Affordable and Adaptable
Public Buildings through
Energy Efficient Retrofitting.

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TRAINERS HANDBOOK

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Disclaimer

Introduction

This handbook is provided as part of the Train the Trainers Workshop which has been developed as part of the A2PBEER project.

A key objective of the A2PBEER project is to provide a mechanism through which technological processes and tools developed through the project can be used by building owners, managers and designers to develop and enhance an understanding in retro-fitting projects, particularly for large public buildings and districts.

This objective is to be partly achieved through the delivery of the necessary knowledge and skills to the target groups in question, by using demonstration sites, case studies and training.

The overall model for training in A2PBEER includes:

Primary Trainers → Secondary Trainers → Building Management

You as primary trainers and this train the trainer course are at the start of this process. It is important, therefore, that you remember that what is learnt here is intended to be used to train others who will then be able to transmit the necessary understanding and skills to those who will make the decisions regarding the carrying out of retro-fitting projects on their buildings.

You are, therefore, the '**primary trainers**' who will train the other '**secondary trainers**'.

The course structure for the train the trainer workshop includes:

1. An introduction to the A2PBEER project
2. A2PBEER technologies
3. Case studies
4. A2PBEER support guide tool
5. Financial tool
6. Pedagogical approaches

This handbook is divided into a number of sections which are related to the course structure. The objective and the learning outcomes of the workshop, preparation tips, as well as appropriate techniques to train others are included:

1. Introduction to the SME and Demonstration Site Workshop
2. Adult learning overview and learning techniques
3. SME and Demonstration Site Workshop structure
4. Preparation for the SME and Demonstration Workshop
5. Training Elements for the SME and Demonstration Site Workshops
6. Reading Material
7. Blended E-Learning and Moodle

A2PBEER SME and Demonstration Site Training Workshops

Introduction:

This workshop is aimed at those who will be directing short workshops for SMEs and building managers in a variety of buildings in different countries. Examples covered by the workshop include: a museum, vocational school, offices in a university district and a heritage building. The structure of the workshop is provided in this document, so that you will be aware of what you are trying to achieve in the workshops in which you will be running and reflect on what you learn on this course in that context.

You will note that the elements of the workshop description are similar to those for this Train the Trainer workshop with a number of differences.

The overview of the workshop is straightforward. The learning outcomes of the workshop are divided into two types – the information that participants are expected to understand and the information that they are expected to be able to do at the end of the workshop. This will be useful for you in designing the exact ways in which the workshop will be delivered and for assessing how well participants are doing during the workshop.

A suggested workshop structure is also provided using a logical step by step approach. This structure covers the delivery and the main elements of the programme, presenting A2PBEER technologies, cases studies, retrofitting methodologies and financial tools, however optional site visits may be beneficial to emphasise the importance of best practice retrofitting of public buildings and districts.

Adult Learning Overview:

There are distinct differences towards the approaches adopted for teaching and learning to adults (andragogy) and children (pedagogy).

Pedagogy and Andragogy

Andragogy can be defined as the science of understanding (= theory) and supporting (= practice) lifelong and life-wide education of adults.

Pedagogy is similar but specifically for children. However, it is often used to refer to both adult and child learning.

The following diagram in Table 1 outline the differences and considerations for both approaches of Pedagogy and Andragogy:

It is important that the trainer take these elements into account in their approach to the workshop. This means that, while the trainer is likely to have experienced knowledge and insights, which the participants may not, it is important to remember that participants also have knowledge and professional experience, and should have an opportunity to express their thoughts. Remember all views are relevant even if they are not accurate.

Pedagogy	Andragogy
Compulsory	Voluntary
Teacher-centred	Learning-centred
Minimal control by learner	Education as freedom
Training for life	Assimilation of learning with life experience
Encourages convergent thinking	Encourages divergent thinking
Rote learning	Active learning
Dependency on educators learning	Learning and teaching roles are blurred
Imparting of information	Opening vista for continuing learning and peer learning Uncertainty about the outcome, whatever the curriculum content

Table 1: Pedagogy vs Andragogy (adopted from Deighan, 2000)

In addition to the above, people are motivated to learn for different reasons – What is in it for me (WIIFM). We need to be conscious of responding to these motivations, especially when dealing with adult learners.

These considerations are linked to the next factor to consider – *motivation*.

Motivation

Malcolm Knowles is an influential theorist in Andragogy, and particularly in the development of Humanist Learning Theory. His work was a significant factor in reorienting adult educators from "educating people" to "helping them to learn". Probably his best known work is "The Adult Learner" (Knowles, 1973).

Knowles (1973) suggests six learning motivators for adults

- *Need to know:* Adults need to know the reason for learning something. In the context of the workshop this means that it is important that they are clear on the A2PBEER Project, its purposes and structure.

- *Foundation:* Experience (including mistakes) provides the basis for learning activities. This means that adult learners need to be able to bring their own experience to bear on the learning and the workshop.

- *Self-concept:* Adults need to be responsible for their decisions on education; involvement in the planning and evaluation of their instruction. This is a little less important in the context of the current workshop but, nevertheless they need to have some role in the way the workshops evolve.

- *Readiness:* Adults are most interested in learning subjects which have immediate relevance to their work and/or personal lives. Again, this implies the importance of participants understanding how the outcomes of the project are relevant to their own

activities. This can be identified at the start of the workshop where participants are asked to introduce themselves.

− *Orientation:* Adult learning is problem-centered rather than content-oriented, whereby adults prefer to learn through solving problems rather than learning abstract theoretical concepts. This workshop incorporates ample opportunities for participant led tasks and discussion, thereby maintaining motivation and enthusiasm.

− *Motivation:* Adults respond better to internal rather than external motivators, insofar as adults respond better to personal drivers rather than drivers imposed by other people. It is anticipated that workshop participants will be in attendance on their own validation rather than being compelled by necessity.

