European Union
European Regional
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ERP

Energy Renovation Path

Contents

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Energy Renovation Path (ERP)

Introduction

What is an Energy Renovation Path?

REBUS supports local authorities in designing an **Energy Renovation Path (ERP)** for planning, implementing and monitoring renovation works in public buildings. In planning, a lack of reliable information, skills and effective decision-making structures hinders the process of prioritising buildings to be renovated. In implementation, it affects the public tender process and subsequent works. In monitoring, it leads to difficulties in selecting/using tools that can monitor impact and consumption.

REBUS uses interregional exchange among more and less developed regions to identify experiences to be included in the ERP, which is the tool REBUS proposes to address the identified need. Experiences refer to energy efficiency renovations in public buildings, with focus on 4 topics:

ERP – the 4 topics	
Topics	**Issues to be addressed**
PLANNING	**Identification of building for renovation (prioritisation, data collection):** → *Lack of reliable information, skills and effective decision-making structures hinders the process of prioritising buildings to be renovated.*
IMPLEMENTING	**Tendering & Financing: procurement rules, funding schemes available (including ESCO contracts/investments/grants):** → *Affecting public tender process and subsequent works*
MONITORING	**Tools available on the market, means of verification:** → *Leading to difficulties in selecting/using tools that can monitor impact and consumption*
HORIZONTAL THEME: CAPACITY BUILDING	**Capacity building schemes for civil servants:** → *Raise awareness and build skills on energy related issues among civil servants involved in the management of the building stock (i.e. those working in spatial planning and legal departments)*

Scopes of the document

The REBUS ERP, developed thanks to interregional exchange, helps public authorities to improve the following aspects of their energy policy content and management:

- raise awareness on potential savings/ efficient use of resources;
- collect feedback and stream line data on energy efficiency needs in the public buildings;
- use this feedback to select buildings for renovation;
- draft tenders for renovation works that include energy efficiency baselines, targets and monitoring measures;
- manage the buildings in a more efficient way after renovation.

The Energy Renovation Path collects experiences from Good Practices identified, including guidelines on planning, implementing and monitoring renovation works in public buildings

PLANNING

✓ **TIPS**

ESTABLISHING BASIS

- If not done yet, establish a coherent database of all buildings under your management, which would include both static data (type, area, volume, technical and energy characteristics of the building and its key systems, type and approx. number of users) and dynamic data (energy consumption, water consumption, weather reference data, e.g. heating degree days).
- Make sure that the database is regularly fed with new data, especially consumption data coming from meter readings, invoices, smart meters, etc.. Verify the data, especially if they are provided by others (e.g. building managers).
- Make comparisons between the buildings. Which of them are the biggest energy consumers? Which use more energy than the average in their category? Try to find out what is the reason and what can be improved with technical and what with organisational measures. Take notes for future activities.

PLANNING ENERGY RETROFITTING PROJECT

- Clearly define the criteria for buildings selection, ensuring adequate balance between economic, environmental and social ones. In principle, the renovations should lead to energy and financial savings with reasonable, reliably calculated payback periods. In some, well justified cases, however, the rise in consumption may be expected due to the necessity of reaching minimum heating and lighting standards.
- Devote adequate time and resources for preparing the investment, including the energy audit, feasibility study, economic and financial assessment, etc. If you do not have competences to evaluate the documents yourself, seek for external help.
- When selecting the technology, take into consideration not only current market offer and prices, but also future maintenance efforts and costs.

- Clear definition of criteria for prioritising buildings, based on real data. Involve experienced experts and relevant stakeholders in the planning process.
- Develop different working process for different types of buildings and different needs
- Use nuanced and holistic views when selecting buildings for renovation.
- Define early what you are going to do.
- Communicate and involve all USERS related to the building (tenants, technicians, users, caretakers etc.).
- Scale up, if possible.
- Build or improve the Strategy for energy efficiency at any level (European, National, Local): planning and plans.
- Foresee good energy audit analysis for any building.
- Set up an energy team (at any possible level).
- Raise building users knowledge and awareness on energy issues (develop ad-hoc campaigns including information on how to use the money saved).
- Foresee Long-term temperature measurements and energy use assessment.
- Look for good practice in Europe with PH or NZEB standards.
- Develop an integrated approach with other policies.
- Follow the 5 requirements for an efficient energy building:
    1. *Air tightness*
    2. *Thermal bridge free design*
    3. *Continuous thermal insulation*
    4. *Ventilation with heat recovery*
    5. *Higher standards for windows*

Megjegyzés [Resolvo1]: PNEC: please revise TIPS session, trying to group and divide into steps

Megjegyzés [Resolvo2]: suggested by PNEC

- Consider Passive House standards that are the most clearly defined and have the Retrofit methodology, including a tool for calculating the energy balance and solutions called PHPP.
- Keep it simple
- Communicate regularly; involve a broad base of colleagues and external stakeholders to encourage shared ownership
- Ensure that the environmental economic and social advantages/ disadvantages are addressed holistically to demonstrate the wider resonance with other polices and plans.
- After the classification of the buildings, the next step is to discuss with the building users about internal conditions, thermal comfort and other demands that can be relevant.

List of ACTIONS	Experiences/ Advices	Good Practices
a) Defining criteria for building selection (e.g. the biggest energy consumer in absolute terms or per m^2, etc.)	There is a need to provide municipalities and public authorities in general with simple guidelines and procedure for buildings selection that would take into account all key issues: environmental (energy consumption, GHG emissions and other pollutants emission reduction), economic (financial savings, payback period) and social (improvement of users comfort, visual effect, i.e. giving good example to the citizens). The methodology should also take into consideration that in some specific cases (buildings in very poor technical state, underheated, underlit, etc.) the investment could lead to the increased consumption (by ensuring that the minimum heating and lighting requirements are finally met), therefore some adaptation scenarios must be implemented during calculation. See experiences from REBUS EU regions	
b) Definition of Tools for data collection, setting up the inventory/database	Is the database fit for purpose, user friendly, readily available and compatible with existing databases? See experiences from REBUS EU regions	
c) Consultation with building users, particularly those who will be responsible for technology.	For such databases to work effectively, those who have access to it must receive training so that they are familiar with the programme and know how to interpret it, and feel comfortable to ask questions so that the software remains accessible. Master users need to be aware of any staff changes so that building managers remain aware and proactively involved with their building energy management.	
d) Is the proposed project appropriate to business and user needs?	Identify any conflicts between business and user needs	
e) Leadership commitment to providing long term	Identify resources required to deliver outcomes, and that these resources are shared between departments.	

Megjegyzés [Resolvo3]: AFE, MALMO, PNEC and DURHAM: please revise this session by adding information and/or suggesting improvements on advices provided

Megjegyzés [Resolvo4]: AFE, MALMO, PNEC and DURHAM: please add references to REBUS GPs, trying to associate GPs with actions. Remember:
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support and resource after project completion		
f) An understanding of land/ building ownership/ conservation issues	It is important to understand and consider roles and legislation as well as cityscape and conservation issues when renovating.	
g) Identification of potential hold-ups i.e. environmental, structural, ecological	Planning to avoid potential hold-ups is necessary to avoid expensive stops in the coming renovation. Make risk analysis much earlier in the process would be an advantage.	
h) Criteria for identifying and prioritising the most energy efficient and innovative renovation options existing on the market	Keep up to date with the existing R&D and innovative technological solutions	
i) Planning synergies with other calls/policies/paths	Identify relationship with local plans and policies	
j) Planning energy efficiency decision-making and monitoring structures/tools	See experiences from REBUS EU regions	
k) Collecting data of the energy use, energy performance and past renovations of the public buildings;	This is one of the main aspects to secure when aiming to work strategically with energy reduction. Realisable and long-term data is essential to be able to take on this work.	
l) Identifying and selecting reliable and prepared energy experts for planning	Important to appoint a person responsible for building renovations– from planning till monitoring. Experts in the energy efficiency field are available but communication and partnership with them is necessary. These specialists can provide information, tools, guiding and training.	
m) Identifying and selecting the best financing options	European funds, local funds, state and governmental funds, sponsors funds and bank loans with small interest rate, ESCO companies. These are only some of the available funds. The choice should be supported by a study regarding the available financial sources in order to know the final costs and the institutional financial capacity. Or else, fund low-medium capital projects, with the understanding that they will pay for themselves overtime either through direct savings, or by mitigating the impact of increasing energy costs.	
n) Strategy which prevent from	Long-term stability and sustainability of energy efficiency measures is a must. Long-term plans and strategies should	

working with just low hanging fruits	always be pursued. Simply increasing the efficiency of a poor and carbon intensive practice may financially pay off in the short term, but is not paradigmatically innovative.	
o) All perspective of building, planning and managing the buildings needs to have energy efficiency in mind.	Establishing an energy efficiency requirement embedded into all development decisions and political manifestos. The ***horizontal theme of capacity building*** is an essential precursor to instil a shared culture of sustainability, therefore avoiding sustainability being considered as 'an' issue, rather than 'the' overarching issue.	

