



## **ERA-NET Eracobuild project**

**One Stop Shop - “From demonstration projects towards volume market: innovations for one stop shop in sustainable renovation”**

**(1<sup>st</sup> September 2010 - 31<sup>st</sup> August 2012)**

### **Project Report WP 3.1**

**Methodology for innovations in supply side for sustainable renovation**

#### **Questionnaire**

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Project Website: [www.one-stop-shop.org](http://www.one-stop-shop.org)

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**The publication reflects the view of the authors (persons/institutions) that have prepared them. These might not be in line with the official position of other persons/institutions or members of the Follow-up Committee.**

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## Project partners

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PHP, Passiefhuis-Platform vzw, Belgium, non-profit organization.

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

Coordinator of the project: [Irena Kondratenko](#)

Contact person: [Erwin Mlecnik](#)



BBRI, Belgian Building Research Institute, private research institute.

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

Contact person: [Jeroen Vrijders](#)



Segel AS, Norway, consulting company.

[www.segel.no](http://www.segel.no)

Contact person: [Trond Haavik](#)



DTU, Building Physics and Services, Denmark, DTU Civil Engineering.

[www.dtu.dk](http://www.dtu.dk)

Contact person: [Svend Svendsen](#)



VTT, Finland VTT Technical Research Centre of Finland.

[www.vtt.fi](http://www.vtt.fi)

Contact person: [Satu Paiho](#)

## In collaboration with:



VCB, Vlaamse Confederatie Bouw, Belgium (Flanders), federations of constructors.

Partner for the Flemish case-study.

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

Contact person: [Pieter Degraeve](#)

## Introduction

This document provides background information on how the questionnaire was structured for detecting key concerns from supply side actors. The results of the questionnaire are explained in the following papers:

Cré J., Mlecnik E., Kondratenko I., De Graeve P., van der Have J.A., Vrijders J., Van Dessel J., Haavik T., Aabrekk S.A., Paiho S., Stenlund O., Svendsen S., Vanhoutteghem L., Hansen S. (2012) **Developing an integrated offer for Sustainable Renovations** Paper presented at the Retrofit 2012 conference, Manchester, UK.

Mlecnik E., Kondratenko I., Vrijders J., De Graeve P., van der Have J.A., Haavik T., Aabrekk S.A., Grøn M., Hansen S., Svendsen S., Stenlund O., Paiho S. (2012) **Collaboration opportunities for advanced housing renovation** Paper and poster presented for the IEA SHC Conference 2012, San Francisco, USA; 9-11 July 2012; paper to be published in Energy Procedia, Elsevier.

The questionnaire was first made available (December 2010-January 2011) in Dutch on: [www.one-stop-shop-renovatie.be](http://www.one-stop-shop-renovatie.be) and later translated for the research partners.

## 1. Characteristics of your company

### 1.1 How would you describe your company?

- Company with turnover < 500.000 euro
- Company with turnover > 500.000 but < 12.500.000 euro
- Company with turnover >12.500.000 but < 25.000.000
- Company with turnover > 25.000.000 euro
- I do not represent a company

### 1.2 How many employees are employed in your company?

- No employees
- 1-5 employees
- 6-10 employees
- 11-20 employees
- 21-50 employees
- 51-100 employees
- More than 100 employees
- I do not represent a company

### 1.3 Are you a member of one of the following organizations? (Choose at least one)

- ATIC
- Bouwunie
- Energik
- Groen Licht Vlaanderen
- Passiefhuis-Platform vzw (PHP)
- UBIC
- Ventibel vzw
- VIBE
- Vlaamse Confederatie Bouw (VCB)
- VOKA
- WTCB
- I am not a member of any of the organizations listed above

### 1.4 Area code where your company is registered:

### 1.5 Which market is important for your company (new construction and/or renovations)?

- Free-standing houses
- Houses in half open construction
- Houses in row
- Apartment up to 3 floors
- Apartment more than 3 floors
- Small offices up to 500m. sq.
- Large offices over 500m. sq.
- Schools
- Service- and care-facilities

- Sports centers and public swimming pools
- Company warehouses
- Shops, supermarkets
- Urban development projects
- Others, which?

1.6 In what type of buildings your company has done renovations of wishes to do renovations? (Choose one or more)

	<b>Already activities executed in renovations</b>	<b>Offer available for renovations but none yet executed</b>	<b>Offer not available now, but interested</b>
Free-standing houses			
Houses in half open construction			
Houses in row			
Apartment up to 3 floors			
Apartment more than 3 floors			
Small offices up to 500 m. sq.			
Large offices over 500 m. sq.			
Schools			
Service –and care-facilities			
Sports centers and public swimming pools			
Company warehouses			
Shops, supermarkets			
Urban development projects			
Others, which?			

