

# [BELGIUM (Wallonia)] Energy premium for refurbishment

## Primes Energie

### About the measure

Policy instrument	Sector	Starting date and status
Financial (grants)	Residential	[2004] – [ongoing]

The objective is to promote **renovation works** improving the energy efficiency of dwellings. Individual owners of dwellings can apply for **grants** that are managed by the Energy Department of Wallonia.

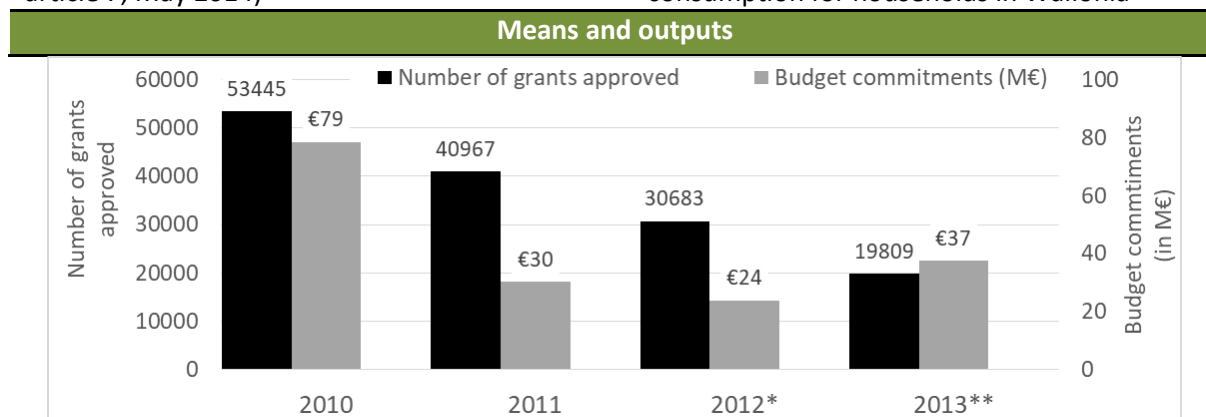
Eligibility conditions are set on the age of the dwelling (> 20 years) and the net income of the households (< €93 000). Grants are fixed amounts per action type, with **bonus factors** since 2010 **depending on income classes** (up to a factor 3 for the lowest income class) **and in case of simultaneous actions** (bonus also depending on income classes, up to 30% for the lowest income class). Both factors can be

cumulated, but the grant cannot be more than 70% of the invoices (all taxes included).

Eligible actions are energy audits, insulation of walls, roofs, floors and equipment for space heating and domestic hot water. **Minimum energy performance criteria** are required, and the actions have to be implemented by a registered contractor (except for roof insulation).

The scheme was revised in April 2015 for efficiency and equity purposes (+ budget restrictions). A new upgrade is planned in 2018 to increase requirements and favour deep retrofits.

Expected energy savings in 2020	Benchmark
2.07 TWh/y (7.4 PJ/y) in 2020 from actions over 2014-2020 (cumulative annual final energy savings) (source: updated notification for EED article 7, May 2014)	32% of the EED article 7 target (for 2014-2020) Average expected rate of new annual savings (0.3 TWh/y) = 1.3% of 2013 space heating consumption for households in Wallonia



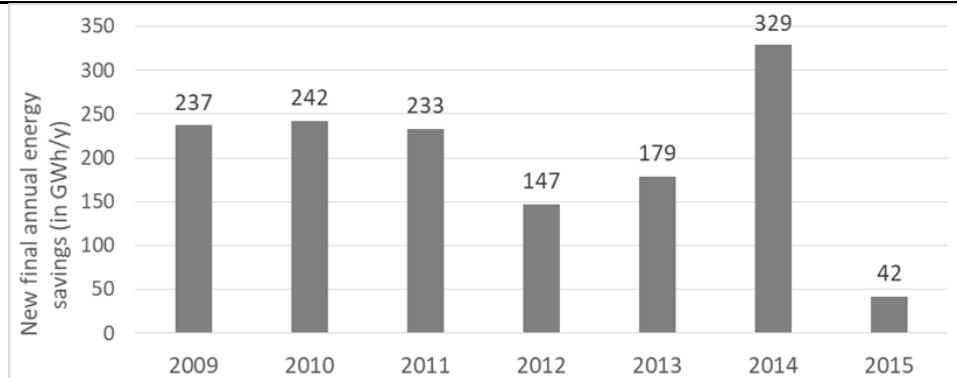
Source: SPW, 2014a (tables pp.54-55) (\*: almost complete data ; \*\*: provisional data)