DOs:	**DONTs:**
✓ Create a complete and updated database. ✓ Plan for continuous training of the personnel. ✓ Find the most appropriate financial schemes. ✓ Consult with building users. ✓ Set up specific energy goals on every building. ✓ Collect real data, with state-of the art methodologies and tools ✓ Involve an experienced energy expert, with relevant references ✓ Cooperate with stakeholders (users/workers, etc.) in order to plan better and based on real demands ✓ Have a long-term and holistic vision about all energy efficiency initiatives, including retrofitting of public buildings ✓ The goals of the retrofitting must be known and accepted by all parts ✓ Make a nuanced categorisation of buildings, so you can see what buildings is worth retrofitting ✓ Define how you can measure the energy mitigation ✓ Communicate as much as possible ✓ Keep the premise simple ✓ Demonstrate wider project relevance ✓ Remember that the energy refurbishment should always lead to energy and financial savings. This is its primary objective. Poorer financial outcome is justifiable only when the building doesn't meet basic standards in terms of users comfort and health (e.g. because it is underheated, underlit). ✓ Look at a building in a holistic way – not only as a structure but also a set of installations, functions and equipment. All	o Don't go for the low hanging fruits, as it usually lacks of quality. o Avoid ad-hoc decisions o Avoid quick solutions without involving the experienced experts o Avoid partial retrofitting solutions (e.g. insulation of only one side of a building, or partial replacement of windows and doors). o Avoid not providing adequate information and not to cooperate with the users of the building o Don´t try to "go around" the public procurement process. Try to take advantage of it o Don't keep the project within a small silo/ group of specialists o Don't go too big too quickly. Start small and build upon successes and lessons learnt. o Frame the benefits only economically or environmentally o Don't rush o Don't underestimate the planning phase of the process. It is actually the most important phase, where most time and effort should be dedicated. Poor refurbishment can be always repaired but poor project never. o Don't be tempted to refurbish too many buildings within one project with limited budget. You will achieve poorer results in terms of energy and financial savings and will have to enter the building with another intervention in a couple of years. Better option is to do a comprehensive refurbishment of a limited number of building reclaiming their full energy-saving potential. o Don't be afraid to seek advice. If you don't have the knowledge and skills to prepare the investment properly, hire an external consultant. Take benefit of networking and

Megjegyzés [Resolvo5]: AFE, MALMO, PNEC and DURHAM: please revise the list of DOs and DONTs suggesting eventual changes/ modifications

these elements and interactions between them need to be taken into account when planning the refurbishment (e.g. putting insulation on the wall requires adaptation of internal HVAC systems, new heating source should be adapted to the new thermal characteristics, etc.). ✓ Carefully select building selection criteria, ensuring adequate balance between economic, ecological and social ones. Make sure that the selection is based on a bottom-up, reliable data. ✓ Consult your project with other departments' investment and action plans. Seek for synergies and avoid mutual disturbing of investments. ✓ Make sure that the investment is preceded with adequate studies (energy audit, feasibility study, economic and financial assessment). ✓ Plan the investment in a way that will ensure that after the refurbishment the building will be not only energy efficient but also comfortable for the users.	exchange-of-experience opportunities and consult the municipalities/building owners, who already done their refurbishments. o Don't take energy audit for granted. Since it is obligatory within many financing programmes, there are many companies that are doing them fast and slovenly. Read the audit carefully and check if the data are correct and recommendations reasonable. If you cannot do it yourself, ask for external help. o Don't forget about the building users. They are an important "component" influencing building consumption. Make sure that their practices and needs are taken into consideration when planning refurbishment and that it is combined with awareness raising and educational activities.

IMPLEMENTING

Megjegyzés [Resolvo6]: PNEC: please revise TIPS session, trying to group and divide into steps

✓ **TIPS**

- A project is a team effort and the base is set in during planning. Secure an appropriate organisation that can follow up on progress and quality and that can adjust their work along the way. Work along with the contractor to secure a good quality of work.
- Involve specialists, public experts, local and European experts.
- Encourage the Public-private partnerships.
- Do market research on project specialists and experts.
- Continue communicating, but with particular involvement of internal specialists – i.e. finance, technical, legal
- Regular meetings with contractor(s)
- Ensure that the sign off/ handover sequence is appropriate and communicated
- Prepare for commissioning and reporting of KPIs
- Clearly define your expectations from the projects, including technical specification, expected results, cooperation details, length and scope of guarantee, complementary services, etc.
- Prepare good-quality and clear procurement documentation. If you don't have your own procurement expert, hire an external one. It may be worth to ask for external legal support especially in case of more complex procurements (competitive dialogue, procuring ESCO).
- Use green public procurement criteria to ensure best possible environmental impact.
- After selecting the contractor, organise a multi-stakeholder meeting and training that will hel them better understand specific characteristics of the municipality, the building and the project.
- Stay in regular contact with the contractor, monitoring its work, providing support and explaining all doubts.
- Formally commission the works only when you are sure that everything has been done properly and all the malfunctions (if any) have been removed.

List of ACTIONS	Experiences/ advices	Good Practices
a) Clear procurement rules (including for ESCOs) stating energy benefits/performances to be reached after works, preferably green and innovative public procurements	Identify a role of Monitoring Officer and establish suitable monitoring systems to ensure effective oversight.	
b) Technical staff (such as mechanical and electrical staff) to be included in meetings that discuss value engineering (particularly relevant for large construction projects)	Project and maintenance team, which means an Integrated team, is mandatory especially in the first phases: Planning and Implementing. It is a must for the mechanical and electrical engineers and staff, involved in project and maintenance of the equipment, to have good communication instruments.	
c) Stakeholders included in the process through meetings organised	In order to achieve good results, the stakeholders should be identified early in the process and a meeting and communication matrix is to be decided. If not all stakeholders can be involved in all meetings, concentrate on communicating progress in order to keep	

Megjegyzés [Resolvo7]: AFE, MALMO, PNEC and DURHAM: please revise this session by adding information and/or suggesting improvements on advices provided

Megjegyzés [Resolvo8]: AFE, MALMO, PNEC and DURHAM: please add references to REBUS GPs, trying to associate GPs with actions. Remember:
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	everyone up to date.	
d) Contractor duty of care to examine and repair snagging issues, working directly with users and building technical staff	Ensure there is provision in original specification to hold contractors accountable for the resolution of snagging issues before project sign off.	
e) If part of a larger project, measures in place to ensure quality control of installations	Measuring is always a way of securing quality in energy efficiency projects. Moreover, the presence of a QA-manager to secure the quality of result is highly suggested.	
f) GP booklet available for public administration	Having at disposal all the main information gathered in one single document is of high advantage for PAs.	
g) Close cooperation among the partners/experts/departments affected by the renovations	Involve all potential partners/ experts/ departments/ politicians affected by the renovation in stakeholder meetings.	
h) Contracting a good and reliable Construction Supervisor	The construction supervisor should be specialised in energy consumption integrated in architecture, engineering, installations.	
i) The different budgets of managing the buildings should all be regarded when discussing efforts of energy efficiencies.	A comprehensive options appraisal of the technologies available should be carried out, including associated costs and payback.	
j) The efforts of energy efficiencies should be prioritized throughout the whole process and for the whole life time of the building.	A continued development process should be encouraged with regular awareness training for employees through good practice programmes.	GP Big Switch Off
k) Development of public-private partnership in energy efficiency sector.	Scope out opportunities to involve private partnerships and the environmental benefits from doing so.	

DOs:	DONTs:
✓ Flow the information between different parts. ✓ Have building implementation meetings on regular basis. ✓ Have a QA in larger projects ✓ Retrofit what is needed. Make ROI calculations ✓ Communicate structured and frequently ✓ Use some technicians that can explain and talk with a non-technical language for dissemination purpose ✓ Pay special attention to phases of handover and secure that all necessary knowledge is passed on ✓ Transparent information between different parts. ✓ Public-private partnership. ✓ Transparent procurement and	o Don´t have too much faith in ESCO: s. They are companies that need to make profit, which will have an impact on your ROI. o Avoid quick not-documented solutions. o Avoid following the minimum requirements for improving the performance of the buildings o Don't try to do it all yourself o Don't assume the contractor is on schedule and aware of handover requirements o Don't keep the project to yourself o Don't use price as the only criterion when selecting the contractor. o Don't be afraid of using the competitive dialogue procedure. It can be helpful in case of more complex and innovative projects. o Don't underestimate the role of building maintenance staff, who knows the building

Megjegyzés [Resolvo9]: AFE, MALMO, PNEC and DURHAM: please revise the list of DOs and DONTs suggesting eventual changes/ modifications

implementation procedures. ✓ Ensure the quality control of all the construction phases ✓ Seek guidance from specialist colleagues ✓ Keep on top of contractor ✓ Prepare for handover ✓ Ensure that all key stakeholders are involved in the implementation process and can influence it. Allow building maintenance staff to share their opinion. ✓ When selecting the contractor take into consideration environmental and social criteria to ensure that the investment is maximally environmentally and users' friendly. ✓ Organise pre-investment meetings and trainings for the contractor to ensure that he understands the local situation well and can deliver the service according to your expectations. ✓ Ensure good quality supervision over the construction works. If you don't have adequate internal capacities, reach for external ones. ✓ Commission the works only when you're 100% sure that the investment was done correctly and no corrective works are needed.	and its problems best. Ask for and listen to their opinions. o Don't forget to stay in regular contact with the contractor, ensuring on-the-job supervision and support and quickly reacting too all possible problems.

MONITORING

- ✓ **TIPS**
  - For proper monitoring you need three systems:
  - Building inventory system
  - Building management system
  - Energy system
  - These can be altogether in one system or three separate system.
  - Beside that you need to communicate and spread the result of the monitoring in order to enlighten tenants and let them feel that they are a part of the result.
  - The development of a national Methodology for the calculation of the Energy Performance of the Buildings is mandatory in order to have relevant data about the energy consumption and the CO2 emissions for the existing building compared with the renovated building.
  - The existence of a Gantt Chart can be a support for the quality assurance of the building.
  - Online platform for the users of the buildings, where they can find reliable information about sustainability, energy efficiency, climate change, reducing CO2 level indoor and outdoor, ecology, etc
  - The elaboration of a list of specialists in the field of energy efficiency, which can be involved in the Monitoring phase of the project.
  - Post implementation follow-ups and feed-back from the stakeholders and direct space users involved in the project.
  - Keep language and data simple and accessible
  - Communicate successes and learn from mistakes
  - Seek feedback
  - Be innovative when problem solving
  - Clearly define monitoring procedures, tools and division of responsibilities already in the investment planning phase
  - Assign adequate resources (time, staff, financial...) that would enable efficient monitoring
  - Consider using ICT technologies for ensuring good quality and long-term monitoring that would last beyond one investment and enable coming up and implementing further energy optimisation measures (smart meters, SCADA, BMS, BEMS)
  - Make sure that the results of the monitoring processes are reported to the decision-making bodies and widely disseminated among the public