1.7 Does your company employ a coordinator responsible for the integration of construction and technical installation on the construction site?

- Yes
- No
- I do not know

1.8 Does your company employ an energy specialist? (several options possible)

- Yes, type A
- Yes, type B
- Yes, type C
- No
- I do not know

## 2. In which activities is your company involved?

2.1 What is your company's main area of activity?

- Earthwork (2.1.1.)
- Shell construction (2.1.2.)
- Mechanical and Electrical Services (2.1.3.)
- Finishing (2.1.4.)
- Complete buildings (2.1.5.)
- None of the above

2.1.2 Which activities does your company perform for shell construction? (Choose one or more)

- Roofs => (2.1.2.1.)
- Façades => (2.1.2.2.)
- Interior walls => (2.1.2.2.b)
- Floors => (2.1.2.3.)
- Carpentry and windows => (2.1.2.4.)
- Insulation => (2.1.2.5.)
- Completely finished construction => (2.1.2.6.)

2.1.3. Which Mechanical and Electrical Services does your company deliver? (Choose one or more)

- Heating => (2.1.3.1.)
- Ventilation => (2.1.3.2.)
- Hot tap water production => (2.1.3.3.)
- Potable water and rain water => (2.1.3.4.)
- Refrigeration/cooling => (2.1.3.5.)
- Renewable energy (2.1.3.6.)
- Lighting (2.1.3.7.)
- Electricity (2.1.3.8.)
- Control circuitry (2.1.3.9.)
- Energy management systems (2.1.3.10.)

2.1.4. Which types of finishing does your company execute? (Choose one or more)

- Ceilings (2.1.4.1.)
- Interior partitions (2.1.4.2.)
- Floors (2.1.4.3.)
- Interior insulation (2.1.4.4.)
- Air and vapor tightness (2.1.4.5.)
- Plastering (2.1.4.6.)
- Painting (2.1.4.7.)
- Installation of kitchens (2.1.4.8.)
- Installation of bathrooms (2.1.4.9.)

### 3. Which renovation activities did your company already perform?

3.1 Which activities has your company performed while executing renovations? Please mark how often this happened during the past 5 years, whether you are interested in gaining this experience, or do not mark when you are not interested in these types of work.

<b>3.1.1. Earthworks</b>			
i. a. o. 2.1.1.1., 2.1.5	Frequent (> 10 projects/5 years)	Sporadic (1 - 10 projects)	Not at the moment, but would like to gain the experience
3.1.1.1. Insulating foundation walls			
3.1.1.2. Excavation for geothermal			
3.1.1.3. Installation of a ground-to-air heat-exchanger (subterranean tubes for ventilation)			
3.1.1.3. Installation of ground-to-liquid heat-exchanger (e. g. For heat pumps)			
3.1.1.4. Water-tightening of foundation walls and floors			
3.1.1.5. Interrupt thermal bridges			
3.1.1.6 Others			

<b>3.1.2. Roofing</b>			
i. a. o. 2.1.2.1., 2.1.2.5., 2.1.2.6., 2.1.4.4., 2.1.5.	Frequent (> 10 projects/5 years)	Sporadic (1 - 10 projects)	Not at the moment, but would like to gain the experience
3.1.2.1. Roof insulation 1-14 cm			
3.1.2.2. Roof insulation 15-19 cm			
3.1.2.3. Roof insulation 20 cm or more			
3.1.2.4. Exterior insulation of the roof			
3.1.2.5. Extension of roof edge			
3.1.2.6. Interior insulation of the roof			
3.1.2.7. Placement of vacuum insulation panels			
3.1.2.8. Replacement of old roofs by insulated prefab roofs			
3.1.2.9. Placement of prefab roofs on existing roofs			

<b>3.1.3. Works in facades</b>			
i. a. o. 2.1.2.2. , 2.1.2.5., 2.1.2.6., 2.1.4.4., 2.1.5.	Frequent (> 10 projects/5 years)	Sporadic (1 - 10 projects)	Not at the moment, but would like to gain the experience
3.1.3.1. Exterior insulation 1-8 cm			
3.1.3.2. Exterior insulation 9-14 cm			
3.1.3.3. Exterior insulation 15 cm or more			
3.1.3.4. Interior Insulation 4cm or less			
3.1.3.5. Interior Insulation > 4cm			
3.1.3.6. Wrap balconies in insulation			
3.1.3.7. Interrupt thermal bridges in balconies			
3.1.3.8. Post-insulation of cavities in walls			
3.1.3.9. Perimeter Insulation (exterior subterranean insulation)			
3.1.3.10. Interior insulation of basement walls			
3.1.3.11. Placement of vacuum insulation panels in facades			
3.1.3.12. Replacement of facade by prefab façade			
3.1.3.13. Placement of prefab facades over existing facades			
3.1.3.14. Removal and replacement of balconies by prefab balconies			