Ways of learning

It is traditionally thought that different people have different learning styles and that they learn more effectively if their preferred style is used (Gardiner, 2006). Figure 1 below shows the general learning styles for visual, auditory and physical, it should however be recognised that people generally do not fit entirely within one of the categories but may have attributes from a number groups.

Figure 1: Learning Styles – Know and use your learning styles

Many of these theories are the subject of on-going debate around the extent of their validity and utility, however this body of knowledge has led to the development of a number of learning principles and conditions which are briefly discussed in this document.

The use of different mechanisms for learning are still important and a variety of learning approaches will make the experience more effective for all participants. Figure 2 provides an outline of the various approaches and their application amongst adult learners. The most pertinent points for a trainer to consider are:

- Distinguishing between abstract and concrete concepts.

- Distinguishing between the participants who are listeners (traditional didactic approach), interactors (opportunity for guided discussion), doers (practical / applied examples) and creators (creative and innovative ways of using the information)

- Identifying the most appropriate teaching aids for each learner type.

- Identifying the most preferred type of facilitator/trainer required for the delivery of the workshop. These include: – the Spoon Feeder; the Discussion Guide; the Application Facilitator; and the Unleasher.
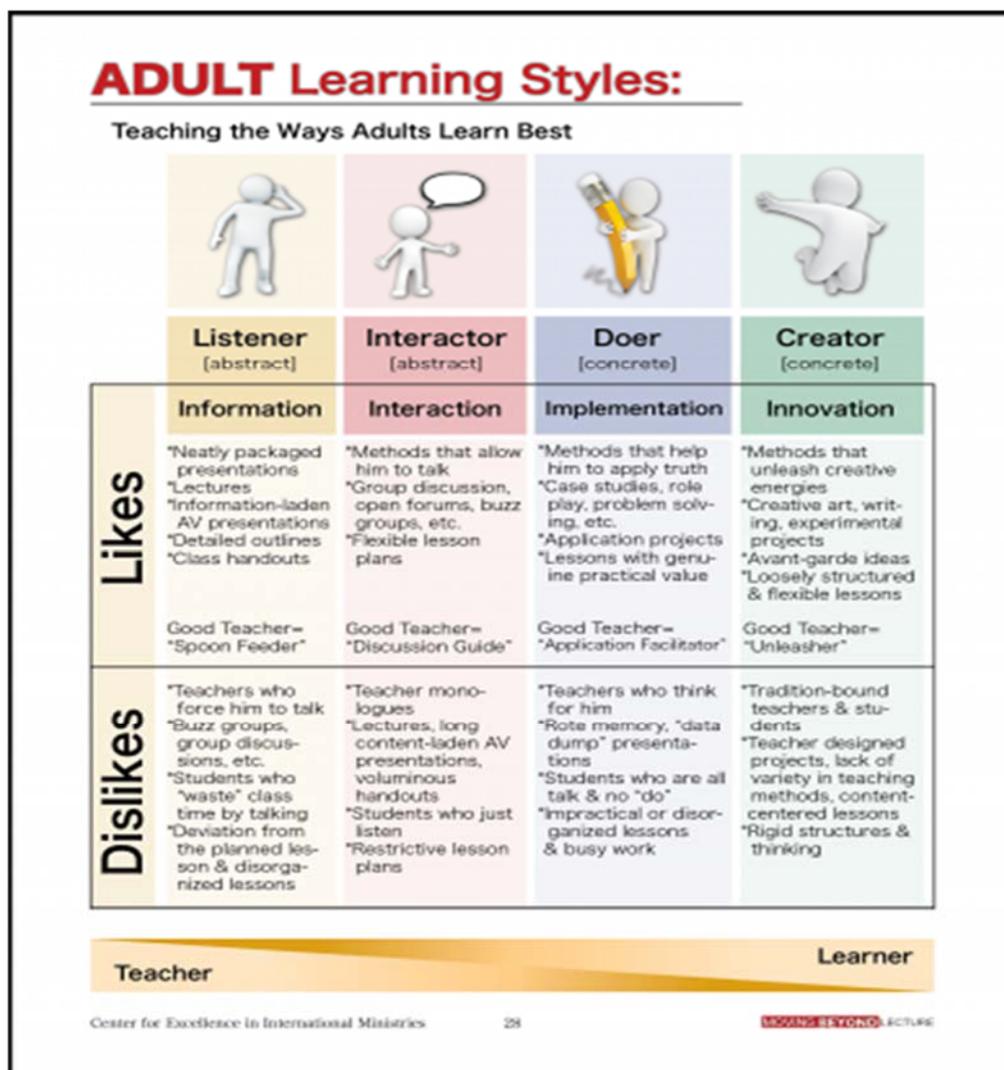

Figure 2: Adult learning Styles – various approaches to learn.

Ideally, one should try to incorporate each approach during the delivery of an individual workshop and be a trainer of different types in different circumstances.

Trainer's attitudes

In facilitating the training of adults, the attitudes of the trainer are particularly important. Effective approaches include:

- Be flexible and respond to events as they arise. While it is important that there is a structure for the workshop, this should not be so rigid as to prevent the addressing of issues or questions which might arise. An in-depth knowledge of course material by the trainer is pivotal for the delivery of the programme.

- Try to be lively and enthusiastic throughout the delivery of the workshop. In order to stimulate interest and commitment from the learners, it is also important that the trainer is positive and enthusiastic.

- Look for opportunities to link the learning to practical situations. The trainer should provide concrete examples from his or her own experience. This applied teaching approach will enable the learning process to become more tangible for the participants.

- Show patience, respect and understanding towards the learners. It is important to remember that the role of the trainer is to provide positive guidance / instruction and more importantly to share and generate knowledge between the trainer and learner; and vice versa. The participants have knowledge and experience which should be utilised to the maximum extent.

- Ensure that you can be heard and seen during the workshop (regularly).