List of ACTIONS	Experiences/ Advices	Good Practices
a) **Reliable monitoring system (i.e. BMS)**	Implementing building monitoring and control systems is a must. The initial costs can be high, but the investment is cost-efficient on long term. Also, try to establish a coherent approach to implementing BMS within all buildings managed.	GP The Mercury project
b) **Using accessible non-technical language, inform building users of project progress and outputs**	There is a need to teach municipal staff and their partners involved in energy renovation projects to better communicate with non-technical people (e.g. local decision makers, building users, general public). In this way they could better report on the activities taken and results achieved, as well as use the opportunity to raise awareness	

Megjegyzés [Resolvo10]: CRETE: please revise TIPS session, trying to group and deleting redundant information

Megjegyzés [Resolvo11]: BORA, SERDA and CRETE: please revise this session by adding information and/or suggesting improvements on advices provided

Megjegyzés [Resolvo12]: BORA, SERDA and CRETE: please add references to REBUS GPs, trying to associate GPs with actions. Remember:
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	of these target groups. It also needs to be considered that energy renovation project is only efficient, when people know how to operate "new" building, systems and equipment in a proper way. Therefore this communication, where both sides speak the same "language", is very important. A user-friendly guide should be created in order to understand all the renovation work and learn how to use the renovated building properly, keeping energy efficiency in mind. Also, it can be useful to organise meetings between the building users and the architects and engineers involved in the renovation project.	
c) Opportunities for feedback; transparent process in place for responding to feedback	Set-up useful and up to date communication channels (online forum, Q&A page, social media pages) for regular communication and feedback with end-users (e.g. to gather people's opinion on the "new" building, comfort within, easiness of difficulties with operating modernised systems and new equipment, etc.). Make sure these social channels are regularly updated and monitored.	
d) Funding structure in place for carrying out repairs and maintenance	Always remember to include funds and measures for maintenance costs in contractual agreements and/or in the overall operational budget	
e) Planned process of work (Gantt chart) – Who, How, When?	It has to be clearly defined in the procurement procedures and the law. A planned process of work (like Gantt chart) can provide quality assurance during the Planning phase, the Implementation phase and Monitoring phase.	
f) Clearly defined reporting system of results and method of reporting (i.e. web)	A public online platform that can easily provide information where these reports can be put online and can be discussed with the involved actors.	
g) Monitoring decision-making structures results	Undertake regular monitoring activities at set intervals, using all available tools (from online management systems, to periodic meetings, etc.).	
h) Planning of Data Collection/analysis of building energy consumption before and after refurbishment	Identify from where energy data is obtained. Is it special/ designated access required? Is it sufficient historical information available (to make a before and after comparison)? Plan a diminishing but realistic reporting programme where information is monitored very frequently at first commissioning, and is tailored accordingly as the installation matures. It would be also useful to introduce a requirement (e.g. in the funding programme) that each investment should have both pre- and after-investment energy audit done.	
i) Improved cooperation	Representatives from finance, M&E, sustainability specialists, senior leadership and building users should meet	

between specialists from various fields of activity within municipalities for monitoring the performance indicators	to discuss what expected performance is. This group must share responsibility of celebrating successes and tackling issues. Municipalities, as well as public authorities in general, should be encouraged and empowered to invite specialists from various fields to join monitoring of the investment performance indicators.	

DOs:	**DONTs:**
✓ Set up the right monitoring team ✓ Secure for a long-term maintenance budget (5-10 years) ✓ Use a web-based project reporting tool, where all supplier reports ✓ Have a structure for all needed information, and secure that they are reliable / updated ✓ Target an ambitious goal, such as a high energy performance of the renovated buildings – exigent requirements for the primary energy consumption, heating demand, cooling demand, air tightness of renovated buildings ✓ Use of a clear Methodology for the calculation of the performance of the building ✓ Set up an online platform where all the parts involved in the projects can see the achievements, the users of the building can find information, like User-Guide, a Question & Answer area, etc ✓ Check and challenge data regularly ✓ Seek feedback ✓ Ensure wider project lessons are understood by colleagues ✓ Ensure that the monitoring process builds on the same procedures and data sources as the baseline development. If not possible, make necessary adjustments ensuring comparability of the data. ✓ Involve all key stakeholders in the monitoring process. Be interested not only in the quantitative, but also qualitative inputs. ✓ Use available ICT technologies as much as possible. They are great support in energy monitoring and optimisation processes and are becoming increasingly available and cheap. ✓ Gain knowledge about state-of-the-art monitoring systems, BMS that are available on the market and get familiar with GPs that feature successful and reliable monitoring processes	o Don´t diversify. Use one process, so you can compare both overtime and with other buildings o Don´t keep things for yourself. Communicate! o Don´t envisage through the renovation projects only a singular issue (like ETICS, for example). A renovation project should be done by an integrated team, with all the specialists involved and working as a team; o Don´t monitor only on short-term; o Don´t forget to estimate a budget for repairs and maintenance; o Don´t forget to set up a clear and flexible method for communication with the building users o Don´t assume expected performance is being met ~~o Don´t keep the project to yourself~~ o Don't underestimate the monitoring phase of the investment. Always check if the real results are as they were foreseen. If they are poorer, analyse why, plan corrective measures and draw conclusions for the future. o Don't rely too much on statistics and aggregated data. Use as much bottom-up data as possible. o Don't focus only on the quantitative results. Also qualitative ones are important.

Megjegyzés [Resolvo13]: BORA, SERDA and CRETE: please revise the list of DOs and DONTs suggesting eventual changes/ modifications

✓ Remember that the monitoring makes sense only when the data are used in practice (e.g. for drawing conclusions for the future, coming up with further optimisation measures, justifying further funds for energy efficiency, promoting the project and its success, raising awareness and encouraging to implement similar initiatives…).	

HORIZONTAL THEME: CAPACITY BUILDING

Megjegyzés [Resolvo14]: SERDA: please revise TIPS session, trying to group and deleting redundant information

✓ **TIPS**

- Organise regular thematic trainings for municipal staff involved in energy-related projects, not only technicians, but also employees of legal department, accounting department, communication department;
- Encourage municipal staff to take part in external events (conferences, workshops, webinar, study tours) and networking opportunities;
- Organise dedicated trainings for other stakeholders involved in energy retrofitting projects (including energy auditors, possible contractors and subcontractors);
- Make sure that all energy retrofitting projects are combined with awareness raising campaigns addresses at building users and encouraging them to use energy and other resources more rationally.
- The sustainability job is never done. Use your imagination to try new ways, and to develop new ideas.
- Involve as many partners as possible. This is a matter for everybody, so communicate!
- Find your way of long-time work with energy efficiency. Make it a process. Don´t go into projects that will end!
- Focus on training that are promoting high energy efficiency of the buildings (e.g.: trainings focused on passive houses standard).
- Plan trainings for all the actors: end-users of the buildings, technical professionals, staff working as employees of the public authorities.
- Sustainability is relevant to every job – identify and talk about its wider relevance and relationship with colleagues from other areas
- Sustainability is everybody's responsibility – don't accept sole responsibility.
- Sustainability is not an initiative or project – these things are temporary. What will the legacy of this project be?
- Everybody will have their own interests – work with these; don't waste time or effort on making all topics interesting.

List of ACTIONS	Experiences/ Advices	Good Practices
a) Educational Campaigns with wider contextual relevance and structured programme using multiple stakeholders (i.e. universities, schools)	Regular campaigns aimed to raise awareness on environmental protection, decreasing fossil energy consumption, encouraging renewable energy production / consumption, etc. should be organised.	• Euronet 50/50 • School Carbon Reduction Programme
b) Regular on-site training sessions for employees/ users/ workers, etc. AND Refresher training as project matures.	Training should be transversal to all 3 topics, such as: - criteria for data collection and building selection - elaboration of the technical documentation for the project proposals and ESCOs schemes - energy performance measuring, etc. Trainings should also be adjusted after the participants' knowledge base.	
c) Regular communication on continuous development via multiple communication routes / social networks	Regularly update the stakeholder group on steering group decisions. Promote internally through intranet and with partners through social media accounts on facebook and twitter and through partner mailing lists.	

Megjegyzés [Resolvo15]: BORA, SERDA and CRETE: please revise this session by adding information and/or suggesting improvements on advices provided

Megjegyzés [Resolvo16]: BORA, SERDA and CRETE: please add references to REBUS GPs, trying to associate GPs with actions. Remember:
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d) How to ensure project legacy – i.e. so that it is not just another initiative	There must be a clear and understandable incentive for the stakeholders involved. Also, the hinders for participation needs to be tackled in the group. Continuity and communication are main obstacles. One must also look for added value.	
e) Stakeholder meetings about energy efficiency	Plan energy efficiency updates and knowledge sharing into work programme to enable effective capacity building and sharing of good practices.	
f) Regular participation in conferences/workshops/webinars etc. related to each topic	Meetings and trainings with all the involved persons should be organised regularly. A good initiative would be to organise free campaigns for the public (city inhabitants). Target those conferences that are applicable to stakeholder interests at a local, regional, national and international basis.	
g) Raised awareness on ESCO concept and energy efficiency business culture (education, information dissemination and demonstration projects) in order to increase the trust of the customers and to stimulate the ESCO market on the long run	Transparent procurement procedures and costs and benefits in working with ESCO. The main concern can be the higher final cost. Awareness campaigns and trainings with public servants regarding ESCO implementation and costs procedures should be organised.	
h) Proper training of energy issues specialists	Architects, engineers, auditors, technicians and installers, personnel directly involved in buildings renovation and modernisation, staff with higher education involved in the inspection and control of construction works, referring both to inspectors from the central or local authorities as well as site supervisors and technical supervisors in charge with the execution to be able to implement the new solutions for making buildings energy efficient. These should all be regularly trained with ad-hoc programmes.	**SEAP-driven energy training for municipal staff to set-up a local energy management agency**
i) Increased allocation of European funds to support vocational training and skills development for the energy efficiency field	There are many examples of soft projects funded from EU or national funds supporting capacity building of municipal staff, also in the area of energy efficiency. Their training material and approaches are freely available and can be further used in the future for increasing thematic knowledge and skills of municipal officers.	

