

# INCREASING ENERGY EFFICIENCY IN BUILDINGS (IEEB)

## Project focus

The IEEB project develops new solutions and promotes energy efficiency in buildings.

Finding new ways to plan and build more energy efficient and technically workable buildings, contributes towards proactive sustainable development.

## Project introduction & results 2010-13

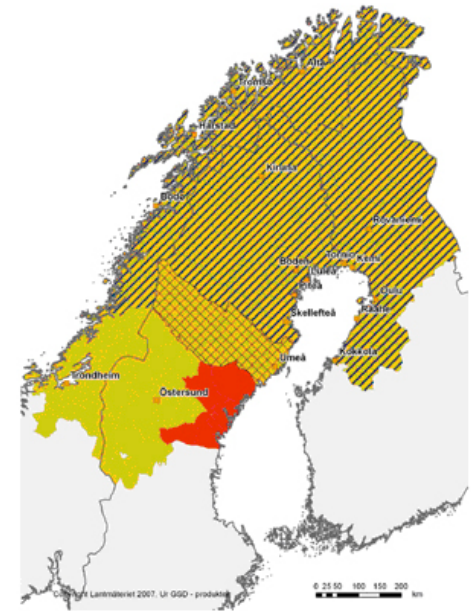
Antti Haapalahti ,OUAS

# Increasing energy efficiency in buildings - IEEB

IEEB was a three-year (2010–2013) Nordic co-operation project.

Lead by Oulu University of Applied Sciences, Finland

Partners from Norway (NORUT Narvik, Norcem AS, Betong & Entreprenuersenteret AS), Sweden (Luleå University of Technology, Umeå University) and Finland (Oulu Building Supervision Office BSO, 10 companies).



IEEB-project



# Increasing energy efficiency in buildings - IEEB

## Partners (7)

Oulu University of Applied Sciences (koordinaattori)

- <http://www.oamk.fi/tekniikka/english/>

Luleå Tekniska Universitet

- <http://www.ltu.se/>

Umeå University

- <http://www.umu.se/>

City of Oulu, Building Supervision Office (BSO-Oulu)

- <http://www.ouka.fi/>

NORUT Narvik

- <http://www.norut.no/en/Norut>

Betong & Entreprenørsenteret AS

- <http://www.be-senteret.no/>

Norcem AS

## Associate partners (10)

- Kastelli-talot Oy
- Kontiotuote Oy
- Lappli-Talot Oy
- Kannustalo Oy
- Puutuomela Oy
- Lammi-kivitalot Oy
- Pyhännän Rakennustuote Oy
- Rakennusliike A Vanttilä Oy
- NCC Rakennus Oy
- SRV Toimitilat Oy

**Funding:**  
**Interreg IVA NORD**  
**Regional Council of Lapland**



# IIEB – why the acknowledgement by Interreg 4a Nord ?

Länsstyrelsen Norrbotten:

“The project Increasing Energy Efficiency in Buildings (IIEB) is good example of project that combines the needs within the academic research field and the industry needs, to develop knowledge in the field of energy efficient buildings.”

## NORTH

1. Trade and industry development
2. Research, development and education
3. Regional functionality and identity

## SÁPMI

4. Sápmi - Borderless development

## 2. Research, development and education

Projektnamn	Huvudsökande
<a href="#">Nordic Mining School</a>	Luleå Technical University
<a href="#">Border crossing entrepreneurship</a>	Municipality of Arjeplog
<a href="#">InnoPreneurship</a>	Kemi-Tornio University of Applied Sciences
<a href="#">HIGHBIO</a>	University of Jyväskylä, Chydenius Institute - Kokkola University
<a href="#">Preliminary study: Meän Koulu</a>	Lapland Vocational College
<a href="#">Meän koulu</a>	Lapland Vocational College
<a href="#">Innovative services in the sphere of e-maintenance for industry and small/medium sized companies</a>	Luleå Technical University