### 3.1.4. Floors

i.a.o. 2.1.2.3. , 2.1.2.5., 2.1.2.6., 2.1.4.4., 2.1.5.	Frequent (> 10 projects/5 years)	Sporadic (1 - 10 projects)	Not at the moment, but would like to gain the experience
3.1.4.1. Cellar floor insulation			
3.1.4.2. Creep cellar floor insulation			
3.1.4.3. Floor insulation on main level			
3.1.4.4. Placement of vacuum insulation panels on or under floors			

Insulation of attic floors? (as far as relevant as separate activity)

<b>3.1.5. Carpentry and windows</b>			
i. a. o. 2.1.2.4. , 2.1.2.5., 2.1.2.6., 2.1.5.	Frequent (> 10 projects/5 years)	Sporadic (1 - 10 projects)	Not at the moment, but would like to gain the experience
3.1.5.1. Replacement of glass with HR+ glazing			
3.1.5.2. Replacement of glass with HR++ glazing			
3.1.5.3. Replacement of glass with triple glazing			
3.1.5.4. Window frame upgrade to a $U_w$ < 1,1			
3.1.5.5. Window frame upgrade to a $U_w$ < 0,8			
3.1.5.6. Insulation of glass-in-lead windows			
3.1.5.7. Replacement of doors with insulating doors			
3.1.5.8 Replacement of portals with insulating portals			
3.1.5.9 Placement of fixed solar protection			
3.1.5.10. Placement of adjustable solar protection			

<b>3.1.6. Joinery and glazing: finishing</b>			
i. a. o. 2.1.2.4. , 2.1.2.5., 2.1.2.6., 2.1.4.5., 2.1.5.	Frequent (> 10 projects/5 years)	Sporadic (1 - 10 projects)	Not at the moment, but would like to gain the experience
3.1.6.1. Finishing of newly placed windows with sealing compound			
3.1.6.2. Finishing of newly placed windows with sealing strips			
3.1.6.3. Finishing of newly placed windows with plaster			

<b>3.1.7. Heating</b>			
i. a. o. 2.1.3.1., 2.1.5.	Frequent (> 10 projects/5 years)	Sporadic (1 - 10 projects)	Not at the moment, but would like to gain the experience
3.1.7.1. Adaptation of radiators to low temperature heating			
3.1.7.2. Replacement of radiators with floor heating			
3.1.7.3. Insulation of heating tubes			

<b>3.1.8. Heating and sanitary hot water</b>			
i. a. o. 2.1.3.1. and 2.1.3.3., 2.1.5., 2.1.4.8., 2.1.4.9.	Frequent (> 10 projects/5 years)	Sporadic (1 - 10 projects)	Not at the moment, but would like to gain the experience
3.1.8.1. Reparation of existent kettle			
3.1.8.2. Replacement of existing kettle with high-performance heat production system			
3.1.8.3. Hydraulic adjustment of the heating system			
3.1.8.4. Replacement of pumps by energy-efficient pumps			
3.1.8.5. Thermal insulation of kettles/ boilers			

<b>3.1.9. Ventilation systems</b>			
i. a. o. 2.1.3.1., 2.1.3.2., 2.1.5., 2.1.4.8., 2.1.4.9.	Frequent (> 10 projects/5 years)	Sporadic (1 - 10 projects)	Not at the moment, but would like to gain the experience
3.1.9.1. Placement of systems with heat recovery: balanced central ventilation systems			
3.1.9.2. Placement of systems with heat recovery: room units			
3.1.9.3. Placement of piping for mechanical ventilation			
3.1.9.4. Placement of ventilation grids for natural ventilation			
3.1.9.5. Placement of ventilation grids for mechanical ventilation			
3.1.9.6. Replacement of extractors			
3.1.9.7. Replacement of driver belts with high-efficiency belts			
3.1.9.8 Hydraulic adjustment of balanced ventilation			
3.1.9.9 Thermal insulation of ventilation ducts			
3.1.9.10. Acoustic insulation for mechanical ventilation			
3.1.9.11. Replacement of filters in ventilation systems			
3.1.9.12. Cleaning of ventilation systems			