Megjegyzés [Resolvo17]: PNEC: could it be possible to add links to such material?

DOs:	**DONTs:**
✓ Educational campaigns ✓ Organise regular trainings not only for municipal staff but also other key stakeholders (energy auditors, contractors, building users). ✓ Workshops for exchanging experience between	o Don't try to prepare universal educational campaigns. All capacity building activities need to be adapted to the target group (needs, initial level of knowledge, professional

Megjegyzés [Resolvo18]: BORA, SERDA and CRETE: please revise the list of DOs and DONTs suggesting eventual changes/ modifications

municipalities ✓ Dissemination of the results between stakeholders ✓ Develop educational programmes for all stakeholder ✓ Challenge your own understanding of sustainability ✓ Expand your thinking. Develop and think new! ✓ Educational campaigns on the national level that increase the awareness on climate change ✓ Regular training sessions for employees/users/workers etc ✓ Workshops for exchanging experience between municipalities ✓ Dissemination of the results between stakeholders ✓ Discuss the wider relevance to the organisation and its individuals ✓ Listen, as well as communicate ✓ Be patient – sustainability is a complex messy topic ✓ Remember that capacity building must be a continuous process. ✓ Remember that each training activity should be preceded with training needs assessment of the target group and finished with comprehensive evaluation. ✓ When working with building users, not only educate them but also try to involve them in energy management processes.	background, etc.). o Don't forget to combine teaching theory with practical exercises. o Don't forget to communicate with the target group before and after the capacity building activity. What are their attitudes and expectations? What is their feedback? o Don´t do as you have always done. Try new things. Develop! o Don´t train only one category (eg. only for engineers) o Don´t miss the best knowledge existing now on the European market on high energy efficiency of buildings o Don´t assume that what interests you, interests everybody o Don´t give orders; sustainability should be participatory and non-prescriptive o Don´t be afraid of being challenged o Don´t be one-dimensional

EXPERIENCES from REBUS EU region:

PLANNING

Defining criteria for building selection (e.g. the biggest energy consumer in absolute terms or per m^2, etc.)	
Florentine Energy Agency	In 2018 Tuscany Region launched a call for improving energy efficiency of public buildings (call drafted with the support of Rebus project). Among the evaluation criterion, additional scores were included as follows: 1. Technical quality of the project in terms of objectives: Reduction of non-renewable global primary energy requirements (EPgl, nren); 2. Project planning and workability: Advancement of the design level of the interventions at the time the application is submitted. 3. Energy class of the building: more points for the lower class. 4. Building volume: Greater gross volume of the building 5. Project concerns building intended for school, sporting and hospital use: 0-4 points : • Scholastic = 4 points • Hospital = 4 points • Sport facilities = 2 points • Other type = 0 points 6. Project involving the transformation of the building into a nearly zero energy building = 3 points 7. Project providing context for seismic prevention interventions = 0-4 points: a project that provides for the context of earthquake prevention measures for which an application has been submitted to the call for applications as per DD13747 / 2016 and at least the technical and economic feasibility project is approved on the date of submission of the application = 4 points 8. A project that provides for interventions for seismic prevention at the same time, for which at least the economic technical feasibility project is approved at the date of submission of the application to this announcement = 2 points 9. The project also provides for interventions for the removal of asbestos = 2 points 10. Project involving the use of monitoring and control systems for the energy consumption of the building and the plants = 2 points 11. Project concerning buildings already included in the SEAPs adopted and / or approved by the Municipality = 3 points
City of Malmo	A nuanced categorization is needed out of size, building category, age, usage and energy consumption. Factors that can give the answer if it is possible to get a ROI and if it is in line with the targeted goal. In a building with a large area a small mitigation of energy consumption per square meter can make a great contribution in total (due to the area), while a small building with a large mitigation of energy consumption of energy consumption per square meter in total can make only a small mitigation due to the total area. The department of internal services of Malmö have used different approaches. One is identifying big energy users where a small saving in percent would have a great impact on energy costs. Another is comparing expected energy use to real energy use to identify buildings with high potential. varying approaches are needed because of varying structure of buildings and together they create a good net in which high potential buildings are identified.

Megjegyzés [Resolvo19]: **ALL PARTNERS:** please revise all information on experiences, trying to provide as many details as possible, including available links to websites, specific references of projects implemented, etc.
Remember that this should be a session where people can find additional information on suggested actions.
Imagine yourself looking for this information and wanting to know as much as possible on it!

Megjegyzés [Resolvo20]: AFE, MALMO, PNEC and DURHAM: please revise all information on experiences RELATED TO PLANNING.
Feel free to add tables and lines in case of actions not listed below.

BORA 94	In the call TOP 3.2.1-16, the following main criteria are listed in terms of defining criteria for building selection: - 100% municipality owned buildings; - only municipal buildings with restricted functions (e.g. educational, cultural, public administration, social, recreational, healthcare, day-care are supported); - there are specific investment cost constraints to narrow down the pool of potential buildings (e.g. in case of 5 000 EUR support, 1 tons CO2 equivalent GHG savings are necessary to undertake; the net eligible investment cost for 1 GJ primary energy savings shall not exceed approx.. 360 EUR/GJ; restrictions for RES application (solar system: 1 500 EUR/kW, sun collector system 900 EUR/m2, biomass furnace 500 EUR/kW; heat pump systems on average: 800 EUR/kW; these amounts are higher in case of heritage buildings.
SERDA	The main idea is to establish the base criteria for energy consumption MW/sqm/yr. According with Norms C107/2005 completed 2010, based on energy inquiry (energy audit) and energy bills we can determine the biggest consumers. These 2 main criteria can be relevant in choosing the building to be refurbished and retrofitted. There are some criteria and regulations already established in the national and local strategy regarding energy efficiency, but also in Sustainable Energy Action Plan 2015-2020 - PAED South-East Region of Romania-Buzau, but all these are not mandatory regulations. The criteria are listed below. The criteria is based on national Norms and Methodology, like C107/2005 completed in 2010 and 2016, Norm regarding "The thermo-technical calculation of the construction elements of a building", and based on MC001 / 2006 – "The Methodology for the calculation of the Energy Performance of the Building", all the needed calculations can be realised, thus providing relevant information about the energy consumption and the CO2 emissions of the buildings, all the data being synthesized in the Energy Performance Certificate of the building and based on current data about the energy bills and energy consumption of the buildings , the criteria for building selection can be defined. On the other hand, concerning the City of Buzau, currently there is no available database with the respective information. To conclude, based on the Energy Performance Certificate of the building and based on the current data about the energy bills and energy consumption of the buildings, relevant criteria for building refurbishing selection can be set, such as the following: • The values of the Primary Energy consumption, • CO2 emissions, • Heating energy demand, • Cooling energy demand, • Hot water energy demand, • Thermal comfort,

	• Internal air quality, • Area, • Number of users, • Age of users, • Location: urban, suburban or rural area, • Year of construction.
Durham County Council	**DCC use three criteria to identify buildings that require energy management support either through renovation or lower cost measures such as controls and training.** 1. **High energy consumption –** buildings with high energy consumption will typically have poor heating controls and poor user control of electrical equipment (i.e not turning something off). Poor controls will reveal themselves through high out-of-hours consumption and an unrealistic baseline for the size or use of the building – i.e. the amount of gas and electricity being used to provide basic services such as maintaining a minimum temperature. 2. **Low space utilisation (poor SAP performance) –** buildings that have poor space utilisation will naturally have high energy consumption. For example, if a building controls are set to maintain a certain temperature during normal working hours, but is only used for some of these working hours, energy is being used unnecessarily. 3. **Is the building fit for purpose –** poor space utilisation is often a sign of a building not being fit for purpose.
Region of Crete	For all the 44 buildings of the Region of Crete (owned and rented), all the available information has been gathered in a database. Specific selection criteria were set (energy consumption, cost, CO2 emissions, number of employees, number of visitors, work schedule, area of the building, construction year etc), in order to make a comparative assessment between buildings, identifying the ones that there are multiple reasons to give them priority for energy refurbishment.

Definition of Tools for data collection, setting up the inventory/database	
Florentine Energy Agency	Good energy manager in public hospitals and in some public building collected good energy audit and good database, with MBS of excellent quality.
City of Malmo	*The system used for monitoring energy use in Malmö is called E4. In this system we register electricity, water, district heating and gas. E4 is supplied with information from their different supplier of energy. For instance is the information for electricity delivered from E.On by daily basis. For the moment the E4 only delivers compilation every month, but since the data is daily specific, this can be change quite easily.*

Megjegyzés [Resolvo21]: further details are needed

	When setting up a data base it is important to establish and secure the energy statistics that goes in to the data base. This to be able to properly analyse the data later. Questions to be answered are among others: What is supposed to be measured, and how is it possible to secure that this will be measured, and nothing else added or withdrawn. How can you secure that this will be fulfilled both before and after the renovation?
BORA 94	*In order to receive support from the targeted policy instrument (TOP), each applicant must provide an energy certificate for the renovations, which contains the current situation including comprehensive energy consumption data of the targeted buildings. The format and content of the energy certificates are determined by law. The energy consumption of the buildings should be proved by utility bills, but estimations of the energy experts are also accepted. A major data collection process concerning public administration owned buildings was implemented on national level in Hungary on 2013 (National Building Energy Performance System, managed by ÉMI)*
PNEC	There are examples with pilot implementation of different data collection tools and inventories that can be used as reference by other municipalities, e.g.: • on-line data collection tool implemented by Częstochowa – each month representatives of all municipal buildings log in the system and provide data on the last month's consumption of utilities (coming from meter readings or invoices). Data from all buildings are collected in one database and thus can be monitored and benchmarked. The building representatives have been adequately trained in using the system and understanding meter readings/invoices. • Energy management system following ISO 50001 implemented in Dzierżoniów municipality – the system includes a database of buildings with historic and current data on utilities consumption and enabling comparison of the current consumption to the established baseline (and thus checking which buildings consume more/less than expected, which are improving, etc.). The data are collected with the help of building managers and periodically verified. • Smart metering systems implemented in Niepołomice municipality, which enable more advanced data analytics.
SERDA	*We already have some tools and inventories containing energy consumption data, CO2 emissions and a methodology but everything needs to be clearer and integrated. The action lines were given in Sustainable Energy Action Plan 2015-2020- PAED South-East Region of Romania-Buzau.* *A new template containing integrated data is a solution and will be a very good measuring tool.* 1. *Energy surveys (audit energetic)* 2. *Energy bills* 3. *CO2 emissions* 4. *The values for the Primary Energy consumption,*

