

Validation of the Decision-Support Framework: Summarised and anonymised transcripts

Question Round 1

1. Can you describe your role in the process of selecting renovations?

Participant 1

Participant 1 explained that their role in the decision-making process involved preparing the memo or decision to be presented, which they did in collaboration with the project team. They worked on developing various options and possibilities, providing information to third parties to support choices or initiate research into potential solutions, thereby developing the decision options.

Participant 2

Participant 2 is the programme manager and is responsible for the sustainability program within the social housing organisation. Their role in decision-making involved two phases: the project plan (PV1) and the execution decision (PV3). In the PV1 phase, which focuses on strategy and real estate management, they are less involved and more of a stakeholder. However, as the project moves from PV1 to PV3, they become responsible for decision-making within their authorisation, working closely with the established steering group.

They emphasised that they were responsible for leading the decision documents through the investment committees from PV3 onwards and defending these documents. They also mentioned that in projects, they had to make decisions together with others, primarily when deviations occurred. They highlighted their overall responsibility for the programme and everything associated with it, including financial aspects, which, if exceeded, would involve their manager.

Finally, participant 2 highlighted that while their role is from the perspective of the social housing corporation, their counterpart (participant 3) from the energy transition company shares similar responsibilities within their respective domain.

Participant 3

Participant 3 also added to the role of Participant 1. They mentioned that Participant 1 is also in contact with other stakeholders within the social housing, including the residents' consultant and the asset manager responsible for the portfolio. As part of the management team, they worked with the technical manager responsible for the buildings during the operational period. They discussed everything with them in advance, involved them in the preparation for decision-making, and ensured they understood the content of the proposed decision.

Participant 3 remarks that Participant 2 has close contact with all decision-makers as they handle the financial aspects.

Participant 3, who is also the programme manager of the energy transition company, is involved in the steering group as Participant 2. Participant 3 is responsible for the team and all project preparations, ensuring everything aligns with agreements and quality standards. They stay informed about all matters, prepare for decision-making and are present when decisions are made.

Participant 4

Participant 4 introduced themselves as a project leader from the energy transition company, positioned between participant 1 and 2 in the organisational structure. Participant 4 is actively involved in project preparation and management. In addition to their project leadership responsibilities, they support

Participant 3 in the program, particularly within the steering group where decisions are made. They also maintain frequent contact with Participant 2 to ensure that projects are well-prepared and the right decisions are made.

2. In which step (simplified decision support framework) are you involved?

Participant 1

Participant 1 is responsible for complete planning within the project team, including collecting information, investigating possibilities, and drafting comprehensive plans to present options. They ensure complex planning is derived from the program and integrate information gathered by the team, policies set by the client, and tasks assigned to third parties. In identifying renovation goals and decision criteria, Participant 1 pursues the client's wishes, determines project-level planning, and advises the steering group on optimal renovation timing. This involves coordinating with the maintenance department, ensuring foundational information on the building is accurate, and conducting inspections.

When establishing preferences, Participant 1 evaluates the pros and cons of each scenario, presenting them for decision-making and creating a knowledge and impact table on potential risks and control measures. They select third parties and partners to aid in this process. In developing renovation concepts, they oversee the entire process from planning to execution, leveraging partners' advice and team development. They also quantify renovation scenarios in collaboration with contractors, similar to establishing preferences.

For ranking solutions and decision analysis, Participant 1 provides advice on the best-fitting scenarios, discussing them with management teams and decision-makers based on feedback from the management team. However, the final decision rests with the steering group; thus, Participant 1 does not make the ultimate decision.

Participant 2

Participant 2 confirmed that they strongly identify with the presented steps of the simplified framework, noting that these steps typically lead to a choice of a renovation scenario, which aligns with their company's approach. Since this year, they have taken on the contractor role, working alongside energy transition consultants. They receive assignments from their strategy partners, specifically the strategy/real estate management department. This department selects a scenario based on their knowledge of the property and its strategy and provides them with the necessary guidance. Participant 2 and their team then ensure the technical aspects are correct, allowing them to make decisions within the assignment alongside the project leader.

