Guideline for MSC phases and toolbox

EFFECT4buildings Toolbox:

Multi Service Contracting; Annex 1

The project “Effective Financing Tools for implementing Energy Efficiency in Buildings” (EFFECT4buildings) develops in collaboration with public building managers a comprehensive decision-making support toolbox with a set of financial instruments: **Financial calculation tools**; **Bundling**; **Funding**; **Convincing decision makers**; **Energy Performance Contract**; **Multi Service Contract**; **Green Lease Contract**; **Prosumerism**. The tools and instruments chosen by the project has the biggest potential to help building managers to overcome financial barriers, based on nearly 40 interviews with the target group. The project improves these tools through different real cases.

To make sure building managers invest in the best available solutions, more knowledge on different possibilities is needed as well as confirmation from colleagues that the solutions performs well. EFFECT4buildings mapped **technological solutions** for energy efficiency in buildings with the aim to share knowledge and experiences of energy efficiency solutions among building managers in the Baltic Sea Region.

This document is a part of the Multi Service Contracting (MSC) toolbox and provides a short introduction to the generic phases in an MSC and an overview over the MSC toolbox with relevant tools for working with MSC.

Partners

EFFECT4buildings project is implemented with the support from the EU funding Programme Interreg Baltic Sea Region (European Regional Development Fund) and Norwegian national funding. The aim of the project is to improve the capacity of public building managers in the Baltic Sea Region by providing them a comprehensive decision-making support toolbox with a set of financial instruments to unlock the investments and lower the risks of implementing energy efficiency measures in buildings owned by public stakeholders. More information: http://www.effect4buildings.se/

Table of content

Guideline for MSC phases and toolbox

Introduction to the guideline

The guideline gives a short introduction to what is important in different phases in the MSC model and which tools in the toolbox are relevant.

Emphasis in the MSC guide and toolbox is in relation to phase 0 (start-up) and phase 1 (planning). The MSC phase 2 is based on a traditional turnkey contract[1] and therefore separate tools for this phase have not been developed. The content of phase 3 is dependent on the project developed in phase 0 and phase 1. Phase 3 is thus only briefly described.

Overview of tools

The following table 1 illustrates an overview of the MSC toolbox[2] and how the tools are related to the MSC phases. As seen in table 1 this document, tool 1, *"*Guideline to MSC phases and toolbox*"*, relates to all MSC phases. For a general introduction to MSC, see the guide to Multi Service Contracting[3].

Table 1 Overview of toolbox and relation to MSC phases

<table>
<tr><th colspan="4">Guide to Multi Service Contracting (MSC)</th></tr>
<tr><td colspan="4">MSC toolbox – tools and instruments for implementing MSC</td></tr>
<tr><td>Phase 0
Start-up</td><td>Phase 1
Planning</td><td>Phase 2
Implementation</td><td>Phase 3
Operation</td></tr>
<tr><td colspan="4">1. Guideline for MSC phases and toolbox</td></tr>
<tr><td>2. Guideline for MSC decision process</td><td>4. Mapping and analysis tools for different services</td><td colspan="2">7. Introduction to performance verification during implementation</td></tr>
<tr><td>3. Content in an MSC procurement and performance requirements</td><td>5. Guideline for planning of indoor climate in schools</td><td colspan="2" rowspan="2">8. Performance operation test</td></tr>
<tr><td></td><td colspan="2">6. Introduction to measurement and verification</td></tr>
<tr><td colspan="4">9. Example of MSC training</td></tr>
</table>

[1] The content of course has to be customised to the specific project

[2] All tools can be found on www.effect4buildings.se. Tool 4 is a group of tools, 4.1, 4.2a, 4.2b, 4.3 and 4.4 and the title cover them as a whole and is not a tool by itself

[3] The MSC guide, can be found on www.effect4buildings.se

Short introduction to the MSC model

In the MSC guide you can find an introduction to the MSC model which would be beneficial to read. The following sums up the key elements of the MSC model (shown in figure 1).

The model offers a holistic approach to projects with renovation and retrofitting of a larger building portfolio in the existing building stock. The model derives from Energy Performance Contracting (EPC) and strategic partnership, building on experiences from these two models.