- Budget commitments are based on the applications received. Paid amounts may be smaller due to withdrawals or non-compliance (for 2010-2013, 170 M€ committed and 122 M€ paid).
- Statistics about number of grants are available per type of action. Most frequent actions over 2010-2013 were condensing gas boilers (26%), roof insulation (24%), energy audits (15%) and wall insulation (8%). Monitored data also provide the costs of the works supported, based on the invoices: 626 M€ between January 2008 and December 2012 (IWEPS, 2014).



## Data about energy savings

Unit	Main source of data
New final annual energy savings (GWh/y)	Annual reports for the Energy Efficiency Directive



Source: 2015 annual report for 2009-2013 data, 2017 annual report for 2014-2015 data

- **New final annual** energy savings = annual energy savings from new actions each year
- Reported results are **gross** energy savings (see below)

### Sources of uncertainties about energy savings

The sources available do not include an uncertainty analysis. Sources of uncertainties may be for example:

- differences between reference values and actual characteristics of participants' dwellings (for the baseline situation);
- differences between the assumptions on heating behaviour and the actual behaviour of the participants (for example due to rebound effect);
- differences between the assumed (deemed) and actual performance of the actions installed;
- errors in the data in the files submitted to get grants (when outliers are identified, then they are not taken into account in the calculations).

## Evaluation of the energy savings

### Calculation method(s) and key methodological choices

- bottom-up calculation methodology based on the recommendations of the European Commission (including values for action lifetime): **scaled savings** determined mostly with **method 5** (engineering calculations combining data specific to the actions to determine the energy performance improvement, and reference values to define the baseline situation);
- **the baseline situation** is defined based on regional statistics and updated regularly: the reference values for the building components (e.g. heat transfer coefficient for roofs, walls, etc.) are determined from databases of energy audits and Energy Performance Certificates (**stock average**) and these values are updated regularly to take into account the overall improvement of the dwelling stock;
- use of normalised weather conditions and behaviour, no adjustment factor applied;
- reported energy savings are gross results: all actions that received a grant are taken into account (no ex-post causality assessment);
- eligibility criteria on actions ensure that they go beyond minimum legal requirements (performance additionality);
- energy savings are evaluated only for actions directly saving energy (for example, insulation actions), and not for supporting action (i.e. energy audits).

### Ex-post verifications and evaluations

A database (Alfresco) is used to monitor the financial incentives, and merged with the other databases and data sources about government policy measures for energy efficiency in buildings. The main other financial incentives for retrofitting actions in Walloon dwellings are a grant scheme for alleviating unhealthy housing and a low-interest rate loan (EcoPack). For more details about other Walloon measures for buildings, see the Belgian NEEAP.

Calculations are then directly performed from the database, using the technical data collected for each action and harmonised values set at national level (CONCERE EE) for the remaining parameters (baseline situation). The ex-post evaluation of energy savings is therefore mainly based on the data collected through the monitoring system. Ex-ante evaluations have also been done to estimate future impacts according to different assumptions about trends in the number of actions implemented (SPW, 2014b).

### Other indicators monitored and/or evaluated

Indicator	Explanations
Avoided CO2 emissions	Final energy savings are first converted into primary energy savings (taking into account the share of electricity savings), that are then converted into avoided CO2 emissions using reference emission factors per energy type (assuming an average energy mix per action type when needed)
Employment effects	Number of jobs supported by the additional turnover for construction companies due to the incentive schemes for energy renovation (see further <i>Focus on the evaluation of market and employment effects</i> ).
Distributive effects	Differences in participation and types of actions implemented depending on the income class (for more details, see IWEPS, 2014).