# Research results – Publications (8)

Author(s)	Topic	Conference, date
Fedorik Filip; Illikainen Kimmo	HAM and Mould Growth Analysis of a Wooden Wall.	Passivhus Norden 2012. Trondheim, Norway. 10 p.
Tulla Kauko; Hienonen Markku; Hannila Heikki	On cooperation of companies, public actors and educational bodies towards energy efficient buildings. Case Oulu energy efficiency quarter	Sustainable Building, SB13, 2013. Oulu, Finland. 13 p.
Fedorik Filip; Illikainen Kimmo	Wooden vs. Concrete Blocks' Structure - HAM and Mould Growth Analysis	Sustainable Building, SB13, 2013. Oulu, Finland. 9 p.
Kauppinen Timo; Siikanen Sami; Vähäsöyrinki Erkki; Seppänen Markku	The use of building own ventilation system in measuring airtightness	Joint Conference 32nd AIVC Conference and 1st TightVent Conference Towards Optimal Airtightness Performance; Brussels, Belgium; Oct 12-13, 2011, 10 p.
Hienonen Markku; Illikainen Kimmo; Kauppinen Timo; Niemi Krista	Rakennusten ilmanpitävyyden parantaminen – kokemuksia Oulusta (Improving Air tightness of Building – Experiences in Oulu).	Building physics –seminar 2013. RIL and TTY, 22.-24.10.2013, Tampere, Finland. 10 p.
Hienonen, Markku; Kauppinen, Timo; Montin, Anu	What public authority can do increase energy efficiency in new buildings	17 <sup>th</sup> International passive house conference 2013. Frankfurt am Main. 9 p.
Hienonen, Markku; Kauppinen, Timo; Vähäsöyrinki, Erkki	Improvement of air tightness of communities.	Joint Conference 32nd AIVC Conference and 1st TightVent Conference Towards Optimal Airtightness Performance; Brussels, Belgium; Oct 12-13, 2011, 10 p.
Kauppinen, Timo; Hienonen, Markku; Siikanen, Sami	Air tightness and energy efficiency	7th International Cold Climate HVAC Conference, 11 - 14 Nov. Calgary, Canada. 2012.

## Research results from Sweden and Norway



Umeå University



Publications by project partners

Sweden

9 publications

Norway

5 publications

Details available at the IEEB web pages:

<http://www.oamk.fi/hankkeet/ieeb/>

## Educational results: OUAS thesis projects (16)

Student	Theme	Web link
Vesa-Pekka Silvola	TIGHTNESS TEST OF BUILDINGS IN FINLAND, SWEDEN AND NORWAY	<a href="http://publications.theseus.fi/handle/10024/28770">http://publications.theseus.fi/handle/10024/28770</a>
Outi Jokiranta	HEATING OPTIONS IN PASSIVE HOUSES	<a href="https://leevi.amkit.fi/vwebv/search?iehack=%E2%98%A0&amp;searchArg=jokiranta+outi&amp;quickSearchButton=HAE&amp;searchCode=GKEY%5E*&amp;searchType=0&amp;sk=fi_FI">https://leevi.amkit.fi/vwebv/search?iehack=%E2%98%A0&amp;searchArg=jokiranta+outi&amp;quickSearchButton=HAE&amp;searchCode=GKEY%5E*&amp;searchType=0&amp;sk=fi_FI</a>
Kimmo Tahkola	ENERGY METERING IN PASSIVE- AND LOW ENERGY BUILDINGS	<a href="https://publications.theseus.fi/handle/10024/28061">https://publications.theseus.fi/handle/10024/28061</a>
Mika Hänninen	AIR TIGHTNESS MEASURING METHODS OF AN APART-MENT BUILDING	<a href="https://publications.theseus.fi/handle/10024/36404">https://publications.theseus.fi/handle/10024/36404</a>
Tuomas Haavisto	CALCULATION OF ENERGY-EFFICIENT BUILDINGS WITH PHPP	<a href="http://publications.theseus.fi/handle/10024/39495">http://publications.theseus.fi/handle/10024/39495</a>
Juha-Pekka Ohenoja	ENERGY CALCULATION OF PASSIVE AND LOW-ENERGY HOUSES	<a href="https://leevi.amkit.fi/vwebv/holdingsInfo?searchId=314&amp;recCount=10&amp;recPointer=6&amp;bibId=163561">https://leevi.amkit.fi/vwebv/holdingsInfo?searchId=314&amp;recCount=10&amp;recPointer=6&amp;bibId=163561</a>
Heidi Jaakkonen	HEAT LOSSES OF WINDOWS AND ENERGY EFFICIENCY REGULATIONS 2012	<a href="https://publications.theseus.fi/handle/10024/45301">https://publications.theseus.fi/handle/10024/45301</a>
Miska Auvinen	MEASUREMENTS OF THERMAL BRIDGES AND HEAT FLUX IN SHALLOW FOUNDATIONS BY COMSOL MULTIPHYSICS SOFTWARE	<a href="https://publications.theseus.fi/handle/10024/48533">https://publications.theseus.fi/handle/10024/48533</a>
Krista Niemi	QUALITY OF CONSTRUCTION SITE WORK IN BUILDING ENERGY EFFICIENT DETACHED HOUSES	<a href="https://publications.theseus.fi/handle/10024/55591">https://publications.theseus.fi/handle/10024/55591</a>
Joni Pennanen	HEAT DEMAND CALCULATION OF LOW ENERGY HOUSES USING DYNAMIC SIMULATING TOOL	<a href="https://publications.theseus.fi/handle/10024/55695">https://publications.theseus.fi/handle/10024/55695</a>
Heikki Rautio	MEASUREMENTS OF THERMAL BRIDGES IN EXTERNAL WALL JUNCTIONS AT RITAHARJU ENERGY EFFICIENCY QUARTER	<a href="https://publications.theseus.fi/handle/10024/56477">https://publications.theseus.fi/handle/10024/56477</a>
Eveliina Alatalo	PRELIMINARY OPTIMIZATION OF PASSIVE HOUSE WITH PHPP	<a href="https://publications.theseus.fi/handle/10024/58124">https://publications.theseus.fi/handle/10024/58124</a>
Jouko Kokko	LINEAR THERMAL TRANSMITTANCE OF BASE FLOOR JOINT	<a href="https://publications.theseus.fi/handle/10024/57875">https://publications.theseus.fi/handle/10024/57875</a>
Olli Alaluusua	AIR TIGHTNESS OF BUILDINGS, ERA 1960 – 1970	<a href="https://publications.theseus.fi/handle/10024/57576">https://publications.theseus.fi/handle/10024/57576</a>
Jonne Erkkilä	AIR TIGHTNESS OF BUILDINGS, ERA 1980 - 1990	<a href="https://publications.theseus.fi/handle/10024/57805">https://publications.theseus.fi/handle/10024/57805</a>
Jalmari Haapalainen	AIR TIGHTNESS OF BUILDINGS, ERA 1940 - 1950	