<b>3.1.10. Cooling systems</b>			
i. a. o. 2.1.3.5., 2.1.5.	Frequent (> 10 projects/5 years)	Sporadic (1 - 10 projects)	Not at the moment, but would like to gain the experience
3.1.10.1. Conversion of cooling systems to high-temperature cooling systems			
3.1.10.2. Hydraulic adjustment of cooling systems			
3.1.10.3. Thermal insulation of cooling conduits			
3.1.10.4. Replacement of compressors with low-energy compressors			
3.1.10.5. Replacement of driver belts with high-efficiency belts			

<b>3.1.11. Experience with heat-exchangers</b>			
i. a. o. 2.1.3.1.-6., 2.1.5., 2.1.4.8., 2.1.4.9.	Frequent (> 10 projects/5 years)	Sporadic (1 - 10 projects)	Not at the moment, but would like to gain the experience
3.1.11.1. Placement of air-to-air heat-exchangers			
3.1.11.2. Placement of air-to-liquid heat-exchangers			
3.1.11.3. Placement of liquid-to-liquid heat-exchangers			
3.1.11.4. Placement of ground-to-liquid heat-exchangers			
3.1.11.5. Placement of ground-to-air heat-exchangers			
3.1.11.6. Placement of heat pumps			

<b>3.1.12. Renewable energy systems</b>			
i. a. o. 2.1.3.6., 2.1.5.	Frequent (> 10 projects/5 years)	Sporadic (1 - 10 projects)	Not at the moment, but would like to gain the experience
3.1.12.1. Placement of Solar hot water collectors			
3.1.12.2. Augmentation of existing heating systems with solar systems			
3.1.12.3. Augmentation of existing ventilation systems with solar systems			
3.1.12.4. Placement of photovoltaic panels			
3.1.12.5. Placement of wind energy producing units on roofs			

<b>3.1.13. Lighting</b>			
i. a. o. 2.1.3.7, 2.1.5	Frequent (> 10 projects/5 years)	Sporadic (1 - 10 projects)	Not at the moment, but would like to gain the experience
3.1.13.1. Replacement of lighting (relighting)			
3.1.13.2. Installing lighting systems with daylight sensors			
3.1.13.3. Installing presence detection sensors for lighting control			

<b>3.1.14. Control systems</b>			
i. a. o. 2.1.3.7.-10., 2.1.5.	Frequent (> 10 projects/5 years)	Sporadic (1 - 10 projects)	Not at the moment, but would like to gain the experience
3.1.14.1. Control systems for solar protection			
3.1.14.2. Placement of presence detection sensors for heating control			
3.1.14.3. Placement of presence detection sensors for ventilation control			
3.1.14.4. Placement of moisture detection sensors for ventilation control			
3.1.14.5. Placement of presence-detection sensors for cooling control			
3.1.14.6. Connecting PV-systems to the existing electric grid			
3.1.14.7. Connecting wind systems to the existing electric grid			
3.1.14.8 Domotic systems for energy efficiency			
3.1.14.9 Placement of energy control systems with permanent energy-use monitoring			
3.1.14.10. Writing of user manuals			

<b>3.1.15. Quality control of shell construction</b>			
i. a. o. 2.1.2.1.-6., 2.1.4., 2.1.5., incl. 2.1.2.2.b and 2.1.5.b	Frequent (> 10 projects/5 years)	Sporadic (1 - 10 projects)	Not at the moment, but would like to gain the experience
3.1.15.1. Airtight finishing of buildings (with quality control)			
3.1.15.2. Pressurization-testing of buildings (airtightness test)			
3.1.15.3. Infrared thermography			

<b>3.1.16. Quality control of HVAC</b>			
i. a. o. 2.1.3.1.-6., 2.1.5. en 2.1.5.b	Frequent (> 10 projects/5 years)	Sporadic (1 - 10 projects)	Not at the moment, but would like to gain the experience
3.1.16.1. Detection of leaks in tubing			
3.1.16.2. Reparation of leaks			

<b>3.1.17. Design &amp; consultancy</b>			
i. a. o. 2.1.1., 2.1.5.b	Frequent (> 10 projects/5 years)	Sporadic (1 - 10 projects)	Not at the moment, but would like to gain the experience
3.1.17.1. Energy performance calculation			
3.1.17.2. Energy audit and recommendations			
3.1.17.3. Integrated design service for renovation			
3.1.17.4. Re-design of technical systems			
3.1.17.5. Others, which?:...			