- Repeatedly check for understanding of key concepts. Where a complex topic is being addressed in a short time it is important to check and monitor participants understanding of key topics   presented in the workshop. Encourage questions and clarifications from the start, as this will help to make sure that all participants are achieving the learning outcomes.

- Watch for signs of dis-interest arising and insert an activity or break (even if not planned).

- Ask learners for regular feedback (can be effectively achieved during scheduled breaks and group activity work). Participants are more inclined to provide feedback (on a one-to-one basis) during an informal break.

Involving the learner

As noted above, it is important to involve adults during the training process and these can be carried out in a number of ways:

- Asking questions of learners

- Sharing of experiences between learners

- Group discussion and feedback

- Case studies with learner feedback

- Interactive worked examples and discussion

- Asking for their responses at the conclusion
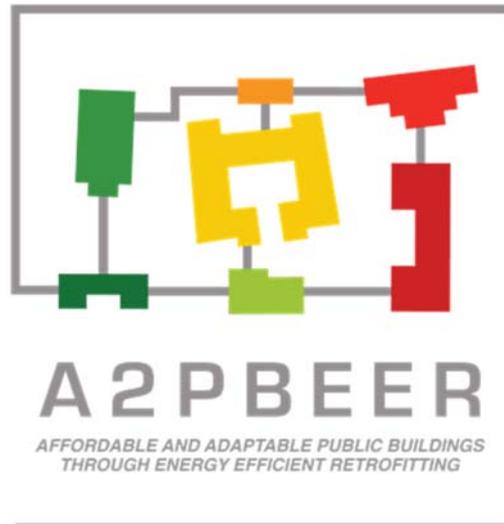
SME and Demonstration Site Workshops Structure

As trainers, it is important to remember that you are being trained to train others as part of the SME and Demonstration workshops, and these have a time duration of one day. As these workshops are limited in time, it is proposed to concentrate on using a small number of learning techniques:

- Short videos to demonstrate the A2PBEER technologies.
- PowerPoint presentations to present a case study.
- Group discussions.
- Site visit to a demonstration building or district.
- Interactive use of the A2PBEER Support Guide toolkit and the financial tool by completing a worked example.

All of these materials will be available prior to the workshop on the A2PBEER Moodle platform. Follow the link: www.a2pbeeronline.eu to review the materials and content.

Overview

The aim of the Training SMEs and Demonstration Site workshop is to develop the knowledge and skills of participants, whereby they will be able to understand the nature of the A2PBEER Project; the nature of the technologies developed during the project; and to effectively apply the technology and financial tools developed through the project in making the most effective energy efficient retrofitting decisions with respect to public buildings, other large buildings and districts, which they are engaged.

The key component of the training programme will be based around the retrofitting activities of the demonstration buildings. The content reflects both new construction, renovation and change of use scenarios from each stage of the demonstration project development. The workshop will include the following:

1. Introduction and overview of the A2PBEER technologies and retrofitting project.

2. The technological components of the façade envelope, windows, lighting systems, district thermal networks and absorption technologies.

3. Presentation of a case study investigating the use of the technologies and how these are implemented and retrofitted to best practice. These will be enhanced by the partners´ experiences and practices.

4. The A2PBEER Support Guide Toolkit is to assist stakeholders in making best practice decisions on how to improve the energy performance of their public building or district. The Guide will outline the methodology on how to carry out a district and building assessment from the viewpoint of energy consumption. There are six stages to understand and complete (District and Building, National Standards, Stakeholder Analysis, Technology Recommendations, Self-Assessment and Best Practice case studies).

5. The Financial tool will focus on the financial analysis, return on investment, cost control and evaluation of rehabilitation of public buildings. It will include data from a case study which is to be completed and understood. It will also focus on strategies and opportunities with alternative financing mechanisms (such as ESCOs and EPCs).

Learning Outcomes (LOs)

The Learning Outcomes and indicative syllabus for the SME and Demonstration Site workshops are outlined in Appendix A. These can be forwarded to the prospective trainers prior to the workshop.

On the completion of this workshop the participants will understand -

1. The principles and benefits of a system approach to the retrofitting of major public buildings.
2. The nature of the technologies which have been developed under the A2PBEER project including the issues which each technology is intended to address, the nature of the developed solution and the ways of applying the technology in different contexts.
3. The effective application of technologies and financial tools developed under the A2PBEER project, thereby ensuring the most effective decisions are adopted with respect to the retrofitting of different types of major public buildings and districts.

On the successful completion of this workshop the participants will be able to -

4. Describe the nature and benefits of a best practice system approach towards the retrofitting of large public buildings and districts of different types.
5. Describe the advanced technologies developed under the A2PBEER project to a variety of stakeholders responsible for building energy management in buildings and districts of different types.
6. **Demonstrate the use of the technology and financial tools developed under the A2PBEER project to participants on the A2PBEER Training Programme and facilitate participants in learning how to use the tools in question to make decisions for different building types.**

The following is the role of each element of the workshop in achieving the workshop learning outcomes. This should be borne in mind when delivering each element of the workshop.

Unit/Learning Outcome	Part 1	Part 2	Part 3	Part 4	Part 5
LO 1	X	X		X	
LO 2			X		
LO 3		X			X
LO 4		X		X	
LO 5			X		
LO 6		X			X

Indicative Programme:

Part 1: A2PBEER Project and Workshop Overview:
- Address the principles and approaches of the A2PBEER project.
- The concept, implementation and Partners.
- Project Video.

- Overview of the A2PBEER programme.
- Intended target audience and delivery.
- Access and understanding of Moodle.

Part 2: A2PBEER Retrofit Technologies: *(summary of the videos of the technologies are available on Moodle)*

- Technological components for the external and internal envelope, windows, lighting systems district thermal networks and absorption technologies.
- Specific emphasis on Public Buildings.
- Reflect new construction, renovation and change of use scenarios.
- Site visit to the demonstration building, to demonstrate and review the installation and the performance of the technologies, the benefits for installing technologies to improve the energy performance of the building and the process of retrofitting.