Participant 2 emphasised the importance of thoroughly reviewing assignments before accepting them. If an assignment lacks clarity or proper consideration, they can reject it. They do not involve themselves in tasks like building analysis and benchmarking (step 1), which the project leader handles. However, they consider themselves stakeholders/decision-makers when identifying renovation goals and decision-making criteria (step 2), working closely with other policy makers to determine realistic goals. For them, step 2 often precedes step 1, as it involves general program-wide considerations, while step 1 is specific to each project.

In later stages, Participant 2 transitions to an advisory role as the asset manager, ensuring the project's feasibility. They consider themselves decision-makers when feasibility concerns arise, asserting that certain decisions cannot be implemented within the project. In the final steps, they act as an advisor and decision-maker in securing approval.

Participant 3

Participant 3 identified their role in the decision-making process across various steps. In the initial phase of Building Analysis and benchmarking, Participant 3 is ultimately responsible for the work and final quality of the team (energy transition company). This involves ensuring access to homes, engaging in conversations with residents, and gathering essential information such as drawings, installation details, and the complaints register. Regarding identifying renovation goals and decision criteria (step 2), Participant 3 participates in annual meetings with representatives from the social housing corporation and energy transition consultants to determine wishes and requirements jointly.

In establishing preferences (step 3), Participant 3 leads the presentation of options and scenarios from energy transition consultants, representing their project teams in the steering group where assessments, decisions, and priorities are made. This requires information from the annually updated programme plan, statement of principles, and other policy documents. For developing renovation concepts (step 4), Participant 3 is ultimately responsible for the process managed by their project team, relying on data regarding network capacities, roof surface area, space for new installations, building capacity, and electrical panel capacity.

When quantifying renovation scenarios (step 5), Participant 3's project team handles the task under their ultimate responsibility, utilising annually updated price books and information from partners related to installations and PV panels. In the ranking solutions and decision analysis phase (step 6), Participant 3 actively steers the process, discussing scenarios and the justification of the preferred scenario with stakeholders and decision-makers before it goes to stakeholders from the social housing corporation. Finally, in the decision-making phase, although the final decision is made by the steering group, Participant 3, along with Participant 4, answers any questions, ensuring compliance with the annual budget and other key performance indicators like label steps, net heating demand, resolving residents' complaints, and CO2 reduction.

Participant 4

Participant 4 mentioned that, in principle, they are involved in all project steps, especially from the beginning to the end. In the Building Analysis and benchmarking phase (step 1), Participant 4 collaborates with the project team (energy transition consultants), utilising data on the necessary components. To identify renovation goals and decision criteria (step 2), they work as a project leader alongside the social housing corporation management team, relying on the maintenance plan and policy. During establishing preferences (step 3), Participant 4 remains involved as a project leader, coordinating with the project team from energy transition consultants and the management team from the social housing corporation, as well as consulting with stakeholders for necessary information.

When developing renovation concepts (steps 4 and 5), Participant 4 uses Vabi software and feasibility tools to gather essential data. In quantifying renovation scenarios, Participant 4 continues their role as project leader, collaborating with the project team, advisors, and contractor and incorporating the budget from the contractor.

For ranking solutions and decision analysis (step 6), Participant 4 serves as project leader and programme manager, engaging with energy transition consultants and housing cooperation using the scenario table and consultations for decision-making. In the final decision phase (step 7), Participant 4 is involved as a programme manager, participating in the social housing corporations' steering group where the decision is made. They ensure the necessary decision documents, such as the project plan and execution decision, are available for the steering group meeting.

