ERA-NET Eracobuild project

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

(1st September 2010 - 31st August 2012)

Project Report WP 3 – Implementation Phase

Innovation in Supply Side Collaboration

Business Zoo - Innovative business models for integrated housing renovation

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1. Introduction

The retrofitting of single family houses may contribute to a large extent to the possible energy savings in the construction sector. In Europe, Small and Medium-Sized Enterprises (SMEs) can set the trend in this emerging sustainable housing renovation market. However, the renovation process is now often fragmented between many market players. The client as well as the SMEs find it difficult to consult all necessary information (examples, technical solutions, companies, quality assurance, financial support...).

Practical innovation in housing renovation is needed. Integrated renovation business models are needed. Unburdening the client is needed, by offering a one-stop-shop concept. In brief, innovation in renovation business models is needed. Innovative technologies can be clustered and presented as a holistic renovation solution. SME competences and know-how can be increased. To both SMEs and clients, the One Stop Shop concept can be proposed as an integrated solution.

To address, discuss and research these issues, the One Stop Shop project partners organized an event offering actors in the supply chain inspiration, knowledge and contacts in a quite active and interactive setting. The aim was to foster collaboration along the renovation business chains, leading to innovative and integrated market concepts. This document reports the organization and the main experiences of this event, entitled “Business Zoo”.

2. Organization of the Business Zoo Event – fostering collaboration for innovative market concepts for integral house renovation

2.1. Concept and Programme

“Business Zoo” was held in Antwerp on 18 April 2012 (http://www.b2match.eu/businesszoo). The dissemination activities and the related PR material specifically targeted persons who are ambitious and committed to contribute to an integrated sustainable renovation market development. Participants from both the demand and the supply side were invited: architects, contractors, project managers, installers, suppliers, engineering offices, energy specialists, DIY companies, energy management companies, project developers, cities and municipalities, tenant and owners associations, investors and banks, research centres. The event was attended by 80 participants (Austria 2, Belgium 57, Denmark 3, Finland 2, Georgia 1, Germany 1, Netherlands 8, Norway 4, United Kingdom 2).

The workshop had an original formula, starting with a kaleidoscope of ten inspiring pitch presentations on integrated home renovation. Each pitch ended in a “burning question” that each presenter put forward to the participants. Afterwards, the participants themselves were consulted to brainstorm on background of the question and answer questions to problems related to these topics, to examine collaboration opportunities using renovation case studies and to develop ideas for collaborative business models to deal with volume market development.

The organizers, that is the One Stop Shop partners led by the Passive House Platform and IWT and in collaboration with the Flemish contractor federation VCB wanted to offer an event on innovation that had a new organization formula in itself: no boring PowerPoint’s and endless discussions. Action and personal commitment were to rule instead, as well as creativity and networking. Participants were invited to join, and share their experiences and ideas. Through the day, inspired moderators tightly guide the small-group
workshops to relevant conclusions and a proper learning effect for all participants. All results were shared and put in a broader perspective. The final programme consisted of four main parts:

**Part I: setting the scene: kaleidoscope**

Through a kaleidoscope of elevator pitches, ‘hands-on’ experts shared their experience on emerging business developments for integrated renovation. Such as: System suppliers willing to introduce prefab-renovation, DIY companies joining with project managers, insulation companies with installers, extending sustainable product lines to integral renovation systems, EP-focused financing of renovations...

The following presenters introduced the following topics:

1. Peggy Bovens, PB calc&consult (B): Objective framework for cost guaranteed renovation
2. Anke Van Hal, Nyenrode Business University (NL): Smart and speedy renovation of post-war housing
3. Stijn Verbeke, VITO (B): Enhancing Energy Performance Certification to promote integrated energy renovation
4. Synnøve Aabrekk, Segel AS (N) (replacing Peik Næsje, Bolig Enøk): House owners’ project manager as key for coordinated and holistic supply side
5. Ivo Opstelten, SEV (NL): Realising marketable propositions for energy neutral buildings
6. Are Rødsjø, Husbanken (N): Public funded energy plans for renovation
7. Koen Daniëls, Mitsubishi Electric Europe BV (B): Challenges of building services manufacturers to reach integrated renovation
8. Colin King, BRE Wales (UK): Quality problems in integrated renovations
9. Adrian Joyce, EuroACE (B): Renovate Europe campaign
10. Susanne Supper, Ögut (A): Innovative supply chain collaboration

The presentations are available for download on: [http://www.one-stop-shop.org](http://www.one-stop-shop.org).

**Part II: Towards clear-cut challenges: thematic group discussions**

It was up to all participants now to get involved. From their own daily practice and their own ambitions, they refined problem definitions as forwarded by the pitches, towards identifying and defining the real challenges. This happened in small thematic groups, guided by moderators.

**Part III: Business zoo - part I: animal gathering**

Part III of the event used the One Stop Shop model based on the five steps in the innovation adoption process (Information > Persuasion > Decision > Implementation > Confirmation) – see the report on methodology. Actor categories were predefined according to their possible contribution in each step of the innovation adoption process using specific animal pictograms (see Table 1, animal characteristics can be also found in characteristics of specific actors within the renovation chain).
CROW – Informing market player – e.g. virtual platform, research centre, non-profit organization, university/school, housing reference centre, energy agencies, material supplier, DIY store,…

HORSE – Consulting market player – e.g. technical advisor, architect, interior designer, energy advisor, engineer,…

TIGER – Contracting market player – e.g. architect-builder, turnkey supplier, project manager, general contractor,…

BEAVER – Implementing market player – e.g. subcontractor, installer,…

HAWK – Quality assuring market player – e.g. accredited certifier, labelling actor, cost manager, energy performance verifier, whole building commissioning agent,…

GOOSE – Customer for integrated renovation – house-owner, public procurer, community, social housing company, real estate owner,…

GULL – Process moderator for the Business Zoo

Table 1. Business Zoo methodology: bringing together different actors (animals) in a supply chain collaboration event (Zoo)

Starting from detected challenges and opportunities, small groups were predefined using animal pictograms and groups were formed as to include all ‘animals’ or market players of the business chain. A role-play and brainstorm on collaboration opportunities for deep and sustainable renovation, with various types of market players (animals) around each discussion table, using a novel ‘animal gathering’ canvas.