Part 3: Public Building Case Studies: *(summary of a choice of 4 presentations showcasing the case studies are available on Moodle)*

- Case study utilizing content from one of the project demonstration sites.
- Depicting partners´ experiences and practices.

**Part 4: Systemic Approaches and Integration:**

- Introduction to the A2PBEER Support Guide Toolkit.
- Description of the A2PBEER tool and techniques.
- Practical example(s).

Part 5: Financial Analysis Tools & Methodologies:

- Cost / benefit balance
- Investment return
- Cost optimality
- Continuation of the practical example(s) from Part 4.

Teaching and Learning Methods:

- Moodle (virtual learning environment) with relevant resource material (reports, guides, photographs and videos).
- Project video(s).
- Interactive classroom PowerPoint presentations.
- Technology videos.
- Classroom-based paired and group work.
- Classroom discussions.
- Site visit to a retrofitted demonstration building (optional).
- Self-directed learning. Outside contact hours.
- On-line use of calculation tool and methodologies developed by the A2PBEER project.
- On-line use of financial tool.
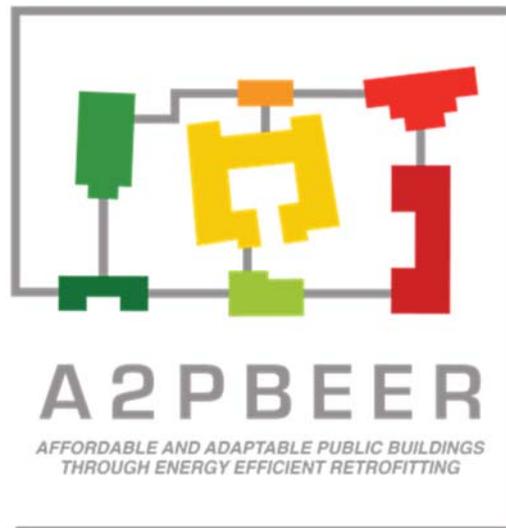
Preparation for the SME and Demonstration Workshop

It is important to develop a conducive and comfortable training workshop environment, whilst also preventing any unnecessary delays. A pre-prepared checklist should be developed to ensure the teaching environment is conducive for effective learning.

Background preparation

There are a number of preparatory elements to consider when running the workshop. These include:

- Arrive early to organise and prepare the training venue properly.

  This allows time for final checks of location, notes, learning aids and handouts. It also permits the trainer an opportunity to relax and greet participants as they arrive.

- As far as possible hold the workshop in a comfortable environment.

  This is important since a comfortable environment will put the participants at ease. If participants are uncomfortable their attention is focused on their discomfort rather than on the learning. Consider lighting levels, temperature, noise, easy access, parking, availability of bathrooms and coffee break facilities.

- Arrange the furniture in the training room so that learners are either in a U-shape or at small tables (Figure 3).

  This furniture configuration is important as it creates a good group dynamic. This workshop event uses a participant and peer-learning model so it is important that a set-up in which such learning is facilitated, is used. Ensure clear vision of the whiteboards, screens and yourself.

Figure 3: Examples of U-shape and small table seating arrangements

- Develop a clear agenda for the day.

  It is important that you have a clear agenda for the day with times associated with each of the elements of the day. This is a short workshop with a lot of material to cover, so therefore, it is important that it is kept to time. Check the time at regular intervals throughout the workshop.

- Share the learning outcomes and the workshop agenda with the learners in advance.

  Inform participants about the requirements of the workshop – learning outcomes; key topics and concepts; schedule; and prescribed readings.

Preparing the presentation

When preparing a presentation or case study, ensure that the overview is provided to the workshop participants at the commencement of the session. This explains to the learner what topic is to be discussed. Each topic should be broken down into several components / sections, thereby allowing the learners to acquire the knowledge in a logical manner. Furthermore, determine the pre-exiting knowledge of learners by asking a number of questions. This will dictate the amount and type of information to be shared with the learners. Practice your presentation beforehand in front of family or colleagues. This will ensure that the presentation fits within the slotted time frame and provides you with confidence.
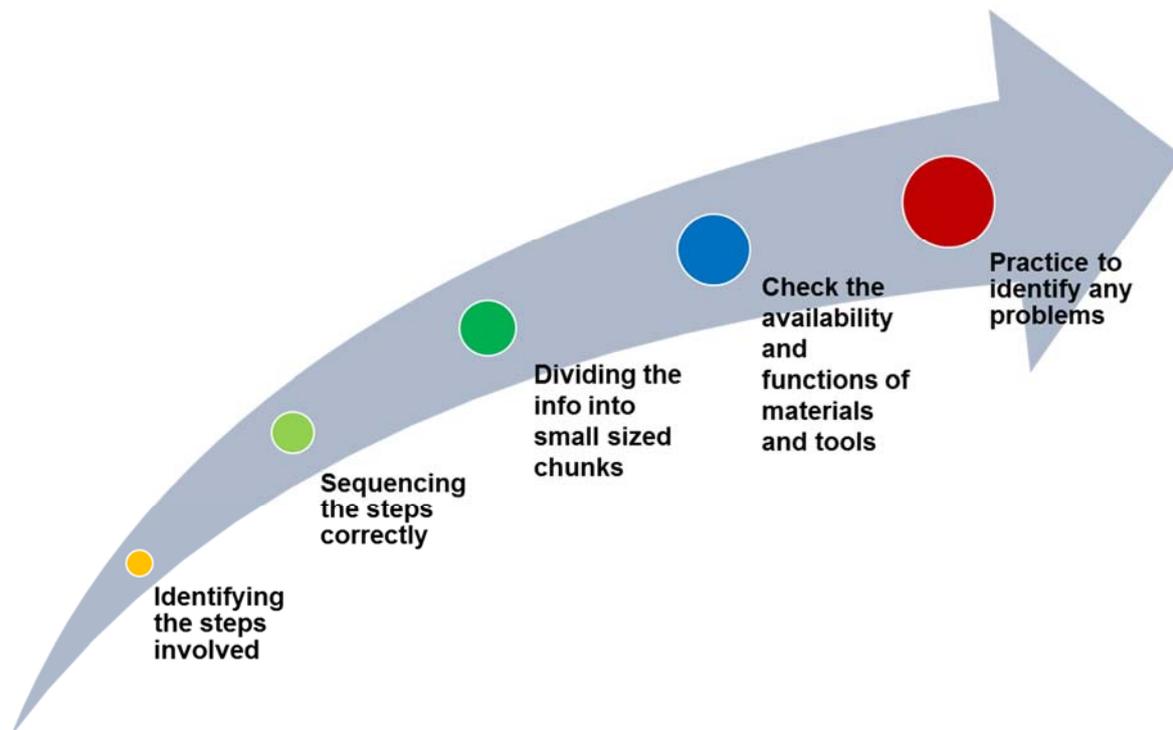