Question round 2

3. The framework accurately represents your decision-making process for the case study.

Participant 1

Participant 1 found the framework clear, organised and structured. They noted similarities between the presented framework and their current practice of providing energy advice. They explained their process, which begins with a preliminary investigation (the Energy Advice Report) and progresses to a detailed project plan that includes risks, control measures, and "what if" scenarios. This alignment suggests that they found the framework to be a reasonably accurate representation of their decision-making process.

Participant 2

Participant 2 also agreed with the statement. They ascertain that the choices made by decision-makers are often a blend of theory and practice. They were particularly interested in understanding the ranking system used in the framework, specifically how value judgments were made concerning different numbers and criteria. Participant 2 also highlighted the practical challenges they face, such as ensuring that theoretical models align with real-world conditions. They gave the example of low-temperature heating systems, noting that residents who prefer to heat their homes to 23 degrees may face issues during extreme winter conditions despite the system being theoretically sound. Nevertheless, Participant 2 appreciated the framework's consideration of higher air temperatures in simulations, as it aligned with their experience dealing with older residents.

Participant 3

Participant 3 believed that the framework was quite accurate but emphasised that their decision-making process includes a range of practical considerations. They mentioned that their decisions are influenced by factors such as replacement moments, the state of maintenance, and practical realities like the warmth of certain areas. For instance, they would not insulate ceilings and floors if there were no complaints, even if it theoretically improved performance.

The participant stressed that technical feasibility is a crucial factor in their decisions. They consider whether actions can be completed within the building's structural limits without relocating residents and whether the timing of investments is logical given maintenance schedules. They highlighted that their decisions are influenced by practical human insights rather than purely theoretical models, which often leads them to dismiss scenarios that might seem viable in a computer model.

Participant 4

The steps taken corresponded to the steps taken during our process.

4. The application of the framework provided a thorough analysis of the case study.

Participant 1

Participant 1 agreed that the case study was used effectively within the framework. They appreciated that the actual situation, including realistic RC values and U-values, was considered. Using actual data helped them feel confident that the case study was accurately represented and analysed within the framework.

Participant 2

Initially, participant 2 struggled to evaluate the thoroughness of the framework application, but upon discussion with Participant 1, they agreed with the statement. Additionally, they emphasised that the framework should be used as a tool to support decision-making rather than as the final answer. They also highlighted the importance of human interpretation in effectively using the framework and avoiding potential pitfalls. Additionally, they noted that the framework provides substantial answers, particularly in energetic aspects.

Participant 3

Participant 3 acknowledged the limitation of the framework in fully capturing human factors but appreciated its attempt to address social categories. They mentioned that project leaders could often make estimations based on scenarios, deciding which ones might work given that residents would not need to be displaced. This practical insight helps fill in gaps that data alone cannot provide. They agreed that while the framework cannot include every human consideration, it provides a valuable basis that their expertise and experience can supplement.

Participant 4

Participant 4 appreciated the approach taken in the analysis, particularly regarding the energetic aspects, agreeing that it was handled correctly. However, they highlighted the challenges of incorporating human factors and social elements into the framework. They noted that while the framework attempted to address these aspects, extracting such insights regarding social factors from data is inherently complex. They mentioned that conversations with residents are not easily captured in the data, making it challenging to fully account for these human-related aspects.

Question round 3

5. How do you trade-off different interests when assessing renovation scenarios for decision-making?

Participant 1

Participant 1 mentioned considering the impact of local governmental and regulatory issues on decision-making. They noted that potential challenges, such as grid capacity for heat pumps, can make certain scenarios impractical, leading them to exclude those options early in the process. This foresight helps streamline the decision-making process by avoiding proposals that would be unfeasible due to regional constraints, even if they appear theoretically sound.

Participant 2

Participant 2 discussed the complexity of balancing various interests, noting many different stakeholder concerns, including those of residents, building strategy, and evolving knowledge related to sustainability. Additionally, the policies and information related to sustainability changes significantly within six months, thus requiring constant updates to their approach.

