



FP6-038441

STACCATO

Sustainable Technologies And Combined Community Approaches Take Off

Integrated project

Concerto

Del. No.: 21

Handbook on innovative energy concepts

Due date of deliverable: February 2012
Actual submission date: November 2014

Start date of project: 8 November 2007

Duration: 84 Months

Organisation name of lead contractor for this deliverable: [Energiaklub]

Revision: February 2015

Project co-funded by the European Commission within the Sixth Framework Programme (2002-2006)		
Dissemination Level		
PU	Public	<input checked="" type="checkbox"/>
PP	Restricted to other programme participants (including the Commission Services)	<input type="checkbox"/>
RE	Restricted to a group specified by the consortium (including the Commission Services)	<input type="checkbox"/>
CO	Confidential, only for members of the consortium (including the Commission Services)	<input type="checkbox"/>

This deliverable aims to inform about the STACCATO experience in perspective of innovative new concepts and projects. It contains benefits for energy efficiency projects in the build environment together with a planning guide on energy efficient retrofitting of multi-apartment houses. Furthermore, it shows how to connect with information and personal contacts concerning innovative energy concepts for renovation projects.

STACCATO experience is used not only for the follow-up in the demonstration communities, but to stimulate replication in other Central- and East-European countries, as well, including the nearest EU-neighbours, such as Ukraine. This can be seen in Deliverable No 6 Plan of action for renovation projects (Latvia (RENESCO) as well as Vinnitsa (Ukraine). Recommendations on innovative energy concepts that are different from business as usual are also highlighted in Deliverable No 31, The set of blueprints for concepts (technical) and approaches (non technical) with respect to renovation projects. Deliverable No 8, Training manual (pages 20-60) offers the lessons learned from the project STACCATO best-practices to guide future ones.

Best practices on innovative energy concepts are available on a wide scale. In the Netherlands for example, several databases are available that can be searched for best practices such as the belowmentioned. The Dutch Energy Innovation (policy) programs Energy Research Subsidy (EOS) and Innovation Agenda Energy (IAE) provided a subsidy between 2005 and 2011 to more than a thousand innovative research and practical projects, of which several aimed at energy neutral residential areas. As inspiration for new research and product ideas provides the Netherlands Enterprise Agency (RVO) practice stories and project descriptions. Websites:

- <http://www.rvo.nl/sites/default/files/2014/10/Innovators%20aan%20het%20woord%202014.pdf>
- <http://www.rvo.nl/sites/default/files/2014/10/Concepten%20voor%20energie%20neutrale%20wijken.pdf>
- <http://www.rvo.nl/sites/default/files/2014/06/Technieken%20energie%20neutrale%20woning%20juni%202014.pdf>

It is common to contact the project coordinator in order to obtain additional information about these innovative projects and/or to organise site visits.

As the Netherlands Enterprise Agency, most STACCATO project partners are involved in a diverse set of innovative energy concepts and approaches in residential and tertiary areas as well. And although lots of information about STACCATO in the perspective of new projects is publically available and contained in several deliverables, conversation with the project manager or other persons involved can be very useful to receive guidance on the development of innovative energy concepts and approaches in residential and tertiary areas. Please, do not hesitate to contact the STACCATO coordinator for further information.

Guide to the planning of energy efficient retrofitting of multi-apartment houses

The “Planning Guide” is based on the experience of the STACCATO project (www.concerto-staccato.eu).

