Successful sustainable renovation business for single-family houses

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Summary

Energy renovation of existing buildings has a large potential for cost-effective energy savings. There is a substantial lack of business concepts for renovation services for single-family houses. The main objective of SuccessFamilies project is to change the business environment in order to speed up the implementation of sustainable renovation of single-family houses. The resulting new service concepts will combine both the technical solutions, financing services as well as other promoting issues to overcome the behavioural, organizational, legal and social barriers that exist in sustainable renovation. Work towards this objective requires analysis of the existing concepts, development of new concepts based on the analysis, development of marketing strategies for sustainable renovation by finding out the barriers and opportunities for sustainable renovation concepts and finally description the new successful service models, based on the information from the analyses and marketing strategies. The beneficiaries of the project will be both the home owners and the companies providing the services. Also the society will benefit from the project results: When the home owners have an easy access to the energy efficiency improvement measures, they will choose these options more often, which in turn will increase the sustainability of the society.

Keywords: Sustainable renovation, renovation business, single-family houses

1. Introduction

1.1 Background and earlier studies
Energy renovation of existing buildings has a large potential for cost effective energy savings. However, it is a major challenge to develop and implement the technologies for reducing the energy use in existing buildings to a very low level in combination with renovation of the buildings. New solutions are needed also on the technological side, but more importantly, for the business environment.

Residential buildings are responsible for 70 % of the energy use in buildings in the Nordic countries. In all Nordic countries single-family houses constitute a large part of the building stock, and offer big business opportunities for renovation services.
There is a substantial lack of business concepts for renovation services for single-family houses, whereas the multi-family houses are better covered. Also, in e.g. Finland and Sweden, most of the apartment buildings are connected to a district heating network, which mostly uses the waste heat from electricity production, whereas most of the single-family houses use other sources for heating, thereby offering a better possibility for CO2 reductions.

Previous studies conducted by the participants have shown that energy optimization has to be done in connection with traditional maintenance and other changes of the building in order to be cost-effective. Furthermore, it has been pointed out that opportunities for thorough improvements of the building envelope and technical installations occur with a long interval so it is of utmost importance not to miss these opportunities by making a renovation without upgrading the energy performance of the specific building component up to, and preferably beyond the current requirements in the building code.

A Danish energy renovation project has proven that it is possible to renovate a typical Danish single-family house from the 1960/70’s in a cost efficient manner to roughly the energy performance standard of a new single-family house. As a positive side effect the living conditions have been greatly improved. Many similar examples are presented in work of the IEA SHC Task 37, which both VTT and Segel AS participated.

About half of a total of 1.1 million Danish detached single-family houses were erected in the 1960/70’s, so applying the same renovation technologies to that part of the building stock would offer big possibilities for energy saving on one hand, and renovation service business on the other hand. Also in Finland there is a typical single-family house, the so called Veteran house, which was a largely applied building concept after the second world war, in 1940’s and 50’s. Similar groups of typical single-family houses can be identified in all the participating countries, where standard technical solutions and new service concepts can be developed.

1.2 Solution
The solution to the lack of business concepts for renovation services for single-family houses is first of all that renovation service packages should be developed to include standard technical solutions for energy efficiency improvements regarding different building systems and ages. Secondly, all other necessary services should be included, providing overall renovation solutions for the people living in single-family houses. The new services must be supported with new features, like better visualisation, guaranteed price and funding services to overcome the behavioural, organizational, legal and social barriers that exist in sustainable renovation.

Providing off-the-shelf renovation service packages would significantly improve the quality of life for many single-family house owners. This kind of concepts would not only improve the energy efficiency and IEQ (Indoor Environment Quality), but they would also provide an economically viable and easy-to-get choice for the house owner. Making the energy-efficient renovation services easy-to-get will speed up the implementation of energy efficiency improvement measures.

To facilitate the emerging of this kind of services, a Nordic Innovation Centre project was launched in 2009 in frame of a Joint Nordic Call of Sustainable Renovation. The key partners of the Successful sustainable renovation business for single-family houses – SuccessFamilies project are VTT Technical Research Centre of Finland, Danish Technical University (DTU), Mid Sweden University and Segel AS (Norway).

