



## Deliverable D3.3 & D3.4 Involvement and organisation of the supply side

GA N° 649865

Project acronym:

REFURB

Project's coordinator:

Virginia Gomez Onate (VITO)

E-mail:

[virginia.gomezonate@vito.be](mailto:virginia.gomezonate@vito.be)

Work Package leader:

Anne Goidts

E-mail:

[anne.goidts@bostoен.be](mailto:anne.goidts@bostoен.be)

Dissemination level

Public

November 2016



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**Main contributors and editors**

Fiene Grieger (ISW, DE)

Dieter Cuypers (VITO, BE)

Anne Goidts (Bostoen, BE)

Ighor Van de Vyver (VITO, BE)

Virginia Gómez Oñate (VITO, BE)

**Contributors**

Lotte Lindgaard Andersen (Clean, DK)

Gerk Jan Kuipers (Fryslan/Municipality of Leeuwarden, NL)

Kalle Virkus (TREA, EE)

Jelena Vidović (BSC, SI)

Christophe Debrabander (Bostoen, BE)

Nele Ameye (Recticel, BE)

Sofie De Regel (VITO, BE)



<b>Version</b>	<b>Date</b>	<b>Author</b>	<b>Description</b>
1.0	11/04/2016	Bostoën	First draft report for startup D3.3 & D3.4
1.1	10/06/2016	Bostoën	Further elaboration after meeting Sonderborg.
2.0	15/06/2016	Bostoën	First skeleton report
3.0	19/10/2016	Bostoën	Draft report for review ISW
4.0	25/11/2016	VITO	Final version

## Summary

Renovation by the private sector towards increased energy efficiency is seriously lagging behind. As more than sufficient technological solutions are available, focus must be on removing non-technological barriers. The main barriers relate to fragmentation of the renovation offer, resulting in inefficient or only partial solutions. In addition to financial restrictions and unclear benefits, homeowners do not have a structured way to obtain all the necessary information. One way to solve this is the use of a 'one-stop-shop concept'. Many have been put in practice. Some were successful, others not. They often lack an understanding of the concerns and demands of homeowners.

The REFURB project focuses on the complex interplay of barriers through coordinated process organization, innovation and optimization. This way the REFURB project will bridge the gap between supply and demand side. Therefore, WP2 and WP3 were dedicated to analyse demand and supply-side drivers respectively.

This report is part of WP3 ('supply side mapping') that focuses on the supply side. For the REFURB project the supply side means everyone who can be a single-point-of contact in a one-stop-shop solution, that is: contractors, architects, engineers, energy consultants, government etc...

To uptake the market of NZEB renovations, the supply side must change behaviour; from selling technology to selling functionality. To undergo this change, the supply side needs access to proper information and training. This is explored further in this deliverable.

As learnt from WP2, D2.5, the customer journey is an important description process of the customer before and during renovation to NZEB. In this report, a closer view on the current involvement and organisation of the supply chain around the customer journey within the one-stop-shop solutions is explored. The analysis focuses on the countries partner of REFURB project.

### Roles in Single Family House NZEB renovation

**Belgium, Denmark, the Netherlands and Germany** all selected single family houses as the main segment. The actors of the supply side and their roles are rather similar, only Germany has a more particular role definition as explained below.

In all the countries, **friends, family and internet** are sought for advice, recommendations and ideas. A recommended contractor by a friend or neighbour is of high relevance. Specially in the **Netherlands**, the peer pressure by using neighbours for benchmarking is exploit. The role of ambassador is more present than in the rest of the countries.

The **service provider** is usually the contractor. In **Belgium**, there is an obligation by law to have the roles of an architect, safety coordinator, energy reporter and ventilation reporter. Depending on the size of the works, the same stakeholder may undertake more than one role. In the rest of the countries there are no specific requirements on roles or necessary education. **Denmark** only specifies requirements on the calculations done to estimate the renovation class.

The **local authority** is responsible in all the countries for the subsidies and issuing permits. In **Denmark**, the tax administration is heavily involved since there exist a tax reduction due to the refurbishment project. In the **Netherlands and Germany**, the local authority takes up an active role launching awareness campaigns and information programs.

In all the countries, the **banks** are responsible for the financing and the loans for the owner to undertake the renovation measures. In the **Netherlands**, banks are also providing independent financial advice on possibilities of financing and subsidies.

**Energy consultancy services** are used in the **Netherlands** for energy advice and are very much present in Germany. That is what distinguishes **Germany** from the rest of the countries. This energy consultant provides a wide range of advice depending on the target group: home energy checks, stationary energy consultation on energetic refurbishment, initial consultation at local information centres, initial on-site consultation, on-site orientation and counselling service, concept-oriented consulting engagement. More details in **Error! Reference source not found.**

Finally, in **Denmark**, the **energy supply company** entails a specific role of approving the expenses and payments of the kWh subsidy.

### **Roles in multiapartment buildings NZEB renovation**

**Estonia and Slovenia** selected the segment of multiapartment buildings as the most representative for their countries. However, they seem to have a very different way to organize NZEB renovations.

In **Estonia**, the **energy agency** is responsible for launching awareness campaigns and for providing all general information regarding energy efficiency. While the **local authority** issues the building permit and supervises the legal aspects of the construction, the **building inspector** is in charge of supervising the technical aspects of the construction process. He is hired by the owners of the building and it is a compulsory role in Estonia. The **KredEx Fund** provides consultation, subsidy and expertise if needed. The **energy consultants** provide advice on HVAC and technical aspects of the renovation. In Estonia, there is no obligation to hire a **building manager**. In case he participates, he can represent the home owners in the negotiations. On the other hand, a **technical consultant** must be hired to be eligible for the renovation fund. He supervises the project design and coordinates the tendering amongst other responsibilities.

Regarding the training initiatives to change behaviour in the supply side, the majority of the training initiatives concentrate on the technical part to address the issue of quality constructions and renovations. Few initiatives were found about training the supply side on the behavioural change.

Denmark has deployed a program, Better housing, to form professionals on the advice about energy renovations for private households. There, the missing support from the municipalities hampers a broader market uptake. The Charlie project addressed several stakeholders in the renovation such as the household, the service provider and the financing institution. Charlie behaved as a coach supporting the household in all the steps of the customer journey.

In France, a tool has been developed to train professionals and targeting also households. The objective is to form groups of craftsmen with complementary skills, gathered around a pilot, and able to propose high-performance energy retrofits at a controlled price.

The deliverable report D3.2 “Existing renovation solutions towards NZEB” identified **seven one-stop-shop** solutions in Belgium, Denmark, Germany and the Netherlands. One of the key characteristics identified in the report included the organisation of the supply side. Therefore, in this deliverable, these initiatives are analysed more in-depth, focusing specifically on how the supply-side was involved and how the supply side was organised in these programmes.

Key success and fail factors were identified in the SWOT-analysis further complemented with literature study and the partners' experience. The success and fail factors are summarized here:

A more **cooperative model instead of a competitive one** is recognised as a success factor, as it encourages to find suitable partners who are complementary to each other and form strong partnerships.

Related with previous point, the **independency** of the renovation advisor was emphasised in a number of cases, so the renovation advisor could really be the linking pin between supply and demand side. This point can become a fail factor.

Furthermore, the Dutch examples pointed out the importance of the involvement and cooperation of **local policy level**.