In short, with Multi Service Contracting (MSC) the building owner signs a framework agreement with an MSC supplier covering planning and implementation of the project. In operation, the responsibility for follow up on performance and operation services can be a part of the agreement with the MSC supplier. Phase 3 might also be handled by the building owner himself.

The contract focuses on more parameters than just energy, including indoor climate, reducing the backlog of maintenance and facility management. The contract also forces both parties to follow up on the performance of the building(s) after renovation. Extending the planning phase and involving an MSC supplier from the very beginning of the project increases the chance that the renovation will meet the building owner's expectations, thanks to the supplier's support with resources and competences, and him taking responsibility for the after-renovation performance.

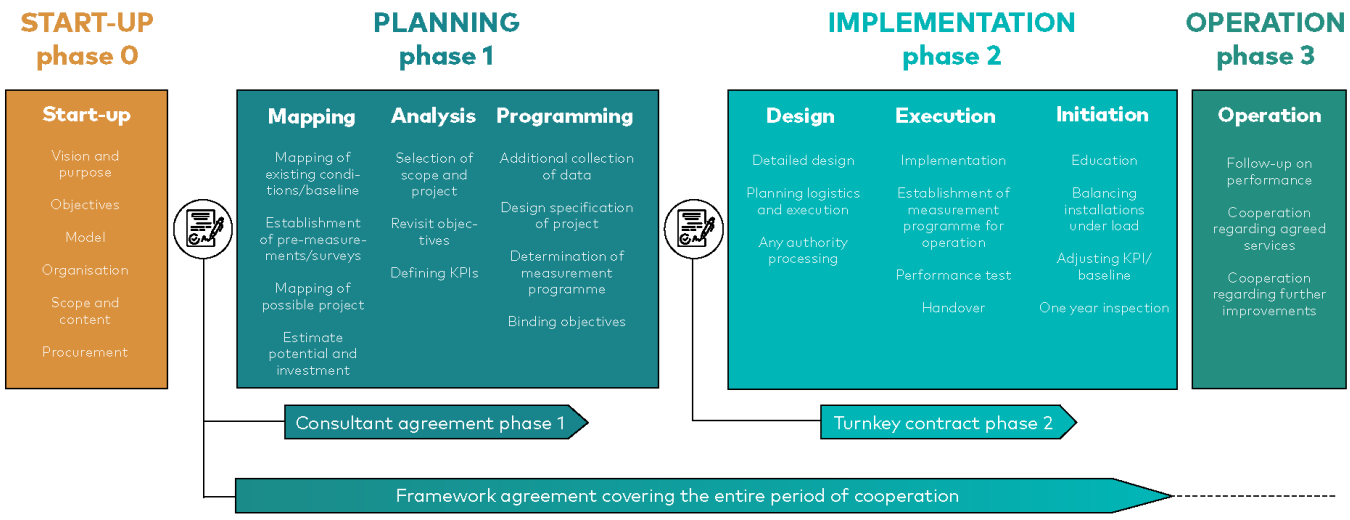


Figure 1 A generic model for MSC. Consisting of four primary phases and subphases in phases 1 and 2, with three different types of contracts to support the phases. Appendix 1 shows model in A4.

In the following, the four primary phases are described in more detail.

Introduction to phase 0, start-up

In **phase 0** the building owner identifies the vision, purpose and main objectives for the project. Based on these, the scope is designed and requirements to the MSC supplier are defined. The MSC supplier is found in a public procurement process. The MSC supplier consists of a full delivery team to execute the entire project.

The start-up

It is important to use resources and time in the start-up phase to identify the purpose and objectives and to align the expectations to the content and framework of the project.

This should be a part of the start-up phase in any large energy renovation or efficiency project, whatever model and design is chosen for execution. It is our recommendation that the final decision whether the MSC model is the right model for executing the project can only be taken after this point.

In the start-up of MSC, focus is set on defining clear objectives for the project and to outline how they are prioritised. In this phase the building owner decides whether the project's primary focus is on energy, indoor climate, maintenance, etc., and what other services should be included. For each service, the building owner sets a main objective and supporting sub-objectives, and hereto the sub-objectives must then be prioritised in relation to one another. For example, the building owner would have to decide whether a main objective related to energy savings should be achieved by focusing on energy efficiency measures on technical installations or renovating the building envelope, and whether it is savings in relation to budget cost or kWh, and whether the focus also includes energy embedded in the building.

