on investment\textsuperscript{32}) and are too costly (6\% of annual interest rate on average, other costly guarantee often required such as an insurance in case of non-repayment) compared to expected energy savings.

Here too the solvability of the borrower is more important than the project and its potential energy savings, which handicaps even more condominiums (cf. difficulty to assess the solvability of this legal person representing a panel of heterogeneous profiles).

\textsuperscript{30} Interview with Ph. Veevaet (director, Foyer Bruxellois), January 2015
\textsuperscript{31} d’Udekem d’Acoz M., 2014
\textsuperscript{32} Bullier & Milin, 2013


4.2.2.3. Conclusions and perspectives

For the same reasons than those exposed in point 2.1, the level of debt of most investors is already high in the housing sector (cf. growing sale price of housing due to demographic issues on demand combined to unsufficient supply) or their repayment capacities limited (cf. lower revenue, competition with other priority expenses, etc.) especially within a context of financial and economic crisis where banks are over-securing their investments (e.g. higher interest rate if the loan exceed 80% of the asset value ; mandatory insurance in case of non-repayment).

For all types of credits, borrowing rules that are already tight given the financial crisis will become even stricter and restrictive with the new legislation on borrowing practices and safeties to be applied in 2014 and 2015.

New bank regulations such as Bâle III and Solvency, transposed in the European legislation via the directive CRD4 and regulation CRR\textsuperscript{33}, will certainly not improve the situation, on the contrary. Banks will indeed have to mobilise a greater part of their own funds, especially to cover consumption credits that are not secured. This prevents them to offer unsecured credit solutions on the longer term.

Financing ambitious sustainable renovation works would on the contrary need to cover higher investment cost and long term repayment period. Moreover, current practices in the financial sector are mostly focussed on an asset-based guarantee (e.g. the home for a mortgage, the product bought for a consumption credit), ignoring energy savings or green certificates as potential revenue flows.

Without guarantee and competencies to adequately assess the risk related to such kind of investment, banks will often be reluctant to grant a credit therefore, or will ask a high premium risk (integrated in the interest rate). Moreover, in the case of buildings in co-property, the borrowing entity will secure the creditworthiness of the condominium association (cf. no vision on individuals repayment capacities, creditworthiness or debt level) by mandatory complementary insurances (e.g. insurance in case of non-repayment).

4.2.3. Inadequacies of main public supports

Public financial supports are also limited (limited available budget, few advances which requires pre-financing by the investor, etc.), heterogeneous (generally one kind of support per issue: renovation, energy, energy poverty, etc.), and their rules of attribution change regularly according to market evolutions, political priorities or new competence sharing between the national and the regional levels.

They generally do not create a long term and stable context which is necessary to go beyond the demonstration projects and reach a massive market uptake. Moreover, their current available budgets are not able to support a growing rate of (energy) renovation projects without complementary financial means.

The Brussels Green Loan is an interesting first attempt to overcome different barriers identified. It relies on a soft loan mechanism with a regional guarantee that are both able to reduce the borrowing cost. Moreover, energy grants are taken into account and even pre-financed, reducing the initial

\textsuperscript{33} http://ec.europa.eu/finance/bank/regcapital/index_en.htm
investment need (and related required loan). However, this loan targets energy measures only (requiring complementary financing for non-energy measures), and has the main same shortcomings of traditional consumption credits: a too short repayment period (7 years), a relative reduced maximum amount that could be lent and the assessed borrowing capacity does not consider energy savings as a potential source of repayment.

4.2.4. Integrated approach – the Energy Houses / Brussels Green Loan good practice

Most dwelling owners, and this is particularly the case in the BCR, are not professionals of the real estate sector and lack therefore technical competences and basic knowledge to be able to assess and design by themselves (deep) energy efficient renovation projects. Indeed, the BCR registers a small share public housing sector (7% of the dwelling stock on average for social housing companies and 2 to 3 additional percent for other public entities) and a great majority of private dwelling owners (occupiers and landlords) being individuals with few properties.34

In condominiums, the property manager is in charge of the “day-to-day” management of the building and has traditionally few competences and knowledge in energy management or ambitious renovation projects. Even if some owners are able to mobilise the other owners in an ambitious project, it is not sure that the property manager will accept to implement it (even with the external support of public facilitators) or at a potentially high extra cost. This task goes indeed by far beyond his/her legal obligations and he/she would have to hire a specialist to define the statements of works, to follow the work progress and take delivery of the final works. Moreover, he/she will have to design an appropriate financing plan according to the condominium characteristics (e.g. rate of bad payers among owners, etc.)35. Even with adequate financial schemes available for such projects, these owners and property managers will have to be supported too for technical aspects to help them take the leap of more ambitious energy efficient works.

The Brussels Green Loan scheme offers a good example of a ‘one-stop-shop’ service integrating both technical and all existing (regional) financial supports within the Energy Houses. However, the scheme targets essentially owners-occupiers and could be improved as regards condominiums (cf. the Brussels Green Loan is only accessible for individuals under specific income and age criteria, meaning a high administrative burden for the property manager and for all owners of the condominium, to mobilise this financial support).

4.2.5. Landlord – tenant dilemma

The landlord-tenant dilemma - also called split incentive, principal-agent issue or diverging interests – occurs in energy efficient building renovation when the major investment has to be made by the owner, while main savings (e.g. on energy bill, comfort and agreement) is registered by the occupier, the tenant.

34 Meyer, 2013
35 They are some examples of property managers in Brussels who preferred to resign because they were no more able to manage tasks related to cogeneration or renewable energy installations, such as green certificates (Personal contact with V. Spruyt, Managimm, in December 2014).
Current practices and existing financial mechanisms do not solve this issue that is identified as a major barrier to energy efficient retrofit in the BCR where the majority of dwellings and rented (60% on average, 10% by public entities and 50% by private landlords), even if some financial supports such as energy grants or soft loans granted via the Brussels Green Loan scheme are available for tenants too.

The only solution up to now to solve the issue is that the landlord and the tenant sign both an addendum to the rental contract for principal residence where an agreed costs and savings sharing is decided between both parties. The current legislation seems to have too restrictive conditions to allow for a large adoption of this procedure. Moreover, without any reference contract or suggested sharing mechanisms, as well as incentive for the landlords, such an agreement is rarely obtained.

Even with such a mechanism, some supports are not accessible to landlords while owners-occupiers could be eligible, creating an even lower incentive for landlords to renovate their property. There are exceptions for private or public dwellings rented via SHAs but such dwellings represent for the moment a very little part of the Brussels rented housing market (3,000 dwellings on average on an approximate total of 335,000 rented dwellings).

4.2.6. Condominiums

Most existing financial mechanisms and supports address individuals and are not designed according to specificities of condominiums.

Bank credits are more difficult or more expensive for condominiums because it is much more complicated for financial entities to assess the solvability and repayment capacity of the legal entity representing the condominium (the co-owners association) than for individual owners.

Except for some energy grants, most public supports are granted on an individual (revenue) basis and are therefore not accessible for investments in the common parts (e.g. renovation grants) or more difficulty mobilised for that purpose because each owner has to apply individually for a support according to its share in the total investment and its personal characteristics (cf. Brussels Green Loan scheme). Energy grants that are applied for by a condominium (one demand for the whole building introduced via the property manager instead of one demand per owner present in the condominium) are eligible but associated with the highest level of revenues (and thus to the lowest level of grants), while simplifying greatly administrative burdens for all involved parties: the owners, the property manager but also the administration in charge of the grants allocation.

Condominiums represent a great majority of dwellings in the Brussels housing stock, but there are no real financing or support mechanisms targeting specifically this market segment, which has a lot of difficulties to overcome (e.g. landlord-tenant dilemma, heterogeneity of owners’ profiles, heavy and low decision process, etc.) but which has also interesting perspectives offered by the mutualisation of equipment and infrastructures (cf. one project could improve the energy efficiency of several dwellings at the same time, energy savings reach a higher amount for the whole condominium than for a home, greater possibility to tackle several stakes simultaneously, etc.).
5. Conclusions

Own financial means of main Brussels dwelling owners are not sufficient, even with the integration of existing financial supports compared to the level of investment needed to reach the regional targets set in the frameworks of tackling climate change or of the European 20-20-20 strategy.

Public supports are also limited because they depend on public budgets which are under pressure in an economic crisis and austerity context. Moreover, they often do not solve the issue of the high initial cost of investment because most of them are granted ex ante while renovation works are already completed and paid for. Finally, the sixth state reform introduces a transition and uncertainty period around tax rebates that will have to be designed now on a regional basis.

