**Managing Sustainability Aspects in Renovation Processes: Interview Study and Outline of a Process Model.**

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Stefan Olsson 1,*, Tove Malmqvist 1 and Mauritz Glaumann 3

1 Division of Environmental Strategies Research, KTH Royal Institute of Technology, SE-100 44 Stockholm, Sweden; E-Mail: tove.malmqvist@abe.kth.se

2 Faculty of Engineering and Sustainable Development, University of Gävle, SE-801 76 Gävle, Sweden; E-Mail: mauritz.glaumann@hig.se

* Author to whom correspondence should be addressed; E-Mail: stefan.olsson@abe.kth.se; Tel.: +46-8-5888-8118; Fax: +46-8-790-8580.

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**Interview Questions—Supplementary Information to Article Managing Sustainability Aspects in Renovation Processes: Interview Study and Outline of a Process Model**

1. **General information**
   1.1 Annual turnover (last year)?
   1.2 Number of apartments and number of properties?
   1.3 Number of square meters of lettable area (living space)?
   1.4 Number of buildings and apartments facing more extensive renovation needs?
   1.5 Intended rate of renovation of above?

2. **Economic aspects**
   2.1 How does the funding look like; are money set aside for maintenance and/or renovation?
   2.2 What are the principles in your organization for setting rents?
   2.3 Does your organization have any policy for setting rents when performing renovations?
   2.4 Is there an overall rate of return or specific rate of return for each building?
   2.5 How do you evaluate the profitability of different measures?
   2.6 Who decides which economic parameters (e.g. lifetime, annual increase in energy price etc.) to be used when evaluating measures in different projects?
   2.7 Do you know of other financial incentives that may affect the renovation process, or our own ideas of wanted incentives?
   2.8 Do you investigate the possibility for building extension when planning for a renovation?
   2.9 Do you investigate the possibility to merge or split apartments in order to obtain larger or smaller apartments if needed?
2.10 Do you use individual metering and billing of domestic tap water (cold and/or hot)?
2.11 Tenants electricity use, do you have control over it or have the possibility to monitor it?
2.12 Is there any possibility to charge extra for services (e.g. domestic hot water) provided by your organization?
2.13 Do you use or have used “green leases”? If so, what are your experiences?
2.14 Do you investigate the possibility to produce your own energy by installing e.g. photovoltaics, solar collectors or small local windmills?

3. Property management process

3.1 Are there maintenance plans for each building and does it handle environmental targets?
3.2 Do you have an environmental management system or energy management system? If so, are they certified according to ISO?
3.3 Does your organization have overarching sustainability objectives or policy?
3.4 How do you handle documentation and reporting of different activities, routines or made decisions within a renovation project?
3.5 Do you use any computerized property management system? If so, which one?
3.6 Do you monitor and analyze energy use and use of domestic tap water in the continuous management process? How is the analysis made?
3.7 Do you compile and analyze energy use and use of domestic tap water in any special way prior a renovation project?
3.8 Does your organization conduct Customer Satisfaction Surveys? If so, how often?
3.9 Does your organization conduct any special survey amongst residents prior a renovation project in order to find out about indoor environmental problems?
3.10 What response rate do you usually receive on your surveys?
3.11 Do you use information from any of the surveys in forthcoming renovation project?

4. Renovation process in general

4.1 Do you have any kind of process model for addressing energy, environmental and indoor environmental aspects in renovation projects? If so, who do what?
4.2 What environmental objectives are normally connected with your renovation projects?
4.3 Who is responsible for ensuring that decided objectives in the project also are fulfilled during the different project stages?
4.4 How does our project organization look like in new construction projects and renovation projects respectively?
4.5 What do you think needs to be done to promote better management of sustainability aspects throughout a renovation project?

5. Building inspection stage

5.1 What are the main criteria when deciding what building to start renovate?
5.2 Do you conduct a special building inspection prior a renovation project? If so, what aspects do you consider and who does the work?
5.3 How do you compare and evaluate alternative renovation measures?
5.4 Do you consider embodied greenhouse gas emissions (e.g. CO2-eq) from added materials when evaluating different renovation measures?

5.5 Who perform energy-saving calculation for the different measures? Does your organization have any guidelines on how to perform these calculations?

5.6 Do you ever consider demolishing a building and construct a new one instead of renovation?

5.7 Do you contact and discuss issues with the local municipal housing committee? If so, when in the process?

5.8 How do you involve residents in the renovation project? And in what stages are they involved?

6. **Construction stage**

6.1 How is the procurement of renovation measures/projects done?

6.2 What type of contract do you often use for renovation measures/projects?

6.3 Why do you choose that specific type of contract?

6.4 How do you assign a project manager to a specific project?

6.5 How do you assign consultants, architects etc. to a specific project?

6.6 Do you have environmental expertise assigned to the different projects?

6.7 How do you handle dismantled parts and material? Do you reuse?

6.8 How do you ensuring that decided objectives in the project design stage also are fulfilled during construction?

6.9 Are tenants evacuated during major renovation projects?

7. **Follow-up stage**

7.1 Do you follow-up energy use after a renovation project?

7.2 If energy use differs from earlier estimations, do you analyze why?

7.3 Do you follow-up other environmental objectives?

7.4 If other environmental objectives not are fulfilled, how do you handle that?

7.5 What do you do to preserve and propagate experience within the project team?

7.6 Do you have the possibility to use the same consultant, architects, entrepreneurs etc. for similar projects?

7.7 Do you know of some organization that has a complete process model for sustainable renovation?

8. **Information and communication systems (ICT)**

8.1 What ICT-systems (or building automation systems) do you have in your building stock?

8.2 In what way does your organization use the information that these systems provide?

8.3 Are there any special functions in these systems that your organization always installs?

8.4 Does your organization have any policy regarding installation of ICT- or building automation systems?

8.5 Are there any differences between system configuration in new construction and renovation projects?

8.6 Who decide what data to monitor and collect (e.g. energy use) from the ICT- or building automation system?

8.7 How are the energy use displayed and communicated to the residents?
8.8 Are you planning for installation of appliances/white goods that residents can control with a smart phone?
8.9 Does your organization have any environmental policy when purchasing white goods?
8.10 Does your organization have any policy for sharing building information (e.g. energy use) through smart phones and/or local display?
8.11 Do you plan for provider independent internet cable to each apartment?

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