When the building owner has clarified the main objectives in the project, the final prioritisation among the objectives can be set. It could be that a prerequisite was to finance measures through energy savings within a certain pay-back period. In that case this objective will be the overall purpose for all objectives. Another case could be a political wish to improve the indoor climate in classrooms. Then indoor climate would be the overall purpose in these classrooms.

We recommend that the building owner prioritise time to define the project's objectives. Of course, this would be an iterative process, where the purpose, objectives and sub-objectives are revisited throughout the project's phases.

An exercise to carry out simultaneously is establishment of the framework of the project, since it is interdependent on the project's purpose and objectives. In this exercise, the building owner will clarify the scope of the project in relation to buildings and services, the framework for budget and time plan, organisation, etc.

To help establish the framework, purpose and main objectives, use the exercises described in tool 2, "Guideline for MSC decision process". In the tool a list of characteristics in a project suited for MSC can be found. Tool 9, "Example of MSC training", is a presentation of MSC and

the exercises for phase 0, also described in tool 2. The presentation provides an example of a facilitated process for establishing the framework, purpose and main objectives.

Project organisation

One of the main barriers for success in complex cooperation projects like EPC projects and strategic partnerships is identified to be a lack of expertise, knowledge and resources on the part of the building owner.

Project organisations must cover the full span of competences, and resources must be allocated and focused on lessening the knowledge asymmetries between the client and the supplier. It is also important that the project organisation is staffed with people who can build up trust and cooperate.

To map the competences and organise the project, use the exercise "Mapping competences" described in tool 2 "Guideline for MSC decision process". In the tool there is a step-by-step guide, a list of relevant competences in the project organisation and a list of ideas to close gaps in expertise. In tool 9, "Example of MSC training", slides for conducting the exercise are available.

We recommend hiring a client advisor with experience in complex public procurement processes and execution of cooperation projects with suppliers.

Procurement

The purpose of the public procurement process is to find the appropriate partner to carry out the cooperation project. Therefore, the supplier's qualifications and approach to solving the project should be given more emphasis than the overall budget.

Since it is the MSC supplier who will carry out the mapping and design specification of the project, the content is not known. It is thus not possible to formulate a description of specific requirements in the procurement documents. Consequently, it is necessary to base the procurement on performance requirements.

In general, the EU directive for public procurements should always be respected, and if a building owner does not have experience with functional procurements in complex cooperation projects, it is recommended to get the necessary assistance to carry out a public procurement.

In tool 3, "Content in an MSC procurement and performance requirements", there is an introduction to performance requirements and an overview of content in a public procurement for MSC.

Contractual basis

A framework agreement is signed with the MSC supplier covering all phases from 1 to 3. The framework agreement is the main contract, while the consultant contract (phase 1), the

turnkey contract[4] (phase 2) and a service contract (phase 3) specify the services and contract terms related to each phase and are signed before entering the specific phase.

In the framework agreement the mutual objectives, form of cooperation, the economy, incentives and remedies are regulated. A keystone is open book with full access for the building owner to e.g. calculations, real cost, as the specific timeframe or cost are not known at the time of the public procurement and tendering.

Together with the framework agreement, a consultant agreement for phase 1 is signed. The consultant contract defines requirements to the process and methods (e.g. mapping and calculation tools).

The framework and consultant agreement can cover many projects to be executed in the cooperation. Every time a new project is launched in **phase 1** (e.g. energy and indoor climate project in 5 schools), an allonge to the consultant agreement is signed on the concrete project based on hours spent and a specification of **A**ctivities, **T**imeframe and **R**esources (an ATR agreement).

One part of the contract documents is a draft of the turnkey contract for phase 2. It is only a draft until phase 1 is finished, and the specific details about the project can be added. The MSC supplier is therefore not guaranteed that the building owner signs the turnkey contract and proceeds to implementation.

In tool 3, "Content in an MSC procurement and performance requirements", there is an introduction to the contractual basis.