	5. *Heating energy demand,* 6. *Cooling energy demand,* 7. *Hot water energy demand,* 8. *Thermal comfort,* 9. *Internal air quality,* 10. *Area,* 11. *Number of users,* 12. *Age of users,* 13. *Location: urban, suburban or rural area,* 14. *Construction year.*
Durham County Council	**Is the database fit for purpose, user friendly, readily available and compatible with existing databases?** Durham County Council have installed a piece of sofware called 'Systemslink', which is an energy monitoring and targeting software system that processes large amounts of complex data on gas, water, electricity, oil, and biomass. Since it was installed in 2010 the software has helped to up to 25% of costs in some buildings. The software also has an interactive portal created for each site, so that building users can see how much energy they are using and compare current and past consumption. This raises awareness of energy consumption costs and consumption and has increased transparency for the bill payer. Energy and water consumption data is collected half hourly for each site meaning that the data can be managed by identifying energy waste (such as boilers being left on overnight), water leaks and billing mistakes.
Region of Crete	*A template was made and energy managers filled in all the characteristics of each building (energy consumption) in order to create the database.*

Megjegyzés [Resolvo22]: further details are needed:
main elements of the database, where is it stored, will it be used in future?

Consultation with building users, particularly those who will be responsible for technology	
Florentine Energy Agency	Excellent energy managers operate in many public buildings, in contact with building users, particularly with responsible for Technology.
City of Malmo	*To be convinced of that the targeted buildings is in line with the goal of energy mitigation, a reality check should be done. Interviews with tenants, building users and technicians will hopefully confirm the adoption and will also complete the view of the needs for the building. In the planning, useful information often can be added during consultation sessions. To add this later in the process often are more expensive or even impossible.*

Megjegyzés [Resolvo23]: further details needed: what kind of activities do they carry out?
Are regular consultations in place?

BORA 94	*According to the relevant call, during the project implementation, building users must be informed in frame of trainings about the benefits of the development, the applied new technological solutions and their appropriate use.*
PNEC	
Durham County Council	DCC manage the use of 'Systemslink' with external users by regular electronic correspondence and simple training tools that are regularly refreshed.

Is the proposed project appropriate to business and user needs?	
City of Malmo	*At this point it is crucial to make the project so financial solid as possible. One way of doing this is to broaden the view, and see if it is possible to scale the project up by examine other buildings to see if there are other buildings with the same needs. If so, the total cost for these building renovations will probably be less expensive than the result of separate renovations of the same buildings.* *There is also a need to take the user perspective into consideration. Is it possible to make all the renovation at one time without disturbing the user activities in the building, or shall it be renovated in sections? Is it possible to move the tenant's operation to an alternative building during the renovation?* *One example of this is the refurbishment of the Mazetti building where we have 10 different tenants, and 10 different rental contracts. A workshop will be performed to sort out what approach will be the best, and how to plan the different steps in the renovation. Also, we have an ongoing dialogue with the technicians in the building to secure that all projects will be appropriate and relevant.* *Being a landlord, we have an opportunity to install more energy efficient technique in conjunction with maintenance/exchange of technical parts. This has enabled us to decrease energy use.*
BORA 94	*Municipalities represent the municipality needs when negotiating with the energy expert. The energy expert usually suggests the most optimal energy efficiency solutions taking into consideration the clients' needs.*
PNEC	Current and possible future functions, as well as the building users' comfort and needs, are usually taken into consideration when planning energy retrofitting projects. There is a need, however, for more in-depth study on the building characteristics influence on human well-being and health, that could be further considered in the future.
SERDA	*In terms of user needs, the proposed project will improve the thermal comfort, the air quality and the energy costs will be minimised. During the retrofitting project, it is important to find the best solution in order not to disturb users: a step by step refurbishing project or even moving users, if possible, to another location.* *In terms of business, energy price has a continuously rising tendency, so having control over the energy consumption is a business-wise approach.*
Durham County Council	*If a site demonstrated a business need for further technological interventions, such as solar panels, DCC would always consult with the building manager to ensure that they were on board with the technology being implemented and understood why there was a business need. For example, this might be to reduce peak electricity demand or to help meet the objective of a renewable energy policy.*

	Consulting with a building manager would also offer a more comprehensive understanding of the buildings use and therefore help identify conflicts between business and user needs.

Leadership commitment to providing long term support and resource after project completion	
City of Malmo	*No leadership commitment is needed for providing support after project completion due to the real estate maintenance process. Every year a budget is done for long term (next 5 years) maintenance of buildings within the organization, which is included in the overall operational budget. In this way, it is possible for the politicians to get an early warning system, they can see the calculated costs for the next 5 years, and can react on that. That gives a stability to the financial situation, to anticipate the coming costs for maintenance. However, a financial budget for adjustments after the implementation, not connected with the maintenance budget, is important*
BORA 94	*The call determines a 5-year maintenance period for the applicants. The municipalities, which are lacking money for developments, are generally determined to successfully implement the projects and to maintain the results on a long-run.*
PNEC	*Utilities consumption and building maintenance costs are included in public entities annual budgets covered from the local budget. In case some repairs/adjustments of refurbished structures/systems are necessary, they should be done within the guarantee offered by the contractor. Adequate guarantee should be requested within the call for tenders.*
SERDA	*Public entities (schools, hospitals, kinder gardens, Town halls etc) have an annual budget for building maintenance costs and energy consumption. According to National legislation into force legislation, energy managers of renovated buildings should be able to provide maintenance costs and annual costs so as to be included in annual municipal budgets. Also some mandatory rules are stated by the law (the destination of the buildings, conservation and maintenance of the investment etc)*
Durham County Council	***Identify resources required to deliver outcomes, and that these resources are shared between departments.*** *Resources may be human and financial. Capacity building is a key component for the success of any energy savings initiative. With leadership support, DCC has increased its capacity by enrolling 'eco-champions' across the organisation in different departments who purport the wider learning of energy conservation projects.*
Region of Crete	*All public entities have an annual budget for building maintenance. Based on Greek legislation the energy manager of the renovated building should provide the required maintenance cost, so as to be included in that annual budget.*

Megjegyzés [Resolvo24]: can this be further explained?

An understanding of land/ building ownership/ conservation issues	
Florentine Energy Agency	Refurbishment of Versilia Hospital offers a good example for this, as the overall planning phase took into account conservation issues to have a good impact in land.

Megjegyzés [Resolvo25]: please add further details on the planning elements taken into account to respect conservation issues

City of Malmo	*It is important to understand and consider roles and legislation as well as cityscape and conservation issues when renovating. We normally involve other authorities early in the process as well as tenants.*
PNEC	*When planning, energy refurbishment projects is imposed by the law. In case of historic buildings, all refurbishments must be consulted with the heritage conservator and his/her guidelines must be followed in the process.*
SERDA	*The law provides the direction, the rules and other specific issues* ***but a monitoring organisation is necessary*** *in order to maintain the investment on the long run.*
Durham County Council	***Identify status of building/ land ownership, and potential hazards/ environmental issues.*** *DCC as an organisation has the in-house expertise to examine ownership and conservation issues that may be affected by the installation of renewable technologies.*

Identification of potential hold-ups i.e. environmental, structural, ecological	
Florentine Energy Agency	1. The most important hold up is the high number of contracts of global services about energy between public administrations and private companies. This kind of contracts make impossible to collect data in real time, to imagine a strategy about energy efficiency, to have public energy manger with the real power to act. The public administration can talk a lot, but decide only little things. 2. Second, political will has been weak about energy efficiency strategies.
City of Malmo	*An example that is quite common in Malmo is polluted ground. This can tip the business case of a renovation. We have dealt with this by make risk analysis much earlier in the process than we used to, in order just to avoid hold-ups.* *Another way of avoiding this is connected to the way to procure. If a General or total entrepreneur with responsibility for all contractors is procured, it is more limited risk of unexpected hold-ups*
BORA 94	*In TOP applications each applicant must elaborate a so called "Project plan" which contains a risk assessment section, considering and explaining in details all risks that can occur during implementation and maintenance period.*
PNEC	*Risk analysis is an important part of any investment preparation, including energy refurbishments. It an important part of a proper feasibility study and is required when applying for external funding, both from public and private funds.*
SERDA	*Environmental hold-up: heavy rains, floods.* *Structural hold-up: Earthquakes (seismic zones)* *Ecological hold-up: Architectural protected zones and monuments, Urban Development Plans, Natural Protected Area (Nature 2000)* *Economical hold-ups: old and unreal Building standard costs* *Structural hold-ups and heavy procedures for authorization rehabilitation of the buildings*

Durham County Council	***Is it contaminated land, archaeological/ ecologically sensitive area, and is consultation required with external stakeholders?*** *DCC must always examine these aspects of planning in order to remain compliant with building and planning legislation. If operating as an individual or small company within a municipality, seeking advice from your local government office would help you ascertain if your renovation would be affected by any of these aspects.*

Criteria for identifying and prioritising the most energy efficient and innovative renovation options existing on the market	
PNEC	*When preparing the investment, the most proper solution for the particular building (or group of buildings), budget, environment, external requirements, etc. must be met (which might be most proven and cost effective solution). And this is done within the feasibility study which is a standard when planning investments and a must when applying for external financing.*
SERDA	*The 5 criteria for a Passive Building defined by Passive House Institute* *1. Air tightness* *2. Thermal bridge free design* *3. Continuous thermal insulation* *4. Ventilation with heat recovery* *5. Higher standards for windows* *The most energy efficient and innovative renovation option on the market is the Enerphit Standard, which is an energy retrofit with Passive House components, developed by the Passive House Institute from Darmstadt, Germany.* *The criteria for a Passive House defined by Passive house Institute consists in reaching a very high energy performance of the building- decreasing the energy consumption with a factor of 10, a high level of comfort and a high indoor air quality.*

