ActNow!

Report on Identification of most Efficient Energy Efficiency Measure (O 3.3)

Group of Actvity 3.3

ACTION FOR ENERGY EFFICIENCY IN BALTIC CITIES
ACT NOW!

Interreg Baltic Sea Region

EUROPEAN UNION
EUROPEAN REGIONAL DEVELOPMENT FUND

EUSBSR
EU STRATEGY FOR THE BALTIC SEA REGION

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1. Introduction

In the Interreg Baltic Sea Region (BSR) Program Project Act Now! (Action for Energy Efficiency in Baltic Cities), participating municipalities are asked to develop own project ideas for improving the energy efficiency in their respective public building stocks. Building on previous activities in the project, e.g. the customised capacity building schemes (GoA 2.3) and data from energy management systems (EMS, GoA 3.2), each of the municipalities selected an actual energy saving measure that suits its specific needs and capacities, and developed it further during the project in terms of an financial feasibility study (GoA 3.4).

Subject to this GoA 3.3 was the decision-making process of selecting these energy efficiency measures. With energy efficiency in the building sector being a vast field, where efficiency gains can potentially harvested at numerous points at numerous scale, making a robust and accountable decision in terms of the most effective energy efficiency measure can be a complex task.

As a practical exercise, the municipalities in the project were asked to discuss different options in their respective LEEGs (Local Energy Efficiency Work Groups), aided by their coaching expert partners. This way, they should learn to identify and compare different energy efficiency potentials and come to a decision, which one should be implemented with more priority.

This report documents both, the process and the results in each municipality.

2. Overall approach

Given the diversity of the nine municipalities and tandems in the project, applying a predefined method of decision-making to all cases was considered not suitable. With different local and historic circumstances, buildings, levels of experience, and stakeholders involved, it was evident that the actual decision process needs to be shaped by the ones most immediately involved: the municipalities, the LEEGs and their coaching expert partners.

In order to assist the local process, and to document and aggregate the process and results, a questionnaire was developed (see

Appendix A – Questionnaire). It was developed with the following guiding principles:

- **Suggest targets and criteria**: The judgement whether an energy efficiency measure is "effective" or not, needs to be made in reference to a set of targets and criteria. Any measure to be seriously considered for implementation must address the strategic targets of the given administration. The questionnaire suggests to be aware of three types of targets:
    - **Main targets** are critical for the success of the activities in and therefore must be addressed by the energy efficiency measures.
    - **Secondary targets** are desirable, but not critical for the success of the activities.
    - In some cases, being aware of **non-targets** might help avoiding confusion. These may appear desirable, but are, for some particular reason, explicitly not pursued.

  While addressing at least one strategic target of the municipality is a minimum requirement for any activity, criteria are required to make a robust and accountable comparison between options. Since "effectivity" is a broad term and needs to be further specified, the questionnaire suggests different categories of criteria:

    - **Ecology** (Examples: CO_2 savings, air quality improvement, noise emission reduction, healthy housing conditions…)
    - **Economy** (Examples: necessary investment, energy cost savings, payoff time, possibility of funding aids…)
    - **Technical** (Examples: availability, reliability, applicable to building stock, innovation level…)
    - **Legal & Administration** (Examples: regulatory hurdles, procurement rules, administrative approval process, consistence to local policy…)
    - **Society** (Examples: co-operation with local stakeholders, public approval of activities, improved quality of life, good example for citizens, symbolic value…)
    - Others

  Assuming that the criteria might be applied with different weighting, respondents were asked to assess the importance of the selected criteria:

    - on a three-stepped scale: critical, important, desirable,
    - or if it is an exclusion criterion that must not be fulfilled.

- **Suggest a stringent process**: While shaping the actual decision-making process was left to each tandem and LEEG, the questionnaire suggests a minimum set of aspects to ensure a stringent process in line with the Act Now! Project:
    - **Baseline**: Respondents were asked to describe the baseline which they started the decision-making process from. In the best case, it should be rooted in provious steps in the Act Now! project, such as the capacity self-assessment or energy management data.
    - **Usage of targets and criteria**: Respondents were asked to justify/explain their decisions in reference to the stated targets and criteria (see above).
    - **Alternatives**: Accordingly, respondents were asked to name alternative measures that were in closer consideration and to explain, why they were deemed less effective.
    - **Difficulties**: Respondents were asked to report difficulties experienced during the decision-making process.

3. Main Observations

While the main result of this GoA – the selected energy efficiency measures – will be processed in GoA 3.4 by exploring their financing opportunities, this section provides a brief overview over the observations extracted from the questionnaire's responses.

- **Diversity of projects:** The energy efficiency measures selected by the responding municipalities cover a relatively wide range in technical scale and cost. On the lower end of the scale are measures addressing particular installations in particular buildings. Examples are:
    - Installation of energy consumption and in-door air quality controlling and monitoring systems into municipal centre, two schools and a kindergarten. (Elva, Estonia)
    - Replacement of town hall's ventilation system including ground-water-based cooling and heat recovery. (Sievi, Finland)
    - Replacement of town hall's ventilation system including ground-water-based cooling and heat recovery. (Gulbene, Latvia)

  Other municipalities aim at scalability, setting up modernisation programmes to be applied to multiple buildings with partly open development in the future. Examples are:
    - Public buildings modernization to increase their energy efficiency, prepared by: energy audits and definition of scope as well as ESCO/EnPC procurement. Target: Up to 8 public buildings. (Silute, Lithuania)
    - Thermal modernization of educational facilities in connection with the energy management system - 1-2 buildings per year. (Gdynia, Poland)
    - Energy retrofitting of private single-family homes (Sonderborg, Denmark)

  The project at the upper end of technical scale aims at the modernisation of an entire urban neighbourhood:
    - Analysis and concept development for a climate friendly neighbourhood including 56 buildings (Bremerhaven, Germany)

- **Targets:** Municipalities focussing on public buildings mostly aim at energy cost saving and healthy indoor environments as primary targets. These immediately tangible results seem to have more priority rather than climate impact. Municipalities aiming at the private sector (Sonderborg, Bremerhaven) have more emphasis on the latter. As a rule of thumb, municipalities with more extensive previous experience and a more elaborate action plan already existing tend to have more elaborate and more specifically stated targets.

- **Criteria**: While the responding municipalities always acknowledged GHG reduction and climate protection as decision criteria, these are by far not the only important aspects.
    - **Ecology**: Besides the obvious criterion of GHG reduction, **healthy working and living conditions** as well as **air quality** were mentioned regularly as criteria. Multiple respondents ranked these immediately tangible effects even higher than the climate impact of the measure.
    - **Economy**: Particularly in cases where public buildings are addressed, **cost saving** is the primary objective of the measure selected, often ranking even higher than the climate protection aspect. Also, short investment pay-off times and availability of funding and support were mentioned regularly.

- **Technical**: Respondents largely focused on “pragmatic” criteria such as **availability** and **reliability** rather than innovation level or smartness.
- **Legal & Administration**: **Compliance** with local policy and national legislation were commonly taken into account, while procurement regulation was another aspect mentioned repeatedly.
- **Society**: Among the most commonly mentioned social aspects are **local stakeholder involvement**, improved **quality of life**, the **exemplary character** towards citizens and a positive, green **image** of the municipality.

- **Process**: Most respondents reported a **stringent decision-making process** in the LEEG and/or tandem, where a number of options were discussed in regard of different criteria, also utilising audits and monitoring data. However, complaints about regulatory obstacles and interference with higher-level administration disturbing a clear process were also reported.

- **Alternatives**: If alternative options that were taken into consideration were reported, they were always of the same or lesser scale than the actually selected energy efficiency measure. This indicates that the responding municipalities consistently tried to implement the largest scale project at their given situation and capabilities.

- **Difficulties**: Only few respondents reported difficulties. These were mostly related to financial restrictions or investment risk, shaping the scope of the possible during the decision-making process.

4. Conclusions

Overall, the responding municipalities proved that they succeeded in making a robust and accountable selection of energy efficiency measures, in compliance with the local policy and based on targets and criteria. Thereby, the selected projects of diverse character, indicating that each selection was made according to the local circumstances and capabilities.

Especially with the public building stock in mind, more immediate impacts such as energy cost saving as well as health and air-quality seem to be the predominant motivation for energy efficiency. The climate and environment aspect are throughout included as target and/or criterion, however not always first and foremost. Apart from this, the municipalities proved to be aware of a broad range of criteria.

Based on the observations reported here, the guideline (GoA 5.1) and web-based learning tool (GoA 5.3) to be compiled later during the Act Now! project will include guidance how to make a criteria-based decision building on the local policy in a robust and accountable way.

Appendix A – Questionnaire

GoA 3.3 – Questionnaire

This questionnaire is part of GoA 3.3 "Identification of potential for energy saving and identification of most effective measures". In GoA 3.3, each tandem shall identify the "most effective and, under the scope of a cost-benefit analysis most useful energy efficiency measures" (project application). The identified measure will then be further developed as a pilot investment case in GoA 3.4.

The aim of this questionnaire is to document the **process** and the **results** of identifying the energy efficiency measure, that later will be the pilot investment case. It seeks to aggregate all necessary information for the final report as well as the web-based training tool (GoA 5.3) in a comparable way, but still being open for the differences in each individual case.

This questionnaire needs to be answered by **each tandem** until **August 31st 2019** and delivered to r.kajimura@unendlich-viel-energie.de.

Should you have any questions regarding this questionnaire, please contact:

Ryotaro Kajimura
Renewable Energies Agency (PP3)
+49 30 200 535 57
r.kajimura@unendlich-viel-energie.de

1. About the tandem

Name of Municipality

Name of coaching expert partner:

2. Baseline

Please briefly describe the baseline, you started the decision-making process from. What were the previous steps taken before considering different energy efficiency measures (e.g. self-assessment, SWOT analysis, energy monitoring)? What kind of data and information was available at that time (e.g. hourly energy consumption data)? What did you find out that affected your decision-making process?

3. Targets

Any decision-making process depends on the targets it is working towards. These may differ from tandem to tandem due to the local circumstances. Please specify the targets you want to achieve by implementing energy efficiency measures in your tandem municipality (e.g. climate protection, cost saving, energy independence, fostering local economy etc.).

Main targets

Please specify the targets, that are critical for the success of the activities in your tandem municipality and therefore must be addressed by the energy efficiency measures you will be selecting.

1.
2.
3.

Please provide a brief explanation why these targets are mandatory for your activities.

Appendix B - Answers to Questionnaire

GoA 3.3 – Questionnaire

This questionnaire is part of GoA 3.3 "Identification of potential for energy saving and identification of most effective measures". In GoA 3.3, each tandem shall identify the "most effective and, under the scope of a cost-benefit analysis most useful energy efficiency measures" (project application). The identified measure will then be further developed as a pilot investment case in GoA 3.4.