Introduction to phase 1, Planning

In **phase 1 Planning**, the building owner and MSC supplier will in close cooperation analyse the potential project and make decisions about the concrete content of the project. The project is then planned and specified with binding objectives and methods for evaluation. In the programming, the important technical risks are explored, e.g. hazardous substances, constructability to reduce the risk for unexpected costs and problems later in the project.

Moreover, in this phase the cooperation is established, and the partners should settle on how to cooperate. We recommend that the cooperation starts with a workshop, with all involved parties from steering group to affected operation staff. At the workshop, the MSC supplier will introduce themselves and their approach to solving assignments. Furthermore, framework, work process and cooperation should be discussed and hereafter agreed upon as a part of the contract.

Phase 1 has three subphases – mapping, analysis and programming.

[4] Also sometimes called a *design and building contract*

Mapping

The purpose of this subphase is for the MSC supplier to map existing conditions to form a baseline for possible improvements. This entails mapping the prerequisites to achieving possible improvements.

Mapping of baseline should be targeted the specific objective in focus, e.g. focus on indoor climate in classrooms, where the technical installation would demand certain measurements and registrations in relation to air, temperature, light and noise.

Various approaches and methods for mapping can be applied, and often they will depend on available data, drafts, registrations and knowledge from operation staff in relation to the property and technical installations. It is important that the building owner makes the organisation available to the MSC supplier and assists the MSC supplier with knowledge and access to the right resources, since it will be crucial to the quality of the mapping.

The building owner should decide on the quality of the mapping in the procurement material. The more information and precise registrations the building owner demands, the more time the MSC supplier must apply. An example could be to demand registration of user-time on a building level versus in all rooms or indoor climate measurements in all rooms versus representative rooms. The mapping can be divided into phases. First the MSC supplier carries out an overall mapping of the property to locate possible challenges. Afterwards, the MSC supplier targets these areas with more detailed mapping, e.g. with measurements in these specific locations. Finally, this mapping provides the MSC supplier with knowledge about the building's condition in relation to the services included (e.g. energy flows, level of maintenance, indoor climate, etc.), which is necessary to form a proposal for concrete measures that is aligned with the project's objectives.

Once again it is important that the building owner is available to give feedback and contribute with ideas.

To finalise the mapping phase, the MSC supplier presents a catalogue with proposed measures and their assumptions, extent and budget. Furthermore, for each measure the impact on performance in relation to the chosen objectives and their sub-objectives should be presented.

Requirements to methods and approach in the mapping phase will depend on the specific project. Moreover, the building owner can decide whether the MSC supplier should have little or great freedom to select methods. Often in EPC-projects and strategic partnerships there is a great freedom to select methods, and this becomes selection criteria in the public procurement.

You can find inspiration in different types of indoor mapping tools in tool 4, "Mapping and analysis tools for different services"[5]. Likewise, tools and requirements for the mapping of

[5] This is a group of documents, 4.1, 4.2a, 4.2b, 4.3 and 4.4, that are tools for phase 1.

energy can be found in the toolbox to EPC[6], and similar tools can often be found on national websites.

In tool 5, "Guideline for planning of indoor climate in schools", specific knowledge about the mapping and planning of indoor climate in schools can be found.

Methods for mapping the condition of the building components and the technical installations and estimate the maintenance back log are often already fixed as a part of facility management for the building owner. If not, apply national standards. Inspiration for how to structure technical mapping can be found in tool 4.2 and 4.4 from tool 4, "Mapping and analysis tools for different services".

Analysis

In the analysis phase, the building owner will decide on project measures based on the MSC supplier's proposal. Often it will require some additional mapping or analysis, e.g. the building owner could desire to get calculations on consequences for different approaches or solutions.

Often it will be necessary to involve the management and stakeholders in the selection, and this phase should thus be planned with enough time to complete activities to do so.

When the project content is agreed upon, the parties should revisit the project objectives and determine expectations for the chosen services' improvement of performance. As a part of this exercise, the MSC supplier should present KPIs that would be good indicators to follow up on performance. Furthermore, the exercise should entail determination of acceptance criteria and a draft regarding methods for verification of performance.

The determination of KPIs, at this time, enables the MSC supplier to incorporate the necessary measurement programmes and implementation of systems in the programming phase, that will make it possible verify the performance.