They highlighted the importance of making decisions that align with long-term goals, such as planning for the building's operation until 2050, rather than opting for short-term solutions that may need to be replaced later. For example, avoid installing elements like windows that will need to be replaced before 2050. Similarly, the participant mentioned following the 'no-regret' philosophy, where they weigh costs against benefits.

Moreover, Participant 2 noted that insulation standards have become more important than energy labels, as they believe insulation provides more meaningful information about the building's energy performance. They acknowledged that as a housing corporation, they operate with limited funds and must ensure their investments carry minimal risk. This cautious approach leads them to favour proven, reliable solutions with higher potential risks over innovative ones.

Participant 3

Participant 3 explained that within budget constraints, they prioritise the scenario with the best performance regarding net heating demand and comfort levels of residents. According to them, energy labels are still relevant for determining rent increases, but they pay less attention to it. Since their portfolio already meets the required standards, they focus on sensible improvements that go beyond minimum requirements.

6. The preferences were incorporated in an effective manner

Participant 1

Participant 1 found it interesting that the A2 emerged as the best alternative compared to the chosen renovation alternative A4 with a Heat Pump based on the current preferences. They noted that selecting A2 did not match with the policies in the past. However, in hindsight, considering current preferences, different choices might have been made, such as opting out of heat pumps and low-temperature heating. They described that they went along with Heat Pump because there was no heat network and the electricity grid was congested. They used the transformer in the nearby new construction complex. These solutions thus can only come by assessing local context, which might be challenging to incorporate in such a framework.

The participant emphasised that only feasible options must be incorporated to provide good advice. Even though the project might start with a vague idea and become clearer as the project progresses, it is essential to be critical about your recommendation.

Consequently, the participant expressed their concerns regarding the decision framework. They suggested that risk assessment should be an active part of the framework to exclude further solutions before considering them for decision-making. In this way, the solutions with unrealistic expectations will be eliminated. Nevertheless, the participant also appreciated the LTH-ready filtering of the solutions done in step 4, but stressed making it more explicit to avoid giving false advice.

Participant 2

They emphasised that the framework's preference elicitation and ranking approach gives a scientific touch to decision-making, which could be valuable as a foundational element. The participant acknowledged that they had filled out the preferences based on the current policy while comparing them with the old policy. They also highlighted a gap between policy recommendation and their personal preferences. For instance, they were not fully supportive of achieving label B but recognised it was a regulatory requirement they had to follow for a long time.

Participant 2 found the pairwise comparison interesting and suggested that project leaders could fill in based on baseline policy and send this to the project team in advance. During the first kick-off meeting, various team members could fill out the form based on their social or technical expertise and then compare the results with the baseline policy. This comparison could reveal discrepancies or agreements with policy, leading to substantial and informed discussions. They noted that strategies often relied on gut feelings, and this method could encourage a more thorough and meaningful debate.

Participant 3

Participant 3 noted that the chosen scenario would align with policy outcomes if preferences were purely policy-driven. They admitted that they factored in their own preferences and advice, which might lead to slightly different outcomes, but they recognised the validity of the difference between renovation alternatives A2 and A4 from their experience. They agreed that the framework performed well.

Participant 4

The participant emphasised that sometimes actions are based on intuition, but there is a need for more substantiated decisions. Along those lines, the participant appreciated that the framework justified certain preferences, such as the growing importance of insulation standards. They agreed with Participant 3 that the framework provides a scientific foundation for decision-making, thus moving towards logical reasoning-based decision-making.

7. Do you agree with the proposed solutions after incorporating preferences?

Participant 1

The participant mentioned that the ranking is appropriate from the perspective of LT readiness. However, if other parameters, for example, the availability of space for installing PVT collectors, the ranking would change. They also noted that all the solutions proposed by the framework could work technically and theoretically. However, many would not be feasible in practice since the renovations were to happen in an occupied building.