The aim of this questionnaire is to document the **process** and the **results** of identifying the energy efficiency measure, that later will be the pilot investment case. It seeks to aggregate all necessary information for the final report as well as the web-based training tool (GoA 5.3) in a comparable way, but still being open for the differences in each individual case.

This questionnaire needs to be answered by **each tandem** until **August 31st 2019** and delivered to r.kajimura@unendlich-viel-energie.de.

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1. About the tandem

Name of Municipality

Bremerhaven

Name of coaching expert partner:

acting as coaching expert: Udo Schmermer KlimaKommunal

2. Baseline

Please briefly describe the baseline, you started the decision-making process from. What were the previous steps taken before considering different energy efficiency measures (e.g. self-assessment, SWOT analysis, energy monitoring)? What kind of data and information was available at that time (e.g. hourly energy consumption data)? What did you find out that affected your decision-making process?

Baseline: Bremerhaven Municipality set a energy saving certification since 2006. The applied energy efficiency management system is called European Energy Award (EEA, based on ISO 50000). The EEA works with a municpal Energy Team (LEEG) which develops an energy policy work programme/prioritised work catalogue EPAP (SEAP) every four years. The whole management process is supervised by an external expert and the EPAP is certfied by an external auditor.

previous steps: The for Act Now prioritized measure x was the concept study "Klimameile Alte Bürger /Climate Mile Alte Bürger - An Energy Efficient Quarter Renovation Concept"

data available / kind of information: heat offtake potential, solar potential, house ownership conditions, demographic data, carbon reduction potential in tons in private housings and enterprises in bremerhaven

affecting decision: The Municiplaity committed itself to reduce its carbon dioxyd emissions. Without private households and private companies, no CO2 savings targets of a nominal size can be achieved by the municipality. Because the municipal regulatory intervention in these savings potentials goes virtually against zero, the path to this goal leads only via incentives and promotion of personal initiative/participation. That has to be described an planned in a written concept.

3. Targets

Any decision-making process depends on the targets it is working towards. These may differ from tandem to tandem due to the local circumstances. Please specify the targets you want to achieve by implementing energy efficiency measures in your tandem municipality (e.g. climate protection, cost saving, energy independence, fostering local economy etc.).

Main targets

Please specify the targets, that are critical for the success of the activities in your tandem municipality and therefore must be addressed by the energy efficiency measures you will be selecting.

1. To foster the improvement of climate protection in the private existing building stock
2. Financially viable solutions must be found that enable low-threshold measures to be taken even with little financial input
3. The measure is expected to result in few long-term financial liabilities for the municipal budget

Please provide a brief explanation why these targets are mandatory for your activities.

Climate protection is a main objectiv of intended municipal policy. As identified in climate protection program KEP2020 residents are a main actor for energy saving and climate protection. Private hausholds have 81 kt carbon saving potential at all (mostly by measures for electricity and heat 73 kt CO2-saving potential, renovation measures in appartment buildings (3 kt), renovation of detached one-family houses / two-family houses / townhouses (2 kt), procurement of electricity saving devices (3kt). Financially viable solutions must be found to also give low-income earners and homeowners with weak financial strength due to low rental income a development perspective for a more energy saving lifestyle. Low-threshold measures to be taken even with little financial input or the splitting of a generous modernization approach into small, step-by-step expandable modernization modules, under the umbrella of a large overall concept, iare prefered. It is intended to keep investment less risky and the burden on the individual calculable. Against the background of a municipal budget heavily burdened with debts and an eminent investment backlog in the municipal infrastructure and the fact that the original task of a municipality must be to ensure the eternal existence of services of general interest (German Daseinsvorsorge), the measures for private investment must not give rise to any ongoing municipal obligations which are fulfilled at the expense of municipal services of general interest.

Secondary targets

In case you have identified other targets that are desirable, but not critical for the success of the activities in your tandem municipality, please specify them below.

1. to be Klimastadt / awareness, trust in municpal administration measures
2. local communal identification and a sense of community, trustfull local relationships
3. making energy transition on local level (everybody can act as a climate protector), capacity building

Please provide a brief explanation of the reasons why these targets are desirable but not critical for your activities.

energy efficiency in housing works without a label Klimastadt too, long term processes that can not be implemented on the spot

Non-targets (optional)

In case there were targets that you intendedly have decided not to pursue for a particular reason, please provide a brief description.

Bremerhaven is not focussing on specific technical solutions. We know that the quality of energy efficiency is also a result of consumers psychology and their economical decisions, not only a result of technical solutions.

4. Process outline

The process of identifying the most effective energy efficiency measure may differ from case to case, depending on factors like the structure of the local working group or the municipal administration. Please outline the most important steps of the process you have worked through in your tandem in order to identify the most effective energy efficiency measure.

- How did you proceed from the baseline described above? What were the main steps in the process?
- What were the main questions that were answered in each step?
- Did you include additional information or data in the respective step?
- Who was involved in each of the decision-making steps?
  (Examples: only the tandem, higher levels of administration, citizens)

*Your input shall include at least 3-4 steps. You are welcome to attach an additional visualisation (e.g. a flowchart) of the process to this questionnaire.

- LEEG discussed and agreed on most important fields of energy efficiency (second meeting 2018)

- from each prioritized field four measures had been preselected by tandem with high proirity and subsequently discussed in the LEEG.

- LEEG identified one most prio measure per field 2018 (Klimameile was one of them)

- LEEG in BHV consists of highest level of administration (members of the Magistrat / municipal authorities)

5. Decision criteria

Decision-making and the evaluation, how "effective" a particular energy-efficiency measure is, requires a set of criteria. For each category below, please name the criteria you applied to the options in your decision-making process, and specify how important each criterion was.
You are free to leave a category empty, if it does not apply to your case.

Ecology

(Examples: CO2 savings, air quality improvement, noise emission reduction, healthy housing conditions…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
CO2 saving	◉	○	○	○
CO2 neutral	○	◉	○	○
	○	○	○	○
	○	○	○	○
	○	○	○	○

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Economy

(Examples: necessary investment, energy cost savings, payoff time, possibility of funding aids…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
energy cost savings	◉	○	○	○
funding aids	○	◉	○	○
quality improvement	○	◉	○	○
Speculation decrease	○	○	◉	○
	○	○	○	○

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Technical

(Examples: availability, reliability, applicable to building stock, innovation level…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
applicable to building stock	◉	○	○	○
innovation level	○	◉	○	○
reliability, not experimental techno	○	○	◉	○
	○	○	○	○
capacity building	○	◉	○	○

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Legal & Administration

(Examples: regulatory hurdles, procurement rules, administrative approval process, consistence to local policy…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
consistence to local policy	◉	○	○	○
regulatory hurdles	○	◉	○	○
	○	○	○	○
	○	○	○	○
	○	○	○	○

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Society

(Examples: co-operation with local stakeholders, public approval of activities, improved quality of life, good example for citizens, symbolic value…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
co-operation with local stakeholde	◉	○	○	○
improved quality of life	○	◉	○	○
good example for citizens	◉	○	○	○
Image Klimastadt	○	◉	○	○
transferability to other local areas	◉	○	○	○

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Others (optional)

Please enter any criteria that you have applied in your decision-making process, but do not fit into the above categories.

Criterion	Importance			
	critical	important	desirable	exclusion criterion
capacity building process overall ir	○	◉	○	○
	○	○	○	○
	○	○	○	○
	○	○	○	○
	○	○	○	○

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Source of criteria

Please describe briefly, how you identified the criteria above.
(Examples: discussion in the local working group, consulted a guideline, advise from administration…)

We discussed all measures in the LEEG but certain less-known aspects of energy efficiency, the most strategic aspects in questions of implementation and new concepts and innovative approaches have been mostly the contribution of the external expert.

6. Identified energy efficiency measure

In this section, please provide a description of the energy efficiency measure, that you have evaluated as most effective and therefore will be subject to the pilot investment further processed in GoA 3.4.

What will be done?

Please briefly describe, what exactly will be done in the selected energy efficiency measure. Please also specify the scale of the measure by providing quantitative information (e.g. refurbished building area, capacity of heat supply system, expected investment volume…).

The project "Klimameile" will show, how in a quarter with a predominant share of buildings from the art deco epoche and with a very mixed ownership and tenant structure, the energy consumption of residents can be changed in such a way that in a long term the greenhouse gas emissions from households and entrepreneurs in this street tend towards zero. The "Alte Bürger" was identified as a suitable neighbourhood for this purpose because of the already proven openness of a good number of local residents and businesses to sustainable lifestyles. The project is structured in four steps. (1) energy saving potential analysis on a technical level by a first greenhouse gas and energy balance sheet for the quarter; target is the calculation and simulation of the reachable degree of a stand-alone energy supply for electricity and heat in all buildings (2) investigation of the energetic potential of selected buildings and energetic renovation concept for those 6-10 buildings by preparation of individual object related renovation concepts combined with advice for local property managements or owners, target is to trigger medium-term investment in the renovation of the building (3) intense participation of residents during the whole project by workshops for residents, installing a join in platform for residents (4) planning and organization of structures for the follow up implementation of a energetic renovation quarter management. The area includes 56 buildings housing alltogether 836 residents. The potentially available roof area for solar plants is 12,321 m2, equivalent to 2 GW/h solar energy. The potential heat requirement is in calculation and will be available in September 2019.

Energy saving effect

Pease quantify the expected energy savings by implementing this measure.

The energy saving potential is not known yet and the requested value will be a result of the project itself.

Investment costs

Pease quantify the expected costs necessary to implement this measure.

€ 170.000

Reasons for selection

Please explain, why you have decided to select this particular energy efficient measure as pilot investment candidate.

Which of the targets specified in section 2 does it address to which extent?

Improvements of climate protection in the private existing building stock will be shown and their financing will be well claculated in concept studie expertise. Financially viable solutions will be developed in a broad participation process to enable action even with a little financial input. Through the creation of local neighbourhood networks during the development of the concept study, communication structures with a long lasting effect are created for progressive investment.

Which of the criteria specified in section 4 does it fulfil?

do not understand this question. What are criteria of 4?

Optional: What additional advantages does the selected measure have, that are not represented by the targets and criteria?

Alternatives

Please name up to three alternative energy efficiency measures, that you took into closer consideration. In which way are they less appropriate for further development, compared to the energy efficiency measure you have actually selected?

As possible new measures for the EPAP, the LEEG has been discussed the:
- Provision of e-bikes for employees as a non-cash benefit
- Inclusion of solar energy use in ensemble protection of residential areas
- Determination of demand for bicycle parking facilities (also mobile)
- Completion and publication of a heat register
- Preparation of a climate protection sub-concept for buildings under administration of the municipal business development agency BIS

7. Difficulties

What kind of difficulties did you experience (if any) during the process of identifying the most effective energy efficiency measure? Why did they occur? How did they affect the process? How did you deal with the problem (solve, work around, ignore…)?