Traditional financing mechanisms supplied by banks are not adapted to energy efficient housing renovations: their duration, cost or access conditions (mostly asset-based, related to the borrowing capacity and solvability of the borrower) do not cope with the profitability horizon and level of these investments and the fact that energy efficient investments generate a real increase in revenues, not via annual cash flows but thanks to avoided expenses.

Alternative solutions have to be developed to translate the interests of both worlds (world of investors in energy efficiency and world of financers) into common acceptable compromises, in order to be able to generate a possible market uptake of ambitious energy efficient and sustainable renovations in the housing sector.

There are several issues that have to be solved to reach such compromises.

Firstly, there is a need for mobilising other existing financial sources such as public (e.g. European, national, regional or local level) and private resources (e.g. private funds, enterprises, individual savings) that are not mobilised yet for sustainable housing retrofit projects. Requested solutions would have to be available for a relative long period (10 years at least and most probably around 15 to 20 years) and at a reasonable cost so that energy savings could compensate for the majority of the repayment cost.

Secondly, to make these energy savings accepted as a reliable future repayment cash flow, they need to be guaranteed and secured.

Thirdly, seeing the lack of competences and knowledge of most dwelling owners to be able to design adequately an energy efficient retrofit, it is quite interesting to develop a mechanism that combines both financial and technical supports.

A combination of these different approaches offers a fourth opportunity of innovative mechanisms.

Having the BCR context in mind, special attention should be paid on solutions that:

- avoid a growth in public debt (at all level: national, regional or local level);
- could reduce (or even eliminate) the need for an initial financial participation of the owner;
- solve, or give a potential solution to solve, the landlord-tenant dilemma;
- could be applied by condominiums.
Chapter II: New (integrated) financial mechanisms for housing retrofit

In the precedent chapter, it has been demonstrated that current available financial mechanisms and supports for housing renovation in the BCR are really narrow and not adapted compared to what is actually needed to reach important targets of energy efficiency in the housing sector (doubling or tripling of the annual renovation rate, increasing the ambition level of the renovation as regards energy and CO₂ emission savings).

- Most existing financial mechanisms and public supports are not able to solve major barriers identified to housing renovation - the lack of financial means and difficult access to traditional credits for most owners and tenants, which are particularly exacerbated in the BCR.

- Grants related to housing renovation are not stable in time, are not centralised or harmonised as regards access conditions or potential pre-financing. They target different beneficiaries and objectives that are not coherently connected to each other.

- Credits, even with subsidised interest rates, are difficultly accessible to main households given their already high debt level (cf. high dwelling price in the BCR) or because their repayment capacity is too limited compared to the global cost of investment (for both energy investments and non-energy renovation works) and the typical loan duration (around 7 years for consumption credits).

- Public supports are already reaching their limit with the current (low) level of building/housing renovation rate (cf. the annual dedicated budget for energy efficient investment grants is regularly not sufficient to cover all demands of the year), while a doubling or even a tripling of deep renovation projects would be required.

These acknowledgments highlight the current missing link between the candidate-investor for housing renovation and the concretisation of the renovation project: an integrated supply of both technical support and financial solutions adapted to the needs of building/housing renovation (duration in accordance with the life-time of building equipment or components, at a low cost and/or with the possibility to reduce the initial investment required from the owner).

There are, across the world and especially across the EU, several initiatives aiming at setting up alternative and innovative integrated financial mechanisms, which could answer to these major issues. They will be the focus of this second chapter.

A first issue consists in increasing the rate of existing financial means, from both public and private sectors, which are mobilised and invested in building/housing renovation. Some examples of interesting initiatives, such as the well-known German mechanism based on the KfW public bank, will therefore be described in the first point, and their applicability to the Belgian/Brussels context will be assessed.
A second issue concerns the possibilities to realise the required investment with little or no financial input from the owner thanks to a pre-financing mechanism ensuring a repayment on the basis of the energy savings. Two interesting initiatives have been implemented in Anglo-Saxon countries which are based on repayments via the energy bill (for the UK Green Deal) or via a local tax on real-estate (for the PACE mechanism in the USA), both linked to the dwelling/building rather than to the owner. A third mechanism, that seems much more compatible with the Belgian legal and policy framework, is based on energy performance contracts (EPCs) and a third-party investor. These three mechanisms will be discussed in the second point with a deeper focus on EPC.

1. Increase the accessibility to available funds

Multiple examples of initiatives to increase funds availability for energy efficient building retrofit have been identified in the EU these last years. Most of them are generated by public authorities alone or in partnership with the private sector and aim at collecting complementary funds, from the private or public sectors, through different channels to make them available for housing renovation at more favourable conditions (cost, duration, guarantees, etc.) than existing market solutions.

1.1. Mobilising private funds

These mechanisms aim at mobilising liquidity from the private sector for building renovation. In order to make the interests and needs converging, a public operator or private-public entity is often used as an intermediary so that funds can be available at a lower cost (e.g. KfW German bank) and/or for a longer payback period (e.g. UK Green Deal).

1.1.1. KfW – Germany

The German case study is often quoted as good practice in financial engineering seeing that it has registered a huge ‘waterfall effect’, meaning that each public euro invested in the scheme has been joined by 11 euros on average coming from the private sector. According to a recent assessment, each euro invested by public authorities in this financing scheme would have generated 2 or 4 euros of benefit for public authorities thanks to taxes or levies, as well as avoided costs of unemployment, without even taking into account positive externalities on environment, wellbeing or local economy dynamism.\(^{36}\)

In this scheme, the German public bank (80% owned by the German federal state and 20% by Landers) borrows money on the international market at low interest rate (cf. rating AAA and public guarantee), and makes it available for local communities and for commercial banks to grant loans dedicated to building renovation for all kinds of actors (small and big enterprises, individuals,

\(^{36}\) Kronenberg et al., 2012 in Bullier & Milin, 2014
associations, etc.) according to their needs. A complementary public financing coming from an energy transition fund (fed by taxes on energy production) allows for even softer loans.\footnote{CEDD, 2013}

Figure 3: German KfW mechanism to mobilise private funds for soft loans targeting housing renovation

For thermal housing renovation, the KfW offers soft loans of maximum 75,000€ with an interest rate ranging from 0.1% for local communities to 1% for households. The amount could serve for both energy and non-energy works in order to favour a global renovation approach. A minimum energy standard has to be reached after work completion but more ambitious projects, in accordance with existing energy standards for new buildings (KfW Efficient Energy House labelling), are granted with additional supports.

Thermal experts are in charge of verifying and controlling the compliance of the projects (ex ante) and of works (ex post) with the eligibility criteria of the scheme.\footnote{Caisse des Dépôts, 2013 pp.112}

However, even with the global success of the mechanism, several points of attention remain unsolved such as the link between the accessibility to the scheme and the borrowing capacity of the candidate-investor, as well as the landlord-tenant dilemma or need for an integrated support (‘one-stop-shop’) for both technical and financial aspects for most candidate-renovators.

Moreover, in the Belgian context where the level of public debt is already too high (impossibility for the BNB to issue specific state obligations for that purpose without worsening the public debt level), where a public financial operator such as the German KfW does not exist anymore, and where most competencies and support mechanisms for building renovation are regionalised, the model should adopt another form.

1.1.2. Caisse des dépôts – France

In France, the national Caisse des dépôts (a public owned financial institution) mobilises liquidity available on savings accounts (“livret A”) to generate long term loans to help social housing
companies improving their buildings thermal efficiency. In this scheme, public debt is not increased as the financing source defers from public guaranteed bonds.

Mobilising citizens’ savings will have to rely on another mechanism in Belgium given that there is no more public financial operator such as the Caisse des Dépôts in France (e.g. attracting these funds in another financial tool with a higher interest rate than on a traditional saving account and the same guarantee of absence of capital risk).

1.2. Mobilising EU funds

Beside the private sector, another important financial source for energy efficient building renovations will come from the increased dedicated financial means of several European financial entities and funds such as the European Investment Bank (EIB), the European Bank for Reconstruction and Development (EBRD) or the European Regional Development Fund (ERDF).³⁹

Other European financial means are dedicated to research projects (e.g. ⁷th Framework Programme for R&D, Intelligent Energy Europe) targeting among other topics building renovation.

1.2.1. European structural and cohesion funds

The EU Cohesion Policy for 2014-2020 has nearly double the amount allocated to sustainable energy (including both energy efficiency and renewable energy), which covers also building renovation. It seems however that these European funds are often underused by member states for building renovation. In 2012, only 18 programmes for energy efficiency and renewable energy investments in existing housing that supports social cohesion were identified in 13 member states, while all member states could use the Structural and Cohesion Funds for such initiatives (for example, they may allocated up to 4% of their European Regional Development Fund (ERDF) funding therefore).