Planning synergies with other calls/policies/paths	
BORA 94	*Creating synergies and eliminating overlaps with other calls/policies are the responsibility of the appointed management authorities (usually ministries), since in the 2014-2020 programming period, planning and programming tasks are dedicated to national level. However local levels are consulted in the planning process.*
PNEC	*More and more often energy retrofitting projects are implemented as a part of long-term strategies and action plans, such as Sustainable Energy Action Plans or Low-Emission Development Programmes, which are compulsory when applying for funds within certain priority lines within the Operational Programme Infrastructure & Environment and Regional Operational Programmes. There is still need, however, for better coordination of activities and investments implemented by different city departments (e.g. with investments not related to energy and thus not included in SEAPs or LEDPs). Some guidelines on investment coordination might be*

	useful.
Durham County Council	***Identify relationship with local plans and policies*** *Within DCC, all proposals must demonstrate a financial business case in order to be approved as viable. A project may still be approved if there is a long payback period, however the project must demonstrate additional benefits such as meeting stakeholder needs or requirements (which would present marketing opportunities), or contributing to wider policies such as the climate change action plan.*

Planning energy efficiency decision-making and monitoring structures/tools	
Florentine Energy Agency	We support the change in the decision-making process, in order to become more transparent and efficient, equip local authorities with an action plan. We planned in our projects a path that begins with Energy audit in order to act to improve the efficiency of existing buildings (insulation of walls and roofs, replacement of door and windows fittings and installation solar screens), the replacement of existing winter air-conditioning systems with plant ensuring higher efficiency (condensing boilers), replacement or, in some cases, new installation of systems using renewable energy (heat pumps, boilers, biomass stoves and fireplaces, solar thermal plant even solar cooling technology for summer air-conditioning). The results of every action have to be monitored, as in KlimaHouse system. The GP of Arezzo Hospital has a monthly comparison between the hospital energy manager staff and the company that handles the energy global service, in order to agree about the energy consumption measurement; in Versilia Hospital the hospital energy manager staff and the company that handles the energy global service share the BMS System
City of Malmo	*Monitoring energy use. The department of internal services monitor energy use by means of E4. With this program we can identify any changes in energy use and analyse the reasons. Furthermore, our contractors dealing with operations do regularly analyses of the buildings to identify possible improvements*
BORA 94	*The energy efficiency modernisation planning is basically call-oriented; those buildings are being renovated that are most suitable for technical and professional requirements of the particular call. The development of monitoring systems is also aligned with the requirements of the call; an energy certificate issued by an energy expert is required after the retrofitting. In the years of maintenance, data service is required for supporting managing authority towards the energy savings achieved, but this is in many cases only administrative data provision, most of the time real measurements are not standing behind it. Good international examples are needed for local level municipalities on how to apply such structures/tools*
PNEC	*More and more often energy retrofitting projects are implemented as a part of long-term strategies and action plans, such as Sustainable Energy Action Plans or Low-Emission Development Programmes. In these cases decision-making process is structured. Regarding the monitoring, in case of both types of documents it is obligatory to include a chapter on monitoring procedures and tools. A*

	good methodology for monitoring projects – both in terms of project implementation and project results – was proposed by the Covenant of Mayors. It is obligatory for municipalities having SEAPs and recommended for municipalities having LEDPs.
SERDA	*There are laws and regulations and energy surveys, but all this information is not centralised in a database. Therefore, a good approach can be the creation of a new organisation (public-private) that can do surveys and research with the given power to recalibrate the problems and inadvertencies.*
Durham County Council	***Ensure buildings work within the energy hierarchy*** *DCC do this by addressing those buildings that are most poorly performing and assess this by energy management software and 'Display Energy Certificates'. A certificate that demonstrates that a building is performing at a rate of 'G' or lower would be treated as a priority. Activities that reduce the amount of energy being consumed would be focussed upon first, and as a building's efficiency increased, supplementing the building's peak time consumption using renewable technologies would be assessed subsequently.*

Collecting data of the energy use, energy performance and past renovations of the public buildings	
Florentine Energy Agency	We have good examples in Versilia and Arezzo Hospital, where they have monitoring in real time with BMS and agreement with the private companies of the external services, so they can collect and use any kind of data. The monitoring system is obligatory in the projects in order to take part in the regional call that allocate ERDF funds
PNEC	*There are more and more examples of Polish municipalities regularly monitoring energy consumption in their buildings. They use different tools for that, mostly EXCEL-based but there are also examples of more advanced tools (on-line, smart metering).* *Regarding overall energy performance, in principle each energy-retrofitting project is preceded with the energy audit, which provides input on the overall energy characteristics of the buildings and its key systems.* *What is often lacking, is the original construction documentation of the building and information on past interventions. There is, therefore, a need for collecting missing historic data, which is often done on the occasion of the energy audit (but makes the procedure more costly).*
SERDA	*It is mandatory for the building managers to achieve energy audit for each building according to the law. It is mandatory for the public building managers to publicly show the energy certificate. The incomplete database is kept in INCERC institute but unfortunately is unused by the authorities.* *Also for the public buildings the database with energy, maintenance and renovation costs exists but only at an informative level. It is mandatory to be used from the planning phase until the end.*
Durham County	***Obtain past data from existing records or software with any gaps to be backfilled using data from energy provider, or using building***

Council	***profile consumption patterns.*** *DCC own hundreds of sites and therefore it is common for metering issues to cause gaps in energy data. This data can amount to significant omissions from a building's energy profile, therefore good relationships with our energy suppliers are important so that they assist us in backfilling the missing data. Having a complete energy record for a building then allows past and present consumption to be examined and the benefits of energy renovations accurately assessed.*

Identifying and selecting reliable and prepared energy experts for planning	
Florentine Energy Agency	Energy managers have been appointed in many regional buildings. They are involved since the planning phase to guarantee smooth execution of renovation works.
City of Malmo	*The public procurement process needs to be considered the contracting expertise. We also rely a lot on internal expertise and find that this gives us a better and more consistent support.*
BORA 94	*Calls for energy efficiency renovations require involving energy experts during the planning and implementation phase. During planning, energy experts work together with specialized experts, such as architect, electrical, mechanical engineering experts*
PNEC	*In general, it can be observed that people dealing with the energy-related projects are becoming more and more prepared for this task, especially in case of municipalities, which have energy managers. A good example are 55 municipalities from the Małopolska Region (including Raciechowice, which is a member of REBUS LSG)., who hired eco-advisers, responsible not only for preparing and managing energy-related projects on behalf of the municipality, but also for educating and involving citizens in energy-related initiatives. The eco-advisers, to be well prepared for the job, had take part in the extensive, one-year post-graduate studies involving technical, financial and social topics.* *In the municipalities, which don't have qualified staff, it is recommended to hire external consultant for supervising the investment. It is necessary, however, that the municipal staff have enough internal capacities to verify his/her work.*
Durham County Council	***Secure references on successful and contextually relevant previous work from energy experts*** *When procuring external expertise, it is DCC procurement policy to request and award work to companies who can demonstrate the most relevant and compelling evidence of previous work that reflects the current project brief.*

Identifying and selecting the best financing options

Durham County Council	***Is the organisation financially able to carry out the work independently?*** *It is standard practice for DCC to fund low-medium capital projects itself, with the understanding that projects will pay for themselves overtime either through direct savings, or by mitigating the impact of increasing energy costs.*
PNEC	*There are various financing options available to cover the costs of energy-retrofitting projects. Polish municipalities are usually well aware of them and – compared to municipalities from other CEE countries – successful in obtaining funding. Since for now there is quite a wide availability of non-repayable grants, these are mostly used for financing investments. There is still limited experience with ESCO scheme, municipal bonds and other alternative funding methods, however there are more and more pilot projects implemented (due to the fact that even with relatively many grants they are not enough to cover all investments, there is a need to cover own contribution, which is often a barrier, etc.).*

Strategy which prevent from working with just low hanging fruits	
City of Malmo	*Malmo environmental programme?!?*
BORA 94	*More and more municipalities recognize the importance of long-term stability and sustainability concerning energy efficiency issues (inter-alia thanks to the related EU calls that foster and facilitate this process). For instance in North-Hungary region, several local municipalities joined to the Covenant of Mayors initiative, which aims at supporting municipalities to elaborate their long-term sustainable energy and climate change strategies (SECAPs). Generally these strategies contain the long-term plans for the public building renovations. Moreover the elaboration of SECAPs is supported by a particular TOP-3.2.1-call*
PNEC	*In case of projects funded from external sources (which is a majority), there is a requirement from the donor (grant operator, bank, financing institution, etc.) to achieve certain level of energy and financial savings. However, reaching for low hanging fruits is not always a bed thing. In case of less experienced municipalities starting with simpler measures (organisational, behavioural) may create appetites for more (of course ensuring the the correct order of investments is maintained).*

All perspective of building, planning and managing the buildings needs to have energy efficiency in mind	
PNEC	

IMPLEMENTING

Megjegyzés [Resolvo26]: AFE, MALMO, PNEC and DURHAM: please revise all information on experiences RELATED TO IMPLEMENTING.
Feel free to add tables and lines in case of actions not listed below.