From the very beginning, we had made every effort to bring together representatives of the individual municipal institutions at the highest possible level. In fact, this proved to be an own goal. At the level of the department heads it was relatively easy to agree on appointments, whereas on the level of members of the Magistrat and directors it was almost impossible to find dates/time.

The biggest obstacle proved to be that any discussion of a measure was immediately placed under the restriction of financial viability. It was very difficult, if not impossible, in the divergence phase of the discussion to develop ideas, any conceivable and desirable measure could not be discussed. Restrictions should have been discussed in the following so called convergence phase instead of cutting off the creative phase.

It proved difficult to establish responsibilities as binding commitments.

Thank you!

GoA 3.3 – Questionnaire

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1. About the tandem

Name of Municipality

Elva Municipality

Name of coaching expert partner:

LETEK

2. Baseline

Please briefly describe the baseline, you started the decision-making process from. What were the previous steps taken before considering different energy efficiency measures (e.g. self-assessment, SWOT analysis, energy monitoring)? What kind of data and information was available at that time (e.g. hourly energy consumption data)? What did you find out that affected your decision-making process?

The main goal was to get an overview of the energy consumption in the municipality and possibly after that to improve energy efficiency in publicly-owned buildings in the municipality. In cooperation with the LEEG, local district heating company and municipal real estate management company preliminary technical data were collected and analysed, SWOT analyses was carried out. Information about the energy consumption of each building was available. Consultations were hold with the users of the building to take into account their expectations and complaints about the present situation. The positive thing was, that all buildings had been modernised and refurbished, some of them more, some less. And they were all connected to the local district heating system, which allowed to get detailed data on energy consumption and the price paid.

3. Targets

Any decision-making process depends on the targets it is working towards. These may differ from tandem to tandem due to the local circumstances. Please specify the targets you want to achieve by implementing energy efficiency measures in your tandem municipality (e.g. climate protection, cost saving, energy independence, fostering local economy etc.).

Main targets

Please specify the targets, that are critical for the success of the activities in your tandem municipality and therefore must be addressed by the energy efficiency measures you will be selecting.

1. cost saving
2. quality and healthy in-door climate
3. green attitude

Please provide a brief explanation why these targets are mandatory for your activities.

As we are working with public buildings, saving public money is a very important issue. In three out of the four selected buildings children spend most of their days and quality and healthy in-door climate is essential for their health and mental abilities. The same goes for advertising green attitude among the young generation. Public buildings are open environments - investments made there can be seen and followed by a wider public and has a strong educational and flagship effect.

Secondary targets

In case you have identified other targets that are desirable, but not critical for the success of the activities in your tandem municipality, please specify them below.

1. enhanced knowledge on energy efficiency
2. attractive living and working environment
3. political capital for local administration

Please provide a brief explanation of the reasons why these targets are desirable but not critical for your activities.

Elva is an attractive living environment and people are willing to have their homes here. Enhanced knowledge on energy efficiency and energy saving is a personal gain for each inhabitant. Each municipal administration needs positive results of their period at power, and local people like to see that investments are made for common benefit. The present project fit perfectly into the line of previous investments made to support energy efficiency in the buildings, including the housing sector

Non-targets (optional)

In case there were targets that you intendedly have decided not to pursue for a particular reason, please provide a brief description.

After discussions we decided to exclude the buildings not connected to the district heating system.

4. Process outline

The process of identifying the most effective energy efficiency measure may differ from case to case, depending on factors like the structure of the local working group or the municipal administration. Please outline the most important steps of the process you have worked through in your tandem in order to identify the most effective energy efficiency measure.

- How did you proceed from the baseline described above? What were the main steps in the process?
- What were the main questions that were answered in each step?
- Did you include additional information or data in the respective step?
- Who was involved in each of the decision-making steps?
  (Examples: only the tandem, higher levels of administration, citizens)

*Your input shall include at least 3-4 steps. You are welcome to attach an additional visualisation (e.g. a flowchart) of the process to this questionnaire.

After the selection of potential buildings and collecting available technical data, the set of five (incl. one outside the town) was selected and detailed energy audits were carried out. All buildings had been previously renovated, some of them insulated, the scope of work was different in different buildings but they all looked nice and refurbished from outside. However none of them allowed the possibility to control and monitor energy consumption and the quality of in-door air according to the modern standards. So the main goal was to find suitable equipment and software and specialists to install and run the system. Preliminary analyses of energy saving potential and approximate costs of available systems confirmed, that the project will pay back in a year or two. Convincing the building users and the owner of the real estate was not a problem due to previous activities in the municipality. The advantage of the project was a close cooperation of the tandem and strong support from the local municipality and the LEEG.

5. Decision criteria

Decision-making and the evaluation, how "effective" a particular energy-efficiency measure is, requires a set of criteria. For each category below, please name the criteria you applied to the options in your decision-making process, and specify how important each criterion was.
You are free to leave a category empty, if it does not apply to your case.

Ecology

(Examples: CO2 savings, air quality improvement, noise emission reduction, healthy housing conditions…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
fuel saving	☐	☐	☐	☐
air quality improvement	☐	☐	☐	☐
healthy in-door conditions	☑	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Economy

(Examples: necessary investment, energy cost savings, payoff time, possibility of funding aids…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
energy cost saving	◉	☐	☐	☐
short pay-off time	◉	☐	☐	☐
possibility of co-funding	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Technical

(Examples: availability, reliability, applicable to building stock, innovation level…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
smartness	●	☐	☐	☐
reliability	●	☐	☐	☐
user-friendliness	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Legal & Administration

(Examples: regulatory hurdles, procurement rules, administrative approval process, consistence to local policy…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
consistent to local energy policy	●	☐	☐	☐
important for local population	☐	☐	☐	☐
comliance with national legislation	●	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Society

(Examples: co-operation with local stakeholders, public approval of activities, improved quality of life, good example for citizens, symbolic value…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
involvement of local stakeholders	☐	☐	☐	☐
good example for inhabitants	☐	☐	☐	☐
educational value	☐	☐	☐	☐
improved quality of life	●	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Others (optional)

Please enter any criteria that you have applied in your decision-making process, but do not fit into the above categories.

Criterion	Importance			
	critical	important	desirable	exclusion criterion
political capital	☐	☐	☐	☐
publicity	☐	☐	☐	☐
visibility	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Source of criteria

Please describe briefly, how you identified the criteria above.
(Examples: discussion in the local working group, consulted a guideline, advise from administration…)

- discussions in LEEG, building users and municipal officers
- analyses of technical data and potential of the project

6. Identified energy efficiency measure

In this section, please provide a description of the energy efficiency measure, that you have evaluated as most effective and therefore will be subject to the pilot investment further processed in GoA 3.4.

What will be done?

Please briefly describe, what exactly will be done in the selected energy efficiency measure. Please also specify the scale of the measure by providing quantitative information (e.g. refurbished building area, capacity of heat supply system, expected investment volume…).

Installation of energy consumption and in-door air quality controlling and monitoring systems into municipal centre, two (+1) schools and a kindergarten. For that the following will be needed: At least 20 indoor climate loggers, stationary and non-stationary, battery powered and remotely readable. Parameters measured – temperature, CO, relative humidity, volatile organic components (could be an option).
1 ventilation controller, allowing remote control and monitoring of the ventilation

Energy saving effect

Pease quantify the expected energy savings by implementing this measure.

Around 300 MWh of district heating per year

Investment costs

Pease quantify the expected costs necessary to implement this measure.

About 35 000 during the project, more in the future

Reasons for selection

Please explain, why you have decided to select this particular energy efficient measure as pilot investment candidate.

Which of the targets specified in section 2 does it address to which extent?

All targets listed above will be addressed. Direct financial savings are most important. Technical criteria are very important to motivate user acceptance and usage.

Which of the criteria specified in section 4 does it fulfil?

Ecological criteria are important and will be met.

Optional: What additional advantages does the selected measure have, that are not represented by the targets and criteria?

Visibility and publicity are important to set a good example and attract the others to follow this.

Alternatives

Please name up to three alternative energy efficiency measures, that you took into closer consideration. In which way are they less appropriate for further development, compared to the energy efficiency measure you have actually selected?

Investment into a new ventilation system in the local municipality centre was discussed but skipped in this stage due to budgetary reasons but will obviously be implemented in future, and as soon as possible.

Investment into a third school house was not included, as quite a lot has been invested there already and due to demographic reasons, change in the use of part of the building may be needed.

No investments into the heating system, although discussed, will be made at this point, as it meets the present needs and expected energy saving will allow in connect new customers with the present capacity

7. Difficulties

What kind of difficulties did you experience (if any) during the process of identifying the most effective energy efficiency measure? Why did they occur? How did they affect the process? How did you deal with the problem (solve, work around, ignore…)?

Due to systematic improvement and refurbishment in Elva Rural Municipality and the decision to address only public buildings, there were no major problems with making the decisions and selecting the measures.

Thank you!

GoA 3.3 – Questionnaire

This questionnaire is part of GoA 3.3 "Identification of potential for energy saving and identification of most effective measures". In GoA 3.3, each tandem shall identify the "most effective and, under the scope of a cost-benefit analysis most useful energy efficiency measures" (project application). The identified measure will then be further developed as a pilot investment case in GoA 3.4.

The aim of this questionnaire is to document the **process** and the **results** of identifying the energy efficiency measure, that later will be the pilot investment case. It seeks to aggregate all necessary information for the final report as well as the web-based training tool (GoA 5.3) in a comparable way, but still being open for the differences in each individual case.

This questionnaire needs to be answered by **each tandem** until **August 31st 2019** and delivered to r.kajimura@unendlich-viel-energie.de.

Should you have any questions regarding this questionnaire, please contact:

Ryotaro Kajimura
Renewable Energies Agency (PP3)
+49 30 200 535 57
r.kajimura@unendlich-viel-energie.de

1. About the tandem

Name of Municipality

Sievi

Name of coaching expert partner:

Centria University of Applied Sciences

2. Baseline

Please briefly describe the baseline, you started the decision-making process from. What were the previous steps taken before considering different energy efficiency measures (e.g. self-assessment, SWOT analysis, energy monitoring)? What kind of data and information was available at that time (e.g. hourly energy consumption data)? What did you find out that affected your decision-making process?

The baseline was obtained by combining the results of the self-assessment tool, SWOT-analysis and energy consumption survey made to the Sievi municipality (data based on the year 2017) as well as the real needs in the municipality. Most of the energy efficiency investments are made because of the need to replace old systems that are at the end of their lifetime or are not efficient enough any more. The feedback from the building users (for example about the quality of air inside the buildings) as well as the consumption data are also factors that form the need.
The information available during the decision making process was the consumption data and technical data (in this case: the ventilation system in municipal hall, and municipality's street lighting) and the feedback from building users. Also the knowledge of the lack of spare parts and maintenance available for the systems affected the decision making process.