Closely related is the aspect of **branding and creating trust with the customers**. A quality label could be a possible strategy, as a way to distinguish competent supply side actors.

Lastly but equally important, in order to achieve success with the more complicated NZEB renovations, it was pointed out the importance to include highly qualified energy advisors as partners. This emphasises the need of **good training programmes** in order to have better qualified experts.

A number of fail factors were identified related to **quality assurance, time investment needed**. Lastly and equally important, a number of **financial factors** were identified.

## CONCLUSIONS ON SUPPLIER INVOLVEMENT STRATEGY

**A supply involvement strategy should be able to adapt, depending on the type of supply side actor and specific renovation package.** The supply side consists of different types of building actors: manufacturers, craftsmen, contractors, architects, engineers, energy consultants, renovation advisors and so on. In the analysed examples, there was a clear focus on the following key actors<sup>1</sup>:

1. Energy and renovation advisors (including related consultants such as energy experts, ventilation expert etc.);
2. Craftsmen and contractors;

They each require a slightly different approach. Therefore, there could be no “uniform” supply involvement strategy without taking into consideration the type of supply side actor. Instead, the strategy should be tailored to the building actor targeted, eventually starting from a general framework but nevertheless customizable

**Provide dedicated training programmes.** The majority of the training initiatives for the supply side concentrate on the technical training to address the issue of quality constructions and renovations. Few initiatives were found about training the supply side on the behavioural change.

“Dedicated” does not mean that these training programmes should only focus on technical, NZEB-related topics, on the contrary. The analysed examples pointed-out two focus areas:

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<sup>1</sup> The role of architects was not explicitly covered, but it can be assumed that they can take up both roles: the architect as a renovation advisor, or the architect as a building professional.



1. There is a need for training on non-technical topics. Slim Wonen highlighted the importance of marketing workshops. Better Home focused on education in communication and how to provide good service to customers.
2. Participating in training programmes can be a prerequisite for partnership. However, continued training should be encouraged as well to maintain the necessary quality level (continuous learning). Ecohome organised additional training to ensure the high level consulting expertise.

**Provide support to the involved partners**, this way unburdening the supplier. To improve the level of engagement, it is recommended to clearly point out the benefits when participating (basically providing the answer to the question “*what’s in for me*”). Identified examples include:

- Access to tools: In the Better home programme, craftsmen could obtain apps or tools for calculating the of energy savings and monitoring the costumer journey.
- Administrative support: The craftsmen do not have to pay to get leads. The secretary of Better Home followed-up potential leads and distributed them among the craftsmen depending on qualification and geographical criteria
- Access to information and network: In the Ecohome initiative, joined parties were granted access to the “Ecohome partner portal” and furthermore, they could directly obtain customer enquiries from their region

Closely related with previous point: **In order to reach SMEs, the threshold to participate in a renovation package should be low enough.** This means that the concept should be clear and not too time demanding for small craftsmen companies or SMEs. Other good examples identified: In the Better House programme, it was relatively easy to become advisor, as a result of flexible and online courses with a holistic education program. Furthermore, in the same programme, it was not difficult SMEs who offer “Better House” plans to obtain a Quality Plan as required from the Danish Energy Agency.

Lastly and equally important, **creating a community and providing network opportunities** allow partners to exchange experience and to collaborate with each other. Partners should have the feeling that they join something greater. Setting up a recognisable brand (branding) further complements this.

## RECOMMENDATIONS FOR ORGANISING THE SUPPLY SIDE

Taking into account the success and fail factors as identified earlier, the following recommendations are suggested for organising the supply side:

1. **Develop a solid business case** between a single-point-of-contact to the homeowner (e.g. a renovation advisor) and the building professionals. Interdependency was quoted as a prerequisite.
2. **Compose a “pool” of building professionals.** A distinction should be made between renovation advisors on the one hand and building professionals on the other hand (which can be further distinguished in craftsmen or contractors, architects, and engineers or consultants). Ideally, this pool should be of cooperative instead of competitive nature.
3. **Define quality requirements** which have to be met by building professionals as a prerequisite to participate in the renovation package. However, the level of complexity and associated costs should be limited in order to engage the smaller SMEs as well.

4. Offer **good training programmes**, to ensure that all building professionals and renovation advisors possess the required knowledge level and skills to participate in the renovation packages.
5. Take into account the **time investment and financial aspects** associated with the NZEB renovations investment by the customer. These can be barriers, both for the demand side as the supply side.

# Introduction

## 1.1 BACKGROUND

Renovation by the private sector towards increased energy efficiency is seriously lagging behind. As more than sufficient technological solutions are available, focus must be on removing non-technological barriers. The main barriers relate to fragmentation of the renovation offer, resulting in inefficient or only partial solutions. In addition to financial restrictions and unclear benefits, house-owners do not have a structured way to obtain all the necessary information. One way to solve this is the use of a 'one-stop-shop concept'. Many have been put in practice. Some were successful, others not. They often lack an understanding of the concerns and demands of homeowners.

The REFURB project focuses on the complex interplay of barriers through coordinated process organization, innovation and optimization. This way the REFURB project will bridge the gap between supply and demand side. Therefore, WP2 and WP3 are dedicated to analyse demand and supply-side drivers.

The objectives of this WP are realized in three different deliverables. Task 3.1 explored how the supply side envisions the drivers of the demand side. As a result, D3.1 'Mapping demand side drivers according to supply side' documented on the match and mismatch between the view of the homeowners and the supply side regarding NZEB renovations. Afterwards, the aim of Task 3.2 was to have an overview of the existing solutions for NZEB renovations available on the market or close to the market for each country involved in the REFURB project.

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As learnt from WP2, D2.5, the customer journey is an important description process of the customer before and during renovation to NZEB. In this task, a closer view on the current involvement and organisation of the supply chain around the customer journey within the one-stop-shop solutions is explored. The analysis focuses on the countries partner of REFURB project.

Within the same countries, the current training initiatives of the supply side are looked at. Their focus and relevance inducing the above mentioned supply chain is taken into account. Their strong and weak points are highlighted.

In chapter 3 of this report, the solutions for the organization and involvement of the supply side to better connect the supply with the needs of the demand side is reported. The analysis encompasses a study of the current solutions for organising the supply side and the strategy for a change in the supplier involvement.

Finally, some conclusions and recommendations on the organization and involvement of the supply side are presented. These conclusions are valuable for the development of renovation packages in WP4.

In the Description of Action, two deliverables are proposed for this Task 3.3 'Involvement and organization of the supply side':

- Deliverable D3.3: 'Supplier involvement strategy'
- Deliverable D3.4: 'Success and fail factors of organizing the supply side'

As the organization of the supply side is considered a part of the involvement of the supply side, both deliverables D3.3 and D3.4 are described together in this report.

## 1.2 METHODOLOGY

In this paragraph, the methodology used to answer the research questions is described:

Firstly, the state of the art regarding the on organisation and involvement of the supply side in the NZEB renovation in the partner countries is mapped. On the one hand, the current involvement of the supply side in the customer journey is explored. On the other hand, existing initiatives in the EU for training the supply side in behavioural change are mapped. These are examples of change management on the supply side which to be applied in the involvement strategy within the customer journey process. This analysis is based on literature study and experiences from the partners.