It is very important that the building owner distinguish between what should be tested at handover, and what the building owner aims to follow up on over time. The tests in relation to handover only demands temporary logs and measurements, while the ongoing supervision demands permanent measurements in an accessible and applicable system.

In tool 6, "Introduction to measurement and verification", there is information about KPIs and methods for measurement and verification. In tool 7, "Introduction to performance verification during implementation", there is information about commissioning and performance test. These two methods can be used to support the ensurance of both focus and documentation of the performance in the implementation phase.

[6] Recommended EPC tools; Template – EPC tender analyses, Template – Baseline data and Template - Project development report and energy analyses, to be found on www.effect4buildings.se

Programming

The purpose of the programming phase is to determine the final selection of solutions and produce the design specification. Not only in relation to technical solutions, but also in relation to logistics and constructability. For instance, it may be necessary to supplement the original mapping with additional data or analyses, and the users should be involved to the extent needed. Furthermore, it can be useful to test different solutions, e.g. regarding lighting, or to get material samples before settling on the final solution and level of quality.

In this phase the focus is to reduce risks that can have an impact on price, time plan and quality. Activities could be environmental assessments, destructive examinations, static assessments, thermography and dialogue with relevant authorities.

As a part of the design specification, a programme for measurements with sensors and meters to follow up on performance over time should be incorporated. Objectives, KPIs and their respective acceptance criteria and methods for verification of performance are revisited and agreed upon based on the final design specification.

The building owner should be involved throughout the process and should have the final approval of the building programme, including changes in project content, extent and impact on performance.

Finally, the MSC supplier determines the price for the completion of the building programme in phase 2 implementation. This is done in a turnkey contract according to the agreed contract and offered prices in the bid.

Transition to phase 2

In the shift between phase 1 and phase 2, the framework agreement is supplemented with necessary allonges on the specific project and the turnkey contract, with a fixed price for phase 2 is signed based on the concrete project.

It is very important that the turnkey contract includes clear requirements to the handover, commissioning, performance test and inspections (in Denmark normally one- and five-year inspections). The supplier naturally has a duty to rectify defects identified at handover and inspections.

In tool 3, “Content in procurement and performance requirements”, an overview of suggested allonges is listed.

Introduction to phase 2, Implementation

In **phase 2, Implementation**, the project is detailed, designed, executed and initiated by the MSC supplier.

The completion of phase 2 is similar to a traditional turnkey, but with increased focus on handover and documentation of compliance with the agreed performance requirements and the transition to operation (initiation phase in the MSC model).

In the MSC model, the MSC supplier has increased responsibility to secure a successful handover and transition to operation in the sub-phase *initiation*. The MSC contract should describe the MSC supplier's responsibility in regard to education of the operational staff, balancing the installations under load and adjusting KPIs and baseline according to the final project.

An essential part of the model is that at handover, the building owner ensures that the installations are operating properly, not just functionally, but also with the desired performance. It might be necessary for the building owner to get professional assistance at handover, including the possibility to supplement the MSC supplier's data with their own measurements and tests.

It can be an advantage, if the MSC supplier is bound to do surveys or tests in the initiation phase to follow-up on the achieved performance level. This could be user surveys, interviews with operation management or indoor logs in an agreed period like summer or winter. The result can then also be included in the one-year inspection that ends the MSC model's phase 2, implementation.

Tool 7, "Introduction to performance verification during implementation", introduces two methods supporting the process of ensuring that the performance requirements are met in the handover and a good transition to operation (commissioning).

In tool 8," Performance operation test", a case with examples and recommendations for follow-up on performance in the period from handover to one-year inspection is described.

A part of the education of operational staff should be to enable them to verify and follow-up on performance using the agreed method. The MSC supplier should, according to requirements set in the contract, implement the necessary technical solutions that make the follow-up possible. That could be systems for BMS (Building Management System) or EMS (Energy Management System). Moreover, the building owner can supplement with implementing own feedback systems or procedures to get an overview of e.g. sickness absence or maintenance backlog in the FMS (Facility Management System).

Introduction to phase 3, Operation

Phase 3, Operation is relevant, if the contract includes obligations on performance after phase 2, or if the contract includes operation and maintenance services. The length of phase 3 must be customised to the project and in respect to procurement regulations.