3. Targets

Any decision-making process depends on the targets it is working towards. These may differ from tandem to tandem due to the local circumstances. Please specify the targets you want to achieve by implementing energy efficiency measures in your tandem municipality (e.g. climate protection, cost saving, energy independence, fostering local economy etc.).

Main targets

Please specify the targets, that are critical for the success of the activities in your tandem municipality and therefore must be addressed by the energy efficiency measures you will be selecting.

1. Cost saving
2. Healthy housing conditions for building users
3. Environmental friendliness in municipality

Please provide a brief explanation why these targets are mandatory for your activities.

To justify the energy efficiency actions (investments, trainings etc.) for the top management and for the residents of the municipality the benefits have to be concrete (e.g. saved money). The second target is related to the investment of the new ventilation system in municipality hall. The feedbacks from users have been that the quality of air is not good enough in the building.
Environmental friendliness in investments is important to the municipality (for example the municipality actively changes the fossil based heating system in their

Secondary targets

In case you have identified other targets that are desirable, but not critical for the success of the activities in your tandem municipality, please specify them below.

1. "Rural" type environment
2. Local economy
3. Increase the knowledge in energy related affairs

Please provide a brief explanation of the reasons why these targets are desirable but not critical for your activities.

In Sievi's Municipality strategy it is written that Sievi is a rural municipality and that continues to be so in the future. Therefore it is important that the target and the energy efficiency actions made should not be inconsistency with it.
For the local economy, it is important that the energy sources come from the municipality area or near, since it not only enhances the economy but also brings jobs to the area.
Increase the knowledge, all the investments are announced in the local newspaper.

Non-targets (optional)

In case there were targets that you intendedly have decided not to pursue for a particular reason, please provide a brief description.

Supporting the use and production of renewable energy. Municipality has zoned land for three different wind farms.

4. Process outline

The process of identifying the most effective energy efficiency measure may differ from case to case, depending on factors like the structure of the local working group or the municipal administration. Please outline the most important steps of the process you have worked through in your tandem in order to identify the most effective energy efficiency measure.

- How did you proceed from the baseline described above? What were the main steps in the process?
- What were the main questions that were answered in each step?
- Did you include additional information or data in the respective step?
- Who was involved in each of the decision-making steps?
  (Examples: only the tandem, higher levels of administration, citizens)

*Your input shall include at least 3-4 steps. You are welcome to attach an additional visualisation (e.g. a flowchart) of the process to this questionnaire.

First it was figured out what are the next important energy efficiency actions that the municipality should do. The actions were either some most do actions/investments that have to be done because of currently used technology is at the end of its life-time, or purely actions that makes the energy efficiency work easier in municipality. Three different actions were found (street lights, the air ventilation renovation in the municipality hall, and purchase of EMS software) that are current.
Second step was to summarize why the action/investment is important. Here the questions such as why it needs to be done (old technology, the problems of finding spare parts and maintenance, makes the energy efficiency work easier, legislation,...), when it needs to be done (deadlines in legislation, the end of the life-time of the system,...) and what are the benefits of it (saved energy and costs, better building air quality, upgrading the current system...) were answered.
Third step was to approximate the costs of investments, payoff time etc. Here the current consumption data etc. were considered.
Forth step the was to prioritize the different actions/investments to find the most important action/investment. Here questions such as what are the targets and criteria the action/investment will fulfill, is one action more critical in than other, and also which action/investment would benefit most of the existence of the Act Now project and the tandem, were asked and answered.

All the steps were made by the tandem.

5. Decision criteria

Decision-making and the evaluation, how "effective" a particular energy-efficiency measure is, requires a set of criteria. For each category below, please name the criteria you applied to the options in your decision-making process, and specify how important each criterion was.
You are free to leave a category empty, if it does not apply to your case.

Ecology

(Examples: CO2 savings, air quality improvement, noise emission reduction, healthy housing conditions…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
CO2 saving	☐	☐	☐	☐
Healthy housing conditions	☐	☐	☐	☐
Good air quality	☑	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Economy

(Examples: necessary investment, energy cost savings, payoff time, possibility of funding aids…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
Short payoff time	◉	☐	☐	☐
Energy cost saving	◉	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Technical

(Examples: availability, reliability, applicable to building stock, innovation level…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
Long life time	●	☐	☐	☐
Easiness	●	☐	☐	☐
Reliability	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Legal & Administration

(Examples: regulatory hurdles, procurement rules, administrative approval process, consistence to local policy…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
Consistence to local policy	●	☐	☐	☐
Systems required by the legislatior	☐	☐	☐	☐
	●	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Society

(Examples: co-operation with local stakeholders, public approval of activities, improved quality of life, good example for citizens, symbolic value…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
Symbolic value	☐	☐	☐	☐
Example to the residents	☐	☐	☐	☐
Co-operation with local stakeholde	☐	☐	☐	☐
Improvement of quality of life	●	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Others (optional)

Please enter any criteria that you have applied in your decision-making process, but do not fit into the above categories.

Criterion	Importance			
	critical	important	desirable	exclusion criterion
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Source of criteria

Please describe briefly, how you identified the criteria above.
(Examples: discussion in the local working group, consulted a guideline, advise from administration…)

-Discussions with technical staff in municipality
-Feedback received by the users

6. Identified energy efficiency measure

In this section, please provide a description of the energy efficiency measure, that you have evaluated as most effective and therefore will be subject to the pilot investment further processed in GoA 3.4.

What will be done?

Please briefly describe, what exactly will be done in the selected energy efficiency measure. Please also specify the scale of the measure by providing quantitative information (e.g. refurbished building area, capacity of heat supply system, expected investment volume…).

Ventilation of municipality hall.
In the same building is also municipality's dental heath care (and temporary child heath clinic and heath care clinic). The ventilation system in the building is more than 30 years old and therefore not energy efficient and at the same time soon at the end of its life-time.
Also the cooling is now only in dental heath care part of the building and it is arranged with electrical heat pumps.

Energy saving effect

Pease quantify the expected energy savings by implementing this measure.

District heating 106 MWh and electric 22 MWh

Investment costs

Pease quantify the expected costs necessary to implement this measure.

150 000 €

Reasons for selection

Please explain, why you have decided to select this particular energy efficient measure as pilot investment candidate.

Which of the targets specified in section 2 does it address to which extent?

All of the main targets, since the action will decrease the costs with the more efficient ventilation system and improve the quality of air in the building. The third target is willed by the replacing the heat pumps working with electricity to water heat pumps.

Which of the criteria specified in section 4 does it fulfil?

The ecological criteria are all fulfilled with this action. The energy cost saving is also fulfilled since the new system will be more efficient. The technical criteria are most probably also fulfilled since the technology has warranty, maintenance and spare parts are available.

Optional: What additional advantages does the selected measure have, that are not represented by the targets and criteria?

-

Alternatives

Please name up to three alternative energy efficiency measures, that you took into closer consideration. In which way are they less appropriate for further development, compared to the energy efficiency measure you have actually selected?

Other energy efficiency measures were:
-Replacing the current mercury lamb street lighting to LED lighting. Although, this investment needs to be done (no spare parts available) and has a deadline do the legislation reasons, it was thought that since it is not related to the energy efficiency of buildings it wouldn't fit the Act Now project as well as the selected investment. However, this measurement will be done as soon as possible.

-Purchasing the EMS software. It was difficult to evaluate the concrete benefits (saved costs and energy) from this investment since those benefits will be visible after longer time. Also this is not a critical measurement and it would not benefit from the "extra help" coming from the expert partner as much as the selected

7. Difficulties

What kind of difficulties did you experience (if any) during the process of identifying the most effective energy efficiency measure? Why did they occur? How did they affect the process? How did you deal with the problem (solve, work around, ignore…)?

All the considered measurements were important to the municipality and it was difficult to select the one for GoA 3.4. However, after the evaluation of all actions/investments the elimination of other measurements could be done.

Thank you!

GoA 3.3 – Questionnaire

This questionnaire is part of GoA 3.3 "Identification of potential for energy saving and identification of most effective measures". In GoA 3.3, each tandem shall identify the "most effective and, under the scope of a cost-benefit analysis most useful energy efficiency measures" (project application). The identified measure will then be further developed as a pilot investment case in GoA 3.4.

The aim of this questionnaire is to document the **process** and the **results** of identifying the energy efficiency measure, that later will be the pilot investment case. It seeks to aggregate all necessary information for the final report as well as the web-based training tool (GoA 5.3) in a comparable way, but still being open for the differences in each individual case.

This questionnaire needs to be answered by **each tandem** until **August 31st 2019** and delivered to r.kajimura@unendlich-viel-energie.de.

Should you have any questions regarding this questionnaire, please contact:

Ryotaro Kajimura
Renewable Energies Agency (PP3)
+49 30 200 535 57
r.kajimura@unendlich-viel-energie.de

1. About the tandem

Name of Municipality

Gulbene Municipality

Name of coaching expert partner:

Riga Technical University

2. Baseline

Please briefly describe the baseline, you started the decision-making process from. What were the previous steps taken before considering different energy efficiency measures (e.g. self-assessment, SWOT analysis, energy monitoring)? What kind of data and information was available at that time (e.g. hourly energy consumption data)? What did you find out that affected your decision-making process?

The focused building segment to strengthening EE measures and EnM systems implementation in Gulbene Municipality includes buildings with different use such as schools, kindergartens, administrative buildings, museums, libraries etc. The selection of these buildings is oriented towards those ones where a yearly activity is guaranteed on daily basis in terms of both municipal employees and visitors.
At the moment energy management practices differs from building to building not having a customized, harmonized and standardized EnM system for the Municipality and Parishes properly framed within a SEAP. Energy consumption monitoring is mainly carried out directly in buildings. The energy manager of the building is responsible to report the energy consumption monitored after the implementation of any renovation project.
Generally the data metering needed for a proper Energy management are not available for all buildings. The most common installed systems and thus metered parameters are: room temperature control systems, and automatic control systems for efficient use of the heat consumption (e.g. in schools there is a lower need of hot water during summer time).
Moreover the main mechanism supporting Gulbene Municipality towards the transition to more tailored and concrete EE measure is the voluntary agreement for

3. Targets

Any decision-making process depends on the targets it is working towards. These may differ from tandem to tandem due to the local circumstances. Please specify the targets you want to achieve by implementing energy efficiency measures in your tandem municipality (e.g. climate protection, cost saving, energy independence, fostering local economy etc.).

Main targets

Please specify the targets, that are critical for the success of the activities in your tandem municipality and therefore must be addressed by the energy efficiency measures you will be selecting.

1. SEAP implementation
2. Cost and CO2 savings
3. Sharing the local government experience in implementing renewable re

Please provide a brief explanation why these targets are mandatory for your activities.