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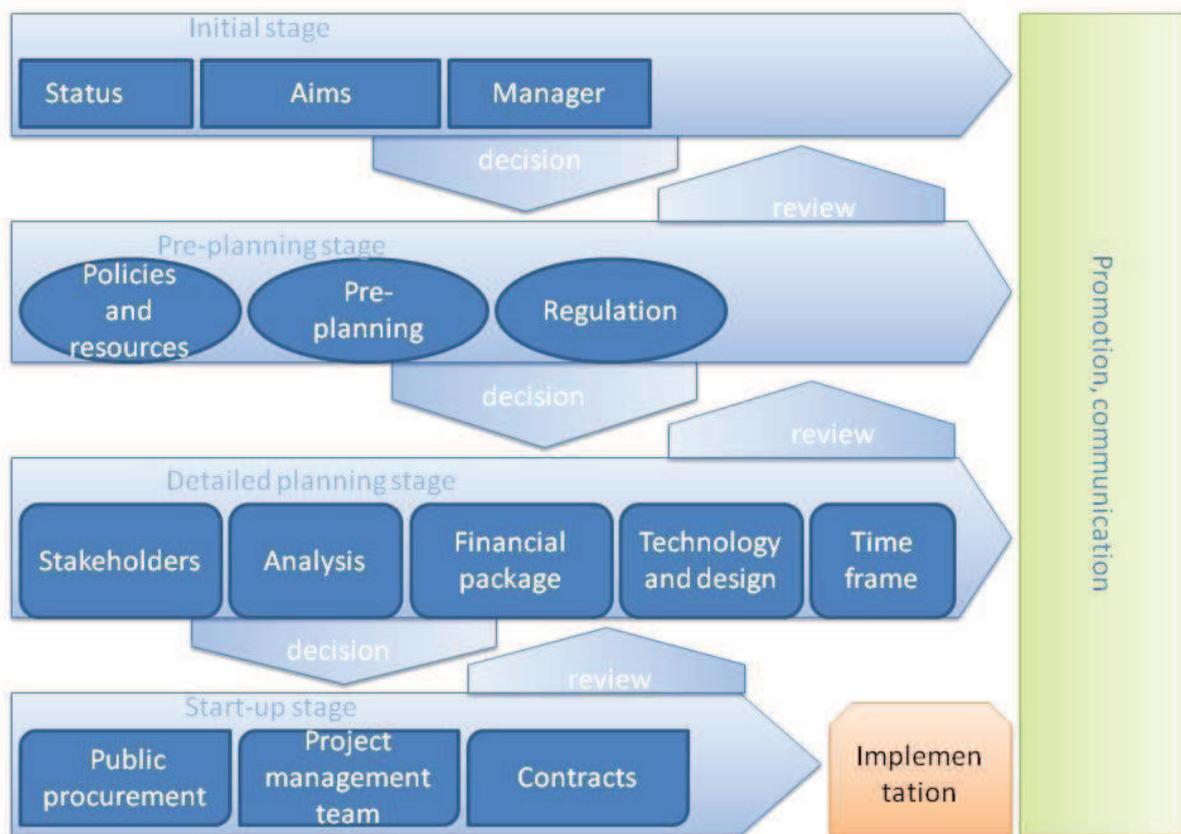
Why shall we do energy efficient renovation?

Faced with great energy challenges relating to competitiveness, climate change and the security of energy supply, Europe has launched several initiatives to do more with less energy. Energy efficiency is the ability to use less with the same quality and performance. As the natural sources are limited it is our task to reduce our consumption. Overall, the European Union is committed to reducing the projected energy use by 20% by 2020. Buildings are account for 40% of energy consumption.

We all benefit from energy efficiency because it:

- decreases Europe's dependence on foreign energy supplies, improves energy security
- decreases the cost of energy bills
- reduces of greenhouse gas emissions, and local air pollution
- expands competitiveness and consumer welfare, which results in significant economic benefits
- boosts the economy by:
 - o providing a market for environmental friendly products
 - o improving building industry services
 - o providing market for energy services
- creates job opportunities, particularly in the building sector
- helps to gain further market share for RES technologies
- aids families affected by fuel poverty
- raises awareness of climate change
- raises awareness of individual metering
- increses the value of energy efficient homes
- improves comfort and therefore provides healthier home environment

PLANNING FLOWCHART



Planning Guide

Basic phase

Status

If you consider renovation you have to be aware of technical, financial and organisational factors. First of all you have to have updated status of the house in order to know what the necessary reconstructions.

You should contract an auditor who issues the energy audit certificate. The certificate provides a clear statement on the present status and proposes possible investments. In most countries this is obligatory requirement in order to gain access to subsidy.

You have to be aware of your financial status: the home owners' or the tenants', and the housing association's financial capacity.

- In industrial types of buildings the main problem is the summer period when there is no possibility of protecting the flats from overheating. That is why they often use air-conditioning which consumes a lot of energy and makes inner climate unhealthy and the air outside even hotter. In this case insulation and shading are important.
- However you cannot implement renovation measures below the minimum set of necessary interventions, otherwise all effort will be senseless!

PRE-PLANNING PHASE

Policies and resources

In an ideal world the national policies towards energy efficiency would work for a long-term, in accountable, transparent and reliable ways. But in reality in the EU we can hardly find countries where supporting schemes are not influenced by elections, government priorities, lobbies and other unforeseen measures. It has a strong impact on energy efficient reconstructions as the EU- and national support programs greatly influence the motivation of the housing communities when they are planning retrofitting.