Secondly, the state of the art organisation solution of the supply side in existing one-stop-shop-solutions is analyzed in SWOT<sup>2</sup> analysis. This is performed by research desk on literature and existing examples. Moreover, a workshop was organised for the partners of the REFURB project to gather the input on the behaviour change on the supply side.

Finally, out of the analysis of all the information, some overall conclusions and recommendations on organisation and involvement of the supply side are presented.

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<sup>2</sup> Strengths, Weaknesses, Opportunities and Threats analysis

## 2. Defining a supply involvement strategy

In order to define a framework for a supply involvement strategy, the current implementations are analysed to learn from their success and fail factors.

### 2.1 BUSINESS AS USUAL: SUPPLY INVOLVEMENT IN THE CUSTOMER JOURNEY

As described in the D2.5 the customer journey is used to describe the process the customer is following before and during the renovation of his dwelling (to NZEB). In this chapter the customer journey process is used to analyse the current supply side involvement in the REFURB countries.

Each country partner described the business as usual involvement of the supply side by indicating the role and step the specific suppliers take up in a customer journey. Special attention was given to the first steps where customers are seduced to start a renovation to NZEB. The customer journey is processed for the chosen segments in each country. These are segments that will be addressed with the renovation packages in D4.2.

#### 2.1.1 Roles in the supply side involvement

Table 1 shows the selected segments of dwelling and dweller per country as the most representative. The state of the art regarding the involvement of the supply side and the different roles are looked into from the perspective of those segments. Below a summary of the main conclusions are presented. Table 2 and Table 3 present a comparison of the roles per segment and country. Details per country are to be found in **Error! Reference source not found..**

Country	Dwelling	Dweller
BE	Single Family House	Young Families
		Empty Nesters
DK	Single Family House	Young Families
		Empty Nesters
NL	Single Family House	Young Families
		Empty Nesters
DE	Single Family House	Young Families
EE	Multiapartment	-
SL	Multiapartment	-

*Table 1: Chosen dwelling and dweller segment per country.*

#### Roles in Single Family House NZEB renovation

**Belgium, Denmark, the Netherlands and Germany** all selected single family houses as the main segment. The actors of the supply side and their roles are rather similar, only Germany has a more particular role definition as explained below.

In all the countries, **friends, family and internet** are sought for advice, recommendations and ideas. A recommended contractor by a friend or neighbour is of high relevance. Specially in the **Netherlands**, the

peer pressure by using neighbours for benchmarking is exploit. The role of ambassador is more present than in the rest of the countries.

The **service provider** is usually the contractor. In **Belgium**, there is an obligation by law to have the roles of an architect, safety coordinator, energy reporter and ventilation reporter. Depending on the size of the works, the same stakeholder may undertake more than one role. In the rest of the countries there are no specific requirements on roles or necessary education. **Denmark** only specifies requirements on the calculations done to estimate the renovation class.

The **local authority** is responsible in all the countries for the subsidies and issuing permits. In **Denmark**, the tax administration is heavily involved since there exist a tax reduction due to the refurbishment project. In the **Netherlands and Germany**, the local authority takes up an active role launching awareness campaigns and information programs.

In all the countries, the **banks** are responsible for the financing and the loans for the owner to undertake the renovation measures. In the **Netherlands**, banks are also providing independent financial advice on possibilities of financing and subsidies.

**Energy consultancy services** are used in the **Netherlands** for energy advice and are very much present in Germany. That is what distinguishes **Germany** from the rest of the countries. This energy consultant provides a wide range of advice depending on the target group: home energy checks, stationary energy consultation on energetic refurbishment, initial consultation at local information centres, initial on-site consultation, on-site orientation and counselling service, concept-oriented consulting engagement. More details in **Error! Reference source not found..**

Finally, in **Denmark**, the **energy supply company** entails an specific role of approving the expenses and payments of the kWh subsidy.

### **Roles in multiapartment buildings NZEB renovation**

Estonia and Slovenia selected the segment of multiapartment buildings as the most representative for their countries. However, they seem to have a very different way to organize NZEB renovations.

In **Estonia**, the **energy agency** is responsible for launching awareness campaigns and for providing all general information regarding energy efficiency. While the **local authority** issues the building permit and supervises the legal aspects of the construction, the **building inspector** is in charge of supervising the technical aspects of the construction process. He is hired by the owners of the building and it is a compulsory role in Estonia. The **KredEx Fund** provides consultation, subsidy and expertise if needed. The **energy consultants** provide advice on HVAC and technical aspects of the renovation. In Estonia, there is no obligation to hire a **building manager**. In case he participates, he can represent the home owners in the negotiations. On the other hand, a **technical consultant** must be hired to be eligible for the renovation fund. He supervises the project design and coordinates the tendering amongst other responsibilities.

In **Slovenia**, the **building manager** takes up a large part of the responsibilities in the renovation process. He takes the initiative to propose NZEB renovation to the owners, he negotiates on behalf of the owners and launches the public procurement process. In this country, the **local authority** has created ENSVET, a municipal office for the transfer of knowledge. Regarding **financing**, there exist a co-financing option, the ECO Fund, to participate in this type of renovations.

**Roles in Single Family House NZEB renovation:**

Role	BE	DK	NL	DE
Friends and family	Sought for advice	Sought for recommendations and ideas	Sought for advice. Neighbours for benchmarking. Ambassadors.	Sought for advice
Internet, press and social media	Sought for advice and ideas	Sought for inspiration and ideas	Sought for advice and ideas	Sought for advice and ideas
Service provider	Contractor is the most conventional partner. Belgian law obliges to have architect, safety coordinator, energy reporter, ventilation reporter	Architect only used in large renovations. No specific requirement. Contractor does not require specific education on energy. There are only requirements on the calculations done for the renovation class	Contractor, building companies, architect and technology providers. No specific legislation	Contractor
Local authorities	Subsidies and permits.	Tax authorities on the tax reduction due to the refurbishment project	Permit is needed. Information on the energy bill by national or local programs	Launch awareness campaigns, subsidies
Financing sector	Banks: financing and loans	To ensure NZEB, the bank ought to require a Better House plan to approve the financing of the project	Banks: independent advice on financing and existing subsidies. Financing and loans.	Banks: financing and loans
Energy supply company	-	Approval of expenses and payment of the kWh subsidy		-
Energy consultancy services	-	-	Energy advice	Provide a wide range of advice: Home energy checks, stationary energy consultation on energetic refurbishment, initial consultation at local information centres, initial on-site consultation, on-site orientation and counselling service, concept-oriented consulting engagement

*Table 2: Roles in Single Family Houses in Belgium, Denmark, the Netherlands and Germany.*

**Roles in multiapartment buildings for NZEB renovation:**

Role	EE	SL
Service providers	Contractors: performs the renovation according to KredEx requirements Architect: draw the project and applies for the building permit	Contractor
Building manager	Not a mandatory role. He can take up the negotiations and represent the owners.	Takes the initiative on proposing NZEB renovation. Does the negotiations on behalf of the owners. Launches the public procurement process
Energy Agency	Awareness campaigns. General information on energy efficiency. Guiding information	-
Internet, press and social media	Sought for information and ideas	Sought for information and ideas
Friends and family	Sought for recommendations and ideas	Sought for recommendations and ideas
Financing sector	KredEx Fund: provides consultation, subsidy and expertise Banks: advise and loan	Co-financing: ECO FUND Other local solutions
Local authority	Issues the building permit. Supervises the legal aspects of the construction	ENSVET municipal office for transfer of knowledge
Energy auditors	Perform the audits	-
Energy consultant	HVAC consultancies, technical consultants	-
Building inspector	It is a compulsory role. It is hired by the owners. He supervises the technical aspects of the construction process.	-