The SEAP implementation has been assumed has one of the key priorities towards a proper definition of EE pathways. The selection of best case practice, like the renovation of the municipal building with solar energy technical solutions, will be relevant within the Energy Management Systems approach in line with the SEAP and in terms of encouraging other public and private persons to estimate the using of renewable recourses solution.
The cost saving is the main and best argument for new activities in energy efficiency

Secondary targets

In case you have identified other targets that are desirable, but not critical for the success of the activities in your tandem municipality, please specify them below.

1. Improved efficiency of the pilot measure system
2. Implement system that allows model different scenarios of efficient ener
3. Propose innovative solutions and rise awareness on use of renewable e

Please provide a brief explanation of the reasons why these targets are desirable but not critical for your activities.

These targets have been considered as secondary because mainly related to the pilot measure implemented, namely solar PV panel installed on the roof of the headquarter building of Gulbene Municipality.
The project idea activities focuses on provide almost zero energy building eventually including the possibility to produce a surplus of electrical energy on real time demand needs. Nevertheless, a prosumer concept is not economically viable at the moment.

Non-targets (optional)

In case there were targets that you intendedly have decided not to pursue for a particular reason, please provide a brief description.

4. Process outline

The process of identifying the most effective energy efficiency measure may differ from case to case, depending on factors like the structure of the local working group or the municipal administration. Please outline the most important steps of the process you have worked through in your tandem in order to identify the most effective energy efficiency measure.

- How did you proceed from the baseline described above? What were the main steps in the process?
- What were the main questions that were answered in each step?
- Did you include additional information or data in the respective step?
- Who was involved in each of the decision-making steps?
  (Examples: only the tandem, higher levels of administration, citizens)

*Your input shall include at least 3-4 steps. You are welcome to attach an additional visualisation (e.g. a flowchart) of the process to this questionnaire.

- How did you proceed from the baseline described above? What were the main steps in the process?
The preliminary steps was the definition of an inventory of all the public buildings in order to create a database identifying the major lacks in terms of steps necessary to implement further EE strategies and a proper EnMS.
Moreover this step was essential for the further developed of the SEAP considered one of the main outcome from the CBS implementation.

- What were the main questions that were answered in each step?
The main questions were mostly addressed on how to find appropriate and tailored EE solutions in the municipality to be implemented in a robust EnMS. Secondly, it was important to propose methods, tools and instruments for prioritization of key actions. The implementation of the methodology to assess the local EE needs in the Municipalities implemented in an integrated multi-criteria method and SWOT analysis was essential.

- Did you include additional information or data in the respective step?
During the inventory phase for the building classifications a specific data sheet was provided by the coaching partner in order to facilitate the further SEAP. The selection of the specific pilot was made in cooperation with the coaching partner in order to optimally find a representative and consistent pilot

- Who was involved in each of the decision-making steps? (Examples: only the tandem, higher levels of administration, citizens)
At this stage the decision making process was involving the municipality management staff, the LEEG and the coaching partner. The results form the pilot will be a key to be used to rise awareness about EE both in municipality and with citizens. These two targets groups will be mainly involved in the key action defined for the CBS.

5. Decision criteria

Decision-making and the evaluation, how "effective" a particular energy-efficiency measure is, requires a set of criteria. For each category below, please name the criteria you applied to the options in your decision-making process, and specify how important each criterion was.
You are free to leave a category empty, if it does not apply to your case.

Ecology

(Examples: CO2 savings, air quality improvement, noise emission reduction, healthy housing conditions…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
CO2 savings	☐	☐	☐	☐
Air quality improvement	☐	☐	☐	☐
	☑	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Economy

(Examples: necessary investment, energy cost savings, payoff time, possibility of funding aids…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
Necessary investment	◉	☐	☐	☐
Energy cost savings	◉	☐	☐	☐
Possibility of funding aids	☐	☐	☐	☐
Benefit payback time	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Technical

(Examples: availability, reliability, applicable to building stock, innovation level…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
Availability	◉	☐	☐	☐
Reliability	◉	☐	☐	☐
Applicable to building stock	☐	☐	☐	☐
Innovation	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Legal & Administration

(Examples: regulatory hurdles, procurement rules, administrative approval process, consistence to local policy…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
Regulatory hurdles	◉	☐	☐	☐
Procurement rules	☐	☐	☐	☐
Administrative approval process	◉	☐	☐	☐
Consistence to local policy	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Society

(Examples: co-operation with local stakeholders, public approval of activities, improved quality of life, good example for citizens, symbolic value…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
Public approval of activities	☐	☐	☐	☐
Good example for citizens	☐	☐	☐	☐
co-operation with local stakeholder	☐	☐	☐	☐
Symbolic value	●	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Others (optional)

Please enter any criteria that you have applied in your decision-making process, but do not fit into the above categories.

Criterion	Importance			
	critical	important	desirable	exclusion criterion
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Source of criteria

Please describe briefly, how you identified the criteria above.
(Examples: discussion in the local working group, consulted a guideline, advise from administration…)

6. Identified energy efficiency measure

In this section, please provide a description of the energy efficiency measure, that you have evaluated as most effective and therefore will be subject to the pilot investment further processed in GoA 3.4.

What will be done?

Please briefly describe, what exactly will be done in the selected energy efficiency measure. Please also specify the scale of the measure by providing quantitative information (e.g. refurbished building area, capacity of heat supply system, expected investment volume…).

Investment costs includes construction (Installation of solar power plant, invertor, accumulator, designing the ITS), designing, construction supervision and cost of project results demonstration (publicly available screen) and publicity events. The estimated annual electricity production from the solar power plant is 49,60 MWh/year with a 54,6 kW system.
Expected investment volume is 101 892,20 EUR, including costs of VAT 21%.

Energy saving effect

Pease quantify the expected energy savings by implementing this measure.

CO2 emission reduction 5406 kgCO2/year. CO2 reduction efficiency inc

Investment costs

Pease quantify the expected costs necessary to implement this measure.

101 892,20 EUR including VAT 21%. 91 484,83 EUR will be financed a

Reasons for selection

Please explain, why you have decided to select this particular energy efficient measure as pilot investment candidate.

Which of the targets specified in section 2 does it address to which extent?

Which of the criteria specified in section 4 does it fulfil?

Optional: What additional advantages does the selected measure have, that are not represented by the targets and criteria?

Alternatives

Please name up to three alternative energy efficiency measures, that you took into closer consideration. In which way are they less appropriate for further development, compared to the energy efficiency measure you have actually selected?

7. Difficulties

What kind of difficulties did you experience (if any) during the process of identifying the most effective energy efficiency measure? Why did they occur? How did they affect the process? How did you deal with the problem (solve, work around, ignore…)?

Thank you!

GoA 3.3 – Questionnaire

This questionnaire is part of GoA 3.3 "Identification of potential for energy saving and identification of most effective measures". In GoA 3.3, each tandem shall identify the "most effective and, under the scope of a cost-benefit analysis most useful energy efficiency measures" (project application). The identified measure will then be further developed as a pilot investment case in GoA 3.4.

The aim of this questionnaire is to document the **process** and the **results** of identifying the energy efficiency measure, that later will be the pilot investment case. It seeks to aggregate all necessary information for the final report as well as the web-based training tool (GoA 5.3) in a comparable way, but still being open for the differences in each individual case.

This questionnaire needs to be answered by **each tandem** until **August 31st 2019** and delivered to r.kajimura@unendlich-viel-energie.de.

Should you have any questions regarding this questionnaire, please contact:

Ryotaro Kajimura
Renewable Energies Agency (PP3)
+49 30 200 535 57
r.kajimura@unendlich-viel-energie.de

1. About the tandem

Name of Municipality

Administration of Silute District Municipalit

Name of coaching expert partner:

Civitta

2. Baseline

Please briefly describe the baseline, you started the decision-making process from. What were the previous steps taken before considering different energy efficiency measures (e.g. self-assessment, SWOT analysis, energy monitoring)? What kind of data and information was available at that time (e.g. hourly energy consumption data)? What did you find out that affected your decision-making process?

One of the largest share of heat energy for heating and hot water is consumed by budget institutions, i.e. public buildings, such as schools, health, culture, administrative buildings (the municipality is responsible for heating those). There are 50 municipal buildings, most of those are built before 1990, every year the Administration of the municipality is carrying out all possible measures/projects for increasing energy efficiency. Main activities of energy consumption reduction in buildings includes modernization and renovation of public buildings, modernization of space heating systems, but those vast projects require a lot of funds, therefore, smaller projects are also being implemented.
In the beginning of 2017 smart heat consumption management system was installed into 3 public schools. The results were good (decrease in heat consumption 7-15%), therefore, the Municipality decided to proceed with such measures and became a partner in the ActNow project, during which comprehensive self-assessment and SWOT analysis were done. Data on heat energy consumption in public buildings is being collected and analyzed (for now - monthly data, but the goal is to get daily data).

3. Targets

Any decision-making process depends on the targets it is working towards. These may differ from tandem to tandem due to the local circumstances. Please specify the targets you want to achieve by implementing energy efficiency measures in your tandem municipality (e.g. climate protection, cost saving, energy independence, fostering local economy etc.).

Main targets

Please specify the targets, that are critical for the success of the activities in your tandem municipality and therefore must be addressed by the energy efficiency measures you will be selecting.

1. Increase energy efficiency of public buildings / Cost saving
2. Meeting hygiene requirements in the buildings
3. Co2 reduction/ climate protection

Please provide a brief explanation why these targets are mandatory for your activities.

Silute District Municipality tries to attract private investments and make the District attractive for business, citizens and tourists. One of the spheres to develop in making Silute District modern and attractive place is sustainable energy development. Currently most municipality buildings is obsolete and ineffective in terms of energy consumption.
It is Silute District Municipality Administration which is responsible for municipality buildings in the District. Most of them are for educational and cultural services. It is

Secondary targets

In case you have identified other targets that are desirable, but not critical for the success of the activities in your tandem municipality, please specify them below.

1. Increasing awareness of EE importance / promoting energy saving.
2. Being example for other municipalities
3.

Please provide a brief explanation of the reasons why these targets are desirable but not critical for your activities.

Some of the Lithuanian municipalities (Prienu, Kedainiu and others) have carried out similar energy efficiency projects. If successfully implemented, Silute District Municipality ' s Energy efficiency improvement for public buildings might be replicated to other Lithuanian municipalities. These projects are crucial seeking to increase energy efficiency of public buildings heating and lighting efficiency, ensuring efficient use of the state funds of the Republic of Lithuania, reducing greenhouse gas emissions (CO_2), ensuring the hygiene of public infrastructure

Non-targets (optional)

In case there were targets that you intendedly have decided not to pursue for a particular reason, please provide a brief description.

-

4. Process outline

The process of identifying the most effective energy efficiency measure may differ from case to case, depending on factors like the structure of the local working group or the municipal administration. Please outline the most important steps of the process you have worked through in your tandem in order to identify the most effective energy efficiency measure.