Specific technical assistance and information campaigns have been developed to help national, regional and local authorities to improve their use of available EU funding and develop bankable projects.⁴⁰

1.2.2. Initiatives in partnership with the EIB

The EIB provides different direct financial instruments for energy efficient investments for both public and private entities, as well as indirect financing through specific investment funds (e.g. the European Energy Efficiency Fund) established with the private sector and a range of international financial institutions.

Two important European initiatives for building/housing energy renovations are supported by the EIB too:

- ELENA (European Local Energy Assistance) which is managed by the EIB and funded by the Commission;

³⁹ BPIE, 2012 p.27
⁴⁰ BPIE, 2014, p.30
- the JESSICA holding fund (Joint European Support for Sustainable Investment in City Areas, based on existing structural funds such as the ERDF which are partially reoriented into holding funds or financial instruments dedicated to JESSICA projects).

1.2.2.1. **KfW – ELENA**

The German public bank KfW has also launched since 2010 a partnership with the EIB in the ELENA initiative to support investments projects above 50 million euros for small and medium-sized municipalities and, where appropriated, Energy Service Companies (ESCOs).41

Two different financial mechanisms are available.

In the first one, local partners will have to play the role of a financial intermediary to which the loan of minimum 50 million euros is granted with the aim of financing in return smaller local investments.

The second financing mechanism relies on carbon crediting.

1.2.2.2. **JESSICA holding fund in Lithuania**

The JESSICA holding fund was established in 2009 by an agreement between both Lithuanian ministers of finance and environment and the EIB. It aims at providing loans and grants for energy renovation, targeting multi-apartment residential buildings (cf. 97% of owners-occupiers, main type of dwelling) or buildings for student accommodation.

The fund (227 million euros) is co-financed by the reorientation of funds available from the European Structural and Cohesion Funds (ERDF) at the level of 56% and by the Lithuanian national government at the level of 44% (financed via the EIB). The EIB manages the fund.

![Figure 4: JESSICA holding fund in Lithuania](image)

Source: INFINITE Solutions, 2014 p.36

41 D’Suza, 2012
The mechanism relies also on:

- financial intermediaries to “assess creditworthiness, verify projects compliance, award, administer and report on loans”
- and local facilitators to promote, prepare, evaluate and supervise technical solutions, make the links with funds intermediaries, etc.

Soft loans are granted to beneficiaries at an annual interest rate of 3% on 20 years, with no need for guarantee or complementary insurance. A self-investment of maximum 5% may be required. Repayments begin after a grace period of two years (period to implement the measures).

Complementary grants cover the preparation documentation (national funding) and investment expenses for low-income households. A 15% loan rebate and complementary grants (up to 25%) are given for more ambitious projects (minimum energy efficiency level to reach).

Two procedures are possible for multi-apartment buildings: the owners initiate the project by themselves, or via the municipality that will completely manage the project (including technical and financial responsibilities) and organise procurement for works.

The first 3,000 projects were selected in 2013 by the government (ministry of environment) from lists established by municipalities of potential eligible candidates. They average energy savings of the projects are around 50%. 1,500 projects have their investment plan approved by financial intermediaries.

The scheme has its own website dedicated to multi-apartment buildings renovation.

1.3. Adaptability of the concepts in Belgium/Brussels-Capital Region

Belgium has no more public bank but several federal or regional investment companies / funds that could issue specific obligations, mobilise available European funds or funds raised by specific taxes to finance housing renovations.

Concerning the mobilisation of European funds, the Belgian private bank Belfius works in collaboration with the EIB to finance public projects up to 50 M€ at a lower cost. Both entities made 200 M€ available notably for projects targeting certain building renovation, energy projects or solutions for individuals. The EIB intervenes for maximum 50% per project, the rest is financed by Belfius. 43

One single (e.g. at the federal level) or several dedicated fund(s) could be set up, by public authorities only or in partnership with private entities (in a public-private partnership). However, given the

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42 Third-party financing mechanism (see point 2.1.2) based on repayment thanks to energy savings: 90-100% of the energy savings generated by the project serve at repaying the investment, while the remaining amount of energy savings (10-0%) benefit to the occupiers.

43 Dedobbeleer, 2014
already high debt level of Belgian public entities and the growing weight of pensions and health care on public budget, solutions to raise complementary funds will have to avoid making the public debt grow. Therefore, particular attention would have to be paid on accounting rules of the different potential configurations to avoid any risk of worsening this situation.

1.3.1. Federal level

At the federal level, Fedesco – the federal entity aiming at supporting and financing the thermal renovation of federal public buildings - was nearly starting a new study aiming at identifying potential schemes to allow for the setting up of a Public-Private Partnership (PPP).

The objectives were to increase the available budget to finance future investments in federal building renovations, and to avoid any negative impacts on the national debt level. However, the federal government decided recently to not support the initiative. The project of a PPP at the federal level to increase funds to finance the annual obligation of 3% of energy efficient public building renovation seems therefore aborted for the moment.

1.3.2. Regional / local level

The Brussels Green Loan scheme in the BCR provides an interesting starting point with:

- its collaboration with an existing financial entity, Credal;
- its network of ‘one-stop-shops’ based on the six Energy Houses combining technical, financial and administrative supports at least for owners eligible to the Brussels Green Loan;
- its mechanism combining both soft loan, regional guarantee fund and pre-financing of grants.

With the Infinite Solutions European project launched in the beginning of 2014 within the framework of the IEE programme, the Brussels Green Loan scheme will evolve toward the creation of a dedicated revolving fund to provide soft loans for the energy transition (energy efficiency and renewable energy measures) of private buildings. The possibility to mobilise European funds is also analysed.

The project considers potential expansion of the scheme toward other categories of beneficiaries (e.g. commercial buildings, condominiums, social housing companies and SHAs, landlords who are not Brussels inhabitants, etc.), with adapted interest rates (0% to 3% for example) according to income or other considerations. As regards financial resources, the project analyses the opportunity to mobilise European funds and other regional public means to increase the global available budget. The scheme aims at providing soft loans up to 20,000 € per project on maximum 7 years, complementarily to regional grants.

44 See point 2 for more details
45 Moreover, Fedesco will be deeply restructured: the Knowledge Centre will be closed and the whole Fedesco entity will be integrated into the Government Buildings Agency. (Interview with Ch. Madam general director of Fedesco, February 2015)
46 Interview with P. Ethuin (coordinator Brussels Green Loan Infinite Solutions project, IBGE-BIM), in February 2015
47 Bruxelles-Environnement / Brussel Leefmilieu, 2014
To be able to improve its effectiveness and efficiency, the scheme would have to solve several problematic issues as regards the identified needs for more ambitious energy/sustainable housing renovations in the BCR:

- the whole cost of renovation should be targeted and not only energy measures;
- the maximum amount should therefore be adapted especially for ambitious renovation project, as well as the loan duration;
- the effectiveness of the scheme would be rather limited without including landlords in the scheme (cf. part of them are not Brussels inhabitants) and solving the landlord-tenant dilemma (cf. opportunity given with the 6th state reform);
- it seems complicated to include condominiums (decision process to slow and requiring a ¾ majority for renovation works in the common parts, no incentive / obligation to improve private parts such as windows replacement for the whole building) in the scheme while they need support to access credit at reasonable conditions, guarantee to limit side-cost and technical support. Accessing the scheme individually represents a high administrative burden for the property manager, the owners and the public entities especially for big condominiums (more than 10 dwellings);
- social housing companies would be difficulty integrate in the scheme given their really huge financial requirements while other financing sources could be available for them (cf. the EIB-Belfius solution or direct mobilisation of specific European funds);
- ESCOs are not taken into consideration as potential beneficiaries;
- conditions to grant the credit are softer than with traditional market practices but they are still facing the problem of repayment capacity of main eligible inhabitants.

With the 6th state reform, the former federal FRGE will be regionalised. Regional entities that will be in charge of FRGE competencies and funds are not determined yet. In Wallonia, a first proposal would be to transform the local FRGE entities into local entities of the Walloon Social Credit Company (in charge of the social mortgage credits and of the ‘ecopack’, a consumption credit at 0% interest rate for housing energy efficient investments targeting also households improving financial difficulties). In the BCR, no official proposal has been made yet (local FRGE entities are much less numerous in the BCR than in the two other regions) but in the 3rd NEEAP, Energy Houses were expected to become the new local entities of the regional fund.

A synergy of these mechanisms, the Brussels Green Loan and the FRGE, could be a real opportunity, if feasible, to increase available financial means and structure support mechanisms around an integrate approach combining technical, financial and administrative support for the great majority of Brussels housing owners.