- In Hungary in recent years there has been a special grant for industrial houses.
- In some countries the energy companies are the initiators of energy efficient retrofitting and RES investments. They do this to secure their position as energy provider in a certain area (eg. central heating companies) or they want to attract even more consumers by providing environmental friendly solutions and new services.
- The local decision makers must have a clear strategy on how they will reduce CO2 mitigation and how they contribute to the EU '20 20 20' goals on climate change. The front runner towns are the [Covenant of Mayors](#)

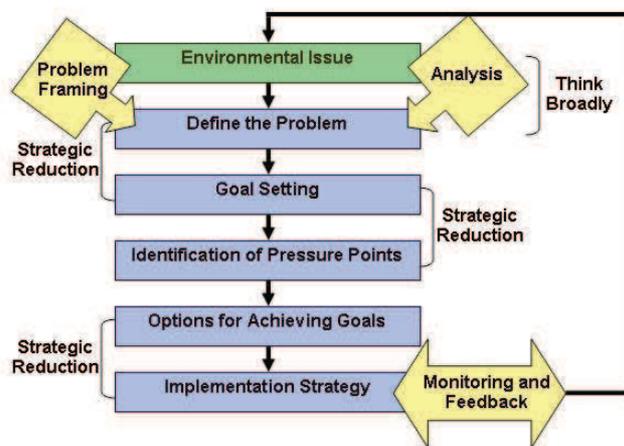
Regulations

'Energy Performance in Building Directive' (EPBD) is compulsory in each member state and there are some common quality measures too. However, besides the energy status of your building there are several regulations you have to comply with in case of retrofitting. There are several regulations at national level, but you should be aware of local directives and regulations too.

- In the Netherlands 70% of the dwellers need to vote yes for the reconstruction otherwise the investment will not start. In contrast, in Hungary this ranges from 70 to 100 %.
- In Italy in several regions if you retrofit your building (to a certain extent) you must install solar panels to the roof.
- In Hungary the law which regulates the public procurement process has been modified 3 times over the last 5 years.

Pre-planning

By collecting best-practices, case studies and visiting projects already carried out in buildings similar to yours you can identify what is possible to achieve. When we have had a good overview of the possibilities, achievable targets, and we consider the financial options, it is time to compile a document, which sums up the general information about the rewards of the reconstruction based on your status and aims. It needs to be clear, strict, informative, and contain basic calculations. The following parts of the building can be considered for improvement: foundation, basement ceiling or main floor structure, heating system, pipes, chimneys, cooling and ventilation system, electrical service and house wiring, plumbing and fixtures, floors and stairs structure, attics, roof structure exterior, walls, windows and doors, design(outlook), shading system, wind protection, elevator, hot water supply, other (thunder protection).



Promotion and communication

The promotion and communication of the project is a continuous task which is a core element of success. First we have to promote the pre-planning document in order to convince dwellers that the retrofitting is a necessary and urgent task. We can present the idea in the general assembly but it is better to send them a direct mail. Organize open days for questions and discussions. It is a good idea to run a website where all documents, offers, case studies are downloadable and which provides an opportunity to ask questions and vote on issues. Listen to the dwellers and if it is possible to integrate their needs into the plan. The promotion is necessary to convince them and reach a minimum of 75% of votes for the project realization.

- You cannot have successful communication with housing associations that have a bad reputation.
- 'Manage' the expectations of tenants/owners. When you first meet them, have a solid story, taking into account the needs and worries of tenants/owners
- The investment is not a „cure for everything“: there is a need to explain how they can do more for further savings and how they can make the most of the retrofitting

Detailed planning stage

Stakeholders

There are several stakeholders with whom you have to build up and maintain a good business relationship. First of all the housing association and flat owners, secondly the project's financial supporters, and there are those stakeholders who could be important depending on the nature of your project. These partners can be: project developers, officers from the municipality, businesses, media, quality controllers, lawyers, engineers and other professionals. At this stage you should appoint potential partners, and contact them personally.

- The project partners in "Faluhaz" at the preparation stage: project developer companies (one for the Hungarian, one for the EU proposal), a communication expert, the housing association, officers from municipality, researchers, public procurement professionals, a quality controller, engineers, an officer from the central heating company, project partners (Sofia, Amsterdam North),
- In the case of sub-contracting always check references!

Financial package

Setting up the financial package is the most challenging task. You have to consider the possibilities of EU, national and local support. Grant makers often award those projects which jump two or more categories on energy level, but sometimes they can also define which eligible technologies should be used during retrofitting. However, it is more than likely that the main part of the financial package is covered by house owners who need to take out loans. Your own resources determine the amount of funds you can obtain. Finding the best financial instrument might take time but in certain cases the loans available for multi-apartment houses for renovation are limited.