- How did you proceed from the baseline described above? What were the main steps in the process?
- What were the main questions that were answered in each step?
- Did you include additional information or data in the respective step?
- Who was involved in each of the decision-making steps?
  (Examples: only the tandem, higher levels of administration, citizens)

*Your input shall include at least 3-4 steps. You are welcome to attach an additional visualisation (e.g. a flowchart) of the process to this questionnaire.

There was no clear process - there is a common problem in Lithuania, certain legal responsibilities we have to follow and opportunities that higher level of administration orders to try.
In May 2011 Lithuania adopted a new Energy Strategy with the target of achieving annual savings of 1.5 percent of the final energy consumption through 2020 (1.3 percent/year between 2020 and 2030). The energy savings potential is estimated at 17 percent of final consumption in 2009, and about 740 ktoe by 2020. The highest potential is found in buildings and transport: 40 percent of energy savings should be achieved in buildings and 40 percent in the transport sector.
Due to the low energy efficiency of public buildings and the high cost of their maintenance and operation, the current cost of public services is higher.
According to the data of the State Enterprise Center of Registers, 906 public buildings (including 438 schools) were renovated (modernized) in 2007 – 2013 with the state budget of the Republic of Lithuania and the European Union structural assistance funds. The Ministry of Economy and Innovation of the Republic of Lithuania has administered the implementation of energy efficiency improvement projects for these buildings (about 300 million EUR have been allocated for this period). The most frequently used means for the implementation of energy efficiency projects in public buildings was ant still are wall, roof, plinth insulation, windows and doors replacement and heating system refurbishment. With the introduction of energy efficiency improvement measures, renewed public buildings can save 215,08 GWh of energy per year. Therefore renovation of public buildings in Silute District Municipalities could reduce energy consumption significantly.
However, this requires large investment that Silute District Municipality doesn ‘ t possess and intend to implement public building modernization by energy supply company (ESCO)/energy performance contracting (EnPC) model. To do this preparational works of project development must be done. Silute District Municipality is searching for ways to co-fund those preparational works and therefore, application for this funding will be prepared.

5. Decision criteria

Decision-making and the evaluation, how "effective" a particular energy-efficiency measure is, requires a set of criteria. For each category below, please name the criteria you applied to the options in your decision-making process, and specify how important each criterion was.
You are free to leave a category empty, if it does not apply to your case.

Ecology

(Examples: CO2 savings, air quality improvement, noise emission reduction, healthy housing conditions…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
Healthy working conditions	☐	☐	☐	☐
CO2 savings	☐	☐	☐	☐
	☑	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Economy

(Examples: necessary investment, energy cost savings, payoff time, possibility of funding aids…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
energy cost savings	◉	☐	☐	☐
necessary investment	◉	☐	☐	☐
possibility of funding aids	☐	☐	☐	☐
payoff time	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Technical

(Examples: availability, reliability, applicable to building stock, innovation level…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
availability	◉	☐	☐	☐
reliability	◉	☐	☐	☐
applicable to building stock	☐	☐	☐	☐
innovation level	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Legal & Administration

(Examples: regulatory hurdles, procurement rules, administrative approval process, consistence to local policy…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
regulatory hurdles	◉	☐	☐	☐
procurement rules	☐	☐	☐	☐
administrative approval process	◉	☐	☐	☐
consistence to local policy	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Society

(Examples: co-operation with local stakeholders, public approval of activities, improved quality of life, good example for citizens, symbolic value…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
co-operation with local stakeholder	☐	☐	☐	☐
public approval of activities	☐	☐	☐	☐
improved quality of life	☐	☐	☐	☐
good example for citizens	●	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Others (optional)

Please enter any criteria that you have applied in your decision-making process, but do not fit into the above categories.

Criterion	Importance			
	critical	important	desirable	exclusion criterion
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Source of criteria

Please describe briefly, how you identified the criteria above.
(Examples: discussion in the local working group, consulted a guideline, advise from administration…)

Discussion in the local working group, advise from administration.

6. Identified energy efficiency measure

In this section, please provide a description of the energy efficiency measure, that you have evaluated as most effective and therefore will be subject to the pilot investment further processed in GoA 3.4.

What will be done?

Please briefly describe, what exactly will be done in the selected energy efficiency measure. Please also specify the scale of the measure by providing quantitative information (e.g. refurbished building area, capacity of heat supply system, expected investment volume…).

Application for this project development will be prepared to get funding for aforementioned preparation works. Objectives: 1. To prepare a energy audits and investment project that identifies and defines the scope (project boundaries) of commercially viable energy saving company (ESCO)/energy performance contracting (EnPC) of public building modernization project. 2. To prepare and implement procurement procedure for (ESCO) selection. It might

Energy saving effect

Pease quantify the expected energy savings by implementing this measure.

It is estimated that successfully implemented municipal building modern

Investment costs

Pease quantify the expected costs necessary to implement this measure.

It is expected to get funding for technical assistance in the form of consu

Reasons for selection

Please explain, why you have decided to select this particular energy efficient measure as pilot investment candidate.

Which of the targets specified in section 2 does it address to which extent?

Because buildings are the biggest potential for energy saving and there is a call for funding technical assistance.

Which of the criteria specified in section 4 does it fulfil?

All

Optional: What additional advantages does the selected measure have, that are not represented by the targets and criteria?

Alternatives

Please name up to three alternative energy efficiency measures, that you took into closer consideration. In which way are they less appropriate for further development, compared to the energy efficiency measure you have actually selected?

Alternatives were not considered yet (it will be if the application will not be successful).

7. Difficulties

What kind of difficulties did you experience (if any) during the process of identifying the most effective energy efficiency measure? Why did they occur? How did they affect the process? How did you deal with the problem (solve, work around, ignore…)?

-

Thank you!

GoA 3.3 – Questionnaire

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1. About the tandem

Name of Municipality

Mönsterås municipality

Name of coaching expert partner:

Energikontor sydost

2. Baseline

Please briefly describe the baseline, you started the decision-making process from. What were the previous steps taken before considering different energy efficiency measures (e.g. self-assessment, SWOT analysis, energy monitoring)? What kind of data and information was available at that time (e.g. hourly energy consumption data)? What did you find out that affected your decision-making process?

It started with the fact that Mönsterås had done energy declarations that needed to be updated and new energy measures were going to be implemented. The main energy measure has showed that the ventilation system in a school had no obligatory ventilation control (swedish abbreviation OVK) was not approved and that the air flows in the classrooms were low. The reason was the contamination in the heating batteries that are in the duct before they blow in the air.

3. Targets

Any decision-making process depends on the targets it is working towards. These may differ from tandem to tandem due to the local circumstances. Please specify the targets you want to achieve by implementing energy efficiency measures in your tandem municipality (e.g. climate protection, cost saving, energy independence, fostering local economy etc.).

Main targets

Please specify the targets, that are critical for the success of the activities in your tandem municipality and therefore must be addressed by the energy efficiency measures you will be selecting.

1. well functioning system
2. Streamline the ventilation system with new fans
3. System maintenance

Please provide a brief explanation why these targets are mandatory for your activities.

Briefly to streamline the system and to get aproval for the ventilation control.

Secondary targets

In case you have identified other targets that are desirable, but not critical for the success of the activities in your tandem municipality, please specify them below.

1. Better comfort
2. Socio economic aspect
3.

Please provide a brief explanation of the reasons why these targets are desirable but not critical for your activities.

In order to get better air flows and student comfort (the air flow in classrooms are not problematic but there is an apportunity so that it can be better).

Non-targets (optional)

In case there were targets that you intendedly have decided not to pursue for a particular reason, please provide a brief description.

4. Process outline

The process of identifying the most effective energy efficiency measure may differ from case to case, depending on factors like the structure of the local working group or the municipal administration. Please outline the most important steps of the process you have worked through in your tandem in order to identify the most effective energy efficiency measure.

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- What were the main questions that were answered in each step?
- Did you include additional information or data in the respective step?
- Who was involved in each of the decision-making steps?
  (Examples: only the tandem, higher levels of administration, citizens)

*Your input shall include at least 3-4 steps. You are welcome to attach an additional visualisation (e.g. a flowchart) of the process to this questionnaire.

A meeting with the LEEG and energikontor sydost was held to discuss the upcoming work with LEEG and to plan for upcoming meetings. When discussing about energy measures, the LEEG hae discussed about the most important measure to work with, the ventilation system. The Municipality of Mönsterås and OVK surveyor, consultants and contractors had a meeting to discuss the ventilation system. Step 1 is to get the system approved and then to plan for the upcoming work.

On the next LEEG meeting, the process will be discussed further and focus will be on implementaton.

5. Decision criteria

Decision-making and the evaluation, how "effective" a particular energy-efficiency measure is, requires a set of criteria. For each category below, please name the criteria you applied to the options in your decision-making process, and specify how important each criterion was.
You are free to leave a category empty, if it does not apply to your case.

Ecology

(Examples: CO2 savings, air quality improvement, noise emission reduction, healthy housing conditions…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
CO2 savings	☐	☐	☐	☐
Air quality improvement	☐	☐	☐	☐
Healthy housing condition	☑	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Economy

(Examples: necessary investment, energy cost savings, payoff time, possibility of funding aids…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
Necessary investment	◉	☐	☐	☐
Energy cost savings	◉	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Technical

(Examples: availability, reliability, applicable to building stock, innovation level…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
	◉	☐	☐	☐
	◉	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Legal & Administration

(Examples: regulatory hurdles, procurement rules, administrative approval process, consistence to local policy…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
	◉	☐	☐	☐
	☐	☐	☐	☐
	◉	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Society

(Examples: co-operation with local stakeholders, public approval of activities, improved quality of life, g xample for citizens, symbolic value…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
Improved quality of life	☐	☐	☐	☐
Socioeconomic aspect	☐	☐	☐	☐
	☐	☐	☐	☐
	●	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Others (optional)

Please enter any criteria that you have applied in your decision-making process, but do not fit into the above categories.

Criterion	Importance			
	critical	important	desirable	exclusion criterion
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Source of criteria

Please describe briefly, how you identified the criteria above.
(Examples: discussion in the local working group, consulted a guideline, advise from administration…)

Discussion in the local working group

6. Identified energy efficiency measure

In this section, please provide a description of the energy efficiency measure, that you have evaluated as most effective and therefore will be subject to the pilot investment further processed in GoA 3.4.

What will be done?

Please briefly describe, what exactly will be done in the selected energy efficiency measure. Please also specify the scale of the measure by providing quantitative information (e.g. refurbished building area, capacity of heat supply system, expected investment volume…).

Discussion next LEEG meeting

Energy saving effect

Pease quantify the expected energy savings by implementing this measure.

to be discussed..

Investment costs

Pease quantify the expected costs necessary to implement this measure.

to be discussed..

Reasons for selection

Please explain, why you have decided to select this particular energy efficient measure as pilot investment candidate.

Which of the targets specified in section 2 does it address to which extent?