**Part IV: Business zoo - part II: business model development**

Guided by a moderator, the experience of the animal gathering was used to start developing an inspiring business models for collaborative action for deep and sustainable renovation with the market players at various tables, using the 'business model generation canvas'. They conceptually worked out specific integrated business models for deep and sustainable renovation.

Afterwards, the various group experiences were exchanged and the participants had ample opportunities to cluster and to initiate ideas in a networking session which ended the event.

Part III and IV used specific project cases to guide the discussions (see Appendix). Part III used a newly developed ‘animal gathering canvas’ (see Figure 1). Part IV used a ‘business model generation canvas’ (see Figure 2).
Figure 1: animal gathering canvas depicting that each renovation market actor category should refer to the next (developed by E. Mlecnik)

Figure 2: business model generation canvas (ref: http://www.businessmodelgeneration.com)
2.2. Research method/ instructions for moderators

The event was carried by various moderators, who were selected and invited according to their experience with the subject. Furthermore, they were trained the day before the event. They received specific instructions by the main moderator on how to handle group discussions. The main moderator was appointed on basis of previous experience and knowledge in the used networking method. This subsection explains the input that was expected from them in each part.

First, it was explained that it is the aim of the event to stimulate daily practice towards achieving high energy efficiency and sustainability goals for housing renovation. The atmosphere moderators were to contribute during the event was one of personal commitment: exchanging information about daily working experiences and helping each other to go further in daily practice. This does not only require a one-way provision of information by moderators, but mostly feedback to personal questions from participants. Every moderator was motivated to be sharp on the structure of the event and on the own contribution.

Then, the format of the pitch presentations was explained. The introductions by presenters were to be relatively short (3.5 minutes each, no intermissions), the day was further committed to creativity and learning from each other, involving all participants in small discussion groups. After the pitch presentations, the moderators were encouraged to play an important and highly visible role. The moderators had a facilitating role for group interaction in parts II-IV. Learning from each other was to be supported by different interactive parts: in the morning groups of maximum 10 persons (intervision meetings) freely assembled according to interest in the presented topic, and in the afternoon predefined groups of different ‘animals’ 7 to 10 persons (animal gathering sessions and business model generation workshop).

All participants in a group should collectively reflect upon topics, guided directly by the moderator, going deeper into analysing a collective problem and into providing possible solutions. It was not the aim that moderators focussed the attention of the group on their own perspective regarding the subject of discussion. All questions and remarks from participants in a group were to have the same value. Persons were chosen as a moderator because they were well connected with the topic and they were known to be able to guide conversations and group interactions in a disciplined manner. If all talks were done in a disciplined manner, every external participant, presenter and moderator would recognize own learning opportunities.

Part I: Kaleidoscope of pitches (presentations)

To create a lively and positive atmosphere, the day opened with a kaleidoscope of enthusiastic stories from people (the presenters) involved in the development and daily practice of advanced housing renovation. At the start of the event presenters showed different problems related to advanced housing renovation. In this part, the action of the moderator was not required, but they should closely follow the presentation of the presenter that was assigned to them for intervision meetings (see further).

These presenters did not tell so much about the topic of advanced renovation, but told about their daily work, from their own experience, and the problems they encountered, particularly regarding supply chain collaboration. The presenters tried to attract attention of the public to the problems they encountered and they tried to make participants enthusiastic to brainstorm on the topic they introduced. The whole presentations session lasted about 45 minutes in total. This is a short time, but the subject was to be
addressed again in smaller groups of people, guided by moderators. These groups should thus involve people who are really motivated to reflect on the ideas proposed.

Part II: Intervision meetings

All moderators play an essential role in the second part, the intervision meetings. The hall was divided into groups of maximum 10 chairs in circular set-up. A table with blank posters and markers was provided for each group. The follow-up number of the presentation of the pitcher was clearly indicated. Moderators were requested to move early to their respective group after the short break. In each group there was a limit of 10 participants. The moderator was to make sure that this number was not exceeded and if so, guide people to other groups, referring to the fact that participants will also find likeminded people in other groups. From now on, the moderator was expected to assure the input from each member of the groups, using the topic and the questions that were introduced as a basis for group reflection. In these smaller groups the theme that was presented in a pitch was central. However, the pitcher’s exact question was put aside. The pitchers’ position from now on was that of a regular participant and the moderator explained that the question of the pitcher should have the same value as questions from other participants. It was not the intention that the pitchers’ question remained central during the discussion process, neither should the moderators’ viewpoint dominate. The moderator took notes during the meeting or assigned another participant to do so, for example the presenter. An overview was provided in advance of who was assigned to act as a moderator per presenter/topic, including pictures of the moderators and the speakers.