### Other aspects evaluated

The Court of Auditors did in 2009 a review of the use of the Energy Fund (that includes the *Primes Energie* scheme) (Cour des Comptes, 2010). This review included an analysis of the scheme management that led to improvements in the way the applications were monitored and controlled by the administration. The review also looked at the consistency between the different measures available at that time to promote energy savings in buildings, pointing some issues such as their multiplicity and that they used different technical requirements. This also led to changes, in particular in terms of simplifications and to track forbidden accumulations of grants. About the evaluation of the results, the Court of Auditors concluded that the database used by the administration to monitor the scheme was not registering all the information from the applications that would be needed to assess energy savings. This was further improved, as shown in (SPW, 2014b).

The ex-post evaluation done in 2014 (SPW, 2014b) summed up the impacts of the different policy measures for energy efficiency in buildings, taking into account only actions that received a financial incentive (*Primes Energie* or other incentive) to avoid double counting. This overall result was compared to the trends observed in final energy consumption of Wallonia.

### Focus on the evaluation of market and employment effects

The Walloon government adopted in 2011 a strategy named “Première Alliance Emploi-Environnement” (AEE – First Alliance Employment-Environment) with the aim to use the opportunities to improve the energy and environmental performance of buildings in order to stimulate economic development, and thereby to maintain and/or create jobs in the construction sector. The *Primes Energie* scheme was reinforced as one of the 50 measures included in this strategy that tackles issues on both sides (demand and offer) of the market for renovation works.

Right after adopting the strategy, the government asked IWEPS (Walloon Institute for Evaluation, Prospective studies and Statistics) to prepare an evaluation in terms of socio-economic impacts on the private demand and offer for sustainable buildings (focusing on renovations), and more specifically about employment effects (IWEPS, 2014). Launched in September 2013, this evaluation was based on the databases used to monitor the measures included in AEE, econometric analyses and qualitative surveys of both, participants (households) and building companies.

The chronological analysis of the data about grant applications for energy renovation works showed that households were very reactive to the changes in the requirements and rates of the incentive. The evaluators therefore pointed the risk of too sudden changes that affect the demand for works, and thereby business cycles. Whereas a stable market environment is needed for companies to be able to invest in new technologies and training. Frequent changes in grant conditions also make it difficult for companies to inform correctly households. In parallel, a detailed analysis on data about roof insulation pointed a trend towards materials with higher performance.

The econometric analyses showed that participants with higher income had higher probability to do works with natural or super-efficient materials compared to households with lower income. The evaluators then recommended to use different grant rates depending on income classes.

The qualitative email survey of households looked at the free-rider effect of the *EcoPack* scheme. *EcoPack* provides a 0%-interest-rate loan together with grants similar to *Primes Energie*. The survey asked households what they would have done in the absence of the incentive. 40% of the surveyed participants said that they would not have done the works, 49% that they would have done some works but less ambitious (partial free-riders) and 11% that they would have done the same works (full free-riders). Results showed higher free-rider shares for households with higher incomes.

Employment effects were assessed with an Input-Output matrix for the Wallonia region, to define ratios in terms of number of jobs per amount of turnover: an additional €1 million in demand for works would support 6 full-time direct jobs (in the construction sector) and 5 full-time indirect jobs (in the other sectors of the Walloon economy). These ratios were then applied directly to the values of additional turnover, taking into account the free-rider effect with two scenarios using the extreme values from the survey (considering or not that partial free-riders are free-riders). The number of jobs maintained or created is finally calculated by taking into account average annual additional turnover over the period under evaluation. The evaluators highlighted the difficulty to assess employment effects on short term, whereas the causal chain should be observed over a longer time to take into account: 1) time needed between application process and work completion; 2) time lag between changes in economic activity and hiring decisions; 3) time lag between changes in the “real” economy and changes in statistics monitored at the regional level.

In parallel, the survey of companies showed that companies who did works that received grants said slightly more frequently that employment increased. And overall, 64% of the surveyed companies told that they have needs in training about new practices/solutions for renovation works.

## Experience feedback from stakeholders

### Interview with Valérie Pevenage (Energy Department (DGO4) of the Public Service of Wallonia (SPW))

#### 1. How is managed the monitoring and evaluation of the scheme?

The Primes Energies scheme is managed by the Energy Department of Wallonia, but its implementation and its monitoring & evaluation are done by two distinct services. The service in charge of the implementation enters into a dedicated database all the data from the applications, including very detailed technical data about the actions implemented (for ex., area of insulation materials installed, heat transfer coefficient of the materials, etc.). These data are based on the invoices that the applicants must submit to receive the grants.