Participant 2

Participant 2 found the definition of "LT-Ready" interesting. They compared this to their understanding of making homes "district heating ready", where everything is prepared except the actual connection to the network, which could take many years. They emphasised that to be truly ready, all internal installations must also be prepared, resulting in extensive measures.

However, financial considerations often prevent the immediate implementation of LT-ready measures for all homes. To solve this, the participant suggested a phased approach focusing on the building envelope, which is often a no-regret measure. The participant acknowledges that most departments do not have funds to make all homes LT-ready. Thus, the renovation scenarios end up being a mix of different measures. They also stressed that current heat pump technology keeps evolving; thus, they recommended investing in no-regret measures first.

The participant agreed to the ranking system, although suggesting incorporating a practical perspective. For instance, balanced ventilation is not feasible in practice because the houses would have to vacate. They suggested to include the feasibility of the solutions while developing the scenarios.

The participant also mentioned the current issues with the heating networks and their associated uncertainty. The participant suggests proceeding with making the houses ready for lower temperature heating, regardless of the Heat pump or district heating.

Participant 3

Participant 3 was not present

Participant 4

Participant 4 mentioned that the optimal solutions address almost everything and appreciated the airtightness measure included in the solutions. However, they noted that it is challenging to implement all measures. Additionally, from a sustainability and material efficiency point of view, replacing existing functional radiators is counter-productive. Nevertheless, the participants agreed that they might have to be replaced when it is absolutely necessary, especially in older buildings where they are due. Given the higher turnover rate in the case study complex, this can be done during the tenant's transition.

The participant also emphasised that some renovation solutions work in theory but might not be feasible in practice. Again, focusing on the non-feasibility of a balanced ventilation system due to the lack of space in the case study apartments.

Question round 4

8. Is this framework helpful for your next project

Participant 1

Participant 1 had nothing to add. They mentioned that they are involved in most steps except for making the final decision, as they only provide advice up to that point. They believe that, overall, they handle things quite well.

Participant 2

Participant 2 expressed that, in their opinion, there is a strong alignment with the discussed framework. They believe it would be natural to look at how this framework can improve their process. Reflecting on their experience with other areas, they noted there is still much to gain from such a framework. Agreeing with Participant 1, they felt that their current approach with the energy transition consultants is ahead of the curve in how it is implemented, and it works well, making it quite interesting.

Participant 3

Participant 3 was not present

Participant 4

Participant 4 emphasised the importance of ranking and considered it essential for the management team to reach well-considered decisions. They believe that this process can significantly contribute to developing good scenarios that everyone understands and agrees upon. They also mentioned the relevance of matching policies with intended goals, suggesting that such an approach is beneficial. Reflecting on past projects, they noted that many steps have already been taken, and because they aim for a certain insulation standard, they often end up with similar measures. They mentioned that while the framework might not immediately add value to their current scenarios, the process of reaching decisions is highly interesting.

9. What changes do you suggest to make the framework usable for your future project?

Participant 1

Participant 1 proposed reordering the initial steps. They suggested that steps one and two should be switched because projects typically start with policy development, followed by defining wishes, requirements, and a program. Only after these steps should the technical inventory and data collection for the specific project occur. They agreed with this reordering and found it aligns well with their experience in a corporate setting, where work follows policy development.

Participant 2

Participant 2 suggested that there might be a need for an additional step after step 9, where scenarios are tested in practice and then reassessed. They wondered how to handle changes that occur when implementing scenarios and whether it would necessitate revisiting the initial steps, creating a feedback loop. They believe this could serve as a backbone for building a robust process.

Participant 3

Participant 3 was not present

Participant 4

Participant 4 agreed with Participant 1's suggestion to reverse the steps and highlighted the importance of considering various policies and factors. They pointed out the need to filter out what can be realistically included in the projects and what requires special attention. They mentioned the impact of specific issues like flora and fauna regulations, which can significantly affect certain measures. This filtering process is essential to address practical challenges in project implementation.