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**A**ffordable and **A**daptable  
**P**ublic **B**uildings through  
**E**nergy **E**fficient **R**etrofitting.

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Grant Agreement no.: 609060

# A2PBEER TRAIN THE TRAINER

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<b>Project Responsible:</b> A2PBEER
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## Programme Learning Outcomes

The aim of this programme is to develop the knowledge and skills of participants such that they will be able to deliver the A2PBEER Retrofit Training Course. 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 the A2PBEER Training Programme to the required standards.

### Workshop Overview:

The A2PBEER Train the Trainer Workshop is designed to enable experienced professionals such as architects, consultants, engineers and academics working in the field of retrofitting public buildings to train and upskill a cohort of experts who can be trainers within their own countries.

The key component of the training programme will be based around the retrofitting 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 four case studies investigating the use of the technologies and how these are implemented and retrofitted to best practice standards. These will be enhanced by the partners' experiences and reports on best practice.
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 of 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 has to be completed and understood by the course participants. It will also focus on strategies and opportunities provided by alternative financing mechanisms (ESCOs, EPCs, etc.)
6. The pedagogical approach is to develop the knowledge and skills of the trainers to enable the transfer of knowledge to future stakeholders, such that they will be able to effectively deliver the A2PBEER training course to a variety of stakeholder types with respect to a number of different public building types.

<b>Learning Outcomes (LO):</b>	
At the end 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	How to use the technology and financial tools developed under the A2PBEER project in order to make the most effective decisions regarding the retrofitting of major public buildings of different types
4	The principles of providing training to an adult audience with a background in the field in which the training is being provided
At the end of this programme the participants will be able to:	
5	Describe the nature and benefits of a best practice system approach to the retrofitting of large public buildings and districts of different types.
6	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.
7	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.
8	Prepare and deliver the A2PBEER Training Programme to the standards required and in accordance with the pedagogical principles applicable to adult learners.
9	Design, apply, analyse and respond to a programme evaluation process by the A2PBEER training course participants

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

Unit/Learning Outcome	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
LO 1	X					
LO 2		X		X		
LO 3			X			
LO 4						X
LO 5	X					
LO 6		X		X	X	
LO 7			X	X	X	
LO 8						X
LO 9						X

## Indicative Syllabus:

### Unit 1: A2PBEER Project and Training 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 content for the course.

**Time:**

- Duration (hrs): 1 hr

**Content:**

- Housekeeping and Introductions.
- Overview of the A2PBEER programme - the principles and approaches of the A2PBEER project, the concept, implementation and partners.
- Project Video.
- Overview of train the trainer workshop.
- Access and understanding of Moodle.

**Resources required:**

- Summary PowerPoint Slides for housekeeping and Introductions.
- Summary PowerPoint Slides of the Project.
- Project video (s).
- Summary PowerPoint Slides of the Training Course content.
- Group Discussion following content delivery.
- Link to Moodle pages.

**Learning Outcomes:**

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

- Communicate the key objectives of the A2PBEER Project to relevant stakeholders.
- Outline the aims and objectives of the A2PBEER Training Programme.
- Utilise the Moodle tool to allow participants to enrol and use the A2PBEER Course Content.

### Unit 2: A2PBEER Retrofit Technologies:

This will deal with the technological components within the A2PBEER project and is to include technical information on the internal and external envelope, smart window, lighting systems district thermal networks and absorption technologies. A specific emphasis will be placed on public buildings and districts which encompass new construction, renovation and change of use scenarios.

After the presentations of the technologies there will be a visit to the test centre, KubiK where the testing of A2PBEER technologies are available to view. This will incorporate a short presentation (prior to the site visit) on the monitoring process and the best practices in retrofitting methodologies will be also explored at the demonstration building in Leioa University.

**Time:**

- Duration (hrs): 6.5 hrs
  - Presentations of technologies 20 mins per technology (6 x 20mins).
  - Kubik Building and Site Visit (3.5hrs).