*Table 3: Roles in multiapartment buildings in Estonia and Slovenia. Involvement of the supply side in the customer journey*



## 2.1.2 Involvement of the supply side in the customer journey

In this paragraph, the roles explained above are situated in a step in the customer journey process. Figure 1 shows the customer journey and the roles per step in single family home segments (SFH) and multiapartment buildings segment (MA). In general, Belgium, Denmark, Germany and specially the Netherlands, are more advanced on the post-renovation steps (organising, sharing, wanting more) than Estonia and Slovenia. More details on the specific role involvement per country are to be found in **Error! Reference source not found.**

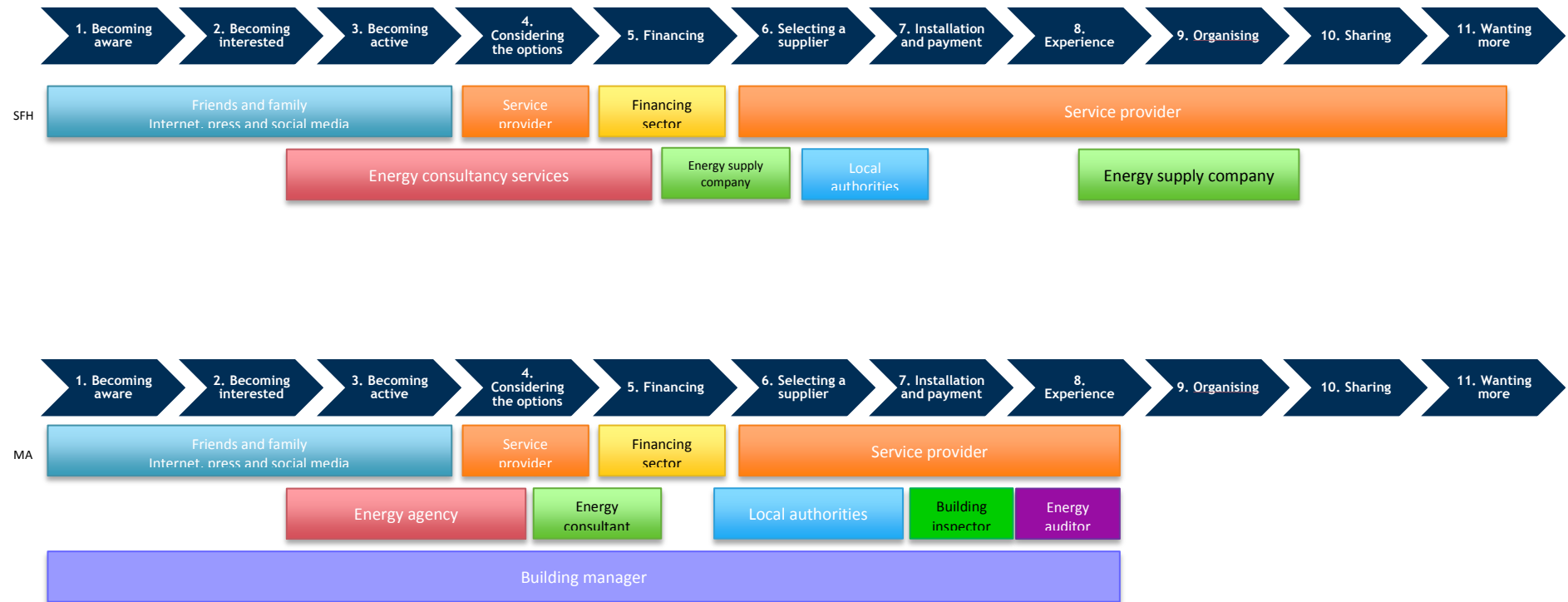


Figure 1: Involvement of the roles of the supply side in the customer journey.

## 2.2 TRAINING THE SUPPLY SIDE

As explained above, the supply side needs to be trained in order to change its behaviour and meet the demand side at the customer journey. Up to the partners' knowledge, there are several existing initiatives in Europe. Some are listed in the next paragraphs:

### 2.2.1 European studies on training initiatives for the supply

There are several European studies on training initiatives for the supply.

EU initiative **BUILD UP Skills**<sup>3</sup> is a new strategic initiative under the Intelligent Energy Europe (IEE) programme to boost continuing or further education and training of craftsmen and other on-site construction workers and systems installers in the building sector. The final aim is to increase the number of qualified workers across Europe to deliver renovations offering a high energy performance as well as new, nearly zero-energy buildings. This initiative addresses skills in relation to energy efficiency and renewables in all types of buildings.

The **EASME EE14 Construction Skills**<sup>4</sup> aims at increasing the number of skilled building professionals and/or blue collar workers to improve the overall quality of renovations and constructions. This initiative is setting up large-scale qualification and training schemes addressing the coordination and the accompanying measures. It is linked with BUILD UP skills initiative.

Since these studies relate to technical skills in construction, not about the soft skills needed to seduce homeowners, they are not further described in this deliverable.

### 2.2.2 Management change training for the supply side

In this paragraph, several initiatives are summarised:

#### 2.2.2.1 Better housing (DK)

The Danish Energy Agency offered the Better House course for free in 2013-2014. The Better House scheme is a voluntary and market driven system to promote the refurbishment of private residential buildings. It is able to remove barriers by making the renovation process simpler and more manageable for the owners. It is inspired by the UK's Green Deal and on the concept of one-stop-shop.

The course is addressed to energy and building professionals who are interested in working with energy renovation as a new business. After the course, they are able to advise on energy efficiency renovation measures for the residential sector.

The Better Houses consultant offers a screening, a Better Houses Plan (based upon an energy check-up and calculation of energy savings in a very well recognized on-line tool) and guidance through the renovation process. The initiative will continue until the end of 2016 with digital marketing, cooperation with local stakeholders and support of local events.

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<sup>3</sup> <http://www.buildupskills.eu/>

<sup>4</sup> [http://ec.europa.eu/easme/sites/easme-site/files/EE14\\_Construction\\_skills.pdf](http://ec.europa.eu/easme/sites/easme-site/files/EE14_Construction_skills.pdf)

The whole idea of Better Houses with a step by step and holistic approach to energy renovation is good. The education of Better Houses Consultants as green ambassadors is brilliant as well as all the supporting tools, building guides and the marketing materials available at the website. It is also a success, there have been 140.000 unique users on BedreBolig.dk. About 30% of them came directly to the website by writing “BedreBolig”.

Despite these facts, there is a lack of willingness to support the municipalities for a local implementation. A municipality has financed around 75% of all the 500 Better Houses Plans partly or fully. Subsidies are needed in order to finance the Better Houses Plans. There is a need to communicate the options in the Home-job plan and the possibility here to get a reduction in the price for a Better Houses Plan and a Better Houses renovation project.