48 Interview with P. Ethuin (coordinator Brussels Green Loan Infinite Solutions project, IBGE-BIM), in February 2015
1.3.3. Emergence of new private actors

New private actors have emerged trying to mobilise private financial means, and more specifically citizens’ savings (which is often called ‘crowdfunding’) for sustainable projects (e.g. ‘green microfinance’).

Mobilising citizen’s savings already exist in Belgium through the setup of citizens’ cooperative societies. The first ones appeared to finance notably energy renewable projects such as wind turbines, small hydroelectricity units, etc. and translate the willingness of citizens to become active actors in the energy transition and not only spectators or simple consumers.

In the Brussels-Capital Region, the citizens’ cooperative Energiris has been set up in 2014 and aims notably at mobilising citizens’ savings and investments into renewable energy projects and sustainable building renovation projects on the BCR territory. More details are available in point 2.3.2 on this initiative.

2. New contracting forms and third-party investor

2.1. What is the issue?

2.1.1. Third-party financing

Third financing consists in providing financial means for a project according to its characteristics and the investor profile, such as banks are doing with traditional credits. In its more elaborated forms, the third-party financer (TPF) will offer a complete financial package with all financing sources available for the investor (grants, soft loans, traditional bank credits, etc.) in order to increase his/her self-financing capacity. A good example of such elaborated third financer targeting housing renovation for low and medium income households in the BCR is the Brussels Green Loan mechanism.

However, as already mentioned in the previous chapter, soft loans, even combined with other financial sources like grants, are only accessible to investors who still have a debt capacity and enough solvability to become eligible. In current circumstances and given the investment needs for ambitious renovation projects, such mechanism is not adequate for a majority of dwelling owners wanting to deeply improve the thermal efficiency / sustainability of their property.

Therefore, another mechanism is required that would avoid a new debt for the owner: the third-party investing (TPI).

2.1.2. Third-party investing

Third-party investing, in its large definition, involves complementary repayment sources beside traditional credit repayments from the owner to finance totally or partially renovation works. Some examples such as the renovation rental agreement⁴⁹ present in Belgium and in France, the reverse

⁴⁹ The tenant finances the renovation works and receives compensation through a lower loan and a guarantee of occupation during a predetermined contractual period.
mortgage experimented in Dunkerke or the Kick Start mechanism implemented in the West Midlands illustrate the wide variety of potential solutions.

In the case of housing renovation in the BCR including energy efficiency improvements or/and decentralised renewable energy production units, green energy annual cash flows (e.g. related to green certificates) and energy savings could become the major repayment source for a third-party investor.

In a narrower acceptation, TPI refers only to mechanisms thanks to which the renovation investment is not carried out by the owner (excluding therefore TPF activities). In that case, green energy annual cash flows and future energy savings become the generally the major repayment basis for the third-party investor who has a claim on them. According to the chosen third investment scheme, the TPI will take on, partially or totally, the risk of not achieving these savings and generating these green energy annual cash flows, or not at all.

Definitions of these two financial mechanisms, TPF and TPI, are not harmonised so that the terms used could refer to different acceptations according to the context and the country.

In France, for example, the workgroup of the “Sustainable Building Plan” dedicated to innovative financing mechanisms for energy efficiency adopted the following definitions50:

“Third-party financing in energy renovation is an economic model aiming at providing an integrated offer, including financing as well as technical and operational management of the project, even after works implementation, in a global approach (energy efficiency being one issue among the others). TPF stricto sensu consists in organising the complete financing, including all possible resources (classical bank loans, soft loans, grants, etc.) above self-financing capacity of the owner, with possibly a part of third-party investing.

Third-party investing in energy renovation is an economic model consisting in granting financial means to energy renovation projects, in compensation for debts guaranteed by energy savings."

TPF is the global mechanism in which TPI represents one of the potential financial resources that could be mobilised. The third-party investor does not necessarily own the equipment or measures implemented, but he has a claim on the energy savings that are generated by them.

There are different kinds of potential relationships between a client and a TPI for building renovation.

In the first model (Figure 5), the client stays the central hub of the renovation project and has to conclude simultaneously two different contracts: one with the operating company (or one with each specialised company if there is no general contractor for the project) and one with the TPI to finance the works. It is a complex model for which the client must have sufficient internal competencies (or must be supported by a technical and legal assistance) to design and manage the renovation project.

50 Caisse des Dépôts, 2013 p.40 (own translation)
In other potential models, the owner/project manager has only one relationship to manage: with the operating third-party investing company or with the consulting third-party financing company (Figure 6). The operating TPI will implement by itself the selected measures and find complementary (re)financing solutions (in the illustration, the TPI and the orange elements are merged). The consulting TPF/TPI has already the financial means at disposal and contracts with one (general contractor) or several ESCO(s) for the implementation of the selected measures (in the illustration, the TPI and the blue elements are merged).

Different variants are also possible in both models presented according to the level integration between the different activities: the TPI could subcontract the technical / energy audit to or realise it internally, the TPI could require a refinancing solution (secondary financing) or not, etc.
2.2. Mechanisms to repay the investment in housing renovation

According to definitions given in the former point, a TPI mechanism requires an alternative source of repayment that has to be guaranteed or secured.

With renewable energies, the alternative source is quite simple for a TPI. The BCR for example guarantees, under specific conditions and during a certain period of time, an annual positive cash flow associated with the amount of energy produced by the unit, thanks to the green certificates mechanism\(^{51}\). These certificates are granted to the owner of the production unit (e.g. photovoltaic panels or CHP unit) which is favourable to the concept of a third–party investor (TPI): the owner contractually authorises the TPI to install RE production unit(s) in/on his/her building against compensation (e.g. a loan), the TPI repays its investment thanks to green certificates, and potentially also thanks to the sale of the produced green electricity.\(^{52}\)

Concerning energy savings coming from energy efficient measures, there is no real annual positive cash flow associated with the investment, but rather annual assessed ‘avoided expenses’ compared to a reference scenario without investment (a Business As Usual scenario). To make these assessed ‘avoided expenses’ tangible and secured, a specific mechanism - in this case a contract - has to be set up between the client and the ESCO so that the ESCO guarantees that a certain amount of energy savings will be achieved compared to the BAU scenario through the implementation of energy efficient measures. The contract is the mean to secure the annual avoided costs (the assessed energy savings), and to make them compatible with TPI securing requirements on the repayment source.

Several kinds of contracting mechanisms aiming at securing and guaranteeing energy savings generated by building renovation projects have been set up. The following points describe three major examples: the UK Green Deal, the PACE developed in the USA, and the Energy Performance Contracts (that are already well developed in different EU countries but rarely for housing sustainable/energy renovation).

2.2.1. The UK Green Deal

This new scheme has been launched in the UK in 2013. It aims at financing energy investments in buildings by private entities (the Green Deal providers\(^{53}\)) that are repaid for on the basis of assessed energy savings generate by the measures implemented, according to the “golden rule” (implemented measures must be repaid on the sole basis of the energy savings they are able to generate). The reimbursement is linked to the energy meter and made through the energy bills.

In practice, the maximum amount of investment is generally around 10.000£\(^{54}\) and owners may chose the repayment duration with a maximum of 25 years. A list of 45 measures of building energy efficiency determines which measures are eligible for and is completed with renewable energy production units for buildings with a good insulation level. The accredited Green Deal Assessors

\(^{51}\) see point 3.4 in the first chapter
\(^{52}\) APERe, 2011
\(^{53}\) These are mainly energy providers but also retail chains and supermarkets
\(^{54}\) 10.000£ equals more or less 14.000€
(GDA) are the certified evaluators who support candidate-investors in assessing and designing their project before their contact a Green Deal provider to carry out the chosen measures.

Accredited Green Deal Providers (GDP) finance the investment via the Green Deal Finance Company (GDFC), a non-profit making consortium of more than 50 public and private entities, granting specific loans at 'lower' cost (from nearly 7% to 8% per year) and on a longer period (up to 25 years). Part of its funds is coming from energy providers and part from a loan at the Green Investment Bank. The interest rate offered is not really attractive because the GDFC does not benefit from any state guarantee. In practice, the GDFC buys the GDPs’ debts back according to standard conditions and will directly recover the owner’s repayments from energy providers on energy bills.

A complementary financing source comes from the Energy Company Obligation (ECO) programme also implemented in 2012 in replacement of the former CERT and CESP targeting specifically deep retrofits. Each Green Deal provider has access to the ECO funds (760.000€ coming from the Carbon saving obligation, 190.000€ coming from the Carbon saving communities and 350.000€ coming from the Affordabile Warmth obligation) for measures that are compatible with the related fund (e.g. wall insulation for the two first funds and heating systems for households in energy poverty for the third fund).

