



Hva er nytt fra forskningen?

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Norsk bygningsfysikkdag 2010, 23. november, Oslo

www.sintefbok.no

SINTEF Byggforsk

PETER G. SCHILD, MICHAEL KLINSKI OG CATHERINE GRØNI

Sammenlikning og analyse av krav til energieffektivitet i bygninger i Norden og Europa

(Comparison and Analysis of Energy Performance Requirements in Buildings in the Nordic Countries and Europe)



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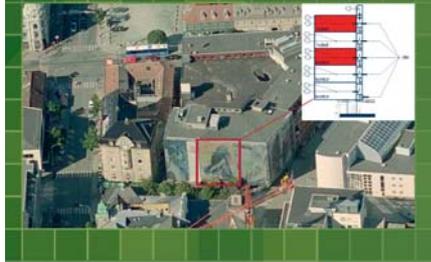
MATTHIAS HAASE OG TORE WIGENSTAD

Evaluering av bruk av dobbel fasade som konsept ved oppgradering av eksisterende fasade

Case: AØF Kongressenter Folket Hus, Trondheim

Prosjektrapport 57

2010



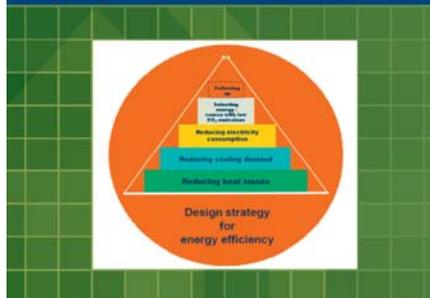
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MATTHIAS HAASE, KARIN BUVIK, TOR HELGE DOKKA AND INGER ANDRESEN

Guidelines for energy efficiency concepts in office buildings in Norway

Project report 56

2010



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TORE WIGENSTAD OG CATHERINE GRINI

LECO Fra normbygg til Faktor 10

Mulig vei for å redusere energibruken med 90 % i et kontorbygg

Prosjektrapport 51 2010



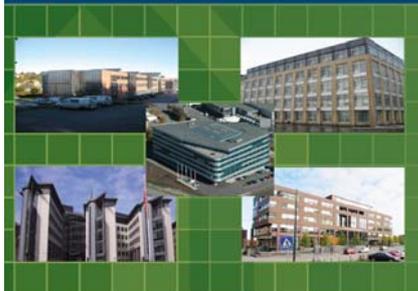
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CATHERINE GRINI, HANS-MARTIN MATHISEN, IGOR SARTORI, MATTHIAS HAASE,
HELLE WOHLK JÆGER SØRENSEN, ARNKELL PETERSEN, IDA BRYN OG
TORE WIGENSTAD

LECO – Energibruk i fem kontorbygg i Norge

Befaring og rapportering

Prosjektrapport 48 2009



SINTEF

FME-ZEB: Zero Emission Buildings



A national research centre that will put Norway in the forefront with respect to research, innovation, and implementation within the field of energy efficient Zero Emission Buildings.

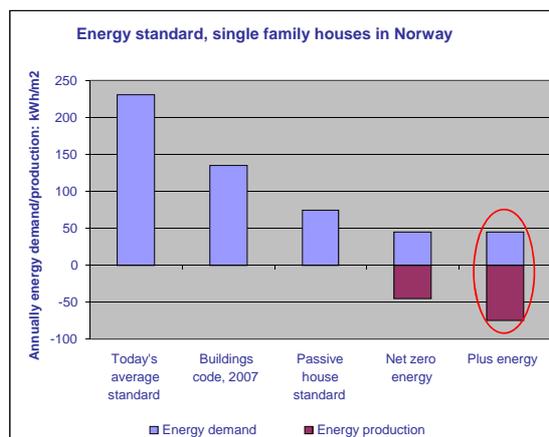
www.zeb.no

ZEB The Research Centre on Zero Emission Buildings



The challenge:

Compensate for CO₂ emissions from the production of materials and construction by producing more energy than the building uses for operation.



Source: SINTEF Byggforsk

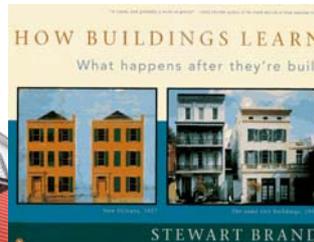
ZEB The Research Centre on Zero Emission Buildings



The ZEB research activities

ZEB will focus its work in five areas that interact and influence each other:

- WP-1: Advanced materials technologies
- WP-2: Climate-adapted low-energy envelope technologies
- WP-3: Energy supply systems and services
- WP-4: Use, operation, and implementation
- WP-5: Concepts and strategies



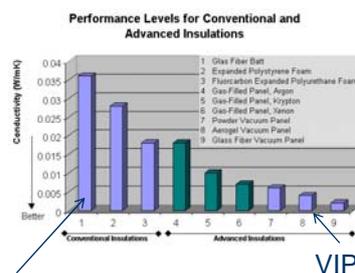
ZEB

The Research Centre on Zero Emission Buildings



Vakum isolasjonspaneler (VIP)

- Etterisoleringssystemer
- Robusthet og aldring
- Fuktproblematikk



Tradisjonell mineralull

VIP

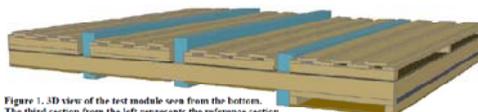


Figure 1. 3D view of the test module seen from the bottom. The third section from the left represents the reference section.