The results from two test municipalities showed that 35% of the homeowners, that got a Better House Plan, chose to carry out a refurbishment project with investments 10.000-25.000 EUR. This is 30-80 % of the recommendations for investments in the Better House Plans, which in average is 32.000 EUR. This is much less than the investment needed for NZEB, which might be the double investment. The conclusion for empowering NZEB renovations are, that a more attractive compelling offer than the Better House scheme, has to be developed and subsidies must follow the offer.

#### 2.2.2.2 *The Klaas project (NL)*

The Klaas project<sup>5</sup>, in the Netherlands, is addressed to the customer interested in renovation measures. Leeuwarden city started an initiative to solve the barrier for the customer to select a contractor and crystalize the renovation measures. It is address to customers that know which energy saving measures they would like to implement as well as the financial benefits, however they doubt about the right choices.

Leeuwarden city proposes for this customers to meet Klaas, a personal assistant for tenders. Klaas looks together with the customer to answer questions such as: how do I ask quotes? Which grants and loans are available? Is it convenient to request along with the neighbours tenders? What measures are suitable for me? What are the financial benefits of the investment? What is the payback and how much there is in it for me?

Within this project, the supply chain is trained to become a Klaas type of contact solving the barriers of the customer to select a contractor.

#### 2.2.2.3 *The Charlie project (DK)*

In the same line as Klaas but with a broader scope, Project Zero implemented Charlie in Sonderborg county<sup>6</sup>. As a result, the uptake of energy efficiency measures in single family houses in Sonderborg significantly increased. Charlie is an independent energy adviser who was a key driver of the activities, acting as a bridge between the household and the supply chain.

The main activities were:

- Energy advice, free of charge by an energy adviser, Charlie, to kick-start the refurbishment process
- Motivating professionals who followed an energy leader training programme
- Distribution of inspiration catalogues carried out by architects
- Involvement of local banks, ready to offer low interest loans
- Continuous follow-up by the energy adviser Charlie, combined with completion of statistics

<sup>5</sup> <http://www.slimwoneninleeuwarden.nl/klaas>

<sup>6</sup> [http://building-request.eu/sites/building-request.eu/files/Pilotpresentation\\_Stockholm\\_SBi.pdf](http://building-request.eu/sites/building-request.eu/files/Pilotpresentation_Stockholm_SBi.pdf)

Key lessons learnt can be summarized as follows:

- Personal dialogue with and kick off by Charlie, the energy adviser free of charge, is probably the main driver for a successful energy saving uptake
- Skilled craftsmen - builders as well as installers - who are familiar with all relevant refurbishment tasks is a basic requirement
- An unbroken supply chain from idea to fulfilment of energy retrofitting is crucial for deep market penetration.

#### 2.2.2.4 *DORéMI (FR)*

DORéMI<sup>7</sup> (Operational Device for the Energy Retrofit of Individual Houses) is a training-action tool developed since 2011 by Enertech and the NéaWatt Institute in order to boost the market for the high-performance renovation of individual houses, in the interest of territories, households and professionals.

DORéMI is above all a tool at the service of the communities (communities of communes, countries, regions, etc.) which, in partnership with the players of the territory (professional organizations, consular chambers, etc.) wish to act on the structuring of the renovation offer at the local level.

DORéMI is an innovative training-action tool mobilizing both professionals and households. The objective is to form groups of craftsmen with complementary skills, gathered around a pilot, and able to propose high-performance energy retrofits at a controlled price. Architects and design offices can intervene in support (consulting), and no longer be prime contractors, which makes it possible to enhance their skills without degrading the profitability of the works.

The interest of such a device for the communities is multiple: economic development of the territory, creation of local jobs, reduction of dependence on fossil energies, etc.

Within the framework of this system, the NéaWatt Institute assists the project owners (AMO) in the communities and supports the various actors involved in the project (professionals, households, investors, professional bodies, etc.)

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<sup>7</sup> <http://www.institut-negawatt.com/page.php?id=10>

## 3. Success and fail factors of organisation of the supply side

The supply side should overcome the problem of fragmented offers and will need to organize themselves. The demand side is looking for a 'one-stop-shop' solution, and the question is how this can be best implemented. Therefore, existing, small scale examples are analysed to determine critical success and fail factors. This will draw upon a brief review of relevant literature and the experience and knowledge of the partners.

The outcome of the analysis is a description of the success and fail factors and formulation of key recommendations to organize the supply side.

Note that the supply side is interpreted broadly: everyone who will be involved in the renovation package that will be offered to homeowners. Not only craftsmen, architects and other building professionals, but possibly also local authorities, renovation advisors etc.

### 3.1 ORGANISATION OF SUPPLY: EXISTING SOLUTIONS FOR ORGANISING THE SUPPLY SIDE

#### 3.1.1 Organisation of supply in one-stop-shop-solutions

The deliverable report D3.2 "Existing renovation solutions towards NZEB" identified seven one-stop-shop solutions in Belgium, Denmark, Germany and the Netherlands. One of the key characteristics identified in the report included the organisation of the supply side. Therefore, in this deliverable, these initiatives are analysed more in-depth, focusing specifically on how the supply-side was involved and how the supply side was organised in these programmes.

More specifically, this report will focus on the following programmes:

- Turnkey Renovation Bostoën (Belgium)
- BetterHouses (Bedrebolig) (Denmark)
- BetterHome (Denmark)
- Ecohome (Germany)
- Slim Wonen in Leeuwarden (The Netherlands)
- Stroomversnelling Koop (The Netherlands)
- Blok voor Blok (The Netherlands)

### 3.1.2 SWOT-analysis of one-stop-shop solutions

SWOT-analysis<sup>8</sup> is used to analyse the one-stop-shop solutions mentioned above. The result will be a non-exhaustive list of success and fail factors of organising the supply side. As mentioned before, this analysis focuses mainly on the organisation of the supply side in these programmes.

This deliverable not only focusses on the organisation of the supply side in order to execute the renovation, but also the organisation of the supply side to convince the homeowners to renovate to NZEB (and to be part of a one-stop-shop solution).

#### 3.1.2.1 Turnkey Renovation Bostoën (Belgium)

Bostoën developed a turnkey solution for renovation to unburden the homeowners in their renovation process. The target group for these renovations are people with expected investment costs for renovations of € 100,000 or more on their renovation in one go. To unburden the client in his or her renovation process. In this process communication tailored to the homeowner is a very important factor to succeed the renovation.

Turnkey Renovation Bostoën (BE)		
	Positive	Negative
Internal	Strengths	Weaknesses
	<ul style="list-style-type: none"> <li>• One story with different partners (one-single-point-of-contact)</li> <li>• Trust of homeowner in one company with one staff who can deliver a quick solution</li> </ul>	<ul style="list-style-type: none"> <li>• Timing: the central coordination needs some preparation before the start of the renovation</li> <li>• Not always easy to keep one single-point-of-contact (SPOC) for the homeowner in communication =&gt; single-point-of-responsible (SPOR) is needed (one responsible for each task or phase)</li> </ul>
External	Opportunities	Threats
	<ul style="list-style-type: none"> <li>• Homeowners seem mostly interested in increasing their comfort (e.g. kitchen and bathroom) and appearance of their house. This could present an opportunity to convince homeowners to link this renovation to an NZEB-renovation</li> </ul>	<ul style="list-style-type: none"> <li>• Timing of subcontractors</li> <li>• Coordination of large number of partners to carry out a renovation</li> <li>• Customer cannot always compare the information or offers he receives with information or offers from other companies</li> <li>• Customers are not often prepared to pay more for their renovation to obtain NZEB level</li> </ul>

<sup>8</sup> SWOT-analysis: analysis of Strengths, Weaknesses, Opportunities and Threats

### 3.1.2.2 BetterHouses (Bedrebolig) (Denmark)

BetterHouses is a one stop-shop initiative, where consultants are educated to guide homeowners in prioritizing a holistic and hopefully deep refurbishment, step by step and provide homeowners with a BetterHouses Plan in order to get the project financed. The initiative will continue until the middle of 2016 with marketing's campaign and supporting local events.