The moderator started the process by asking all participants in the group to reflect on the pitchers’ question from their own experience, possibly introducing new questions and refined ideas. Together the group would decide which question should be discussed further, based on what was found by group interaction. This process was explained step by step during the moderator training session, using a practical exercise with questions on ‘intervision meetings’. The moderators were to ensure that the discussion went systematically and timely through the following steps:

1. Stating name and own question of each participant related to pitch subject (8 min)
2. Choosing two key questions for group reflection (based on group relevance): two ‘question-owners’ are attributed to these questions (3 minutes)
3. This first question owner elaborates the own context of the question (2 minutes)
4. Participants ask 1 question to the question owner to clarify (10 minutes)
5. Further elaboration of the question by the question owner (2 minutes)
6. Free exchange of remarks by the group (10 minutes)
7. The question owner reformulates the question, correcting misinterpretations of other participants (2 minutes)

Looking back to the event this was probably not the best choice – the participants expressed expectation that the pitch question should be focus on the table (after all that was a strong reason why they joined a particular table in the first place.)
8. Each participant suggests a main solution (10 minutes)

9. Reaction on solution and evaluation process by question owner (3 minutes)

10. What has the group learned? (5 minutes)

11. Short break (5 minutes) + Repeat from number 2 with the second question

The intervision meetings took place in two rounds dealing with two main questions in each group. Moderators were asked to summarize the findings from their group on the poster provided. These posters allowed other participants to learn from other groups during the break.

**Part III: Animal gathering**

The animal gathering used a transversal approach, bringing together different disciplines. To highlight different disciplines, each participant received a name badge with an animal depicted, referring to his/her role in the renovation chain. The main moderators first explained the function of this animal pictogram in plenary session. Prearranged group were formed, with the number of the group depicted on the badge. Each group gathered in circular setup around a table with two preformatted posters on the table, an animal gathering canvas on top of a business model generation canvas. Three colours of Post-its (yellow, pink and green) and markers for all participants were made available in each group on the table. Animal pictograms and group compositions were chosen beforehand by the organizers to assure sufficient interaction. Each group contained maximum 10 persons with an optimal of seven persons (prearranged). The moderators had a ‘gull’ badge. Each participant was asked to take some Post-its according to the colour of the background of their animal on the animal gathering poster. Gulls did not take post-its.

In the animal gathering exercise, the importance of the homeowner’s view was stressed to enforce enterprises to think from the client’s perspective. Goose were first asked to step forward. The moderator gave them a picture of a house (their ‘imaginary house’) and short instructions of requirements for the renovation of this house (see Appendix). Now, the main topic for discussion in all groups was how to improve collaboration using all animals, using the animal gathering poster. The end-goal of the game was to convince the Goose (the customer) that all the other animals together (except the Gull) would be able to solve the Goose’s renovation problem. This session lasted about 60 minutes. The moderators ensured that the animal gathering meeting went systematically through the following ten steps, which were explained and tested in detail beforehand during the moderator training session:

1. All participants’ main activity to be introduced as post-it on the animal. (4 min)

2. The moderator explains the process and goal of the gathering: in an imaginary process, these companies have to work together to satisfy the Goose. (3 min)

3. The Goose shows the renovation problem and selected a first contact. (3 min)

4. The selected player responds. (4 min)

5. An animal previous in line on the bar is asked to help the selected player. (3 min)

6. Repeat for all animal categories in the bar. (13 min)
7. Brainstorm with different categories of animals on new ideas. (10 min)

8. Go linearly through the bar and ask to put Post-its on or next to main activity. (10 min)

9. Reaction on solution and evaluation process by the Goose. (5 min)

10. What has the group learned? (5 min)

Afterwards the moderator introduced a short break and asked participants to return to the same group.

Part IV: Business model development

The goal of the last part was to define key issues for a business model, focusing on the ‘Tigers’ (responsible actors), or if lacking, on the ‘Beavers’ (implementing actors). The output of the previous part (Post-its) was directly used to fill in certain parts on the business model canvas. In agreement with others in the group the moderator selected what was useful in the business model canvas for example as information on ‘customer segment’, ‘key partners’ and ‘value proposition’. For example, the detected client’s requirements (Goose Post-its) were useful in the field ‘value proposition’.

The moderator ensured that the business model generation workshop went systematically through the following steps. Again, this was also trained beforehand during a moderator training session.

1. Moderator’s introduction of goal. (2 min)

2. Explaining canvas and control questions. (3 min)

3. Going through each block. (40 min)

4. Adjusting model. (10 min)

5. What has the group learned and roundup. (5 min)

Afterwards all moderators were requested to comment on the findings in their sessions, using the posters as a background. Moderators could comment on the main findings, novel ideas and innovations discovered in their group.

3. Business Zoo results

3.1. Key challenges and opportunities
The following provides an overview of (a selection of) the final questions (detected challenges) that were established during the intervision meetings, and the final answers and solutions (detected opportunities).

Q1. How can a technical company become more human science oriented? How to change focus from mainly technical to a combination of technical and human science focus?

- Organize meetings. Don't neglect organizational changes. Integrate different departments. Hire someone with knowledge. Incorporate human science (sociologist) in R&D. Deal with different companies together.
• Thinking needs to change (subsidies?).
• Collect the right information. Use client segmentation. Use clients as input: ask them what indoor climate they need. There is no average person, so define a range of needs. Set up a questionnaire for architects.

Q2. Which role can a future EPC advisor play in future renovation processes, taking into account independency?

• The expert needs to be independent, but his/her role should be extended to advice on more topics than only energy efficiency. For example, advise on aesthetical elements that incorporate energy efficient solutions.
• The advisor should point out a range of solutions so that people become aware of the possibilities of renovation and are not only cost oriented.

Q3. How to stimulate more energy responsibility for house-owners?

• Create obligation for an energy label.
• Create different groups of house-owners.
• Support clients in finding subsidies.
• Make information more accessible.
• Involve financial sectors and ESCO’s in advisory role.

Q4. How do we get the building sector convinced to build differently?

• Training programs and communication to build differently.
• Involve all professions and all stakeholders.
• Visualize long term path: Passivehouse/low energy standard today will be the building code in the future. In a long term perspective this will be an investment.