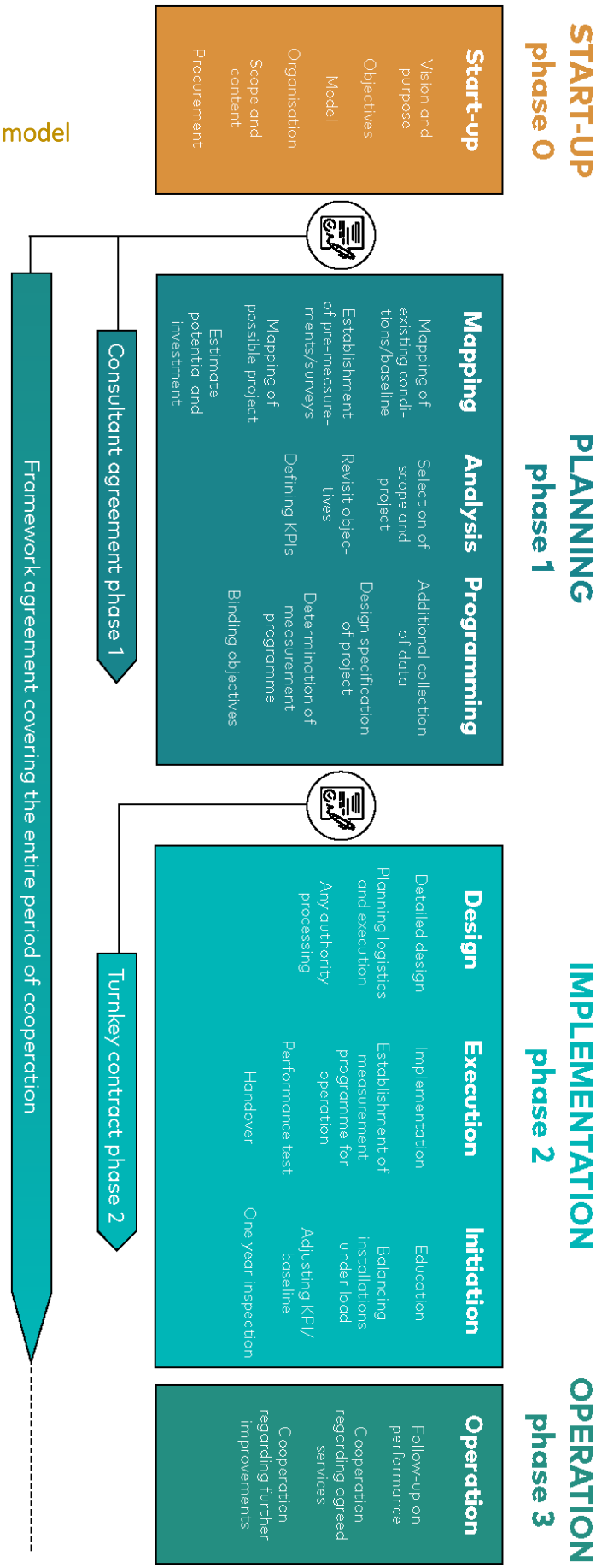
Before entering phase 3, the MSC supplier and building owner agree on the workflows and the distribution of roles when following up on performance and how deviations in performance are being handled.

The content in phase 3 must be adapted to the specific needs and project. The procurement can include obligations regarding performance management and contain penalties and incentives in the contract. The contract can also include extra services. Examples of extra services besides performance management could be:

- Monitoring of BMS and EMS in a remote operation center, supporting the local operation organisation.
- Service check of installations, both mandatory and normal servicing.
- Operation of building/installation.
- Around the clock services e.g. in the event of breakdown and emergencies.

An important note is that phase 3 often begins before the phase 2 contract is completed. In the MSC model, the MSC supplier has contract obligations in the turnkey contract in the period from handover to one-year inspection (the subphase initiation) as described under phase 2. But the normal operation of the building is still the building owner's responsibility, and phase 3 and operation of the new installations thus begin immediately after handover, unless otherwise agreed.

Appendix 1 – MSC model



Interreg Baltic Sea Region

EUROPEAN UNION

EUROPEAN REGIONAL DEVELOPMENT FUND

EU STRATEGY FOR THE BALTIC SEA REGION FLAGSHIP

EFFECT4buildings