Better House (Denmark) - Organising supply side		
	Positive	Negative
Internal	<b>Strengths</b> <ul style="list-style-type: none"> <li>• Easy to become a Better House advisor – flexible / online courses with a holistic education program</li> <li>• High number of educated Better House advisers were satisfying</li> <li>• Easy for medium size companies that offer Better House plans to get a Quality Plan as required from the national Energy Agency</li> <li>• Knowledge about the programme amongst municipalities</li> </ul>	<b>Weaknesses</b> <ul style="list-style-type: none"> <li>• The concept is market driven and have <u>no</u> focus on organising the educated energy advisers</li> <li>• The focus was top-down, education, marketing, organising demand through stakeholder meetings.</li> <li>• Quality systems as a requirement seemed to be too complicated and expensive for the small adviser companies</li> <li>• Less than 50 % of the educated Better House advisers are now at the list of educated Better House advisers, due to missing orders and implementation of the quality systems.</li> </ul>
	<b>Opportunities</b> <ul style="list-style-type: none"> <li>• The Better House concept can be a success, when the supply side organise itself and offer packet solutions for energy check-ups and follow-up actions to municipalities</li> <li>• The concept can be a success in craftsmen guilds, where there is a cooperation between an independent adviser and energy craftsmen.</li> <li>• The Better House Concept has been a success in 6 out of 99 possible municipalities, that paid half or the full expenses for a Better Housing Plan.</li> <li>• The supply side has to offer an independent adviser, because that is what the homeowners feel most secure about</li> <li>• More than 50 % of the homeowners that</li> </ul>	<b>Threats</b> <ul style="list-style-type: none"> <li>• The Better House advisers have not been able to organise with the craftsmen and offer a free or independent energy check-up</li> <li>• Competition with free energy check-ups in the market as an assess to the homeowner</li> <li>• Timing: stop-and-go politic. The subsidy program and possibility to redraw the Better House plan at the tax bill came too late, 2 years after the program started</li> <li>• Building companies are business oriented and will not prioritize too time consuming projects at single family homes.</li> <li>• The subsidy for energy renovation or energy check-up is too little to empower</li> </ul>
External		

	<p>get a Better Housing Plan carry out a light energy renovation (investment 13-27.000 EUR)</p> <ul style="list-style-type: none"> <li>• For having success with NZEB an attractive business model between the contractors and the independent energy adviser has to be developed</li> <li>• The prices for NZEB has to be lower, an investment for NZEB at 70.000-100.000 EUR is too high.</li> </ul>	<p>the home-owner to NZEB</p> <ul style="list-style-type: none"> <li>• The average investment due to Better House is approx. less than 30 % of the cost for an NZEB renovation</li> <li>• In economic good times there is a trend to focus of non-energy investments such as new kitchens and bathrooms.</li> <li>• In up turns periods a lot of new small craftsmen companies start up and leave the possible, multi skilled NZEB contractors.</li> </ul>
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**3.1.2.3 BetterHome (Denmark)**

BetterHomes presents three types of solution packages to homeowners (energy, comfort and refurbishment package). The interested home owner can, after carrying out an on-line energy check of his house, be contacted by a craftsman.

Better Home (Denmark) - Organising supply side		
	Positive	Negative
Internal	<p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>• A total private market driven initiative by 4 strong providers of energy solutions (insulation, pumps, energy management, windows).</li> <li>• Better Home is far better than Better House at organising the supply side and make it easy and not time demanding for the craftsmen to get leads.</li> <li>• The craftsmen do not have to pay to get leads.</li> <li>• The secretary of Better Home gives leads depending on the craftsmen’s qualifications and geography</li> <li>• The craftsmen do not have to compete with other craftsmen inside Better Home, but of course the consumers can get offers from craftsmen outside</li> <li>• Better Home offer craftsmen education in good service, communication and knowledge about the products.</li> <li>• Better home craftsmen get app/tools for calculation of energy saving and customer journey.</li> <li>• The average investment of a Better Home energy renovation is bigger than a</li> </ul>	<p><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>• Advices are not independent</li> <li>• Not all Better Home craftsmen have a post energy education and are able to give the costumers holistic energy advice and a good customer journey.</li> <li>• No quality system is required from the craftsmen connected to the concept</li> <li>• The craftsmen/costumers can only choose product from the 4 providers of energy solutions</li> <li>• The overall results and success rate of the concept are not transparent at the website</li> <li>• The list of craftsmen is not transparent at the website</li> <li>• The only entrance to the website is for costumers. The costumers have to write their contact information</li> </ul>



	<p>Better House investment</p> <ul style="list-style-type: none"> <li>• Better Home craftsmen have network meeting and exchange experiences</li> <li>• 50 % of the offers lead to energy renovation</li> <li>• The craftsmen are satisfied with the number of leads, from 5,5 mio. EUR to 13 mio. EUR (2015 to 2016)</li> </ul>	
<b>External</b>	<p><b>Opportunities</b></p>	<p><b>Threats</b></p>
	<ul style="list-style-type: none"> <li>• The Better Home concept can be even more successful, if post education about energy savings options, communication and IT-skills were required as part of being an approved Better Home craftsmen</li> <li>• More open website publishing customer surveys and success rates</li> <li>• For having success with the more complicated NZEB Better Home has to include more qualified energy advisers as partners.</li> <li>• The average investment in the Refurbishment packet is at the same level as the cost for an NZEB renovation, up to 63% energy reduction and an investment at EUR 90.000</li> <li>• The concept is not too time demanding and good for small craftsmen companies, Better Home is a place to join something greater.</li> </ul>	<ul style="list-style-type: none"> <li>• The Better Home get a bad reputation because of bad communication/service and not holistic advises from craftsmen</li> <li>• Competition with independent and personal energy check-ups/ Better House Plan as an assess to the homeowner. The on-line energy check-up is too general.</li> <li>• The craftsmen are compared to energy consultant not necessarily competent to help consumers with knowledge about subsidies</li> </ul>

### 3.1.2.4 Ecohome (Germany)

Ecohome<sup>9</sup> is a refurbishment of listed buildings in Halle which typically consists of a combination of insulation measures (walls inside/outside; new windows) and new heating system. Target value for energy savings is 75%. There are four distinct steps in this one-stop-shop-concept: 1) visit of an approved energy consultant; 2) 'planning': consulting results are interpreted and the renovation measures are planned; 3) company assigns their partners (master craftsmen) with actual renovation measures; 4) control and certification - consultant tests the renovation success and issues the energy performance certificate. In addition, the energy consultant applies for subsidies.