Clear procurement rules (including for ESCOs) stating energy benefits/performances to be reached after works, preferably green and innovative public procurements	
PNEC	*There are clear procurement rules to be used in all public procurements, which allow using also other than price evaluation criterion. There are also more and more experiences with the ESCO scheme, which can be used as a reference for other municipalities that would like to fit ESCO project into existing legal framework. In these cases, however, most often external legal support is obtained to ensure that the process is done correctly. Regarding green public procurement, they are being widely promoted by various ESCOs and are often included in SEAPs and LEDPs as one of energy efficiency measures, however they are rarely used in practice. Therefore there is a need for more capacity building and practical examples in this area. There is also a need for wider dissemination of the competitive dialogue procedure, which is useful in more complex and innovative projects, however is very rarely used due to various legal doubts and lack of good practices to follow.*

Technical staff (such as mechanical and electrical staff) to be included in meetings that discuss value engineering (particularly relevant for large construction projects)	
City of Malmo	*In all refurbishment projects, all adequate personnel are in place during for instance building preparation meetings. This is very important because in order to achieve good results all parties need to understand the purpose of technique/material involved in order to reach the goals as is comes to energy use. An airtight building for instance is achieved only if engineers, ingoing material, storage and workers fully understand the goal and why it is important. Engineers checking the work on site and if necessary adjusting work descriptions and drawings is another example.*
Durham County Council	***Integrate technical staff in stakeholder meetings to integrate them into the project.*** *Mechanical and Electrical engineering staff are invited to participate in the planning and implementation of all minor and major capital projects at DCC to provide specialist advice. This is replicated throughout the process where comments regarding the performance implications of value engineered HVAC services are invited. Consistently this should also involve specialists from the low carbon economy team who can offer comment on the energy performance and sustainability of the building.*

Contractor duty of care to examine and repair snagging issues, working directly with users and building technical staff	
City of Malmo	This is an important issue in order to get the full potential out of the renovation. However, it is also a complicated one. Our

	procurement normally contains a responsibility for the contractor to examine and repair physical goods broken. Other contractors are responsible for the maintenances and running of the building and yet others for the contact with tenants. It is a good idea to decide in advance how the phase after the renovation work will be organised and communicate this to all parties. We have tried an approach where we take notes of all problems occurring and then do follow-ups in meetings with all parties involved.
PNEC	It is a common practice to ask during public procurement for a guarantee extending guarantee imposed by the low, which secures the building owner from struggling with malfunctions itself. Usually the guarantee covers at least the project timeframe and 5 years after, however it can be longer (but then the building owner can expect higher price offered by the contractor).
SERDA	It is mandatory by the law to have Warranty certificate for a period of 24 month, which includes also snagging issues.
Durham County Council	DCC as a matter of course include contractual obligations for snagging issues to be rectified post-occupancy through our procurement frameworks.
Region of Crete	It is obligatory by the law to have a 15month period for snagging issues.

If part of a larger project, measures in place to ensure quality control of installation	
PNEC	*Each investment needs to be formally commissioned before closing the contract with the contractor, which requires quality control of the installation. The problem is that sometimes this commissioning is done by the employees, who don't have enough knowledge and experience to do the quality check. Therefore, more capacity building in this area is needed or obtaining support from external expert (which would generate additional costs, though).*
SERDA	*The law no. 10 / 1995, updated in 2017, foresees that there is a quality control in every step of the implementation process*
Durham County Council	*It is DCC standard practice to ensure contractors carrying out the work are certified and approved to install specialised equipment, i.e. MCS approval.*
Region of Crete	*The law foresees that there is a quality control in every step of the implementation process.*

GP booklet available for public administration	
City of Malmo	we have something called Instruction for building projects which contain guidelines based on experience
PNEC	
Durham County Council	*DCC have the GP accessible as a hard copy, and disseminate it across public administration networks i.e. Area Action Partnerships.*

Close cooperation among the partners/experts/departments affected by the renovations	
City of Malmo	*During the renovation, there are always building meetings planned (every 10-working day, or so) where all the partners meet and discuss progress, snagging's/ setbacks etc.*
PNEC	*In case of some of the municipalities (more aware of the benefits of participative processes and experienced in implementing energy-related projects) key stakeholders are always involved in project planning and implementation.*
Durham County Council	*Involve all potential partners/ experts/ departments/ politicians affected by the renovation in stakeholder meetings.* *Unless a major capital development, smaller more localised renovations do not require stakeholder meetings, but rather DCC will keep stakeholders informed of the project's progress and invite comment as part of an inclusive process.*

Development of public-private partnership in energy efficiency sector	
PNEC	*There are already examples of public-private partnerships developed in the energy efficiency sector, including the ones focusing on improving energy efficiency in buildings (e.g. case studies of Sosnowiec, Płock and Kobyłka). There is a need, though, for such experiences and more favourable legal frameworks for public-private cooperation.*
Durham County Council	*In schools this has been developed through a partnership approach with Solar for Schools, a company providing funded solar PV systems for schools across Europe with no upfront capital outlay.*
Region of Crete	*Public-private partnerships have already developed for street lighting. It is now planned to happen for energy renovation in buildings.*

MONITORING

Megjegyzés [Resolvo27]: BORA, SERDA and CRETE: please revise all information on experiences RELATED TO MONITORING.
Feel free to add tables and lines in case of actions not listed below.

Reliable monitoring system (i.e. BMS)	
PNEC	*There are already examples of pilot projects involving implementation of smart metering systems (e.g. comprehensive thermal retrofitting project implemented in Niepołomice), as well as BMS (e.g. Warsaw Library, Seat of the Voivodeship Fund for Environmental Protection and Water Management in Gdańsk). These could be used as a reference for other municipalities interested in the implementation of similar solutions. However, it needs to be notices that such systems are still a novelty and should be wider promoted and disseminated.*
Durham County Council	*Identify how energy information is collated, and establish a procedure that means routine/ non-routine performance is identified.* *Though DCC doesn't have a coherent approach to implementing BMS within its buildings, it has energy management software called 'Systemslink' that collates and monitors energy use (gas, electricity and water) for all of its buildings. Though this software cannot independently control the settings within each building, it can help to identify erroneous consumption quickly and accurately.*
BORA 94	*There are more and more attempts in Hungary to install smart metering systems to either public or privately-owned buildings. Mainly these are pilot cases for experimental purposes, but some of them are in place for a while now. A good example can be the case of a PPP-type of geothermal project, involving MIHŐ Ltd owned by the City Municipality of Miskolc and PannErgy Ltd. (private company). They have jointly decided to found a project company, called Miskolc Geothermal Ltd in August 2009 with the intention to supply a large proportion of heat to Hungary's third largest city from renewable resources. The technical goal of the investment was to feed geothermal energy to the heating system of Miskolc's Avas district situated the nearest to the facilities to supply heat to the panel buildings of the local housing estates and also to some schools. The heat output of the thermal wells is transmitted to the heat consumers via pipelines and heat exchangers, while after cooling down the fluid is reinjected. One of the fundamental requirements of the operation of the system was that as depending on the momentary demands for heat output the system could be regulated by controlling water production by the pump of the thermal well and the water-carrying performance of the accelerating pumps. Towards this end, at a number of points measurements had to be performed to determine the temperature, pressure and volume flow rate values as means of managing the geothermal heating plant via the central remote surveillance system. This system provides all necessary data, and actual values to the persons who operate the plant, and sends immediate alerts via sms, in case of emergency.* *The Geothermal Project of Miskolc has been recognized with GeoPower Market's international prize "Best Heating Project 2013". Further information: http://pannergy.com/en/projects/#miskolc* *MIHŐ Ltd (district heating company of the City of Miskolc) operates surveillance/monitoring systems for other renewable energy projects (biomass, biogas) to monitor performance as well in different districts of Miskolc.*

Using accessible non-technical language, inform building users of project progress and outputs	
Florentine Energy Agency	A dedicated Facebook page "Europa per la Toscana" has been set-up providing for accessible non technical language to inform building managers and users of ongoing project progress and output, as well as inputs for open dialogue and exchange with citizens. https://www.facebook.com/europatoscana/
Durham County Council	*Identify and meet with building users.* *When carrying out the Big Switch off campaigns in multiple buildings, DCC would inform building users and campaign participants of the benefits of their engagement by sharing simple accessible displays of the energy saved and the associated carbon emissions and financial savings.*
BORA 94	In this programming period, for each project that applies for funding in the frame of e.g. the Territorial and Settlement Operational Programme for investments using RES or upgrades/renovations for their buildings to become more energy efficient, municipalities - who are the project owners - are obliged to inform building users about the progress and outputs of their project. They either use their website, social media sites, or have public events, or other communication channels (e.g. brochures), where they explain the benefits of these renovation works.

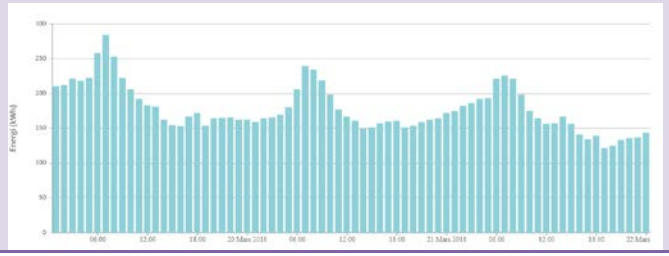
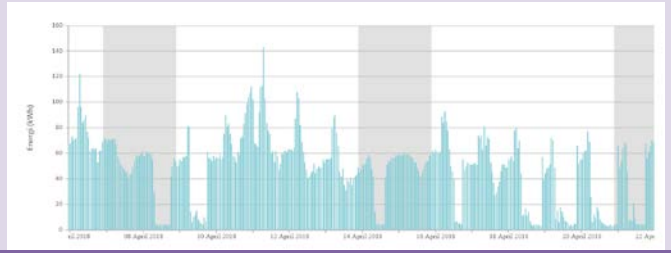
Opportunities for feedback; transparent process in place for responding to feedback	
Florentine Energy Agency	We use the facebook page and meetings with stakeholders to give opportunities for feedback. See dedicated page: https://www.facebook.com/europatoscana/
Durham County Council	***Shared ownership of feedback responses to avoid delays.*** *DCC have created a shared email address that when emailed, will be received by a team of people. This 'energy' email address allows building managers within schools, for example, to get in touch with any concerns they have regarding their school's energy use and provides reassurance that their query will be responded to quickly.*

Clearly defined reporting system of results and method of reporting (i.e. web)

Florentine Energy Agency	Tuscany Region has set-up a dedicated website for reporting of results and expenses incurred for projects financed through ERDF funds, including those on energy efficiency of public buildings. The online system (http://www.sviluppo.toscana.it)foresees ad hoc monitoring tools to assess achieved objectives and results against initial set indicators.
City of Malmo	***The real-estate department has a team of energy experts analysing the data from our energy management software E4, which together with the real-estate owner communicates with the tenants. When having a web-based tool for energy consumption it is easier to analyse data and work efficiently with abnormalities.***
Durham County Council	***Nominated team for identifying and troubleshooting problems, and internal service standards in order to ensure timely resolution.*** *DCC has an internal team of Low Carbon Economy specialists that use the energy management software 'Systemslink' to identify energy management problems within the DCC estate and use their expertise to troubleshoot and resolve the problem.*
BORA 94	The method of reporting on the progress of the projects is determined by the Managing Authority in accordance with the EU regulations, thus each beneficiary must follow this reporting process, which is internet-based; reports must be submitted through an on-line system called "EPTK" (Electronic Applicant Information and Communication System).