Figure 4: Step by step process to prepare and deliver a presentation

Training Aids and Materials

The use of visual learning materials helps a variety of learners to engage with the learning content. In order to be effective, learning resources need to be well designed and exhibit the principles of effective instructional design. Table 2 shows a brief description of the training aids that may be used during the A2PBEER training programme.

Instructional Aid	Useful for	Advantages	Disadvantages
Hand-outs	Providing guidelines for activities	Provide detail for activities	Must be well structured and clearly written
	Supplementing visual aids	Memory aids to presentations and demonstrations	Must be kept up to date with presentations
	Supplementing demonstrations		
PowerPoint slides	Gaining attention with the use of graphics	Help learners remember what you say	Depending on technology to work
	Providing reinforcement of oral presentations	Easily combine works with graphics animations videos and sound	Passive form of delivery
	Emphasising key points		
Flipcharts/ Whiteboards	Recording ideas from brainstorming and feedback	Can be used without preparing in advance	Requires excellent writing skills
	Clarifying points from oral presentations and demonstrations	Inexpensive	Can be confusing and hard to read if crammed with information
	Making lists		Can be difficult to use without turning your back on learners
Videos	Provides visual support for concepts and ideas	Effective in demonstrating best practice	Can be costly to develop
	Good for demonstrating skills	Engaging for the learner	Learners may become too passive
	Good for providing attitude training		Needs to be high quality not to distract the learner

Table 2: Summary of Instructional Aids

Delivering the presentation

There are a set of instructional design principles to consider when selecting or designing learning content for a workshop (Harris, 2012). These include:

- Use titles and subtitles that are informative or that summarise the text.
- Prioritise information so that the most important information is at the beginning.
- Introduce only one idea in one sentence.
- Provide descriptive examples when explaining technical words.
- Use graphics, charts and pictures to reinforce crucial facts and points.
- Deliver the same information both orally and in hand-outs.
- Simplify your words and choose standard language.
- Be direct, avoid long sentences.
- Remember that visual aids should be used as an aid to your oral presentations and demonstrations, not as a replacement for them.

A variety of instructional aids have been described in Table 2 (previous section), detailing the advantages and disadvantages of each one. It is important to remember that instructional aids are there to support the learning process. Aids that encourage active participation are particularly relevant.

There are various mediums of transferring information from an instructor / teacher to a learner, with clear differences in the level of retention of knowledge from learners using differing delivery methods. Figure 5 demonstrates that using interactive teaching methodologies encourages retention of learning; whether this is through discussions, demonstrations with work examples, hands-on action or continual practice.

Figure 5: Levels of retention of information for different delivery methods

Handling learner questions

Whilst it is important to deliver information to your participants and encourage their involvement, it is equally important to listen to their comments, questions and opinions. Appropriate effective listening and feedback is required. The following are some points which may be useful when involved in listening situations:

- Adopt a positive attitude.
- Display appropriate body language.
- Read the signs – pay attention to the participant's body language.
- Chose a response carefully – accept and respect the opinion of the participant.

Do not allow the training workshop to be dominated by a single query or question. Remember time needs to be carefully controlled for the duration of the workshop. In certain instances additional time with a participant may be required so politely ask them to continue the conversation or query at break time or at the end of the course. Do not ignore or delay the process if it is important to workshop.

Introduction to the Workshop

After reception it is worthwhile spending a short time welcoming the participants and carrying out a brief introduction to the training workshop. In this introduction:

- The learning outcomes can be reviewed, but check that the participants understand these outcomes by asking several questions.

- Ascertain any concerns that participants may have at the commencement of the workshop. If concerns are expressed, they should be addressed as far as possible in the class or at the breaks.

- Participants can be asked to introduce themselves to the rest of the class. One mechanism for doing this is to divide participants into pairs and ask each pair to chat for a few minutes. Afterwards, get the participants to introduce each other to the group.
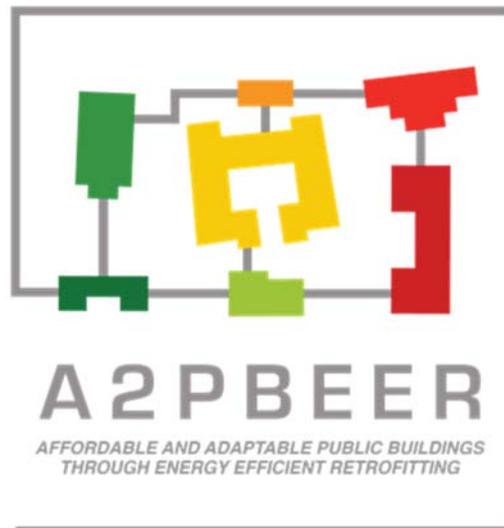
Training Elements for the SME and Demonstration Site Workshops

The aim of this programme is to develop the knowledge and skills of participants such that they can advise and undertake retrofitting to best practice by taking appropriate decisions and choices to reduce energy consumption, deliver energy savings and provide comfort levels for its occupiers.