1.3 Objective
The main objective of the project is to change the business environment in order to speed up the implementation of sustainable renovation of single-family houses. The resulting new service concepts will combine both the technical solutions, financing services as well as other promoting issues to overcome the behavioural, organizational, legal and social barriers that exist in sustainable renovation.
1.4 Working items
Work towards this objective requires analysis of the existing concepts, development of new concepts based on the analysis, development of marketing strategies for sustainable renovation by finding out the barriers and opportunities for sustainable renovation concepts and finally description the new successful service models, based on the information from the analyses and marketing strategies. Dissemination works two ways: the results of the project will be disseminated to the stakeholders and the feedback from the market players is collected for the use in the development of the new concepts.

1.5 Beneficiaires
The beneficiaries of the project will be both the home owners and the companies providing the services and materials. Also the society will benefit from the project results: When the home owners have an easy access to the energy efficiency improvement measures, they will choose these options more often, which in turn will increase the sustainability of the society. (Figure 1)

Figure 1. The project logo is designed to describe the sustainability of the SuccessFamilies service concept: Not only will the energy label of the house improve, but also the indoor environment will be better and the energy bills smaller, which makes the house owner happier.

2. Results

2.1 Sustainable renovation concepts
The term “sustainable” includes many environmental, social and economic indicators. In this project, sustainable renovation is defined with emphasis on primary energy use, but without disregarding the other indicators. A sustainable renovation concept is defined as "A concept that results in cost-effective renovation of a house with substantially better energy performance, coupled to a mainly renewable energy supply system, and improved indoor environment. The level of total primary energy use should be preferably equal to a new house built according to standard building code requirements or better."

The studies conducted in SuccessFamilies [1] indicate that the Nordic single-family house renovation market is dominated by a craftsman based approach with individual solutions, traditional warehouses “do-it-yourself-shops” and some actors marketing single products. To speed up the implementation of sustainable renovation of single-family houses there is a great need for full-service packages including consulting, contract work, follow-up, financing and operation and maintenance. There are few Nordic examples of such service models for renovation of single-family houses which entered the market recently. The success of these concepts is yet to be evaluated. [1]

One successful full-service package described in report D1.1 (Existing sustainable renovation concepts) is a campaign by an energy company in Sweden who convinced 78 % of 456 owners of houses with resistance heaters to connect to its biomass based district heating network. The campaign was successful because of its package offer and information provision with emphasis on economic aspects and functional reliability. [1]

The existing technical renovation concepts, typically focusing on application of only a few of the available technical solutions, have not been successful in realizing large scale energy efficiency gains. Key aspects of reaching a low primary energy level in connection with renovation are described in the form of typical energy renovation measures and technical principles of low energy
Full service and technical renovation concepts should make it easy, simple and secure for the consumer to invest in a low energy renovation of their house. The building sector needs easy to use knowledge and initiatives which ensures that they can offer solutions which fulfil the demand for quality, economy and a simple process. To speed up the implementation of sustainable renovation of single-family houses, society needs to stimulate the process including better incentives structures, e.g. increased tax on energy and/or subsidy programmes. Combined with an outlook for rising global energy prices, sustainable renovation of single-family houses then has the potential to become an important market area in the future. [1]

Building stock analyses have been conducted in all participating countries and in all these countries, some typical houses can be found for different construction periods. This information has been gathered in a report and the relevant results regarding single-family houses are reported. [2]

Different technical renovation scenarios have been tested for the typical single-family houses with large energy saving potential in each of the participating countries. Since the typical single-family houses differ from each other regarding type and age, the renovation measures in the renovation scenarios also differ from each other. According to the different renovation measures and differences between the typical single-family houses, also the results regarding energy performance and indoor environment will differ. The results are reported in [2].

From here, the work continues by developing new sustainable service concepts based on the analyses conducted in [2].

2.2 Marketing strategies
A SWOT analysis has been done for common one-stop-shop concept, and it will be presented in a report coming out soon [3]. It started with identifying barriers and opportunities through the value chain for sustainable renovation of single family houses. The purpose was to address important issues related to each of the potential actors to take part in supply of complete or parts of services to the single family house owner. By making such descriptions we also will identify eventual differences between the countries.

As input from building stock analysis, the segments with highest energy saving potential are concluded. Important governmental regulations are listed, the customers’ needs are analysed and present type of actors offering solutions to these needs are recognised. Conflicting interests between different types of actors are considered and potential joint ventures to create new service packages are looked for. These will form the basis for strategic planning for the One-stop-shop concept.

2.3 More information
More information on the project, its events and results can be found at http://successfamilies.vtt.fi

3. References