Q5. How can we demonstrate the future added value of renovation to future building owners at the moment of sale or rent?

• Long term path; convince this is a future investment.
• Energy Performance Certificate.
• Communication: “right thing first”, “sustainable houses”, “this investment is right”.
• Data gathering.
• Governmental subsidies.

Q6. Building contractors offer renovation, but clients are hard to be convinced. How to convince the client?

• Government should do more focused on the long term.
• Ask as much as possible the persons to speak who have experienced the renovation. A book token is more effective than subsidy.
• Demonstrate the effect by means of congresses, share the experience, and create value.
• Create more value by connecting all lines in the network: 1+1=3: there is a lot of knowledge.
• Offer the best solution; don’t offer the best solution for the building contractor. The renovation is not (only) for the interest of the contractor, but for the interest of everybody.
• Offer complete unburdening

Q7. How can the basic principles of sustainable building and living be implemented in a consistent and non-political way?
• Solution is in the quantified final perspective that can be realized in the present political context (short-term policy mandates). Several ways are possible; however it is not a point on a far horizon, but a point close to now and here.
• An organization working for sustainability and controlling sustainability should work in parallel to politics.
• “Governmental Mayors” lay down their ambitions and are mutual concerned.
• Politicians are needed in order to involve everybody in the debate, in order to have one vision for the next 20 years. The organization should exceed the political term. This should be fixed by law, and politicians should be set responsible for that. We have our financial matters shipshape; now the sustainability!

Q8. How to motivate first moving companies (SMEs)?
• Visualize (including labelling) the market for the suppliers
• Challenge the companies through public transparent innovation procurement.
• Pioneers to make packages where they can involve/include others.

Q9. How can companies sensibilize public authorities to establish incentives for sustainable renovation to the private market?
• Solve some municipality problems (school, social housing). The public market may be used to build trust, by offering solutions best for society – where the municipality is the customer.
• Look for synergy with governmental goals (climate change, CO2 free city, transition arena).
• Focus on green city arena.
• Demonstration project by companies.

Q10. How can we reach and convince individual home owners to renovate? What info do we need to give them?
• Prepacked solutions & clear communication.
• Good information.
• Modular, open renovation packages that can cover multifaceted requirements (each owner asks something else).
• A credible party to convince the home owner.
• We don’t need to convince the home occupier, 50% is not owned by the occupier -> We need strong legislation that forces people to do it.
• The approach towards the client should be building typology based – knowledge on owners needed.

Q11. How to develop a business model that clearly defines roles of different parties (ensuring financial benefits and avoiding competence overlapping)?
• Define clearly common goal as doing the building team that can go beyond one project and have possibilities and interest in doing more work together on the market.
• The architect should be the coordinator and create a natural partnership with others.
• Subsidies for owners who have overall renovation plan.
• New buildings are good driver for clustering companies (observed in new passive house builders in Flanders, Belgium). They look holistically.
• Project Team Partnership (PTP experience from the UK), whereby one contract is signed by all parties sign with collective interest.
Q12. Where does the money come from when the “market” does not work?

- Enforced savings mechanisms.
- GreenDeal/GreenBanks.
- “Name and shame” social pressure.
- Note: CO2 goals cannot be reached without subsidies. Without the presence of a market, this has to be regulated (differences in different states). Society has to step in for the poor.

Q13. Deep renovation or demolition/reconstruction?

- Clarify by changing EPC’s to energy/renovation plans or replacement proposals. Look at cities to devise gradual piece-meal change, not demolishing whole neighbourhoods. Adapt local solutions, building by building, perhaps street by street. Key is to choose appropriately based on careful evaluation of each property. Targeted demolition based on understanding when to stock a good thing.
- Aim for a database and decision tools, including ‘soft factors’. Decision tree based on inventory and survey including “Google thermal street view”. Add to GIS. Analyse how much space, depth is needed for installations and calculate costs.

3.2. Barriers and opportunities for supply chain collaboration

During the animal gathering process the following barriers for collaboration between the persons present in each group were reported.

One group talked about three barriers: responsibility, personnel and planning.

- Responsibility was a basic problem and had two sides:
  - Who will be the one that talks to the client?
  - Who will be the one responsible if something goes wrong?
- Nobody seemed eager to be the one and only channel for the client because they feared being held responsible in the end. Being the only one known to the client makes you responsible in his eyes. He will come to you if there are problems. => finally the tiger took this job.
- Personnel and planning seemed to be barriers because of the case itself. The villa needed to be done in one week and not everybody had enough trained and experienced people to pull this off. Related to this they needed a fixed and strict planning. Without it, nobody wanted to start. In any other case, this wouldn’t have been raised as an issue.

One group found that the implementing actor was reluctant towards collaboration.

- Contractor (beaver) was a bit laid-back and waited for instructions (in first instance). No one eventually took the lead of working together and interchanging thoughts – no real commuting process was started.
- “We aren’t used to communicate with these partners” (for example the Client)
- An architect needs a third party (quality assurance) before he can have trust in the contractor.
- There’s a gap between what the architect prescribes and how the contractor wants to/can execute it.

Another group detected that the persuading party was not able to find connection.

- The customer (goose) chose the horse as her partner in charge of the renovation project, because she wanted advice of what to do. The horse was not so keen to ask for assistance, but the other
actors were eager to offer their collaboration and assistance => One possible barrier: attitude of company in charge.

- Lesson learnt: it is important to establish teamwork, and to choose a company in charge of the renovation project that is willing to implement other professions and also choose an actor with the best network.

Four groups could not establish a full supply chain answer for the customer.