3.2 You indicated as a main activity for your company: earthworks / shell construction / HVAC / finishing

Do you wish to describe any sideline activities? (This information also will be used to describe your company in the One-Stop-Shop)

- Yes
- No
- I have no sideline activities

2.1.b. In what area does your company perform sideline activities? (Choose one or more)

- Earthworks (2.1.1.b)
- Shell construction (2.1.2.b)
- HVAC (2.1.3.b)
- Finishing (2.1.4.b)
- Design of buildings or installations (2.1.5.b)
- My company has no other activities

## 4. What do you offer for very energy-efficient renovation?

4.1 How would you describe your current offer in the market of highly energy-efficient renovation (e.g. Renovations with E-60 after renovation)

- Still studying the market
- I occasionally work in this market
- I mainly work in this market (4.1.1.)

4.1.1.1. Does your company perform full shell construction renovations of buildings?

- Yes
- No
- Maybe in the near future

4.1.1.2. Does your company perform full renovations of technical installations?

- Yes
- No
- Maybe in the near future

4.1.1.3. In how many highly energy -efficient renovations your company participated during the past five years? (Give a numerical value)

4.1.1.4. Do you have any knowledge on highly energy-efficient renovations you would like to share with others? You can describe in detail below:

4.2 How large would you estimate the share of highly energy-efficient renovations compared to all activities of your company?

Very small (0-5%)  
Small (6-25%)  
Considerable (26-74%)  
High (75-94%)  
Principal (95-100%)

4.3. How large would you estimate the share of high-energy-efficient renovations compared to all activities of your company in five years?

Very small (0-5%)  
Small (6-25%)  
Considerable (26-74%)  
High (75-94%)  
Principal (95-100%)

## 5. How can we create a network with our members on this subject?

5.1. Of which type of company would you like to gain access to know-how or consider an alliance with, to be able to contribute sufficiently to realizing highly energy-efficient renovations?

- Shell construction company (5.1.1.)
- Installation experts (5.1.2.)
- Finishing company (5.1.3.)
- Designer (5.1.4.)
- I am not interested in know-how of other companies

5.1.1. With which types of shell construction company would you like to cooperate?

- Roofing
- Exterior cladding
- Floors
- Carpentry/ windows
- Insulation
- Completely finished construction

5.1.2. With which types of technical installation experts would you like to cooperate?

- Heating
- Ventilation
- Plumbing
- Cooling
- Renewable energy
- Lighting
- Electric systems
- Control systems
- Energy management
- Others:...

5.1.3. With which type of finishing companies you would like to cooperate?

- Ceilings
- Interior partitions
- Floors
- Insulation
- Airtight screens and vapor barriers
- Plastering
- Painting
- Others:...

5.1.4. Which type of designer would you like to assist you?

- Architect
- Engineer-consultant
- Designer construction
- Designer technical systems
- Energy expert type A
- Energy expert type B
- Energy expert type C
- Others:...

5.1.5. Optional: List a couple of companies of which you think they offer valuable know-how, and who you would like to cooperate with to realize highly energy-efficient renovations: ...

5.1.6. Optional: List a couple of companies of which you think they offer complementary services, and who you would like to cooperate with to realize highly energy-efficient renovations: ...

## **6. In what way would you like us to offer you know-how?**

6.1. What is the best way we can give your company access to information concerning developments in the renovation market? (Please mark what is important for your company; you can mark more than one option)

- Seminars/ workshops for professionals
- Training for employees
- Training for construction workers
- Overview reports
- Informational brochures with specific examples of projects
- Articles in professional magazines
- Newsletter of the member association
- Website
- Radio / Television
- Individual expert support
- Possibility to communicate with other companies
- Others: ...

6.2. Please mark what you consider to be an important condition to enlarge the market of highly energy-efficient renovation in Flanders (several options are possible):

- Generating consumer awareness
- Raising awareness with companies
- A listing of experienced companies for consumers
- Regular professional courses in renovation
- Clustering of individual companies
- Tools to calculate renovation budgets
- Support for innovation within the company
- Better counseling of the client
- Better quality control for renovations
- Raising awareness with politicians
- Grant initiatives
- More demonstration projects
- Better information on technical solutions
- Other: ...

## 7. Your remarks

7.1. If you have encountered complex problems concerning highly energy-efficient renovations to which you could not find an answer or solution, please explain below:

7.2. Do you have specific expectations for your company if we distribute know-how on highly energy-efficient renovations?

7.3. Do you have any remarks on the subjects mentioned above? (Sustainable renovation, spreading of information, communication channels, training, social network)

## 8. Contact information

Please do not respond if you wish to remain anonymous. If you fill out this form, we might contact you later to offer specific services for the renovation market through the One-Stop-Shop we will develop for this end.

Name:

Company:

Address:

Tel:

e-mail:

Thank you for your cooperation!