ECOHOME - Germany		
	Positive	Negative
Internal	<b>Strengths</b> <ul style="list-style-type: none"> <li>high quality standards for suppliers:               <ul style="list-style-type: none"> <li>only recognized master businesses receive ecohome -admission</li> <li>certified ecohome energy consultants:                   <ul style="list-style-type: none"> <li>high reputation of the ecohome umbrella brand; are allowed to use the original ecohome logo on their website (temporary rights of use);</li> </ul> </li> </ul> </li> <li>ecohome further trainings ensure the high level consulting expertise (seminars 349€/person);</li> <li>technical expertise, application for funding, and payback calculation;</li> <li>suppliers have access to the ecohome partner portal, exclusive listing;</li> <li>suppliers directly receive customer enquiries from their region</li> <li>ecohome quality label for energy consultants and product partners / manufacturers of building materials</li> </ul>	<b>Weaknesses</b> <ul style="list-style-type: none"> <li>no specific focus on NZEB</li> <li>testimonials / references are mainly covering stepwise renovation</li> </ul>
	<b>Opportunities</b> <ul style="list-style-type: none"> <li>further trainings / seminars for energy consultants and technical experts: ecohome partner programme offers a dense regional coverage across Germany</li> <li>flexible offers / broad range: from single renovation elements to deep renovation (adaptable for NZEB)</li> </ul>	<b>Threats</b> <ul style="list-style-type: none"> <li>advertising offer: 4-6 weeks overall duration for energetic renovation (might be misleading because of probably higher expenditure of time for deep renovation / NZEB) (This refers particularly to financial barriers)</li> </ul>
External		

<sup>9</sup> <http://ecohome.de/>

- announced: inventory optimisation for landlords: new service for the optimisation of single multi-family dwellings and entire property portfolios

### 3.1.2.5 Slim Wonen in Leeuwarden (The Netherlands)

Slim Wonen In Leeuwarden aims to help and advice home owners and offer special deals at selected moments. The key difference to many other 'one stop shops', or marketing in general, is that a customer management system is used. This based on tailoring the provision of information or offers to the stage of awareness or demand in which the customer is. Therefore the 'customer journey' is central. As well as this, the scheme works with firms that offer an one stop shop service and a unique quality assurance promise.

Key lesson learned in the Slim Wonen programme: Motivating homeowners to invest their own money in energy efficiency can only work if you understand and closely follow their decision-making process.

Slim Wonen in Leeuwarden		
	Positive	Negative
Internal	<b>Strengths</b> <ul style="list-style-type: none"> <li>• Independency</li> <li>• good brand</li> <li>• information organized by a council</li> <li>• right information on the right time</li> <li>• Having a independence person as linking pin between demand side and supply side</li> <li>• Organizing (new) marketing sessions for the suppliers</li> </ul>	<b>Weaknesses</b> <ul style="list-style-type: none"> <li>• Suppliers leaning backwards</li> <li>• Different visitors, many different wishes = complex</li> <li>• Long-term approach, with a duration of several years</li> <li>• Knowing the journey does not mean knowing all the different solutions</li> </ul>
	<b>Opportunities</b> <ul style="list-style-type: none"> <li>• Creating ambassadors at the public</li> <li>• Starting the growth of energy efficiency</li> <li>• Working together</li> <li>• Finding other points of interest owners can be convinced and mix it with energysaving: like permanent living of the path of life</li> <li>• Suppliers: Help each other, consortia with one office and one offer helps. Companies doing this are front runners</li> <li>• Offer practise and lessons special for the supply side. Some branche organisations do so.</li> </ul>	<b>Threats</b> <ul style="list-style-type: none"> <li>• Suppliers getting used to unburden by government</li> <li>• Costs ... when does it stop</li> <li>• Not interested customers</li> <li>• Dancing energy cost by world conditions</li> <li>• Bad stories about some solutions</li> </ul>
External		

### 3.1.2.6 Stroomversnelling Koop (The Netherlands)

Stroomversnelling is a Dutch-based cooperation that strives to combine supply and demand, regarding the refurbishment of private terraced houses (building period: 1950-1980), on a large scale and quick manner. In this way zero-energy building can be realized, which results in savings and a more comfortable way of living for the homeowner. The cooperation consists of 200 parties, including municipalities, energy cooperatives, construction companies, distribution channels, financial institutions and real estate agencies. The founders concluded that with an investment of € 45.000,- the monthly repayment and interest costs are equal to or lower than the energy usage costs prior to the refurbishment. The renovation can be financed by the homeowner's private money or with the use of a loan or additional mortgage. The affiliated financial institutions are willing to explore an additional loan construction, making use of the energy costs savings of the homeowner. Several pilots have already been completed and communicated, and multiple municipalities are currently developing their first pilots.

Stroomversnelling Koop		
	Positive	Negative
Internal	<b>Strengths</b> <ul style="list-style-type: none"> <li>• Total concept, cooperation of government and total supply-side</li> <li>• More space in loans: good financial solutions</li> </ul>	<b>Weaknesses</b> <ul style="list-style-type: none"> <li>• Unknown ways to discover</li> <li>• Slowly</li> <li>• Supply-side not used to work together in this new way</li> </ul>
	<b>Opportunities</b> <ul style="list-style-type: none"> <li>• Total concepts for all the same dwellings</li> <li>• Fabrication can more efficient: customized</li> <li>• Good financial concepts</li> </ul>	<b>Threats</b> <ul style="list-style-type: none"> <li>• The prototypes are still too expensive</li> <li>• Building companies cannot develop it fast enough</li> <li>• House owners are sceptic</li> </ul>
External		

### 3.1.2.7 Blok voor blok (The Netherlands)

“Blok voor Blok”<sup>10</sup> is a large-scale renovation programme in The Netherlands. Fourteen projects are currently on-going. Each project is a collaboration of minimum three market actors in which 1.500 to 2.000 dwellings are renovated in one municipality.

<sup>10</sup> <http://www.rvo.nl/onderwerpen/duurzaam-ondernemen/gebouwen/blok-voor-blok>

Blok voor Blok		
	Positive	Negative
Internal	<b>Strengths</b>	<b>Weaknesses</b>
	<ul style="list-style-type: none"> <li>• District-wise approach</li> <li>• Recognizable companies who work in the neighbourhood</li> <li>• National awareness</li> <li>• National financial support</li> <li>• Focus not only to energysaving, also to other things like bathrooms, kitchens etc</li> </ul>	<ul style="list-style-type: none"> <li>• Dwellings are in different condition, some were more insulated than the other</li> <li>• Different owners want different approaches</li> <li>• Time consuming</li> </ul>
External	<b>Opportunities</b>	<b>Threats</b>
	<ul style="list-style-type: none"> <li>• Total concepts for all the same dwellings</li> <li>• Customized/industrial solutions</li> <li>• Financial opportunities for the owners and building consortia</li> <li>• Lot of buildings, more offers</li> </ul>	<ul style="list-style-type: none"> <li>• Same offers of the same companies, nothing to compare</li> <li>• Specialized offers to many different owners</li> <li>• Time investments</li> </ul>

## 3.2 SUMMARY OF SUCCESS AND FAIL FACTORS

This chapter summarises the key success and fail factors, identified in the SWOT-analysis which was further complemented by literature study and the partners' experience gathered in a workshop.