- In one group there was no actor able to take the role of co-ordinator as a one stop shop contact point.
- In another group too many sorts of animals were missing, which made it difficult to have a primarily responsible partner.
- Another group consisted of two federations and a student who were asked to deliver services to the client. In this configuration, implementing parties were difficult to define. The PhD. student did not think beforehand of opportunities of setting up an own business.
- Another group had difficulties with involving informing and quality assuring parties. In the beginning there was little focus on involving informing and quality assuring partners.

The animal gathering exercise also detected several opportunities regarding supply chain collaboration, mainly related to providing a better link with real customer values.

One group found opportunities for more speedy renovation

- Because of the specifics in this case (a very fast job) the participants really focused on that idea as a value proposition.
- In order to do this they proposed working together in lab settings and using lots of prefab. They left the idea of a chain and talked more about a building team.

One group found opportunities to involve federations

- Since the group missed several animal characters, the participants were forced to look beyond their usual activity and to involve parties that regularly collaborate with them. Two federations showed motivation to help a start-up business in providing the needed contacts and contracts for collaboration.

One group found opportunities to attract the homeowner as a business partner

- Remarkable in the same group was also that, given the lack of practical expertise, the client started to think together with the supply side. During the negotiation process the client became part of the building team, by expressing own opportunities as opinion leader to promote the renovation service if quality is delivered.

Two groups found opportunities for a strong collaboration with the architect

- The contractor wanted to involve the architect strongly, who had a very strong focus on the customer’s needs.
- Architect and engineering office team up as one unity. A three-party system between project manager (= architect + engineering office) – contractor – quality assurer seems to be a good balance for actions and responsibilities.

One group found opportunities for a strong collaboration with informing actors
- Information is needed about new products and technologies from universities/R&D institutions – thus stronger cooperation between actors and research institutions.

Two groups confirmed opportunities for a strong collaboration with quality assuring actors

- Quality assurance acts as control on design and on execution, and as feedback and source for learning in practice by the designer, and should be 'during the process', and not only afterwards.
- Quality assurance is needed during renovation process from independent consultants to build trust towards customer. Quality in the end needs also involvement and correction in the beginning of the renovation process. All professions being present together allowed to detect which areas overlapped and therefore important issues were detected regarding responsibility and way of renovating.

One group found opportunity to engage a supply chain coordinator

- An extra actor has to be 'created' to coordinate the process. Preferably this is a network organization that has already a lot of contacts in the field.

3.3. Opportunities to increase customer confidence

Moreover, the various groups were also asked to report the detected opportunities to improve customer relationships.

Two groups confirmed the importance of better supply chain collaboration/ One Stop Shop to increase customer confidence.

- The customer chose the contractor as contact point. The contractor then first selected the architect and wanted her to have the first contact with the customer. The customer however wanted to keep on the one-to-one contact with the contractor. Solution was that they went together (but this is increasing costs). After planning they wanted to involve the implementing partners. The moderator had to provoke the involvement of the crow and hawk.
- Everything can stay the same, but only one contact person is needed, whose core business is coordinating actors for the renovation.

One group expressed the importance of securing and negotiating funding opportunities

- The customer fictitiously owned a single family house, and expressed a wish to expand it and at the same time implement energy saving measures. However, he noted to be financially challenged, so the expansion and energy renovation should be provided at least possible cost. Customer confidence was improved during negotiation with the actors around the table, which led to rephrasing some of the expressed wishes. A proposed solution was to make a case study of the renovation, and in that way secure funding and/or discounts. Another solution was to make a different kind of extension than the one the customer suggested. Instead of making a new addition to the building, the open terrace was suggested to be closed and included in the house. This would take less alteration, less materials and result in decreased energy consumption, as the surface of the building will be reduced.

One group found quality assurance key to improving customer confidence:

- Suggested by the crow (in this case represented by technical university): Trustworthiness regarding selection of best product; technical performance and price. Suggested by the hawk (consultant company): Independent quality assurance in the beginning regarding objectives (energy performance and renovation process itself).
One group reported that specific actors such as architects can increase customer confidence.

- The group decided that the architect, with a main role as ‘project manager’, was the best partner to be in contact with the client. The client ‘needs help’, and the architect is the best person to do this. The role of architects should grow in Low-Energy Housing Renovation.

One group detected training and testing as a key opportunity to improve customer relationships for increasing the adoption of speedy prefab renovation.

- Training and testing. Those seemed to be the keywords to convince the customer. The group only wanted to start the business if they had trained personnel and had tested everything in lab settings. The client liked the idea that she could go to that lab and see how it would look like. She didn’t consider proposed quality assurance arguments or labels. If she could see and feel everything beforehand, that would be enough.

### 3.4. Barriers and opportunities for business model development

The renovation cases (Appendix) were studied as opportunities for collaborative business model development for a volume market, using the business model generation canvas as guidance. The following Table 2 gives an overview of some of the detected business model generation processes per building typology.

<table>
<thead>
<tr>
<th>Fictitious renovation case for volume market development</th>
<th>Actors for whom contours of a business model were developed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Villa renovation</td>
<td>● Company offering prefab solutions</td>
</tr>
<tr>
<td></td>
<td>● Contractor</td>
</tr>
<tr>
<td>Home extension</td>
<td>● Start-up company</td>
</tr>
<tr>
<td>Collective renovation</td>
<td>● Consultant</td>
</tr>
<tr>
<td>Monumental renovation</td>
<td>● Project manager/architect as interface to the client and allied with a contractor and a (third party) quality assurer.</td>
</tr>
<tr>
<td></td>
<td>● Network actor</td>
</tr>
</tbody>
</table>