Described above

Which of the criteria specified in section 4 does it fulfil?

Described above

Optional: What additional advantages does the selected measure have, that are not represented by the targets and criteria?

Alternatives

Please name up to three alternative energy efficiency measures, that you took into closer consideration. In which way are they less appropriate for further development, compared to the energy efficiency measure you have actually selected?

7. Difficulties

What kind of difficulties did you experience (if any) during the process of identifying the most effective energy efficiency measure? Why did they occur? How did they affect the process? How did you deal with the problem (solve, work around, ignore…)?

The difficult thing was assessing what to do with the system in conjunction with OVK inspector, consultant and contractor.
The final summary is to get OVK approved.

Thank you!

GoA 3.3 – Questionnaire

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+49 30 200 535 57
r.kajimura@unendlich-viel-energie.de

1. About the tandem

Name of Municipality

Municipality of Gdynia

Name of coaching expert partner:

IMP PAN

2. Baseline

Please briefly describe the baseline, you started the decision-making process from. What were the previous steps taken before considering different energy efficiency measures (e.g. self-assessment, SWOT analysis, energy monitoring)? What kind of data and information was available at that time (e.g. hourly energy consumption data)? What did you find out that affected your decision-making process?

Educational facilities are the largest group of heat energy consumers in the city of Gdynia. The potential for achievable energy and economic savings is much greater than in residential buildings. Analysis of energy audits carried out for selected educational institutions showed that these facilities can reduce heat consumption by 45 to 60 percent. The self assessment tool, SWOT analysis tool, audits and invoices from most schools (average Energy consumption per month) were used to specify the next steps.

3. Targets

Any decision-making process depends on the targets it is working towards. These may differ from tandem to tandem due to the local circumstances. Please specify the targets you want to achieve by implementing energy efficiency measures in your tandem municipality (e.g. climate protection, cost saving, energy independence, fostering local economy etc.).

Main targets

Please specify the targets, that are critical for the success of the activities in your tandem municipality and therefore must be addressed by the energy efficiency measures you will be selecting.

1. increased energy efficiency in a short period of time
2. cost saving
3. improving of thermal comfort in public buildings

Please provide a brief explanation why these targets are mandatory for your activities.

The municipality of Gdynia is focused on the implementation of the SEAP document and solutions corresponding to the current reality. This activities can bring improvement of energy and ecological security in the city. School conditions that affect students' health are also very essential

Secondary targets

In case you have identified other targets that are desirable, but not critical for the success of the activities in your tandem municipality, please specify them below.

1. climate protection
2. fostering local economy
3.

Please provide a brief explanation of the reasons why these targets are desirable but not critical for your activities.

Gdynia committed to reduce energy consumption and CO2 emissions by 20% by 2020.
Project activities fit into these goals.

Non-targets (optional)

In case there were targets that you intendedly have decided not to pursue for a particular reason, please provide a brief description.

4. Process outline

The process of identifying the most effective energy efficiency measure may differ from case to case, depending on factors like the structure of the local working group or the municipal administration. Please outline the most important steps of the process you have worked through in your tandem in order to identify the most effective energy efficiency measure.

- How did you proceed from the baseline described above? What were the main steps in the process?
- What were the main questions that were answered in each step?
- Did you include additional information or data in the respective step?
- Who was involved in each of the decision-making steps?
  (Examples: only the tandem, higher levels of administration, citizens)

*Your input shall include at least 3-4 steps. You are welcome to attach an additional visualisation (e.g. a flowchart) of the process to this questionnaire.

As part of the regional LEEG group activity, audits and technical conditions of individual school buildings were discussed at subsequent meetings. Analyzing invoices and school administration requests were also important. The Buildings Department (responsible for facilities management), the Education Department and the Energy Department in cooperation with an expert partner IMP PAN decided which schools should be included in the project and in what order they should be audited. Informations from the Education Department in the City Hall of Gdynia based on guidelines of SEAP indicated that investment activities regarding thermal modernization will be undertaken. Activities related to the modernization of public buildings are long-term and agree with the project's objectives. Topics related to Users behavior and implementation of energy monitoring and management systems were also
discussed.

5. Decision criteria

Decision-making and the evaluation, how "effective" a particular energy-efficiency measure is, requires a set of criteria. For each category below, please name the criteria you applied to the options in your decision-making process, and specify how important each criterion was.
You are free to leave a category empty, if it does not apply to your case.

Ecology

(Examples: CO2 savings, air quality improvement, noise emission reduction, healthy housing conditions…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
CO2 savings	☐	☐	☐	☐
sustainability	☐	☐	☐	☐
air quality improvement	☑	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Economy

(Examples: necessary investment, energy cost savings, payoff time, possibility of funding aids…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
energy cost saving	◉	☐	☐	☐
payoff time	◉	☐	☐	☐
subsidies	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Technical

(Examples: availability, reliability, applicable to building stock, innovation level…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
technical state of art	●	☐	☐	☐
reliability	●	☐	☐	☐
innovation level	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Legal & Administration

(Examples: regulatory hurdles, procurement rules, administrative approval process, consistence to local policy…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
regulatory hurdles	●	☐	☐	☐
procurement rules	☐	☐	☐	☐
consistence with local policy	●	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Society

(Examples: co-operation with local stakeholders, public approval of activities, improved quality of life, good example for citizens, symbolic value…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
public approval of activities	☐	☐	☐	☐
improved quality of life	☐	☐	☐	☐
good example for citizens	☐	☐	☐	☐
students' comfort in school	●	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Others (optional)

Please enter any criteria that you have applied in your decision-making process, but do not fit into the above categories.

Criterion	Importance			
	critical	important	desirable	exclusion criterion
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Source of criteria

Please describe briefly, how you identified the criteria above.
(Examples: discussion in the local working group, consulted a guideline, advise from administration…)

Discussion in the local working group LEEG and the document of SEAP, previous experience with thermomodernization.

6. Identified energy efficiency measure

In this section, please provide a description of the energy efficiency measure, that you have evaluated as most effective and therefore will be subject to the pilot investment further processed in GoA 3.4.

What will be done?

Please briefly describe, what exactly will be done in the selected energy efficiency measure. Please also specify the scale of the measure by providing quantitative information (e.g. refurbished building area, capacity of heat supply system, expected investment volume…).

Thermomodernization of educational facilities in connection with the energy management system - 1-2 buildings per year. Depending on the size of the building, as a result of thermomedernization, the heat consumption will decrease on average 600 MWh, while the average cost is about 1,2 mln PLN (274 000 euro) per building.

Energy saving effect

Pease quantify the expected energy savings by implementing this measure.

based on past results and audits, there will be a minimum of 30% energ

Investment costs

Pease quantify the expected costs necessary to implement this measure.

average cost is about 1,2 mln PLN (274 000 euro) per building

Reasons for selection

Please explain, why you have decided to select this particular energy efficient measure as pilot investment candidate.

Which of the targets specified in section 2 does it address to which extent?

It is estimated that energy management system can bring energy reduction by 30 percent on average. Thermomedernization with an Energy managment in the long run brings not only economic but also ecological benefits, contributing to the reduction of pollution and degradation of the natural environment. It all includes improving the quality of life and the health of people using the building. EMS is seen as innovative by the public, which is desirable as a good example for other municipalities and their citizens.

Which of the criteria specified in section 4 does it fulfil?

all criteria

Optional: What additional advantages does the selected measure have, that are not represented by the targets and criteria?

Alternatives

Please name up to three alternative energy efficiency measures, that you took into closer consideration. In which way are they less appropriate for further development, compared to the energy efficiency measure you have actually selected?

- modernization of city lighting to more energy-efficient
- energy efficiency improvement program in the utilities RES

7. Difficulties

What kind of difficulties did you experience (if any) during the process of identifying the most effective energy efficiency measure? Why did they occur? How did they affect the process? How did you deal with the problem (solve, work around, ignore…)?

Economic aspects - choosing the most effective solutions is expensive and some of them can be risky. The choice is limited to investments that are feasible due to financial resources. Thermal modernization of buildings requires investing significant financial resources. Solutions that would not bring visible profits were not taken into account.

Thank you!

GoA 3.3 – Questionnaire

This questionnaire is part of GoA 3.3 "Identification of potential for energy saving and identification of most effective measures". In GoA 3.3, each tandem shall identify the "most effective and, under the scope of a cost-benefit analysis most useful energy efficiency measures" (project application). The identified measure will then be further developed as a pilot investment case in GoA 3.4.

The aim of this questionnaire is to document the **process** and the **results** of identifying the energy efficiency measure, that later will be the pilot investment case. It seeks to aggregate all necessary information for the final report as well as the web-based training tool (GoA 5.3) in a comparable way, but still being open for the differences in each individual case.

This questionnaire needs to be answered by **each tandem** until **August 31st 2019** and delivered to r.kajimura@unendlich-viel-energie.de.

Should you have any questions regarding this questionnaire, please contact:

Ryotaro Kajimura
Renewable Energies Agency (PP3)
+49 30 200 535 57
r.kajimura@unendlich-viel-energie.de

1. About the tandem

Name of Municipality

-

Name of coaching expert partner:

ProjectZero

2. Baseline

Please briefly describe the baseline, you started the decision-making process from. What were the previous steps taken before considering different energy efficiency measures (e.g. self-assessment, SWOT analysis, energy monitoring)? What kind of data and information was available at that time (e.g. hourly energy consumption data)? What did you find out that affected your decision-making process?

Since the cases concerns private homeowners there is no clear baseline. However, considerations regarding the climate was what started the decision making process in the specific case outlined here.

3. Targets

Any decision-making process depends on the targets it is working towards. These may differ from tandem to tandem due to the local circumstances. Please specify the targets you want to achieve by implementing energy efficiency measures in your tandem municipality (e.g. climate protection, cost saving, energy independence, fostering local economy etc.).

Main targets

Please specify the targets, that are critical for the success of the activities in your tandem municipality and therefore must be addressed by the energy efficiency measures you will be selecting.

1. Climate protection and sustainable living
2. Safeguarding the homeowners retirement
3. Energy cost savings

Please provide a brief explanation why these targets are mandatory for your activities.

First and foremost climate protection was the target of energy renovating the home. Secondly, it was a desire to secure their retirement by lowering the energy costs of the home.

Secondary targets

In case you have identified other targets that are desirable, but not critical for the success of the activities in your tandem municipality, please specify them below.

1. None
2.
3.

Please provide a brief explanation of the reasons why these targets are desirable but not critical for your activities.

Non-targets (optional)

In case there were targets that you intendedly have decided not to pursue for a particular reason, please provide a brief description.

4. Process outline

The process of identifying the most effective energy efficiency measure may differ from case to case, depending on factors like the structure of the local working group or the municipal administration. Please outline the most important steps of the process you have worked through in your tandem in order to identify the most effective energy efficiency measure.