Doctoral dissertations:

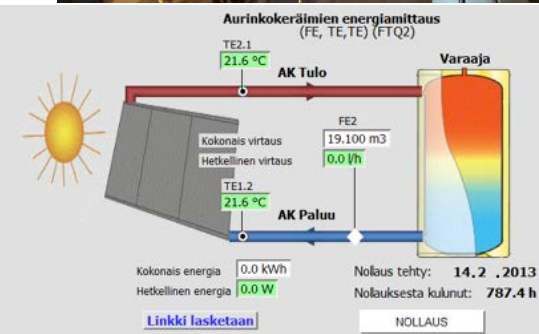
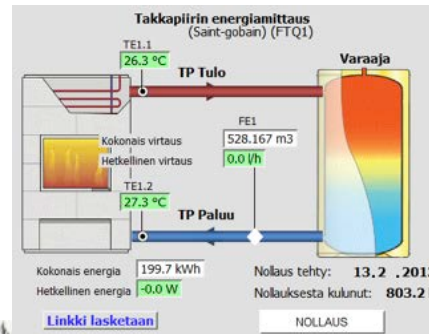
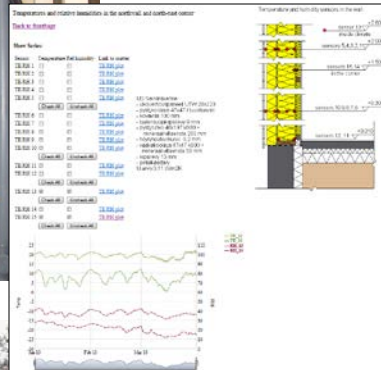
Ingrid Allard/University of Umeå

Gustav Nordström/Luleå University of Technology

# Main development results Oulu Energy Efficiency Quarter

Author: Kimmo Illikainen

<http://www.buildmeon.com/>





## Dissemination results - Public events

<b>Event</b>	<b>Date</b>	<b>Participants</b>
Media info session	March 29, 2011, Oulu, Finland	14
BSO -meeting: BSO Oulu and Luleå BSO	April 4-5, 2011, Oulu, Finland	60
Seminar: Development of building decrees and energy efficiency in the Nordic countries	May 27, 2011 Oulu, Finland	80
Seminar: Building physical functioning of wooden houses. Miniseminar and lecture (H. Viitanen)	December 14, 2011 Oulu, Finland	6 + 50
Workshop, Co-operation in energy in buildings between partners	January 30-31, 2012 Umeå, Sweden	20
Seminar: Industrialization of timber housing production	June 15, 2012 Pudasjärvi, Finland	20
Exhibition: EU-day, IEEB	September 21, 2012 Oulu, Finland	120 visitors
Seminar: Industrialization of timber housing production-Lindbäcks Bygg Ab	October 16, 2012 Piteå, Sweden	24
Visit: IEEB, Oulu Energy Efficiency Quarter (EEQ). Seminar for European building professionals teachers from 9 countries	March 19, 2013 Oulu, Finland	35
Sustainable buildings (SB13) Conference in Oulu 2013. Presentation and Excursion to IEEB, Oulu EEQ construction site	May 23, 2013 Oulu, Finland	15
IEEB Final Symposium in Oulu	September 27, 2013 Oulu, Finland	68
<b>+ 8 other international workshops, courses</b>	<b>Finland, Norway, Sweden</b>	<b>&gt; 200</b>
Total of 11+8 events		>700 participants

# Lessons learnt

- Collaboration with Swedes and Norwegians is productive, natural and easy
- New project ideas developed by demand, by partners
- Co-operation continues with partners & Nord-program

- Companies do not always follow project plans  
→ delays due to recession in building industry
- Large organizations have heavy bureaucracy



# Thanks a lot for your attention !!

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on behalf of Lars, Helena, Bård, Kim, Clara, Kauko, Kimmo, Markku, Sofia,  
Thomas, Ingrid, Ilkka, Jukka-Pekka & many other