- There are some alternative solutions to gather some plus funds. If the house is in a good place (busy area) it is an option to let the facade of the house during the reconstruction, or to negotiate with those businesses which provide the product or the technology for the retrofitting of the house. If there is no frame for posters in the house, the reconstruction might be the ideal time to construct one.
- In some cases it is possible to sell the attic of the house and this can partly cover the costs of the investment
- Come up with the idea of a so-called split incentive, for example involve an energy service company
- Since creation of a financial scheme for covering of the renovation expenses is crucial part of all activities you should have a consultant/expert involved in this stage of the project

Analysis

To decide upon the exact stages and content of the retrofitting: analyze the saving potential, the payback period and the cost of the investment. The analysis of energy cost and energy needs leads to the identification of saving potential. It can be further improved with feasibility studies on EE and RES technologies.

- High-performance building envelope: insulation of the facade, insulation of the roof, insulation of the top ceiling, insulation of the ground floor, double glazed windows with PVC frames, renovation of the balconies, renovation of entrances
- Improvement of the heating system: insulation of the pipe system, smart metering, management and control system, installation of heat meters, new energy efficient boilers, installation of heat valves,

Technology and design

After an inventory of what technologies should be used and the assessment of the status of the building and the financial resources you have to commission an engineering company to do the technical planning. You should follow these steps: 1. Technology diagnosis 2. Pre-design 3. Final design 4. Permitting

- For the integration of RES in buildings, some regulations might be lacking. Do not panic, negotiate with the stakeholders.
- in most cases solar collectors for hot water supply are the cheapest and easiest technology to install, they can also be connected to an existing system e.g. central heating
- if you consider other RES technologies you have to have an extensive knowledge of national regulations (feed-in tariff) and local supply chains (biomass)

Time frame

Plan your project generously. If you apply for grants it might take a while until you receive the grant. The actual implementation can be realised fast, but it depends on your building type and the chosen refurbishment. Sometimes you need to move out the families to be able to do the retrofitting or you have a historical building which needs special treatment - these are the most time-consuming renovations. Please consider that your project will not end with the implementation but only at least two years after the reconstruction, while you are doing some guarantee work and the monitoring, the evaluation and communicate the findings.

- In the Faluhaz project the actual retrofitting took 6 months, but the project started in 2005 and the reconstruction was in 2009 while the monitoring, repairs and the fine-tuning are running still in 2012.

Start up phase

Public procurement and contracts

The progress of public procurement varies from country to country but if you want to make sure that you spend public money according to the most recent regulations you should contract professionals. It is advisable to ask for offers from several businesses even if you have your own resources to find the best value for your money. In order to find the contractor you have to check their references and make sure of their financing capacity. The main contractor is responsible for the whole project and

guarantees their sub-contractors' work as well. As for the contract, besides the technical requirements it should include PR related tasks too.

- It is handy if we ask the main contractor to draw up execution phases. It gives us an opportunity to inform the dwellers about the steps of the investment and you can also secure quality control.
- In Faluhaz dryvit (polystyrene foam) insulation was installed to the facade. The craftsmen should be trained as to how the product should be installed to reach the best possible savings.
- Energy performance requirements have to be communicated explicitly and be detailed in the tender procedure and it should form an essential part of the contract. Furthermore their realization has to be enforced.
- Sub-subcontracting is a guarantee for badly done work!

Financing (cash-flow)

If we have several different sources to finance the project it is necessary to plan the cash-flow of the project. It is necessary to know whether we need to pre-finance some parts and the cash-flow can also influence the conditions of the contracts.

It is important to know if the funders have a special policy on who they are paying for: in some cases national programs target only the housing association, while for EU related funds the municipality is to be involved. If the project is financed by two groups it makes the management of the project rather difficult.

- In the case of "Faluhaz" the municipality was the project manager and its responsibility was to pre-finance of the project, although the housing association was the main commissioner.

Management team

Before you start the implementation you have to set up the management team and decide on a place and time to meet at least weekly for a few hours to discuss the progress. The team members should be: the project manager, an independent quality controller, a representative of the housing association, a representative of the municipality, a representative of the central heating company (if appropriate), representatives of the main contractor and other contractors who might be concerned.

- Successful projects are always supervised by an independent energy expert who oversees all the phases: from the first conceptual design through the instruction of craftsmen and the construction phase right up to the final acceptance.
- Never underestimate the time and the cost that is needed for the project management. The team's salary should be included in the proposals.

Scheme of energy efficiency measure implementation in Daugavpils, 38a Vienibas street (solid line arrows indicate contractual relations, dashed line arrows indicate cash flows)