- How did you proceed from the baseline described above? What were the main steps in the process?
- What were the main questions that were answered in each step?
- Did you include additional information or data in the respective step?
- Who was involved in each of the decision-making steps?
  (Examples: only the tandem, higher levels of administration, citizens)

*Your input shall include at least 3-4 steps. You are welcome to attach an additional visualisation (e.g. a flowchart) of the process to this questionnaire.

The case person started the project by being visited by Energy Charlie an enginere consultant.
- Here the case person got an overview of the most profitable investements.

Afterwards he investigated different solutions regarding the energy renovation of his home
- He investigated both production cost and savings on electricity, heat and water.
- Some of the solutions he could implement himself and with some he needed help from professionel consultants. (You have to use authorized craftsmen when working with VVS and electircity.)

Lastly, he completed the energy renovation.

The decisionmakers in each steps have been the caseperson and his familiy.

5. Decision criteria

Decision-making and the evaluation, how "effective" a particular energy-efficiency measure is, requires a set of criteria. For each category below, please name the criteria you applied to the options in your decision-making process, and specify how important each criterion was.
You are free to leave a category empty, if it does not apply to your case.

Ecology

(Examples: CO2 savings, air quality improvement, noise emission reduction, healthy housing conditions…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
CO2 savings/ climate protection	☐	☐	☐	☐
Sustainable living	☐	☐	☐	☐
Healthy housing conditions	☑	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Economy

(Examples: necessary investment, energy cost savings, payoff time, possibility of funding aids…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
Energy cost savings	◉	☐	☐	☐
Payoff time	◉	☐	☐	☐
Necessary investment	☐	☐	☐	☐
subsidies campaign PV	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Technical

(Examples: availability, reliability, applicable to building stock, innovation level…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
Innovation level	●	☐	☐	☐
Availability	●	☐	☐	☐
Applicable to building stock	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Legal & Administration

(Examples: regulatory hurdles, procurement rules, administrative approval process, consistence to local policy…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
Administrative approval process (F	●	☐	☐	☐
	☐	☐	☐	☐
	●	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Society

(Examples: co-operation with local stakeholders, public approval of activities, improved quality of life, good example for citizens, symbolic value…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
Good example for citizens	☐	☐	☐	☐
Symbolic value	☐	☐	☐	☐
Improved quality of life	☐	☐	☐	☐
Local investment	●	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Others (optional)

Please enter any criteria that you have applied in your decision-making process, but do not fit into the above categories.

Criterion	Importance			
	critical	important	desirable	exclusion criterion
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Source of criteria

Please describe briefly, how you identified the criteria above.
(Examples: discussion in the local working group, consulted a guideline, advise from administration…)

Based on interview with the homeowner

6. Identified energy efficiency measure

In this section, please provide a description of the energy efficiency measure, that you have evaluated as most effective and therefore will be subject to the pilot investment further processed in GoA 3.4.

What will be done?

Please briefly describe, what exactly will be done in the selected energy efficiency measure. Please also specify the scale of the measure by providing quantitative information (e.g. refurbished building area, capacity of heat supply system, expected investment volume…).

Installment of mass stove (masseovn), solar panels, solar thermal collector and paper wool insulation.

The energy renovation was completed in the period of 2012-2015.

Energy saving effect

Pease quantify the expected energy savings by implementing this measure.

Not applicable

Investment costs

Pease quantify the expected costs necessary to implement this measure.

Not applicable

Reasons for selection

Please explain, why you have decided to select this particular energy efficient measure as pilot investment candidate.

Which of the targets specified in section 2 does it address to which extent?

The case person is selected because he is a good candidate for a deep energy renovation in the rural area of Sønderborg.

Which of the criteria specified in section 4 does it fulfil?

All.

Optional: What additional advantages does the selected measure have, that are not represented by the targets and criteria?

-

Alternatives

Please name up to three alternative energy efficiency measures, that you took into closer consideration. In which way are they less appropriate for further development, compared to the energy efficiency measure you have actually selected?

7. Difficulties

What kind of difficulties did you experience (if any) during the process of identifying the most effective energy efficiency measure? Why did they occur? How did they affect the process? How did you deal with the problem (solve, work around, ignore…)?

None

Thank you!

GoA 3.3 – Questionnaire

This questionnaire is part of GoA 3.3 "Identification of potential for energy saving and identification of most effective measures". In GoA 3.3, each tandem shall identify the "most effective and, under the scope of a cost-benefit analysis most useful energy efficiency measures" (project application). The identified measure will then be further developed as a pilot investment case in GoA 3.4.

The aim of this questionnaire is to document the **process** and the **results** of identifying the energy efficiency measure, that later will be the pilot investment case. It seeks to aggregate all necessary information for the final report as well as the web-based training tool (GoA 5.3) in a comparable way, but still being open for the differences in each individual case.

This questionnaire needs to be answered by **each tandem** until **August 31st 2019** and delivered to r.kajimura@unendlich-viel-energie.de.

Should you have any questions regarding this questionnaire, please contact:

Ryotaro Kajimura
Renewable Energies Agency (PP3)
+49 30 200 535 57
r.kajimura@unendlich-viel-energie.de

1. About the tandem

Name of Municipality

-

Name of coaching expert partner:

ProjectZero

2. Baseline

Please briefly describe the baseline, you started the decision-making process from. What were the previous steps taken before considering different energy efficiency measures (e.g. self-assessment, SWOT analysis, energy monitoring)? What kind of data and information was available at that time (e.g. hourly energy consumption data)? What did you find out that affected your decision-making process?

Since the case concerns a private homeowner in a single house building there is no clear baseline. However, considerations regarding energy cost savings was waht started the decision making process in the specific case outlined here.

Therefore, no SWOT-analysis or energy monitoring was prepared in this process.

3. Targets

Any decision-making process depends on the targets it is working towards. These may differ from tandem to tandem due to the local circumstances. Please specify the targets you want to achieve by implementing energy efficiency measures in your tandem municipality (e.g. climate protection, cost saving, energy independence, fostering local economy etc.).

Main targets

Please specify the targets, that are critical for the success of the activities in your tandem municipality and therefore must be addressed by the energy efficiency measures you will be selecting.

1. Energy cost savings
2. Safeguarding their retirement
3. Emision of less CO2 of their home

Please provide a brief explanation why these targets are mandatory for your activities.

First and foremost, energy cost savings was the target of the energy renovation. The case person had a wish of lowering the cost of their home and thereby safeguarding their retirement.
Lastly, the case person had a wish of their home becoming as CO2 neutral as possible.

Secondary targets

In case you have identified other targets that are desirable, but not critical for the success of the activities in your tandem municipality, please specify them below.

1. none
2.
3.

Please provide a brief explanation of the reasons why these targets are desirable but not critical for your activities.

Non-targets (optional)

In case there were targets that you intendedly have decided not to pursue for a particular reason, please provide a brief description.

4. Process outline

The process of identifying the most effective energy efficiency measure may differ from case to case, depending on factors like the structure of the local working group or the municipal administration. Please outline the most important steps of the process you have worked through in your tandem in order to identify the most effective energy efficiency measure.

- How did you proceed from the baseline described above? What were the main steps in the process?
- What were the main questions that were answered in each step?
- Did you include additional information or data in the respective step?
- Who was involved in each of the decision-making steps?
  (Examples: only the tandem, higher levels of administration, citizens)

*Your input shall include at least 3-4 steps. You are welcome to attach an additional visualisation (e.g. a flowchart) of the process to this questionnaire.

The case person started the project by being visited by "energy Charlie", who helped with providing an overlook of profitable investments.

Secondly, they were visited by the supplier of the PV, Sydjysk Eltekniq. At this point they got a price on what they could save, because 5 single house buildings all wanted solar panels, by all buying their product (ca. 10.000 dkr.)

They chose to accept the offer and professionals installed the solar cells - completing the energy renovation.

The decision makers of each step has been the families of the 5 homes, choosing to find a solution together.

5. Decision criteria

Decision-making and the evaluation, how "effective" a particular energy-efficiency measure is, requires a set of criteria. For each category below, please name the criteria you applied to the options in your decision-making process, and specify how important each criterion was.
You are free to leave a category empty, if it does not apply to your case.

Ecology

(Examples: CO2 savings, air quality improvement, noise emission reduction, healthy housing conditions…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
CO2 savings	☐	☐	☐	☐
	☐	☐	☐	☐
	☑	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Economy

(Examples: necessary investment, energy cost savings, payoff time, possibility of funding aids…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
Energy cost savings	◉	☐	☐	☐
Payoff time	◉	☐	☐	☐
Possibility of price deduction	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Technical

(Examples: availability, reliability, applicable to building stock, innovation level…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
Applicable to building stock	●	☐	☐	☐
Availability	●	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Legal & Administration

(Examples: regulatory hurdles, procurement rules, administrative approval process, consistence to local policy…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
None	●	☐	☐	☐
	☐	☐	☐	☐
	●	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Society

(Examples: co-operation with local stakeholders, public approval of activities, improved quality of life, good example for citizens, symbolic value…)

Criterion	Importance			
	critical	important	desirable	exclusion criterion
Doing good for the next generation	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐
	●	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Others (optional)

Please enter any criteria that you have applied in your decision-making process, but do not fit into the above categories.

Criterion	Importance			
	critical	important	desirable	exclusion criterion
None	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

(*critical = must be fulfilled, exclusion criterion = must not be fulfilled)

Source of criteria

Please describe briefly, how you identified the criteria above.
(Examples: discussion in the local working group, consulted a guideline, advise from administration…)

Based on interview/discussion with the homeowner in charge of the project / Erik Steg

6. Identified energy efficiency measure

In this section, please provide a description of the energy efficiency measure, that you have evaluated as most effective and therefore will be subject to the pilot investment further processed in GoA 3.4.

What will be done?

Please briefly describe, what exactly will be done in the selected energy efficiency measure. Please also specify the scale of the measure by providing quantitative information (e.g. refurbished building area, capacity of heat supply system, expected investment volume…).

Installment of solar paneæs, extra isolation in a single house building from the 1970s

Energy saving effect

Pease quantify the expected energy savings by implementing this measure.

Not applicable

Investment costs

Pease quantify the expected costs necessary to implement this measure.

Not applicable

Reasons for selection

Please explain, why you have decided to select this particular energy efficient measure as pilot investment candidate.

Which of the targets specified in section 2 does it address to which extent?

Which of the criteria specified in section 4 does it fulfil?

Optional: What additional advantages does the selected measure have, that are not represented by the targets and criteria?

Alternatives

Please name up to three alternative energy efficiency measures, that you took into closer consideration. In which way are they less appropriate for further development, compared to the energy efficiency measure you have actually selected?

7. Difficulties

What kind of difficulties did you experience (if any) during the process of identifying the most effective energy efficiency measure? Why did they occur? How did they affect the process? How did you deal with the problem (solve, work around, ignore…)?

None

Thank you!