This rich dataset is then transferred to the service in charge of the monitoring & evaluation, and merged into a global database used to assess the results of all the measures for energy efficiency (all sectors).

Calculation formula based on the recommendations of the European Commission are used to process the data collected and obtain the results of energy savings.

#### 2. What is the role of evaluation in the management of the scheme?

The evaluation of the Alliance Employment-Environment (AEE) was asked by the Walloon government, in particular with the objective to assess the effectiveness of the different measures included in the AEE umbrella framework.

However, the government changed between the time when the evaluation was commissioned, and the time when the evaluation results were released. This made that the evaluation results were taken as an assessment of the previous government, while they were based on the evidence available and did not include a political dimension.

At the end, the new government chose to implement some of the recommendations made in the evaluation, depending on the priorities newly set.

Independently of the change in government, this experience showed that it is very important to know the effectiveness of the measures. It is indeed essential for the discussions about budget. Effectiveness is first analysed in terms of public cost per energy saved (c€/kWh saved). But other criteria are also taken into account for decision making, like the policy priorities set by the government.

An example of decision is that sun protection/shading was removed from the list of eligible actions from 2015, based on the low effectiveness assessed and the fact that priorities were set on building envelope and heating system's improvements.

#### 3. How did you choose the method to evaluate the impacts in terms of energy savings?

The evaluation method is based on the recommendations of the European Commission, as the evaluation results are used to report to the European Commission, initially within the ESD framework, and now within the EED framework.

The way to apply the evaluation method was adapted to the existing data collection used to monitor the scheme.

#### 4. Based on your own experience, what would be your recommendations for the evaluation of energy savings impacts?

The first point is a no-brainer, but always useful to remind: evaluation should be thought from the start, meaning when designing and starting each new policy. This is essential to organise the data collection and to ensure that the data needed for the evaluation will be available. This also helps to optimise costs for data collection.

Another important point is to combine several data sources for validating the data and key assumptions. This makes possible to have results based on the best data available.

Then the issue of evaluators' independency should be considered in a pragmatic way. In the case of the Primes Energie scheme, the evaluation is done by a different service than the implementing service, but both services belong to the same department (Energy Department). On the one hand, one may say that this is not enough to ensure an independent evaluation. But on the other hand, this made that it was much easier for the evaluator to access the data needed for the evaluation, as programme managers may be reluctant to communicate data to persons outside their administration. They may have concerns about what the data will be used for, and about the way the evaluation conclusions will be drawn and communicated.

Indeed, the adoption and ownership of the evaluation results require trust between programme managers and evaluators. So our experience is that the evaluation has more chances to be used, and recommendations to be implemented, when it is an internal evaluation.

#### **5. Did you encounter difficulties in evaluating the energy savings?**

The biggest difficulty is to justify the efforts (time and budget) needed to collect the energy-related data. This is particularly true for the evaluation of measures that have multiple objectives and/or for which energy efficiency is not the priority objective (for ex., the other scheme providing grants for dwelling renovation and aiming at eradicating substandard housing). The difficulty is then to find the right compromise between minimizing data collection efforts and ensuring the reliability of the results.

When energy efficiency is not the priority objective of the measure, then it may also be difficult to assess its effectiveness in terms of public cost per energy saved. Sometimes only some part of the public cost should be attributed to the energy efficiency objective. Such assessment requires a good understanding of the measure and its policy theory to use the right assumptions.

Another difficulty is the relation between "providers" and "customers" of data or databases. As mentioned earlier, data providers (here programme managers) may not fully trust data customers (here evaluators), and then not give easily an access to the data.

It is also an issue to track the changes that may affect the definition of the baseline situations, and to update baselines consistently.

We also encountered some difficulties to get a common understanding of the evaluation of energy savings between experts using different methodologies, due to distinct evaluation objectives. This was the case about the way to estimate the baseline energy consumption. For the evaluation of energy savings from boiler replacements, we used statistics based on metered energy consumption. Whereas the experts in charge of the scheme for Energy Performance Certificates (named PEB in Wallonia) are used to conventional energy consumption (i.e. defined according to standardized assumptions on heating behaviours). This may create some confusions and require to explain the results.