Table 2: Detected business model generation processes per building typology

The following notes were made in these groups regarding the nine different building blocks of the business model canvas in each group. Each group detected some opportunities in each building block as described in the following Tables.
<table>
<thead>
<tr>
<th>Business model generation ideas for prefab oriented actor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Customer segment</td>
</tr>
</tbody>
</table>
| 2. Value proposition                                    | Speed: minimize the amount of days the workers need to be around the house.  
Use of prefab materials, time management, fixed price, ...  
Note: In order to do this a large number of preparation days and careful planning is needed. Therefore the amount of days between the order and execution could be large but the number of days needed to execute once planned was minimal.  
All other value propositions then speed emerged from the speed idea. Everything can be planned into such a great detail that everything is known from the start. |
| 3. Channels                                              | All media (tv, internet, radio, ...).  
Also mouth to mouth, personal advice.  
Municipalities giving subsidies and marketing the idea.  
Note: In this field the group just started summing up all possible channels of marketing. No thought was given which was best to reach the segment or what channel would give the best results. No thought was given about the costs and the return of each of these. |
| 4. Revenue streams                                       | More pay because of the fast execution (less trouble).  
Possible subsidies. |
| 5. Customer relationships                                | Client can check everything beforehand and see the quality himself beforehand. |
| 6. Key activities                                         | Time management, planning and monitoring. |
| 7. Key resources                                          | Trained personnel, a lot of knowledge and human resources.  
Note: The suggestion was raised that this would take loads of time and was very costly as a startup cost. Conclusion: will not be starting today or even in the next year. |
| 8. Key partners                                          | Prefabrication company.  
Architect (in a planning role) and quality assurance companies.  
Note: This last one was mainly by demand of the client. Otherwise the group wouldn't have added them. |
| 9. Cost structure                                         | Study costs, training costs, testing every single project in labs, ...  
Note: suggestion to add to the client segment people with lots of money. |
# Business model generation ideas for a start-up company for home extensions

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>10. Customer segment</strong></td>
<td>Young homeowners, who might be financially challenged. Most house renovations take place a short time after a sale, so young, new house owners have a good potential as customers for house renovations.</td>
</tr>
<tr>
<td><strong>11. Value proposition</strong></td>
<td>Certainty of the results, by penalty. A certain energy saving is guaranteed, and if it is not achieved, the OSS will cover the value. Only one contact person for the house owners, to make it more accessible and less confusing.</td>
</tr>
<tr>
<td><strong>12. Customer relationships</strong></td>
<td>Keep the customer informed, so they feel included in the process and on top of the decision making. Proof of the reduction in energy use, and the customer receives instructions in energy saving user behavior. ’Serious gaming’, where the customer engages in a contest on maximum reduction of energy use, thereby winning prices.</td>
</tr>
<tr>
<td><strong>13. Channels</strong></td>
<td>Advertisement and connections to get the first customers. Then move on to the main channels, reference houses, word on mouth, social media, and so on.</td>
</tr>
<tr>
<td><strong>15. Key activities</strong></td>
<td>Coordination between the different parties. Engineering. Accounting. Networking, contacts.</td>
</tr>
<tr>
<td><strong>16. Key resources</strong></td>
<td>The knowledge of experts in the necessary fields. Demonstration projects. Standard plans for renovation, that can be used as a base and adjusted to fit each single project.</td>
</tr>
<tr>
<td><strong>17. Key partners</strong></td>
<td>Contractors (agreement). Interior specialist. Architects (business to business).</td>
</tr>
<tr>
<td>Business model generation ideas for a contractor</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>1. Customer segment</td>
<td></td>
</tr>
<tr>
<td>Owner occupied single family houses.</td>
<td></td>
</tr>
<tr>
<td>High income.</td>
<td></td>
</tr>
<tr>
<td>Families who cannot/will not leave their homes during renovation.</td>
<td></td>
</tr>
<tr>
<td>2. Value proposition</td>
<td></td>
</tr>
<tr>
<td>Better indoor climate and lower energy bill (mentioned by the customer in the animal gathering)</td>
<td></td>
</tr>
<tr>
<td>Listed by the supply side in the animal gathering:</td>
<td></td>
</tr>
<tr>
<td>- No stress</td>
<td></td>
</tr>
<tr>
<td>- Within budget</td>
<td></td>
</tr>
<tr>
<td>- Advice to keep wall paper</td>
<td></td>
</tr>
<tr>
<td>- Timing</td>
<td></td>
</tr>
<tr>
<td>- Good execution quality</td>
<td></td>
</tr>
<tr>
<td>- Preparation</td>
<td></td>
</tr>
<tr>
<td>- Upgrade garden</td>
<td></td>
</tr>
<tr>
<td>- Options available</td>
<td></td>
</tr>
<tr>
<td>In addition found during this session:</td>
<td></td>
</tr>
<tr>
<td>- Level energy efficiency</td>
<td></td>
</tr>
<tr>
<td>- Comfort</td>
<td></td>
</tr>
<tr>
<td>3. Customer relationships</td>
<td></td>
</tr>
<tr>
<td>Trust based.</td>
<td></td>
</tr>
<tr>
<td>Close personal.</td>
<td></td>
</tr>
<tr>
<td>4. Channels</td>
<td></td>
</tr>
<tr>
<td>Mouth to mouth.</td>
<td></td>
</tr>
<tr>
<td>Architects.</td>
<td></td>
</tr>
<tr>
<td>Local home owner teams.</td>
<td></td>
</tr>
<tr>
<td>5. Revenue streams</td>
<td></td>
</tr>
<tr>
<td>Fixed but changes based on &quot;unit costs&quot;.</td>
<td></td>
</tr>
<tr>
<td>Invoice from one party.</td>
<td></td>
</tr>
<tr>
<td>Comment: they got one innovative idea which they did not take the risk to choose: 90% fixed price and 10% based on energy efficiency.</td>
<td></td>
</tr>
<tr>
<td>6. Key activities</td>
<td></td>
</tr>
<tr>
<td>Planning.</td>
<td></td>
</tr>
<tr>
<td>Networking.</td>
<td></td>
</tr>
<tr>
<td>Education.</td>
<td></td>
</tr>
<tr>
<td>Renovation.</td>
<td></td>
</tr>
<tr>
<td>Quality control.</td>
<td></td>
</tr>
<tr>
<td>7. Key resources</td>
<td></td>
</tr>
<tr>
<td>Skilled workers.</td>
<td></td>
</tr>
<tr>
<td>A good network.</td>
<td></td>
</tr>
<tr>
<td>Capital.</td>
<td></td>
</tr>
<tr>
<td>8. Key partners</td>
<td></td>
</tr>
<tr>
<td>Technical advice.</td>
<td></td>
</tr>
<tr>
<td>Architect.</td>
<td></td>
</tr>
<tr>
<td>Implementing companies.</td>
<td></td>
</tr>
<tr>
<td>9. Cost structure</td>
<td></td>
</tr>
<tr>
<td>Management.</td>
<td></td>
</tr>
<tr>
<td>Labor costs.</td>
<td></td>
</tr>
<tr>
<td>Financing.</td>
<td></td>
</tr>
<tr>
<td>Offices.</td>
<td></td>
</tr>
<tr>
<td>Marketing costs – publicity.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Business model generation ideas for a consultant</td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>1.</td>
<td>Customer segment</td>
</tr>
</tbody>
</table>
| 2. | Value proposition | Best available prices and E-level.  
Energy performance of building (EPB).  
Insulation + air tightness = energy efficiency.  
Best advice solution regarding roof, wall and floor.  
Quality focus from start to end:  
- Beginning: Quality of offers, right and proper information.  
- During: Cost control.  
- End: Quality check. |
| 3. | Customer relationships | Face to face.  
Client has contact with one and same person during the whole renovation process.  
Information on a weekly basis. |
TV-spot.  
Through municipality, public publicity as pilot project. |
| 5. | Revenue streams | Percentage on total works.  
Percentage on building costs; coordination and construction.  
Dynamic pricing in function of energy reduction. |
| 6. | Key activities | Planning.  
Cost calculation.  
Coordination of different trades on site.  
Design collaboration. |
| 7. | Key resources | Cooperation.  
Experience.  
Knowledge.  
Quality. |
| 8. | Key partners | Contractors.  
Design companies.  
Consultants.  
Suppliers. |
| 9. | Cost structure | Work hours.  
Materials.  
Quality assurance on site. |
### Business model generation ideas for a project manager/architect