At the end of this course the participants will be able to:
- Discuss in detail the training content on the A2PBEER Course.
- Describe advanced technologies, demonstrated in the A2PBEER project, which may be utilised in a retrofit project.
- Prepare and deliver an A2PBEER Training Programme to the required standards.

Part 1: A2PBEER Project and Workshop Overview

Part 1 of the workshop is largely a presentation style / didactic format. It is relatively short so it should not involve a great amount of participation. However, it may provide an opportunity for participants to have clarified, any general questions on the learning objectives or the A2PBEER project. It is important to check with the participants that they understand the information presented in this part of the workshop. This is important because if participants do not understand the fundamental objectives of the workshop it will be difficult for them to impart this to others.

Content:
- Welcome and Introductions
- Overview of the A2PBEER programme - address the principles and approaches of the A2PBEER project, the concept, implementation and partners.
- Project Video(s)
- Overview of training workshop - Intended target audience and delivery.
- Access and understanding of Moodle.

Resources required:
- Summary PowerPoint Slides for reception and introductions.
- Summary PowerPoint Slides of the project.
- Project video (s).
- Summary PowerPoint Slides of the training course.
- Group Discussion following content delivery.
- Link to Moodle website.

Learning Outcomes:
At the end of this Unit you will be able to:
- Communication the key objectives of the A2PBEER Project to relevant stakeholders.
- Outline the aims and objectives of the A2PBEER Training Programme.

Time allocation – 40 minutes

Part 2: A2PBEER Retrofit Technologies:

This part of the workshop outlines the different technologies which are involved in the A2PBEER model. Given the technical nature of this element of the workshop, it is particularly important that participants are asked on a regular basis if they understand the technical and application components of the technologies.

This part of the workshop may include a site visit to view the technologies in practice. It may also include virtual visits where the on-site experience is transmitted by camera link or virtual presentation.

Content:
- Technological components for the external and internal envelope, windows, lighting systems district thermal networks and absorption technologies.
- Specific emphasis on Public Buildings.
- Reflect new construction, renovation and change of use scenarios.
- Site visit to the demonstration building, to demonstrate and review the installation and the performance of the technologies, the benefits for installing technologies to improve the energy performance of the building and the process of retrofitting.

Resources required
- Video presentations of technologies.
- PowerPoint presentation of specific technology (optional).
- Arrangements for travel and viewing of a retrofitted building as a site visit (optional).
- Moodle Pages.

Learning Outcomes:
At the end of this Unit you will be able to:
- Describe the A2PBEER Technologies.
- Define appropriate situations where such technologies might be applied in practice.
- Determine where additional information can be obtained on each relevant technology.

Time allocation – 120 minutes

Part 3: Public Building Case Studies:

This part of the workshop includes a review of one of the A2PBEER case studies. The purpose of this element of the workshop is to add to the practical understanding of the benefits which can result from the application of the A2PBEER model. It is important that the details of the case studies are clearly stated, that the retrofit technologies which were used are outlined and their impact explained to the participants.

Content:
- A case study utilizing content from one of the project demonstration sites.
- Depicting partners´ experiences and practices.

Resources required:
- PowerPoint presentation of a case study.
- Video/photos of each A2PBEER demonstration site.
- Links to relevant EU Projects/Resources.
- Moodle Pages.

Learning Outcomes:

At the end of this Unit you will be able to:
- Present relevant case studies appropriate to the A2PBEER Project.

Time allocation – 30 minutes

Part 4: Systemic Approaches and Integration:

This is one of the key parts of the workshop. It primarily involves the introduction of the A2PBEER support guide Toolkit and the application of the Toolkit by the participants. A key element of this part of the workshop is the explanation to the participants of how the Toolkit works. This might best be explained by using an example or case study to demonstrate how the Toolkit can be applied in practice. Given the core function of the Toolkit and its technical nature, it is important that participants understand the elements of the Toolkit and its operation. Participants should be regularly asked to confirm that they understand the elements of the Toolkit and any parts they have difficulty with, should be re-visited.

After the structure of the Toolkit has been explained, and the implementation process outlined, the participants should be divided into groups of two and, in pairs, they should be asked to work through an example which is provided to them. Ideally, the example should be relevant to the particular circumstances of the area in which the workshop is being held.

As the participants work on the example the trainer should walk between them and ask if they are proceeding without any difficulty. If any pair is having a difficulty, the trainer should provide assistance. Ideally, this should take the form of guidance to the participants rather than the completion of the task for them. The provision of adequate guidance and allowing the learner to complete the task will provide a better learning environment rather than the trainer completing the task.

Content:
- Introduction to the A2PBEER Support Guide Toolkit.
- Description of its tools and techniques.
- Carrying out a practical example.

Resources required:
- Laptop to be brought by participants.
- Wifi connection.
- PowerPoint presentation introducing the A2PBEER support guide toolkit.
- Short video or presentation on how to use the tool.

- Support Guide Handout for using the A2PBEER Tool.
- Link to A2PBEER support guide tool.
- Handout containing a practical example (A2PBEER tool) to be completed by participants
- Links to A2PBEER WP Reports/Deliverables & Relevant Sub Sections.
- Moodle pages.

Learning Outcomes:

At the end of this Unit you will be able to:
- Outline the key strategic drivers and issues associated with retrofitting a public building.
- Utilise the A2PBEER Tool to define the key characteristics of the proposed retrofit project.
- Prepare a high level strategic plan for a proposed retrofitting project.

> *Time allocation – 90 minutes*

Part 5: Financial Analysis Tools & Methodologies:

Similar to Part 4, this is a key component of the workshop. It primarily involves the introduction of the A2PBEER Financial Tool and the application of that Tool by the participants. A key element of this part of the workshop is the explanation to the participants of how the Toolkit works. This might best be explained by using an example to demonstrate how the Toolkit can be applied in practice. Given the core function of the Financial Tool and its technical nature, it is important that participants understand the elements of the Financial Tool and its operation. Participants should be regularly asked to confirm that they understand the elements of the Tool and any parts they have difficulty with should be re-visited.