In this scheme, thrust in energy efficient investments has been insured by an accreditation mechanism of professionals in contact with candidate-renovators (assessors and energy service providers).

It seems however that the scheme is not successful on the residential market: less than 1% of the 1.468 audits realised within the scheme have resulted in a real renovation project. Several municipalities have decided to support the mechanism in mobilising households via notably European projects (e.g. project IEE MLEI) or initiatives (e.g. ELENA Birmingham).

The fact that the debt is attached to the building could also introduce a risk of reducing its value on the market. Another issue with this procedure is that it would be difficult to adapt the scheme according to the owner profile (e.g. specific support or conditions for low income households) given that the owner profile may change after the sale.

2.2.2. The Property Assessed Clean Energy in the USA

In this mechanism set up in 2008 by several American states, public authorities finance the energy efficient investment in dwellings based on an assessment and feasibility study carried out by an accredited professional. It targeted in the beginning only single family houses before being extended to multi-residential, commercial, industrial or even agricultural buildings.

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55 Bullier & Milin, 2014
56 CERT was a former obligation mechanism set on energy providers aiming at reducing CO₂ emissions by households.
57 CESP was also an obligation mechanism set on energy providers but aiming at financing energy efficient investments for households in energy poverty (UK definition of energy poverty at that time referred to energy expenses higher than 10% of the household income). (Huybrecht et al., 2011)
58 INFINITE solutions, 2014
59 Bullier & Milin, 2014
60 Association des Régions de France, 2011
The owner wanting to upgrade his/her property without having to pay for the upfront cost signs a PACE contract (that may be as long as 20 years) with the municipality and may choose the enterprise(s) that will be in charge of the works. The municipality pays the bills of the enterprise, while the owner reimburses the municipality through a higher property tax (the tax is increased by the amount of annual assessed energy savings) until the end of the contract.

The repayment is therefore not linked to the owner but to the dwelling as it is the case in the Green Deal mechanism, which allow for a longer payback period and an automatic transfer of the reimbursement charge if the dwelling is sold.

The municipality financial means come from different sources such as a dedicated fund, own funds, an emission of public bonds, etc., which are generally at a lower cost than with banks. The repayment of the PACE has a claim prior to other debts. Banks were therefore reluctant to grant loans to owners having contracted a PACE, until the creation of a public guarantee fund61.

As regards the landlord-tenant dilemma, it has to be solved through an agreement authorising the landlord to pass-through at least partially the increase in the property tax on the tenant.

It seems that the mechanism is rather unsuccessful in the residential sector and very limited in the private tertiary sector.62

2.2.3. Energy Performance Contracts

In this contract, the provider of the energy efficiency improvement measure guarantees contractually that the measure will generate, at least during the contract duration, a certain amount of annual energy savings compared to the BAU scenario. Contrarily to the other mechanisms that are mean oriented, the Energy Performance Contract (EPC) is result oriented.

According to the EU Directive on Energy Efficiency 2012/27/EU, an EPC is a “contractual agreement between the beneficiary and the provider of an energy efficiency improvement measure, verified and monitored during the whole term of the contract, where investments (work, supply or service) in that measure are paid for in relation to a contractually agreed level of energy efficiency improvement or other agreed energy performance criterion, such as financial savings”. (Energy Efficiency Directive)

The key characteristics of an EPC project are the following63:

- **Turnkey service**: The energy service company (ESCO) provides all services required to design and implement a comprehensive energy saving project at the customer's facility, from initial energy audit to measurement and verification of savings.

- **Without the need for up-front capital**: Energy efficiency investments are repaid directly from energy savings and related financial savings, so there is no need for up-front capital on the customer's side.

- **Risks for customers minimized**: The ESCO assumes the contractually agreed performance risks of the project.

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61 Palmer et al., 2012
62 Caisses de Dépôts, 2013 pp. 118-119
63 [http://www.transparense.eu/eu/epc-qa/what-is-epc](http://www.transparense.eu/eu/epc-qa/what-is-epc)
- **Savings guaranteed**: The ESCO guarantees the achievement of the contractually agreed level of savings and is obliged to compensate savings shortfalls.

- **Support in finding financing**: The capital to finance the EPC project can either be supplied out of the Client's own funds, by the EPC provider or by a third party. Provision of financing by the EPC provider is an option, not a necessary part of the EPC project.

Conditions specified in the contract are crucial because they define the BAU scenario, the energy savings calculation method (cf. the ES provider tries to neutralise as much as possible main external factors such as climate variation, evolution in the number of occupiers, etc. that are not under control), the verification and control measures, etc.

There are two major types of EPC models: the guaranteed savings and the shared savings models.

### 2.2.3.1. EPC models

**Guaranteed savings - EPC**

In the guarantee savings model, the owner has enough favourable financial solutions and requires from the ES provider (the ESCO) only his/her technical competences to install the selected energy efficient measures and guarantee the energy savings (via an EPC). These secured savings will help the owner to repay for the investment, possibly financed thanks to a TPF.

It is not an innovative financing mechanism but an innovative way to increase the own funds of the owner and his/her borrowing capacity. It is indeed an answer to the traditional reluctance of financial entities to take energy savings into account in the solvability and borrowing capacity assessments of the owner. Access to existing TPF is therefore facilitated at a lower cost (cf. lower risk premium thanks to the contractual guarantee on energy savings).

![Figure 7: Model of the guaranteed savings – EPC](image)

This model is complex (cf. point 2.1.2) and generally used when the owner has sufficient own funds or an easy access to TPF at better conditions than the ESCO. In this model, the EPC is used by the client to guarantee and secure energy savings so that his/her access to TPF is facilitated. The ESCO does not invest in the implemented measures but assumes the technical risk and guarantees the

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64 Such kind of third-party financer could be considered as third-party investor in the wide acceptation of the term, seeing that financial means are made available on the basis of an EPC with guaranteed savings and not on the traditional basis of investor’s profile and repayment capacity. This is quite confusing because in this case, the third-party investor has no direct ownership on the installations (maybe indirectly according to complementary guarantees).
amount (in kWh or in € according to the terms of the contract\textsuperscript{65}) of energy savings, calculated according to an agreed methodology. Moreover, the ESCO guarantees also that the energy savings will be high enough (for energy price higher than a specified minimum level) to support the loan repayment.

In Belgium, this EPC model is the most commonly applied, especially by (large) multinational ESCO such as Dalkia or Axima Services that are active in building facility and management, or such as Siemens, Johnson Controls or Honeywell that are active in building automation and control.\textsuperscript{66}

\textit{Shared savings – EPC}

In the shared savings model, the ESCO finances the energy efficient measures and uses the major part (agreed fixed amount or percentage) of the energy savings that are guaranteed by the EPC to repay the investment, the rest of the savings benefit to the owner. The “golden rule” (as it is called in the UK Green Deal) for this mechanism is that energy savings are sufficient to cover all (or at least the major part) of the global investment cost.

This mechanism is a real TPI because the owner does not use his/her own funds to make the investment or increase his/her debt level. The ESCO-TPI bears the technical and the credit risks. If energy savings are expressed in money and not in quantity achieved (e.g. kWh), the ESCO-TPI has also to assume the risk of energy price.

It is therefore a potential solution to implement energy efficient (or RE production units) for owners who do not have enough financial means and/or limited access to affordable TPF. However, the concentration of risks in the hands of one single actor makes this solution often more costly (cf. higher capital cost and necessity for the ESCO to host both technical and financial competences).\textsuperscript{67}

\textbf{Figure 8 : Model of the shared savings – EPC}

Through the EPC, the ESCO finances (on its own funds or via a TPF) and implements measures selected thanks to the feasibility study (in general carried out internally by the ESCO), while the client commits his/herself to pay the ESCO for an agreed percentage of energy savings realised via the EPC, calculated according to an agreed and contractual methodology. The ESCO generally transfer the ownership of installed components/equipment at the end of the contract.

Given the risks for the ESCOs, shared savings EPCs often focus on short payback measures with no holistic approach of the global opportunities.

\textsuperscript{65} If energy savings are guaranteed in euros, the ESCO assumes a certain financial risk too.