**as interface to the client and allied with a contractor and a (third party) quality assurer**

<table>
<thead>
<tr>
<th></th>
<th>Customer segment</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rich, single family house, parents, in their 50s.</td>
<td>Well educated, well aware of environmental problems. Customer &quot;knows what he wants&quot;.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Value proposition</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Comfort – high quality – good taste – 'image'</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Customer relationships</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Trust – assistance – personal approach – service</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Channels</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Publicity: Fair &amp; exhibitions – lifestyle magazines – databases with manufactures &amp; contractors (they have time to look for a good contractor). Banks &amp; subsidies (money brings money)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Revenue streams</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>One fixed cost. Trouble free solutions (service)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Key activities</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Key resources</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Key partners</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Suppliers, ... ?</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Cost structure</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Salary – expertise. Software. Publicity.</td>
<td></td>
</tr>
</tbody>
</table>

### Business model generation ideas for a network actor

<table>
<thead>
<tr>
<th></th>
<th>Customer segment</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Building owners, public and private. Secondly: all other stakeholders.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Value proposition</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Complete solution with planning and management.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Customer relationships</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Trust, reliability, transparency.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Channels</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Local governmental information point (support point, 'steunpunt'); internet, brochures; fairs (Batibouw).</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Revenue streams</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Integrated solution and risk management.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Key activities</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Communication, networking, managing the network.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Key resources</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Experts in the network, investors.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Key partners</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Umbrella organizations, financiers, federations, public authorities.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Cost structure</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Networking cost management, office, staff.</td>
<td></td>
</tr>
</tbody>
</table>
### Business model generation for a material supplier

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Customer segment</td>
<td>Customers that want to reduce energy use. On the other hand we think customers want also achieve some other goals when they are renovating, not just related to energy use.</td>
</tr>
<tr>
<td>2. Value proposition</td>
<td>Solution toolkits and package deals. Staying in house during the renovation without needing to move away.</td>
</tr>
<tr>
<td>5. Revenue streams</td>
<td>Paying for quality and good services. Paying to have dreams come true.</td>
</tr>
<tr>
<td>6. Key activities</td>
<td>More planning and possibly a survey are needed to decide the key activities. Innovative inside insulation might be a good way to start energy renovations. Use of energy sources should be moved to heat pumps and if possible to solar panels reduce energy use.</td>
</tr>
<tr>
<td>7. Key resources</td>
<td>Use LCC (Life Cycle Cost analysis), training and brochures.</td>
</tr>
<tr>
<td>8. Key partners</td>
<td>BBRI, VITO, BIM + LIDAR, DUBOWO consulting. Thermography providers, during construction for detecting energy leaks. Partners offering prototype solutions with detailing and well thought priorities. Partners facilitating group renovations with the customer’s neighbors.</td>
</tr>
<tr>
<td>9. Cost structure</td>
<td>-</td>
</tr>
</tbody>
</table>
The following ideas emerged on why a One Stop Shop business model could fail:

- A business model can be too costly (compare: cost structure). For example, it can be too complex to test everything beforehand in lab settings.
- A big challenge is dividing the responsibility between the different parties in the cooperation, as the customer should be able to hold the OSS responsible as a single unit. This will require a contract between the different parties.
- In order to ensure the result of the renovation, it will be necessary to get in contact with good local contractors. Bad execution can ruin good planning, and will not only cost the One Stop Shop a lot of money when the goal is not met, it will also give a bad reputation.
- When the customer segment is to a large part financially challenged, it will be a key point to keep the price down. This will take good planning, and effective work procedures, to keep the time spent on each project down, while ensuring good quality.
- It will also be very important to get the first success stories, in order to sell the concept. People are not ready to gamble with something as important as their home, so to be able to sell a secure and proved concept is worth a lot.
- Today there is a lack of cooperation between the different sectors, perhaps due to a lack of knowledge beyond their own area of expertise.
- There is a risk that every actor thinks of his/her profession only without actually thinking as one-stop-shop: Same procedure as today: “classic way works!”
- Some One Stop Shop solutions are only useful for large buildings using system solutions.
- One central partner should be able to do it.
- The value should be evenly distributed through the chain and the actors.
- Clear communication channels are needed.
- A financer for the project is needed.
- The network that is created can be too big.

The following ideas emerged on why a proposed One Stop Shop business model could be successful:

- Prefab orientation is a fast solution, a total concept. If focused on prefab, the quality reached could be really high.
- The guarantee for a certain energy saving is a strong customer value.
- A One Stop Shop offers easy access to energy renovation for the customer.
- When cooperation is working, almost anything can be achieved by the combined effort.
- The leader in the One Stop Shop can be made responsible for resources, finding new market segments.
- A One Stop Shop allows for clear understandings, roles and communication and allows to be 'fit for purpose'.

The participants in one group were very convinced that a One Stop Shop approach cannot fail, but a first project is needed to start with, which can serve as an example.
4. Conclusion

The developed "Business Zoo" methodology - as a new interactive method including networking opportunities – guided different actors through detecting supply chain collaboration opportunities as well as barriers amongst potential national and international partners. The questions dealt with during the networking event included various important issues such as:

- how to make renovation cost fully transparent,
- how to speed up renovation of large stocks of post-war housing with fast construction methods,
- how to steer energy performance certificates - and energy performance advisers - towards integrated renovations, and so on.

Further, new business opportunities were explored that resulted from developing a business model for collaboration between different renovation actors, such as architects, contractors, project managers, suppliers, do-it-yourself stores, owners, financers, cities and communities, and so on.

During this research it was detected that substantial innovation is still needed on the supply side, especially regarding collaboration between different craftsmen and experts. Various contours of new business models were developed for integrated home renovation, all of which showed to have pros and cons which can now be studied further. It was found that a key element for business development in an emerging market of deep renovation is that the homeowner should be “unburdened”. Various market actors showed specific competencies to unburden the client, for example by offering to coordinate the whole renovation process, or to help the customer to find all information concerning deep renovation solutions and examples. However, the need for stronger collaboration between actors was expressed by various actors. Enterprises perceived important barriers in ensuring quality while keeping control of cost and energy performance, but these were also observed as very important customer values. Uncertainty regarding financing One Stop Shops business development was expressed, but various groups of market players found the development of a One Stop Shop feasible. In general, in order to prepare for a growing market, deep renovation companies must be aware that the clients expect one sole responsible player, quality assurance, fast execution and unburdening of investment. To effectively respond to these customer values with a market supply, companies need to collaborate.

Acknowledgements

The authors would like to thank the organizers (PHP, IWT), the One Stop Shop partners and all participants, speakers and moderators for their valuable effort and feedback. Based on the reported experiences with the Business Zoo, the organizers will improve the Business Zoo experience in future editions, and it is a goal to establish similar business collaboration events in several countries and regions.
Appendix: Case studies

Group 1: MODERN VILLA

Renovation requirements:
Renovation to passive house standard

Side conditions:
To be renovated in one week
Group 2: **EXTENSION**

Renovation requirements:

- Increase indoor space
- Upgrade to best practice low energy house

**Side conditions:**

Inhabitants remain in the house during construction
Group 3: MODERN VILLA

Renovation requirements:
High thermal insulation and airtightness of the building walls and roof
Installing mechanical ventilation with heat recovery

Side conditions:
No indoor construction activity allowed
Group 4: DISTRICT

Renovation requirements:

Upgrade all back façades and harmonize roof lines

Side conditions:

Owner-occupants will sign energy performance contract
Group 5: COLLECTIVE BUILDING

Renovation requirements:

Integrated renewal of apartment building to improve neighborhood

Side conditions:

Owner-occupants signed energy performance contract and expect income tax reduction for passive houses
Renovation requirements:

Renovation of several single apartments in a collectively owned building

Side conditions:

Personalized offer per inhabitant

Budget per inhabitant varies from 5000 EUR to 50000 EUR and should not be exceeded
Group 7: MONUMENTAL

Renovation requirements:

Upgrade poorly insulated façade and deteriorating roof

Thermal insulation level of walls and roofs is required to be lower than 0.15 W/m²K

Side conditions:

Protected monument
Group 8: **MONUMENTAL**

Renovation requirements:

Upgrade poorly insulated façade and deteriorating roof

Thermal insulation level of walls and roofs is required to be lower than 0,15 W/m²K

Side conditions:

Renovation to be exemplary as European green solar building
Group 9: **DISTRICT**

**Renovation requirements:**

Upgrade all back façades with thermal insulation

**Side conditions:**

Roof renewal and window replacement to be offered as optional to inhabitants
Group 10: **EXTENSION**

Renovation requirements:

- Increase indoor space
- Upgrade to best practice low energy house

Side conditions:

Budget limited to 75000 EUR