After the structure of the Financial Tool has been explained, and the implementation process outlined, the participants should be divided into groups of two and, in pairs, they should be asked to work through an example which is provided to them. Ideally, the example should be relevant to the particular circumstances of the area in which the workshop is being held.

As the participants work on the example the trainer should walk between them and ask if they are proceeding well. If any pair is having difficulty, the trainer should provide assistance. Ideally, this should take the form of guidance to the participants rather than the completion of the task for them. The provision of guidance and allowing them to complete the task will provide better learning than would arise from the trainer carrying out the task him or herself.

Content:
- Cost / benefit balance.
- Investment return.
- Cost optimality.
- Carry out a practical example/case study for each A2PBEER Building.

Resources required:
- Laptop to be brought by participants.
- Wifi connection.

- PowerPoint presentation introducing the financial tool and its functions.
- Short video or presentation on how to use the tool.
- Link to Financial Analysis Tool.
- Handout containing a practical example pertaining to the financial tool (to be completed by participants).
- Links to A2PBEER WP Reports/Deliverables & Relevant Sub Sections.
- Moodle pages.

Learning Outcomes:

At the end of this Unit you will be able to:

- Present the financial feasibility for a retrofit project using A2PBEER and other tools.

Time allocation – 75 minutes

Part 6: Evaluation:

As part of this training and part of the A2PBEER project, it is important to understand how the training programmes can be improved upon and further developed into the future. A short learner feedback questionnaire sheet has to be completed by all participants at the end of the training workshop (see attached in Appendix B). Ensure collection of the sheets before the participants leave the workshop. Additional questions may be answered or further discussed within this part of the training workshop.

All completed questionnaires are to be sent to LIT for the evaluation of the entire A2PBEER training programme. Questionnaires from all the workshops will be compiled together in order to develop the final training plan.

Content:

- Completion of a Learner Feedback Questionnaire by participants.
- Return of Learner Feedback Questionnaire sheets to the trainer.

Resources required:

- PowerPoint presentation explaining the importance of evaluation.
- Learner Feedback Questionnaire sheet – provided by LIT and handed out at the beginning of the workshop (Appendix B).

Time allocation – 20 minutes

Reading Material

Essential Reading available in Moodle: Follow the link: www.a2pbeeronline.eu to review the workshop materials and content.

Part 1:
Website link to the A2PBEER project.
http://www.a2pbeer.eu/
Link to the A2PBBEER video
http://www.a2pbeer.eu/results-reports/presentations/

Part 2:
Analysis of the Public Building envelope and strategies for energy efficient retrofitting - http://www.a2pbeer.eu/wp-content/uploads/2013/11/D3-1_Analysis-of-the-Different-Existing-Envelopes-of-Public-Buildings_Final_AbudIK.pdf

Indoor lighting technologies for public buildings - http://www.a2pbeer.eu/wp-content/uploads/2013/11/D4-1_Analysis-of-Lighting-Needs_Final_Toshiba_FR.pdf

Conceptualization of the smart dual thermal network - http://www.a2pbeer.eu/wp-content/uploads/2013/11/D5-1_Conceptualization_Final_Dapp_SA.pdf

Part 3:
Replicability framework for virtual pilots - http://www.a2pbeer.eu/wp-content/uploads/2015/04/8.1-Replicabilitiy-framework-for-virtual-pilots-Final.pdf

Part 4:
Public-Building-and-District-Characterization of common retrofitting approaches - http://www.a2pbeer.eu/wp-content/uploads/2013/11/D2-1_Public-Building-and-District-Characterization_Final_AbudAG.zip

Technologies and strategies of public building retrofitting - http://www.a2pbeer.eu/wp-content/uploads/2013/11/D2-2_Technologies-and-strategies_Final_AccionaAR.pdf

Best Practices on Public Building and District Retrofitting - http://www.a2pbeer.eu/wp-content/uploads/2013/11/A2PBEER_D2-3_Best-Practices-on-Public-Building-and-District-Retrofitting_Final_AccionaAR.pdf

Definition of a Systemic Public Building and District Retrofitting Methodology - http://www.a2pbeer.eu/wp-content/uploads/2013/11/A2PBEER_D2-5_Definition-of-a-Systemic-Public-Building-and-District-Retrofitting-Methodology.pdf

Part 5:
Financial assessment of public building retrofitting - http://www.a2pbeer.eu/wp-content/uploads/2013/11/A2PBEER_D2-4_Financial-assessment_Final_DAPP_MM.pdf

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Blended e-Learning

In recent years, distance learning has become an increasingly popular way to provide access to educational programs and for people to learn about topics that they might not otherwise have been able to pursue. Distance learning occurs when there is a separation between trainer and the learner, usually due to geographical or time concerns that prevent the learners from attending an on-campus course. Often, electronic means are used to bridge this gap and distribute educational material though a Virtual Learning Environment (VLE), with Moodle and Blackboard being prominent examples.

The A2PBEER training workshop is based on a blended e-learning programme with the use of the Moodle platform which is used to distribute the learning material, keep learners in touch with lecturers, and can provide access to communication between learners. The communicating of information is easier and more efficient than ever before and learners may find possibilities for using interactive videos, e-mail, and discussion boards to complete their lessons.

Moodle

Moodle is a learning platform designed to provide educators, administrators and learners with a **single robust, secure and integrated system** to create personalised learning environments.

Moodle has many functionalities but, for the purposes of this workshop, it will be primarily used as a repository for course material.

Courses are the spaces on Moodle where trainers add learning materials and activities for their students. Courses may be created by administrators, course creators or managers. Trainers can then add and re-organise content according to their own needs.