\textsuperscript{66} Vanstraelen in Langlois & Hansen, 2012 p.126

\textsuperscript{67} Langlois & Hansen, 2012 pp.18-19
The shared-savings model is not well developed in Belgium yet, but different (emerging) small companies acting as ESCO or TPI in niche (specific market segments or specific technology solutions) have adopted this model too.68

2.2.3.2. Does an EPC guarantee a high level of renovation ambition?

There are different types of EPCs according to the kind of measures implemented and according to the follow-up degree and guarantee type provided by the ESCO during and after the implementation phase. The ambition of the EPC depends on its scope of measures and on the follow-up after implementation. There are therefore several types of EPCs69, offering from ‘simple’ to highly complex solutions.

With the more complex solutions, the ESCO assumes a higher technical risk, related notably to the combination of several technics/technologies at the same time. This often requires subcontracting tasks to different specialised professionals and strong coordination capacities from the ESCO.

With more ambitious renovation projects, financing will become an increasing issue too. More ambitious renovation projects require indeed implementing measures with a longer payback time and for which annual energy savings would not be sufficient to keep the duration of the EPC manageable, so that the owner will often have to complement the financial means. From the ESCO point of view, more ambitious renovation increases its risks and its need for refinancing (cf. higher budget per project with a longer repayment period). This means that if the target is to make the ESCOs adopt a more ambitious EPC model, a favourable and incentive framework has to be put in place to develop demand (e.g. standards or regulations, incentives, etc.), as well as potential complementary mechanisms aiming at facilitating ESCOs refinancing (e.g. development of standard measures or procedures) or diversifying its risks (e.g. aggregation of several different buildings).

Integrated Energy Contracting (IEC)

It is the most common energy contract, used by ESCOs to guarantee the quality of energy savings measures implemented and the quality of the (renewable) energy supply. It differs greatly from other EPCs because it is mean-oriented (no guarantee on performance), while EPCs are mostly result-oriented.

Energy Supply Contracting

In this contract, implemented measures only consider the energy supply side. The ESCO provides the client with a predetermined quantity of heat, cold air or energy at a fixed contractual price in order to reach a contractual level of comfort. The ESCO manages the energy supply for technical installations.

Maintenance & Energy Performance Contracting (M-EPC)

This EPC integrates a specific clause in the contract on preventive maintenance that will guarantee that energy savings will remain stable during the whole contract duration.

Comprehensive Refurbishment- EPC (CR-EPC)

This EPC integrates explicitly ambitious measures on the building envelope. Given that those measures are generally more costly and with a longer payback time, this kind of EPC generally

68 Vanstraelen in Langlois & Hansen, 2012 pp.128-129
69 Belesco, 2013 p.12
requires a complementary financing from the owner, so that the duration of the contract stays manageable. There are three sub-categories of CR-EPC: General Contractor EPC (GC-EPC; one contractor is responsible for the whole project and its performances but is free to choose the measures to implement), General Planner EPC (GP-EPC; the project is coordinated by one entity and the client generally dictated some mandatory measures to implement) or CR-Light-EPC (only minimal measures are implemented on the envelope such as roof insulation).

‘Smart-EPC’
The ‘smart-EPC’ is an innovative type of EPC trying to include the multiple benefits70 generated by renovation works in the performance assessment of the contract (it is therefore not a ‘pure’ EPC based only on the energy performance assessment but an extended performance contract).71

In Belgium, Fedesco in collaboration with Factor4 (a small Belgian ESCO) have developed a model of smart-EPC for federal building renovation projects including energy, maintenance and comfort (based on a satisfaction survey) performance contracting. Factor4 has adapted the model to other kinds of users, notably to the residential sector.

This type of performance contract targeting energy related issues could also be extended to other topics such as water consumption and management, and maybe even evolves gradually to a sustainable building performance contract.

2.3. TPF, TPI, EPC: what is the situation in Belgium?

2.3.1. General evolution

Energy contracting and third-party financing exist for a long time in Europe and the USA. They are mainly developed in the industrial and tertiary sector and concern especially energy related installations (e.g. lighting, heating and cooling, ventilation, renewable energy units) that have a short payback time and low technical risk.

However, first examples of EPCs in Belgium were recorded only in the 1990s, taking mostly the form of a “chauffage” model for public buildings and industries.72

In 2005, a new development occurred. The federal government set up Fedesco73, a limited liability company under public law, to play the role of a TPF for federal buildings to implement energy-

70 According to the OCDE report on “Capturing the Multiple Benefits of Energy Efficiency”, energy efficient investments generated different benefits for different stakeholders (e.g. “enhancing the sustainability of the energy system, economic development, social development, environmental sustainability and increasing prosperity”). The integration of those benefits in the decision process to invest in energy efficiency is expected to make them evolve from their current “hidden cost” position to a “first fuel” position in public attention. 71 Coolen, 2014b
72 Vanstraelen L. in Langlois & Hansen, 2012 pp.124-131
savings measures. To avoid public procurement procedures for selecting the TPF partner, Fedesco was granted in 2007 an exclusive right from the federal government. In 2008, an objective of 22% of CO₂ emissions reduction by 2016 for federal buildings was adopted by the federal government, generating a potential market for Fedesco TPF activities. Fedesco identified EPC as a useful tool to reach this goal, and the federal government approved its suggestion to apply the model to at least half of the federal buildings that will be renovated with the help of Fedesco.

Fedesco endorses since then the role of both facilitator of the EPC model for federal entities (and until recently for other public entities too via its Knowledge Centre⁷⁴) and aggregator by pooling several buildings together in one single procurement procedure.

First public procurements for EPCs where launched recently and a first attribution was made in 2014 for a first group of 13 buildings. In these projects, the maintenance contract of the buildings has been replaced by a tender for M-EPC.⁷⁵

Fedesco has worked hard on designing adequate and modular EPCs that could easily adapt to most federal building needs, including notably energy savings calculation methods based on an internationally recognised standard (the IPMVP). Fedesco has also published users’ manual on EPC models.

The BCR will indirectly benefit from this first large scale experience of TPF-TPI based on EPC to renovate public buildings: several selected buildings are located in the BCR and professionals of the sector will experience their first structuration attempts to be able to manage these contracts. Two municipalities (Etterbeek and Watermael-Boisfort) have also benefited from the services of the Fedesco’s facilitator (the Knowledge Centre).

2.3.2. In the housing sector

The residential sector is less attractive for TPI given its heterogeneity (e.g. types of buildings, ownership patterns, occupation patterns and energy consumption behaviours) and the relative lower size of the projects and related amount of potential energy savings. These characteristics make the residential sector more costly for private TPIs (cf. higher transaction cost related to the lack of applicability of standard solutions and to the lower size of projects and savings), and more risky.

EPC is however an interesting mechanism that could help solving more easily the landlord-tenant dilemma. In addition, renovation of the housing sector in the BCR is a crucial issue that could generate huge energy savings with current technologies⁷⁶. This potential is not achieved notably because owners, even if well aware of the issue, lack financial means, technical knowledge and time to set up a sustainable energy project.

2.3.2.1. EPC and the landlord-tenant dilemma

In the residential sector, especially in urban areas such as the BCR where the majority of the dwellings are rented, the split incentive between the owner and the tenant as regards renovation

⁷⁴ Two Brussels municipalities, Etterbeek and Watermael-Boisfort, were clients of the Knowledge Centre, as well as the Brussels public transportation company (STIB-MIVB). Vanstraelen in Langlois & Hansen, 2012 pp. 125-131.
⁷⁵ Belesco, 2014
⁷⁶ cf. results of the cost optimum analysis point 5.2 in the first chapter
and energy efficient investments (the landlord-tenant dilemma) is a major and long-lasting barrier to increase the rate of deep renovation projects. The issue has been partially solved at the level of the public housing sector via the introduction of a specific contribution in the loan to be paid by households living in energy efficient dwellings\(^\text{77}\), but is still present in the private housing sector.

One of the advantages of the EPC is that the investment cost is transformed into a charge that is partially compensated for by energy savings. This means that the traditional and complex issue of how to adapt the loan and subsequently the rental agreement according to the investment made by the owners and energy savings generated for the tenant could be quite simplified. The rental agreement could in fact stay the same. To adapt the sharing of charges during the occupation period, the tenant and the landlord could make an agreement (which is facilitated because energy savings are contractually guaranteed, measured and verified by a third ‘neutral’ party). Another solution would be to legalise the adaptation of the occupation charges (cf. new type of charge to be included in the occupation charges to repay for the investment) when a certain type of EPC\(^\text{78}\) is used to renovate a residential building guaranteeing that the total amount of occupation charges stays neutral or is lowered according to a certain %.

The current Belgian context could offer a great opportunity to adapt the legislation in that sense. With the \(6^{\text{th}}\) sixth state reform indeed, legislation concerning the principal residence contract is now a regional competency\(^\text{79}\). Until regions implement their own requirements and rules, the old national legislation prevails.