**Content:**

- Technological components for the external and internal envelope, windows, lighting systems district thermal networks and absorption technologies.
- Specific emphasis on Public Buildings and Districts.
- Reflect new construction, renovation and change of use scenarios.
- Visit to the Kubik testing centre.
- 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:**

- Speaker from each of the technology providers/developers.
- PowerPoint presentations of all the A2PBEER technologies.
- PowerPoint presentation of the monitoring process in Leioa University.
- Arrangements for viewing the testing elements in the Kubik building
- Arrangements for a site visit to view the demonstration building at Leioa University
- WP Reports/Deliverables & Relevant Sub Sections.
- 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.

**Unit 3: Public Building Case Studies.**

This will provide an overview of the case studies from the A2PBEER Project, and other relevant projects.

**Time:**

- Duration (hrs): 1.5 hrs

**Content:**

- Four Case Studies of A2PBEER Projects and other EU Projects.
- Depicting partners' experiences and practices.

**Resources Required:**

- Speaker from each of the demonstration sites and pilot sites.
- PowerPoint presentations of four case studies.
- 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

**Unit 4: Systemic Approaches and Integration:**

This will provide an overview of the A2PBEER support guide tool, its uses and review appropriate case studies. It will provide an overview of the key deliverables from WP2.

**Time:**

- Duration (hrs): 2 hrs

**Content:**

- Introduction to the A2PBEER Support Guide Toolkit.
- Description of its tools and techniques.
- Carrying out a practical example using the support guide tool.

**Resources Required:**

- Laptop to be brought by participants.
- Wifi connection.
- PowerPoint presentation introducing the A2PBEER support guide toolkit.
- Short video or screenshot 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 related to the A2PBEER tool (participant involvement).
- 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.

**Unit 5: Financial Analysis Tools & Methodologies:**

This will focus on financial analysis, return on investment for the rehabilitation procedures. It will include data from previous cases allowing the use of problem based learning as pedagogical strategy. It will also focus on strategies and opportunities with alternative financing mechanisms (ESCOs, EPCs, etc.).

**Time:**

- Duration (hrs): 2 hrs

**Content:**

- Cost / benefit balance.
- Investment return.
- Cost optimality.

- Carry out a practical example/case study for one of the A2PBEER demonstration Buildings.

**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 related to the financial tool (participant involvement).
- 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.

**Unit 6: Pedagogical Approaches:**

This will focus on appropriate pedagogical approaches to training professionals in relation to energy efficiency. It will recommend appropriate training approaches and techniques.

**Time:**

- Duration (hrs): 1.5 hrs

**Content:**

- Adult learning styles.
- Training tools and techniques.
- Preparation of a training workshop.
- The importance of effective evaluation.
- Completion of a Learner Feedback Questionnaire.

**Resources required:**

- PowerPoint presentation of overview of adult learning styles.
- PowerPoint presentation of the elements of the SME and Demonstration Site training.
- Hard copy and link to trainers Handbook.
- Learner Feedback Questionnaire sheet.
- The Moodle Course Content.
- Moodle Pages.

**Learning Outcomes:**

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

- Identify appropriate training tools and techniques which should be used for training professionals

### **Teaching and Learning Methodologies**

- Online use of Moodle with relevant resource material (reports, guides, photographs and videos)
- Academic-based expert lectures.
- Classroom interactive PowerPoint presentations.
- Project video.
- Classroom-based paired and group work.
- Classroom discussions.
- Site visit to exemplar Kubik centre to review the testing of the prototypes.
- Site visit to renovation demonstration building.
- Self-directed learning during and outside contact hours.
- On-line use of calculation tools and methodologies developed by the A2PBEER project.
- On-line use of financial tool.

## Reading Material

**Essential Reading available in Moodle:** Follow the link: [www.a2pbeeronline.eu](http://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](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](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](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-Replicability-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](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](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](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](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](http://www.a2pbeer.eu/wp-content/uploads/2013/11/A2PBEER_D2-4_Financial-assessment_Final_DAPP_MM.pdf)