In the case of this workshop, the course administration and material will be managed and uploaded by LIT. The link to the Moodle platform is www.a2pbeeronline.eu where all the workshop materials and content can be review and downloaded.

Workshop participants must be enrolled in the course on Moodle so that they can access the material. In the case of the present workshop, the course leaders will enrol the participants manually. This allows a user to enrol other users into a course manually via Settings > Course administration > Users > Enrolled users

A password will be provided for the course before the commencement of the workshop. This password must be given to students who should then be able to access the Moodle course following login, which will also be provided by LIT.

Bibliography

Gardiner, H. (2003) *Multiple Intelligences – New Horizons,* New York: Basic Books.

Harris, J.M. (2012) *Presentation Skills for Teachers,* New York: Routledge.

Knowles, M.S. (1973) *The Adult Learner: A Neglected Species,* Houston: Gulf Publishing Company.

Appendix A

SME and Demonstration Workshop Overview

Project Responsible:	**A2PBEER**

This is a 1 day workshop. It is proposed to concentrate on using videos to demonstrate the A2PBEER technologies, short PowerPoint presentations to present a case study and interactive learning for the tools. All these materials will be available prior to workshop on the A2PBEER Moodle platform. Classroom presentations followed by a worked example will be provided for the A2PBEER Support Guide toolkit and the financial tool for best practice retrofitting.

Module Overview:
The aim of this Training SMEs and Demonstration Site programme is to develop the knowledge and skills of participants such that they will be able to understand the nature of the A2PBEER Project, the nature of the technologies developed during the project and to effectively apply the technology and financial tools developed through the project in making the most effective retrofitting decisions regarding public buildings and districts in the management of which they are engaged. .   The key component of the training programme will be based around the retrofitting activities of the demonstration buildings. The content will be developed to reflect both new construction, renovation and change of use scenarios from each stage of the demonstration project development. The workshop will include the following: 1. Introduction and overview of the A2PBEER technologies and retrofitting project.   2. The technological components of the façade envelope, windows, lighting systems, district thermal networks and absorption technologies.   3. Presentation of a case study investigating the use of the technologies and how these are implemented and retrofitted to best practice. These will be enhanced by the partners´ experiences and practices.   4. The A2PBEER Support Guide Toolkit is to assist stakeholders in making best practice decisions on how to improve the energy performance of their public building or district. The Guide will outline the methodology on how to carry out a district and building assessment from the viewpoint of energy consumption. There are six stages to understand and complete.   5. The Financial tool will focus on financial analysis, return on investment, cost control and evaluation of rehabilitation of public buildings. It will include data from a case study which is to be completed and understood. It will also focus on strategies and opportunities with alternative financing mechanisms (ESCOs, EPCs, etc.)

Learning Outcomes (LO):
On the completion of this programme the participants will understand:

1	The principles and benefits of a system approach to the retrofitting of major public buildings.
2	The nature of the technologies which have been developed under the A2PBEER project including the issues which each technology is intended to address, the nature of the developed solution and the ways of applying the technology in different contexts.
3	The uses and applicability of technology and financial tools developed under the A2PBEER project, thereby enabling the most effective decisions to be adopted with respect to the retrofitting of various types of major public buildings.
Furthermore, on the successful completion of this programme, participants will be able to -	
4	Describe the nature and benefits of a best practice system approach to the retrofitting of large public buildings and districts of different types.
5	Describe the advanced technologies developed under the A2PBEER project to a variety of stakeholders responsible for building energy management in buildings and districts of different types
6	Demonstrate the use of the technology and financial tools developed under the A2PBEER project to participants on the A2PBEER Training Programme and facilitate participants in learning how to use the tools in question to make decisions for different building types

The following is the role of each unit in achieving the programme learning outcomes

Unit/Learning Outcome	Part 1	Part 2	Part 3	Part 4	Part 5
LO 1	X	X		X	
LO 2			X		
LO 3		X			X
LO 4		X		X	
LO 5			X		
LO 6		X			X

Indicative Syllabus:

Part 1: A2PBEER Project and Workshop Overview:
This will address the principles and approaches of the A2PBEER project, its concept, implementation and partners. It will also provide an overview of the A2PBEER Retrofit Course, its intended target audience and delivery:

- Address the principles and approaches of the A2PBEER project,
- The concept, implementation and Partners.
- Project Video
- Overview of the A2PBEER programme,
- Intended target audience and delivery.
- Access and understanding of Moodle.

Part 2: A2PBEER Retrofit Technologies: *(summary of technologies - videos available on Moodle)*

- Technological components for the external and internal envelope, windows, lighting systems district thermal networks and absorption technologies.
- Specific emphasis on Public Buildings.
- Reflect new construction, renovation and change of use scenarios
- Site visit to the demonstration building/district, to demonstrate and review the monitoring, installation and performance of the technologies, the benefits for installing technologies to improve the energy performance of the building and the process of retrofitting. (optional)

Part 3: Public Building Case Studies: *(summary of a choice of 4 case studies with presentations are available on Moodle)*

- Case study utilizing content from one of the project demonstration sites.
- Depicting partners´ experiences and practices.

Part 4: Systemic Approaches and Integration:

- Introduction to the A2PBEER Support Guide Toolkit:
- Description of its tools and techniques
- Carrying out a practical example from an appropriate Demo Site.

Part 5: Financial Analysis Tools & Methodologies:

- Cost / benefit balance
- Investment return
- Cost optimality
- Carry out a practical example continuing from appropriate Demo Site from Unit 4.

Teaching and Learning Methodologies:

- Online Moodle with relevant resource material (reports, guides, photographs, videos)
- Project video(s)
- Interactive classroom PowerPoint presentations
- Technology videos
- Classroom-based paired and group work
- Classroom discussions
- Site visit to a retrofitted demonstration building (optional)
- Self-directed learning during and outside contact hours
- On-line use of the Web-tool and methodologies developed by the A2PBEER project
- On-line use of the financial tool.

4

NOTES