### 3.2.1 Key success factors

In the Better Home program, the craftsmen do not have to compete with other craftsmen inside the programme. This could result in a mentality shift: from “we are competitors” to “let’s help each other”. In other words, a more **cooperative model instead of a competitive one** is recognised as a success factor, as it encourages to find suitable partners who are complementary to each other and form strong partnerships.

In the Better House programme, a **cooperation model with a renovation advisor and craftsmen** was pointed out as a success factor. A condition for this is an appropriate business model.

Related with previous point: the **independency** of the renovation advisor was emphasised in a number of cases, so the renovation advisor could really be the linking pin between supply and demand side.

Furthermore, the Dutch examples pointed out the importance of the involvement and cooperation of **local policy level**. This can range from:

- providing support to reach the target customers,
- offer additional quality assurance to customers,
- form a true cooperation of government and market actors.

Closely related is the aspect of **branding and creating trust with the customers**. A quality label could be a possible strategy, as a way to distinguish competent supply side actors.

Lastly but equally important, in order to achieve success with the more complicated NZEB renovations, the Better Home pointed out the importance to include highly qualified energy advisors as partners. This emphasises the need of **good training programmes** in order to have better qualified experts.

### 3.2.2 Key fail factors

A number of fail factors related to **quality assurance**:

- In the Better Home program, no quality system was required from the craftsmen to participate in the programme. As a result, craftsmen were not necessarily competent to help customers with specific advice such as subsidies when compared to for instance energy consultants.
- However, quality systems as a requirement were sometimes perceived as to be too complicated and expensive for the smaller SMEs.
- In the Better House programme, less than 50 % of the trained advisors are effectively on the list of qualified advisors, due to various reasons such as the implementation of the quality systems.

Regarding the **single-point- of-contact**, independency could be an issue (this was pointed out in the Better Home programme). The turn-key service of Bostoën highlighted a shift from a single-point-of-contact to a “single-point-of-responsible”, meaning one responsible for a certain task (for instance: sales, construction, interior). In the Better House programme, advisors were not always able to compose partnerships with the craftsmen to offer a free or independent energy check-up to homeowners.

Second, fail factors related to the **time investment needed** were quoted in a number of the analysed examples:

- Renovations of single family homes were pointed out as time demanding;
- Each homeowner basically requires a different approach, which can be very time-consuming as well;
- Coordination of building partners needs preparation before the start of the renovation and also requires a time investment during the process. In general, coordination of a large number of partners to carry out a renovation was highlighted as a point of attention.

Lastly and equally important, a number of **financial factors** were identified:

- The cost of NZEB renovation: an investment of 70.000 EUR - 100.000 EUR was identified as too high.
- Customers are not often prepared to pay more for their renovation to achieve NZEB level. In the Better House programme, the average investment was approx. less than 30 % of the cost for an NZEB renovation
- Subsidies or financial support proved to be a driver for energy check-up or renovation advice. In some cases, the amount of subsidy was quoted too low, or too late implemented.

## 4. Conclusions and recommendations

### 4.1 SUPPLIER INVOLVEMENT STRATEGY

This chapter identifies the key lessons learned regarding the involvement of the supply side in one-stop-shop solutions for NZEB renovations.

The purpose of this deliverable was not to define a generic supply involvement strategy, which will be difficult to accomplish as the conditions will vary depending on the context. Rather a framework will be outlined with a suggestion of possible building blocks to fill this framework. This way, a customized supply involvement strategy can be composed, based on the local context of both demand side (starting from the customer journey) and supply side (starting from the desired partnership or organisational structure).

**A supply involvement strategy should be able to adapt, depending on the type of supply side actor and specific renovation package.** The supply side consists of different types of building actors: manufacturers, craftsmen, contractors, architects, engineers, energy consultants, renovation advisors and so on. In the analysed examples, there was a clear focus on the following key actors<sup>11</sup>:

3. Energy and renovation advisors (including related consultants such as energy experts, ventilation expert etc.);
4. Craftsmen and contractors;

They each require a slightly different approach. Therefore, there could be no “uniform” supply involvement strategy without taking into consideration the type of supply side actor. Instead, the strategy should be tailored to the building actor targeted, eventually starting from a general framework but nevertheless customizable

**Provide dedicated training programmes.** The majority of the training initiatives for the supply side concentrate on the technical training to address the issue of quality constructions and renovations. Few initiatives were found about training the supply side on the behavioural change.

“Dedicated” does not mean that these training programmes should only focus on technical, NZEB-related topics, on the contrary. The analysed examples pointed-out two focus areas:

3. There is a need for training on non-technical topics. Slim Wonen highlighted the importance of marketing workshops. Better Home focused on education in communication and how to provide good service to customers.
4. Participating in training programmes can be a prerequisite for partnership. However, continued training should be encouraged as well to maintain the necessary quality level (continuous learning). Ecohome organised additional training to ensure the high level consulting expertise.

**Provide support to the involved partners,** this way unburdening the supplier. To improve the level of engagement, it is recommended to clearly point out the benefits when participating (basically providing the answer to the question “*what’s in for me*”). Identified examples include:

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<sup>11</sup> The role of architects was not explicitly covered, but it can be assumed that they can take up both roles: the architect as a renovation advisor, or the architect as a building professional.



- Access to tools: In the Better home programme, craftsmen could obtain apps or tools for calculating the of energy savings and monitoring the costumer journey.
- Administrative support: The craftsmen do not have to pay to get leads. The secretary of Better Home followed-up potential leads and distributed them among the craftsmen depending on qualification and geographical criteria
- Access to information and network: In the Ecohome initiative, joined parties were granted access to the “Ecohome partner portal” and furthermore, they could directly obtain customer enquiries from their region

Closely related with previous point: **In order to reach SMEs, the threshold to participate in a renovation package should be low enough.** This means that the concept should be clear and not too time demanding for small craftsmen companies or SMEs. Other good examples identified: In the Better House programme, it was relatively easy to become advisor, as a result of flexible and online courses with a holistic education program. Furthermore, in the same programme, it was not difficult SMEs who offer “Better House” plans to obtain a Quality Plan as required from the Danish Energy Agency.

Lastly and equally important, **creating a community and providing network opportunities** allow partners to exchange experience and to collaborate with each other. Partners should have the feeling that they join something greater. Setting up a recognisable brand (branding) further complements this.

## 4.2 RECOMMENDATIONS FOR ORGANISING THE SUPPLY SIDE

Taking into account the success and fail factors as identified earlier, the following recommendations are suggested for organising the supply side:

6. **Develop a solid business case** between a single-point-of-contact to the homeowner (e.g. a renovation advisor) and the building professionals. Interdependency was quoted as a prerequisite.
7. **Compose a “pool” of building professionals.** A distinction should be made between renovation advisors on the one hand and building professionals on the other hand (which can be further distinguished in craftsmen or contractors, architects, and engineers or consultants). Ideally, this pool should be of cooperative instead of competitive nature.
8. **Define quality requirements** which have to be met by building professionals as a prerequisite to participate in the renovation package. However, the level of complexity and associated costs should be limited in order to engage the smaller SMEs as well.
9. Offer **good training programmes**, to ensure that all building professionals and renovation advisors possess the required knowledge level and skills to participate in the renovation packages.
10. Take into account the **time investment and financial aspects** associated with the NZEB renovations investment by the customer. These can be barriers, both for the demand side as the supply side.