



Education
IS THE KEY!

*Mr. Tommi Lindh,
Alvar Aalto Foundation & Museum, Finland
& Virpi Slotte, Kiinko – Real Estate Education, Finland*



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SUMMARY OF PRESENTATION

WP 5 outcome- Education is the key

- Collaboration across disciplines
- Targeting all parties involved
- Filling the gaps of knowledge

New training course material

- Higher education
- Craftsmen education
- Workshops, lecture events

Collaboration across disciplines

Refurbishment outcome is as good as is the collaboration of team members and their ability to share knowledge



Architects, conservators



Engineers, energy efficiency experts

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Targeting all parties involved

Reason why they are important

Local authorities

... regulate the renovation of listed buildings
... should encourage and support the projects

Real estate developers, owners and tenants of historic buildings

... initiate and finance refurbishment works.
... should know how they should use and behave in historic buildings.

Facility managers

... should know how the renovation must be carried out and who must be involved in the process.

Architects, engineers

... should know the methods of renovation and which are relevant to each specific case.

Construction companies, construction workers

... should have the skills and knowledge to refurbish historic buildings without causing any damages.

Students, apprentices

... should learn the methods of renovation and obtain the skills.

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Filling the gaps of knowledge

Educational materials of modern teaching institutions needs to cover:

- **history of construction**
- **building physics** (damage patterns, moisture regimen, heat transmission),
- **modern materials** for refurbishment (effective materials and their characteristics),
- **modern technologies** of refurbishment and where it is possible to apply it (especially insulation from the inside),
- renewable **energy sources**, **energy saving** on heating (methods of heating, heat pumps).



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NEW TRAINING COURSE MATERIAL

New materials were developed for architects, conservators, engineers, energy auditors.
The materials are divided into 4 lecture packages:

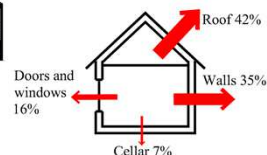
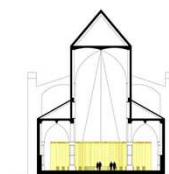
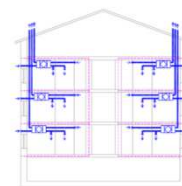
1. **Cultural heritage and historic constructions**
2. **Energy efficient refurbishment measures and technical services**
3. **Quality Management and work planning**
4. **Market opportunities**



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NEW TRAINING COURSE MATERIAL

New lecture materials dealing with knowledge and skills how to apply suitable methods of energy efficient refurbishment of historic constructions and how innovation can be combined with cultural heritage were developed additionally from the results of project work package 4



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LIST OF MATERIALS ON INNOVATIONS

INNOVATIVE MEASURES	ENERGY SAVINGS, %
Improving heat production/boiler	17
Heat pumps	15
Post-insulation of roof and sloped ceilings	15
Post-insulation of exterior wall (from inside)	14
New windows or energy efficient secondary glazing on windows, shading the windows	11
Increasing building airtightness	8
Regulated ventilation system	---
Energy effective modern lighting system	7
Post-insulation of cellar ceiling, cellar walls	3
Home automation and smart applications	2
Infrared heating	---

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HARMONISED TRAINING PROGRAMMES		
Target group	Learning content	Related lecture materials
Building conservators	damage patterns and causes, interrelations, overview of possible weak points	LP2.1-4, WP5 Handbook, innovative measures
Architects	tolerable techniques, assessment of damages, possible treatments and improvement measures	LP1.1-3, LP2.1-4, WP5 Handbook, Brick consultant
Constructors, engineers, energy auditors	history of brick(work), building materials, comparison to modern ones, tolerance with modern materials	LP1.1-3, LP4.1-4, LP3.1-3, innovative measures, WP5 Handbook, Brick consultant
Construction site managers, project managers, administrative workers	All fields, but just general knowledge	

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CERTIFICATION FOR CRAFTSMEN CURRICULA	
<p>It is a criteria catalogue for a planned certification system – Learning contents according to the required add-on knowledge about historic buildings for different specializations:</p> <ul style="list-style-type: none"> ▪ Bricklayer I: Renovation ▪ Bricklayer II: Energy efficient retrofit ▪ Carpenter and Roofer: Energy efficient refurbishment of a sloping roof construction ▪ Construction planning and supervising: Airtightness ▪ Construction planning: Pre-analysis of weak points 	<p>Learning modules 1: Theory basics Moisture in masonry Salinity in masonry Causes of moisture damages Causes of salinity damages</p> <p>Learning module 2: Damage ascertainment Assessment of masonry and damage ascertainment Site visit for the damage ascertainment and questioning of people from site </p> <p>Learning module 3: Typical damages at historic buildings Cross-trades identification of damages Typical damages at the different building components and materials Assumption of the possible causes of the damages</p> <p>Learning module 4: Exercise to learn recognise damages, discussion of possible causes and refurbishment measures Cross-trades identification of damages Typical damages at the different building components and materials Assumption of the possible causes of the damages </p>

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HARMONISED CURRICULA FOR THE CRAFTSMEN

Three different packages for three target groups were created and described in order to harmonise the curricula for the craftsmen

Non-technical group	Technical group (management)	Technical group (operational)
Local authorities	Facility managers	Apprentices
Sales and facility managers	Architects, engineers	Skilled workers
Investors, developers	Local authorities (tech.)	Building supervising staff
Owners	Real estate developers	Architects, engineers
Occupiers	Construction companies	Construction companies

WORKSHOPS, LECTURE EVENTS

During the project period 27 educational events took place.

The addressed target groups were professionals, administrators, students and workers, as well as general public.



Project partner

Place of event

Date of event

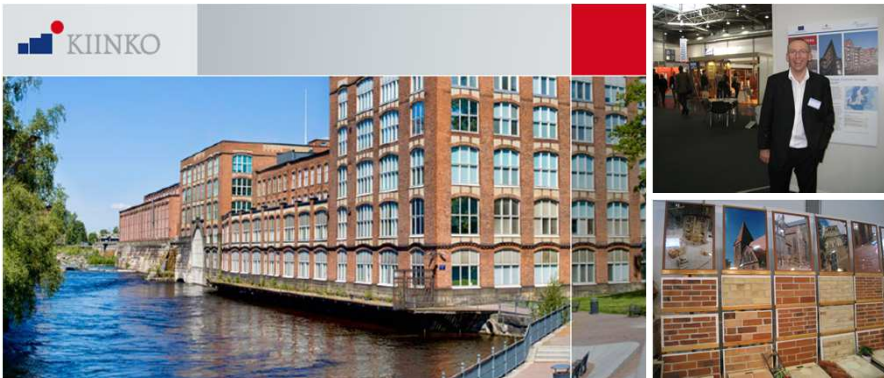
Topic/Agenda

Lecturers

Target groups addressed

STUDY EXCURSIONS, SEMINARS ETC.

Several seminars and study excursions, e.g., Leipzig, Stockholm, Tampere were organized bringing together project partners from various Co2olBriks countries.



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