This regional implementation phase could be a very important driver to solve the landlord-tenant dilemma, as former legislation has been identified as a barrier for landlords and tenants to find and sign a common agreement that could be profitable for both parties.

The idea is to introduce the possibility to increase the loan paid by the tenant in the course of the contracting period if energy investment are realised by the owner. Current studies and pilot tests are ongoing to find a fair sharing procedure but it seems quite difficult to reach a satisfactorily solution that would simultaneously give the necessary incentive to landlord to invest in energy efficiency, and would not penalise the tenant.\(^\text{80}\)

Another possibility, in line with promoting ESCOs activities in the residential sector and EPC, would be to ‘play’ on the sharing of building expenses related to an EPC between the occupier and the owner, for which current rules are quite subject to interpretation and legal uncertainty.

In condominiums for example, property managers are suggesting a cost sharing based of their interpretation of legislation on which cost categories should be borne by the tenant (occupier) or by the owner (landlord). However, this sharing is not mandatory and landlords have the opportunity to

\(^{77}\) SLRB, 2014

\(^{78}\) E.g. eligible EPCs could be those fulfilling the “golden rule” of the Green Deal which guarantee that energy savings will be sufficient to cover the investment requirements

\(^{79}\) Van Den Driesche P-F. in Bernard, 2014 p.137

\(^{80}\) Bernard et al., 2014
modify it (sometimes with an express mention in the tenancy contract). If the tenant disagrees, he/her has the possibility to ask to the Justice of Peace to determine the matter.\textsuperscript{81}

If a clearer cost sharing is developed by regional authorities, special attention should be paid on the potential development of energy services in residential buildings and provide a solution to share related costs and try to solve the landlord-tenant dilemma as regards energy savings investments.

EPCs offer indeed the opportunity to guarantee that energy savings related to the energy efficient investment will cover the costs related to the global investment made (e.g. auditing, measures implementation, (partial) financing, repair and maintenance, verification and control, etc.) and generally induce a reduction of global occupation expenditures (usually a 15\% reduction on heating and hot sanitary water costs compared to a baseline scenario that is contractually agreed).

If the investment is made by the condominiums via a TPF or by a TPI according to an EPC, and if the legislation is adapted, the landlord would not have to invest him/herself to improve the intrinsic value of his/her property (cf. renovated dwellings and dwellings with a better energy performance certificate have a higher sale price) because the repayment could be included in the global occupation charges, and the tenant would be certain that the occupancy expenditure he/she will have to bear for energy in the following years (duration of the energy performance contract) would be lower and more predictable than in the absence of any energy efficient investment.

Here, there is no need to revise the tenancy contract itself. It would however be necessary to set clearly the rules to authorise such cost sharing without the need of a mutual agreement between the landlord and the tenant (providing that an EPC contractually guarantees the savings). This legal clarification would avoid potential disagreements and lawsuits on occupancy expenditures, making the framework for ESCOs, TPF and TPI in the residential sector more secure and simple (no need any more to negotiate an agreement for each ‘couple’ of landlord-tenant in the condominium), reducing related transaction costs.

\textbf{2.3.2.2. An emerging niche market in the BCR}

Since 2 or 3 years, different private actors in the BCR are trying to develop a TPI activity targeting notably the private housing sector.

Sophia Group is coming from the consulting sector and offers a range of specialised services (technical audit, facility management, building engineering, real estate consulting). Via its new subsidiary Sophia Environment, it was apparently the first to try to develop a TPI solution especially targeted on condominiums and based on a CR-EPC model in the BCR. The project intended to set up a Green Investment Fund to finance the selected measures to be implemented by the client. A legal study was carried out at the beginning of the project to give inputs to share on how to share the costs between the landlord and the tenant according to the current legislation. The model contract established would have to be accepted by both parties via a formal agreement. This initiative seems however to have failed, the subsidiary Sophia Environment being forced into bankruptcy\textsuperscript{82}.

Launched in 2014, Energiris is a citizens’ cooperative aiming at third financing sustainable energy measures (installation of photovoltaic panels and/or energy efficient renovation including insulation

\textsuperscript{81} Personal discussion with V. Spruyte, Managimm in December 2014

\textsuperscript{82} Interview with P. Hendrickx (director, Sophia Group) in February 2015
aspects) for public and private buildings. The size of the actor is small, so that its TPI solution may only come as a complementary source of financing for a project. To manage its risk, Energiris prefers investing a small amount in different projects. Via its network of partners (other TPI actors like Blue Tree, or general contractor like Soltis, traditional banks, etc.), a global solution is offered to the client combining, potentially, both technical and financial solutions (see Figure 9). Suggested solutions for housing renovation (first focus on condominiums of more than 10 dwellings), could combine different kinds of contracting (EPC, leasing, energy sale at reduced price, classical loan) according to the characteristics of the implemented measures and the investment needs.

Figure 9 : Energiris model of TPI

Source: based on Daoud, 2014 p.22
Chapter III: Conclusions, recommendations and perspectives

In Chapter I, it has been demonstrated that current available financial mechanisms and supports for housing renovation in the BCR are really narrow and not adapted compared to what is actually needed to reach important targets of energy efficiency in the housing sector (doubling or tripling of the annual renovation rate, increasing the ambition level of the renovation as regards energy and CO₂ emission savings, investment requirements above ‘classic’ renovations).

- Most existing financial mechanisms and public supports are not able to solve major barriers identified to housing renovation - the lack of financial means and difficult access to traditional credits for most owners and tenants, which are particularly exacerbated in the BCR.
- Grants related to housing renovation are not stable in time, are not centralised or harmonised as regards access conditions or potential pre-financing. They target different beneficiaries and objectives that are not coherently connected to each other.
- Credits, even with subsidised interest rates, are difficultly accessible to main households given their already high debt level (cf. high dwelling price in the BCR) or because their repayment capacity is too limited compared to the global cost of investment (for both energy investments and non-energy renovation works) and the typical loan duration (around 7 years for consumption credits).
- Public supports are already reaching their limit with the current (low) level of building/housing renovation rate (cf. the annual dedicated budget for energy efficient investment grants is regularly not sufficient to cover all demands of the year), while a doubling or even a tripling of deep renovation projects would be required.

These acknowledgments highlight the current missing link(s) between the candidate-investor for housing renovation and the concretisation of the renovation project in the BCR: suppliers of financial solutions adapted to the needs of building/housing renovation (duration in accordance with the lifetime of building equipment or components, at a low cost and/or with the possibility to reduce the initial investment required from the owner), which would preferably integrate technical support too.

Alternative solutions have to be developed to translate the interests of both worlds (world of investors in energy efficiency and world of financers) into common acceptable compromises, in order to be able to generate a possible market uptake of ambitious energy efficient and sustainable renovations in the housing sector.

Firstly, there is a need for mobilising other existing financial sources such as public (e.g. European, national, regional or local level) and private resources (e.g. private funds, enterprises, individual savings) that are not mobilised yet for sustainable housing retrofit projects. Requested solutions
would have to be available for a relative long period (10 years at least and most probably around 15
to 20 years) and at a reasonable cost so that energy savings could compensate for the majority of the
repayment cost.

Secondly, to make these energy savings accepted as a reliable future repayment cash flow, they need
to be guaranteed and secured.

Thirdly, seeing the lack of competences and knowledge of most dwelling owners to be able to design
adequately an energy efficient retrofit, it is quite interesting to develop a mechanism that combines
both financial and technical supports.

A combination of these different approaches offers a fourth opportunity of innovative mechanisms
consisting in an integrated and comprehensive approach.

There are, across the world and especially across the EU, several initiatives aiming at setting up
alternative and innovative (integrated) financial mechanisms, which could answer to these major
issues. Some interesting examples have been described in Chapter II.

To mobilise complementary financial means, the KfW German public bank gives a good illustration on
how public authorities may mobilise private financial means and make them available for energy
efficient building renovation, while the Lithuanian experience in setting up a JESSICA holding fund
shows how European funds could support a national program to improve housing energy efficiency
in multi-apartment buildings.

These alternative mechanisms are especially powerful when combined with all already existing
financial supports (e.g. grants, soft loans, guarantee) by third-party financing (TPF) operators that will
make them available and adequately redesigned for sustainable and ambitious renovation projects
(low cost, longer repayment duration, etc.) and when a strong relationship exist between the
financial and technical supports related to the eligible projects (‘one-stop-shop’ approach for both
technical and financial supports). Public entities are therefore often preferred TPF operators,
sometimes in partnership with private entities, because the public guarantee allows for mobilising
lower cost financial means and because public entities are the most legitimate actors to define
notably the access criteria as well as design the mechanism according to the targeted market
segment.