#### **6. What else would you like to highlight about your experience related to the evaluations of the scheme?**

The efforts needed to collect data and perform the evaluation are really worth it. It is very useful to be able to assess the results at a given time horizon. This was the approach of the ESD (reviewing the energy savings achieved in 2010 and then in 2016). And this is in line with the governance of the AEE for example.

However, we do not see the added value of the additional efforts of data processing due to the requirement of the EED article 7 to assess the energy savings over a given period (2014-2020) that is not in line with the way the actions are monitored for the scheme management. And neither is it consistent with the temporality of the impacts of the actions implemented to achieve the overall 2020 target.

Additionality is also a very challenging issue. Our approach is to attribute the energy savings to the measure for which a direct link can be established between the measure and the acting decision. We do acknowledge that the acting decision results from a combination of factors. But this approach makes possible to avoid risks of double counting. However then, things get more complicated if the evaluation has to take into account the additionality rules set by the EED (Annex V). For example, when a boiler is replaced: would it have been replaced anyway (in the absence of the grant)? In this case, it may be relevant to use as baseline the EcoDesign requirements for boilers. But if the boiler would not

have been replaced, or replaced a few years later, then it would be more relevant to define the baseline situation as the efficiency of the boiler that was replaced. In practice, this is too difficult (and costly) to assess and to implement in the evaluation.

More generally, it is very difficult to distinguish the effects of a measure from all the other factors that affect acting decisions. Particularly for measures that are already implemented for a long time. This is the case for the Primes Energie scheme that started in 2004. How to know what would have happened now, if the Primes Energie scheme had never existed?

Meanwhile, the experience acquired with monitoring and evaluating the scheme over many years makes that we have some qualitative understanding about how it may affect acting decisions. One lesson learnt is for example that the incentive should be attractive, not only financially attractive but also in terms of simplicity of use. This was clearly observed in 2015 with a drop in the applications for Primes Energie, due to both, a decrease in the incentive rates and new requirements making the application process more complex, or less in line with the way renovation works are actually decided and done. For example, applicants must now submit their application file before starting the works. However in practice, homeowners may not be willing to spend time to prepare an application before they are sure to do the works.

The decrease in the incentive rates was due to budget restrictions. But the changes in the application process were mostly due to the requirements of the EED (for ex. about materiality and additionality). This shows how the rules applied to monitor and evaluate the energy savings may sometimes affect the way the measure works, and even its effects.

And another lesson from this recent experience is that it is very difficult to predict quantitatively the effects of a change in the characteristics of a measure (for ex., incentive rates, eligibility conditions, application process). It is obvious that the incentive rate has an impact on the attractiveness (and thereby effects) of the scheme. But it is much less obvious that an elasticity could be assessed between the incentive rate and the number of applications, and that this elasticity would be linear. So any change in a measure should be done very carefully, analysing the pros and cons.

About additionality, another lesson learnt is that trying to limit free-rider effects may lead to unexpected negative effects (for ex., if the decrease in the applications is stronger for households who would be the most in need).

## To go further

### About the measure

- Official webpage with the detailed conditions for the grants:  
<http://energie.wallonie.be/fr/primess-energie-a-partir-du-1er-avril-2015.html?IDC=8793>
- Description of the measure in the MURE database:  
[http://www.measures-odyssee-mure.eu/public/mure\\_pdf/household/BEL30.PDF](http://www.measures-odyssee-mure.eu/public/mure_pdf/household/BEL30.PDF)
- Official webpage of the Alliance Employment-Environment (umbrella strategy):  
<http://www.wallonie.be/fr/alliance-emploi-environnement>

### References of the evaluation(s)

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### Other useful references

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- Climact, 3E, BPIE, 2017. Stratégie Wallonne de rénovation énergétique à long terme du bâtiment [Wallonia long term strategy for the energy renovation of buildings]. Report for the Public Service of Wallonia (SPW) – Department of Sustainable Buildings (DGO4), April 2017.  
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