Monitoring decision-making structures results	
City of Malmo	*Tools for data collection needed can be categorized in three different tools:* - *Building inventory database. A database of all needed drawings of the building (Hyperdoc)* - *Building management system. Inventory of all technique in the building (Citect)* - *Energy consumption database. A database of energy consumption of all buildings individual energy consumption. (E4)* *Monthly analysis of deviations is performed made by our technicians. This will lead to further investigations, services or maintenance.*
Durham County Council	***If a fault or repair has been identified, what are the social, environmental, and economic impacts of not doing/ doing the repair.*** *DCC consider these impacts within the decision making processes and jurisdiction of the Low Carbon Economy team (described above), taking a longer term view than would be perhaps taken in other areas within DCC.*

Planning of Data Collection/analysis of building energy consumption before and after refurbishment	
City of Malmo	*Through the data analyse tool, called E4, statistics from all our building comes in from our energy supplier. Then it is possible to*

	compare different building with each other's or to compare different month from one building, both in real terms or grade day adjusted. Example:  
SERDA	1. *Energy Certificate of the building before and after the renovation.* 2. *Comparison of the energy characteristics of the building from the existing database before and after the renovation.*
Durham County Council	*The Low Carbon Economy Team as part of building business cases would always analyse energy consumption data to determine a business need for refurbishment. Part of this process would require the monitoring and reporting of energy consumption post-project completion to ensure the expected performance is being achieved. DCC produces a monthly 'benefits realisation' report detailing the ongoing savings achieved from energy efficiency projects such as the installation of solar panels, or the performance of a biomass boiler.*
BORA 94	*Before and after refurbishment, an energy certificate/audit is carried out. This certificate contains the data of the building energy consumption.*

HORIZONTAL THEME: CAPACITY BUILDING

Megjegyzés [Resolvo28]: BORA, SERDA and CRETE: please revise all information on experiences RELATED TO CAPACITY BUILDING.
Feel free to add tables and lines in case of actions not listed below.

Educational Campaigns with wider contextual relevance and structured programme using multiple stakeholders (i.e. universities, schools)	
PNEC	*There are many examples of successful educational campaigns aiming at different stakeholders, including building owners, managers and users. Among them there are worth mentioning: 50/50 projects implemented in pilot schools and other public buildings, trainings for municipal buildings' staff organised by the city of Częstochowa, educational activities conducted by the municipality of Niepołomice within their thermal retrofitting project and the work of the municipal eco-advisers hired within the regional LIFE programme.*

Regular on-site training sessions for employees/ users/ workers, etc.	
PNEC	*There are examples of regular training sessions (Częstochowa, Raciechowice) and thematic training material (TOGETHER project) developed for different types of employees and users, however such trainings are still not a common thing.*
BORA 94	*A SEAP-driven training material was elaborated (and is widely accessible) specifically for municipal staff in the frame of the GREENING REGIONS project (www.greeningregions.eu), and a training-series was carried out by experts from ENERGIAKLUB (NGO). These trainings could be regular on-site trainings upon request and could be tailored to the specific needs of other municipalities as well.*

Regular communication on continuous development via multiple communication routes / social networks	
City of Malmo	*Energy use per building is shown on the internal web-site. It is possible for all employees to check energy statistics of all buildings in the city of Malmo.*
PNEC	*Usually municipalities are communicating on their energy-related projects in order to inform citizens about what is going on in the municipality, increase their energy awareness and build municipality's image as an environmentally friendly and a pleasant place to live. They use various available channels, including municipal website, local media, meetings, dissemination of thematic material, etc. Social media are more rarely used and the communication is usually one-way (municipality informing the citizens). This should be changed (i.e. more advanced and two-way communication is needed).*
BORA 94	*Beneficiaries of EU funding are obliged to upload information regarding realized developments on their websites and on their social media sites, but the latter is not obligatory. There is an illustrator Map, called "TÉRKÉPTÉR" for summarizing the main elements of each project implemented, but this contains only very basic information about the projects, only a few core data, so the energy efficiency development technical data is not available to the public.*

d) How to ensure project legacy – i.e. so that it is not just another initiative	
PNEC	*Project legacy is ensured by:* • *fitting it into the local strategy (e.g. SEAP, SECAP, LEDP);* • *ensuring wide dissemination of the project and its results, encouraging other to follow*
BORA 94	*With long-term and systematic planning (e.g. SECAP), and through close and continuous cooperation with all interested actors/experts (e.g. public actors, such as decision-makers, private investors, energy experts, NGOs)*

Stakeholder meetings about energy efficiency	
City of Malmo	*The real-estate owner has recurrent meetings with the tenants, where energy efficiency is one of the subjects to discuss. However, this needs to be broadened and taken in to a more public dialogue between real-estate owner and the tenants.* Also there are recurrent meetings with energy distributors, other municipalities and other organisations in order to cooperate successful.
PNEC	*Within its previous projects (Energy for Mayors, MESHARTILITY), PNEC promoted organisation of so called "Energy Forums" gathering local stakeholders and involving them in the development of local energy initiatives and projects. The methodology for organising such forums is available and can be used by other municipalities to actively involve their citizens and key stakeholders in the energy-related processes.*
BORA 94	*In the frame of the ongoing REBUS and EMPOWERING projects (where BORA 94 is a project partner), regular stakeholder/energy board meetings are organized targeting energy efficiency and action planning (REBUS), as well as revision of existing SEAPs and planning new SECAPs (EMPOWERING) in Borsod-Abaúj-Zemplén county. These meetings provide a great occasion to bring together all relevant actors and to facilitate and strengthen cooperation among them.*

Regular participation in conferences/workshops/webinars etc. related to each topic	
PNEC	Each year, there are various events (conferences, workshops, webinars, study tours) organised around the energy topics that municipalities can take part in. Many of them are organised within EU and national-funded projects, therefore the participation is free. More and more municipalities are taking part in such thematic meetings and those, which do it regularly usually are more advanced in active implementation of energy-saving solutions. Important part of such events should be networking, as usually the attendees learn more during informal talks and practical exchanges than during the presentations.
BORA 94	EMPOWERING project organizes regular conferences/webinars/workshops for its stakeholders on energy efficiency and SECAP issues.

Raised awareness on ESCO concept and energy efficiency business culture (education, information dissemination and demonstration projects) in order to increase the trust of the customers and to stimulate the ESCO market on the long run	
Florentine Energy Agency	A regional initiative of ESCO contracts and energy efficiency culture in a Hospital was taken as an example in the Region and the results presented to all the main regional stakeholders in 10 itinerant meetings . Attendees were municipalities and energy experts interested

	in apply for funding within a regional call for energy efficiency in public building. The aim was of raising awareness and interest and provide food for thoughts on the basis of real initiatives that could boost replication in other places in the region.

GOOD PRACTICES identified within REBUS:
1. School carbon reduction programme (Durham)
Implement energy saving learning and behaviour change with schools. The overall objective of the project is to reduce carbon emissions and costs in schools
2. Big switch off (Durham)
A novel campaign to implement energy saving measures in existing council buildings in order to reduce carbon and energy consumption costs.
3. SEAP-driven energy training for municipal staff to set-up a local energy management agency (Borsod-Abaúj-Zemplén County)
On-site, 5-day energy training for municipal staff with the aim to incorporate the content of the local Sustainable Energy Action Plan in the everyday operation of the employees of two neighbouring municipalities.
4. New Hospital "Versilia" the 3 "Rs" strategy: reduction, regulation and renewable (Tuscany)
Integrated strategy for healthcare facilities towards energy consumption reduction, proper energy system usage and regulation via BMS, integration of renewables
5. Green Hospital Project (Tuscany)
More efficient and friendly hospitals through an optimised management focused on the reduction of heat and electricity uses.
6. 50/50 Methodology (Poland and Crete)
50/50 methodology aims to achieve energy & financial savings by sharing economic incentives from energy savings between schools (50%) and municipalities (50%)
7. Green Roof (Crete)
Green roof implementation on the Town Hall building, providing energy savings and improving comfort conditions for the building users.
8. 2015-2020 Sustainable Energy Action Plan of Buzau Municipality (South-East Romania)
SEAP to implement local policies including the Urban Development Strategy of the Municipality in the field of energy efficiency and environment protection.
9. Green University Strategy for TUC (Crete
Strategy for a "Green University" to sustainably transform the Campus through mid and long-term energy reduction measures.
10. Thermal retrofitting of the National Library in Warsaw (Poland)
Thermal retrofitting of the buildings of the National Library in Warsaw combined with installation of BMS (the library occupies a complex composed of 3 units connected with internal gardens).
11. Comprehensive thermal retrofitting programme implemented in Niepołomice (Poland)
Example of a comprehensive thermal retrofitting programme based on municipality's long-term strategy for sustainable development (planning, implementing, monitoring and capacity building).
12. Mercury Project for building monitoring centre (Malmo)
The Mercury project brought together discrete Building Management Systems BMS into a singular

system, thus providing significant savings and simplify monitoring