In Belgium, two issues have to be born in mind when trying to implement a similar approach. Firstly,
main public entities have already a high debt level, so that any potential solution to mobilise
complementary funds should paid special attention to its legal form and related accounting impacts
on public debt. Secondly, when applied to the housing sector, most public supports and
competencies are now in the hands of the regions, which would require regional and/or local
initiatives.
However, TPF is only part of the solution. One major financial barrier remains unsolved: owners with no sufficient financial means or borrowing capacity will not be able to mobilise even soft-loans complemented by grants and guarantees. Third-party investing (TPI) could in that case be a solution to foster renovation projects: the third-party investor finances the renovation works on its own or by mobilising a TPF, while the owner repays for the investment mainly thanks to the positive cash flows (e.g. green electricity, green certificates) and energy savings generated by the renovation.

As energy savings do not correspond always to a real positive and measurable annual cash flow, the TPI mechanism must rely on a contract that will determine notably how and when energy savings will be assessed compared to an agreed scenario without investment (BAU reference scenario).

Several contracting mechanisms have been set up to allow for this TPI approach.

In the UK, beside the existing obligation scheme for energy suppliers to reduce annually their clients’ energy consumption, the Green Deal has set up conditions to allow energy suppliers playing the role of a third-party investor for energy-efficient investments in buildings and organise the repayment of the loan via the energy bill. Complementary mechanisms have been designed to assure a lower energy bill for the occupier compare to the initial situation without investment and make the loan transferable to next occupiers in case of change and manage the situation when occupiers decide to change their energy supplier. Another example of similar mechanism is developed in the USA with the PACE (Property Assessed Clean Energy), where local communities invest in the renovation works and organise the repayment via a higher (real estate) tax on the building.

These two mechanisms are not really adapted to the Belgian legal and policy context (e.g. role of the energy suppliers, necessity for local communities to finance the scheme via the emission of obligations) and could induce negative effects on the property market value.

A third approach, the Energy Performance Contract (EPC) is defined in the European Energy Efficiency Directive as a “contractual agreement between the beneficiary and the provider of an energy efficiency improvement measure, veriﬁed and monitored during the whole term of the contract, where investments (work, supply or service) in that measure are paid for in relation to a contractually agreed level of energy efﬁciency improvement or other agreed energy performance criterion, such as ﬁnancial savings”. It is considered as the most appropriate approach to allow for the larger scale development of TPF (guaranteed energy savings model) and TPI (shared energy savings model) approaches in the building sector, and especially for public buildings (cf. Belgian experience in the field developed by Fedesco). This approach could however be interesting for other buildings, like residential buildings, too thanks to the knock-on effect induced by experiences from the public sector.

EPCs have different levels of ambition according to the type of measures implemented and the integration of preventive maintenance. Up to now, the most common used EPC (notably in the Fedesco TPI mechanism for federal buildings) does not include, or quite timidly, measures on the building envelope, while such a global approach would be the best to reach a higher rate of energy efficiency.

The combination of new financial mechanisms, such as TPF and TPI, to mobilise complementary financial means from the private sector and from European funds and make them available in an
adequate form for sustainable housing renovation (e.g. soft loan schemes combined with guarantee fund, grants or third-party investing) with appropriate and trustworthy EPC schemes has the potential to alleviate several barriers to more ambitious building renovations, to structure both demand and supply sides of the market and to foster the development of the ESCOs activities within the Brussels residential sector.

These mechanisms are for sure complex and require a long preparation time to be effectively implemented (cf. they have indeed to be designed notably in accordance with local specificities and requirements with careful attention paid to legal and accounting issues). They rely on strong public authorities’ involvement not only to set the favourable framework (e.g. information, incentives, regulation and or labelling, etc.) to foster TPI activities, but also to participate as active actors assuming the TPF (and potentially TPI), facilitator or even aggregator roles. This public involvement is necessary to facilitate the market and to offer adapted financial means, but also to drive the market toward an increased level of ambition in the renovation projects and offer differentiated solutions according to owners and buildings profiles (e.g. higher grants for low income households, set priorities on very inefficient buildings, etc.).

The implementation of such combined mechanisms gives however the opportunity to structure both demand and supply sides of the building renovation markets, and offer an integrated (‘one-stop-shop’) and adapted technical and financial solution to owners with limited financial means and borrowing capacity. These issues are very often highlighted as major barriers to energy/sustainable building renovations.

It seems therefore quite difficult to develop a mass market uptake of ambitious renovation projects, which is needed to reach the regional targets concerning energy and climate stakes, without considering these alternative mechanisms and try to implement them at the regional level.

Considering the BCR, 2015 and on would be crucial years for implementing a favourable framework for housing renovation, as well as for the development of such alternative mechanisms. 2015 could even represent more specifically a “momentum” for different reasons:

1. different pilot projects, based on a TPI-EPC mechanism, are being carried out by Fedesco on federal buildings present on the Brussels territory and are just starting their practical implementation. This represents a great opportunity to demonstrate the feasibility of the scheme and its interests. If the experiences are successful, they could induce a knock-on effect inside the public buildings market segment but also on other types of buildings that could benefit from a better renovation market structuration and the learning effect.

2. the 6th state reform transfers this year different major competencies as regards the housing sector and housing renovation (e.g. principal residence rental agreement, tax rebate for energy saving investment in the residential sector, FRGE, etc.) to the regional level. This is an opportunity to make synergies between different existing schemes (e.g. FRGE and the Brussels Green Loan?), to solve the landlord-tenant dilemma issue, etc. Concerning the landlord-tenant dilemma, the EPC could help solving the problem by focussing on the occupation charges instead of a revision of the rental agreement: charges related to an EPC respecting the “golden rule” (charges related to the EPC are compensated for by guaranteed
energy savings of measures implemented) should be recognised legally as occupancy charges.

3. the Brussels Green Loan scheme relies already on an integrated service to the owners (the Energy Houses grant both technical support and financial/administrative supports) and gather different public supports (soft loans, pre-financed energy grants) in a global package. Thanks to the INFINITE Solutions project, the scheme intends to evolve toward a revolving fund, a more perennial and large scale mechanism potentially mobilising European funds. This promising base seems however to have shortcomings and several aspects would need improvement to become compatible with TPF and TPI mechanisms for ambitious renovation projects (e.g. longer payback repayment period, considering energy savings guaranteed by an EPC as a valuable repayment source, targeting other beneficiaries than Brussels inhabitants). In addition, the new regional government has decided to reform the recent Energy Houses network, which was identified as the potential TPF-TPI facilitator and ‘one-stop-shop’ operator, with the intention of increasing its effectiveness and reduce the related operating costs, but there is still great uncertainty about its future design, competencies and linkage.

4. niche market TPIs are emerging in the BCR (e.g. Energiris, Blue Tree, Sophia Group Environment) showing that this missing link between owners and professionals (both from the financial and building sectors) in the renovation market represents an opportunity to develop new economic activities in municipal and residential buildings. First TPI projects of Energiris for example concern the ‘easiest’ part of the market (installation of photovoltaic panels on municipal buildings) but renovation projects, notably in condominiums are also targeted. Pilot projects in this field could give interesting feedbacks on what is required to foster the development of such activities in the BCR.

To enable this development, as well as the development of more ambitious housing renovation projects, several prerequisites are needed:

- there is an urgent need to solve the landlord-tenant dilemma and the competency lays no in the hand of the region;
- TPIs should be able to mobilise the same financial supports as its client to avoid any distortion in the advantages granted for a solution with or without TPI (e.g. low cost and long term credit, lower VAT on renovation works for old buildings, grants, etc.).

In the future, if the TPI market increases, as well as ambitions in the building renovation projects, complementary funds could be needed, stepping up the debate around the possibility to increase financial means dedicated to the purpose thanks to the potential setup of public-private partnerships, as suggested last year by Fedesco.

In that respect, the recent French initiative ‘Energie POSIT’IF’ is particularly interesting for the BCR. This project gathers regional and municipal entities in a public-private partnership (private partnership is limited however to the participation of the Caisse de Dépôts which is not a ‘pure’ private actor) to set up an integrated local TPF, and potentially TPI when needed, operator targeting ambitious energy renovation for both public social housing companies and the private housing sector. On the basis of an inventory of buildings energy consumption, buildings presenting highest energy consumption are targeted in priority. This example could represent a potential evolution trend for the Brussels Green Loan scheme, or other regional/local entities targeting specific market
segments such as the social housing sector, toward the setup of an integrated local TPF-TPI entity, opened to private investors.

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