Figure 2. Horizontal cross-section of the test module. Build-up of the left section which is outside retrofitted with 30 mm VIP: Indoor panel, Mineral Wool, Wind Barrier, 30 mm VIP, Furring strip, Vertical weather

ZEB

The Research Centre on Zero Emission Buildings



PhD-study (by Birgit Risholt)
Rehabilitering av 80-tallshuset til ZEB standard !

	Beregnet som bygd*	TEK 2010	Passivhus NS 3700:2010
Energiramme	215 kWh/m ²	126 kWh/m ²	74 kWh/m ²
Romoppvarming	145 kWh/m ²	56 kWh/m ²	15 kWh/m ²
Energimerke	E	C	A

* Beregnet i henhold til NS 3031



Nylig oppstarta PhD-arbeider i ZEB på tema

Energy performance of Advanced Transparent Facade Systems

PhD candidate Steinar Grynning
Department of Architectural Design, History and Technology, NTNU

PhD candidate Francesco Goia
University of Torino/NTNU



Smart windows (adaptive and controllable) state-of-the art

ARTICLE IN PRESS

Solar Energy Materials & Solar Cells (2009) 93, 98–108

Contents lists available at ScienceDirect

Solar Energy Materials & Solar Cells

journal homepage: www.elsevier.com/locate/solmat

Review

Properties, requirements and possibilities of smart windows for dynamic daylight and solar energy control in buildings: A state-of-the-art review

Ruben Baetens^{a,b}, Bjørn Petter Jelle^{a,c,*}, Arild Gustavsen^d

^a Department of Building Materials and Structures, SINTEF Building and Infrastructure, NO-7465 Trondheim, Norway
^b Department of Civil Engineering, Catholic University of Louvain (KUL), B-1300 Heverlee, Belgium
^c Department of Civil and Transport Engineering, Norwegian University of Science and Technology (NTNU), NO-7401 Trondheim, Norway
^d Department of Architectural Design, History and Technology, Norwegian University of Science and Technology (NTNU), NO-7481 Trondheim, Norway



Fig. 1. Switching sequence of an electrochromic laminated glass [46].

Available smart windows has been carried out (crystal and electrochromic or suspended-ionic daylight and solar energy control in chromic windows seem most promising to buildings, where they have been found most of the total solar spectrum. Their efficiency more research is necessary to validate the commercial products in order to control both heating and cooling loads. © 2009 Elsevier B.V. All rights reserved.

Phase Change Materials –state of the art review

-hot-box measurements to evaluate the effect of a PCM board in traditional norwegian constructions – obvious effect on indoor temperature

Energy and Buildings 42 (2010) 1361–1368

Contents lists available at ScienceDirect

Energy and Buildings

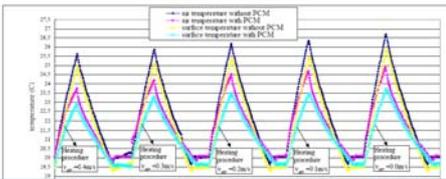
journal homepage: www.elsevier.com/locate/enbuild

Review

Phase change materials for building applications: A state-of-the-art review

Ruben Baetens^{a,b,c}, Bjørn Petter Jelle^{a,c,*}, Arild Gustavsen^d

^a Department of Materials and Structures, SINTEF Building and Infrastructure, NO-7465 Trondheim, Norway

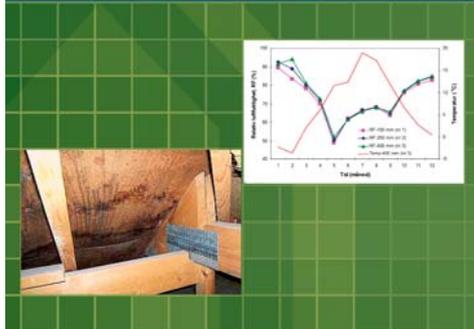



STIG GEVING OG JONAS HOLME

Høyisolerte konstruksjoner og fukt

Analyse av fukttekniske konsekvenser av økt isolasjonstykkelse i yttervegger, tak, kryperom og kalde loft

Prosjektrapport 53 2010



TOR EVEN PEDERSEN, BERIT TIME OG ELLEN M. DEVOLD

Kledning med trespon – eksperimentelle laboratorieundersøkelser og tidligere tiders erfaringer

Prosjektrapport 47 2009



Hva skjer i Sverige på fuktsiden?



<http://www.fuktcentrum.lth.se/>



<http://www.fuktsakerhet.se>

Seminarer i 2011

Norsk Murdag 2011 – 16. mars:

- Arrangeres i Trondheim på Dokkhuset, www.dokkhuset.no
 - Det vil bli utdeling av Murverkspriisen 2011 med påfølgende middag på Rockheim, www.rockheim.no

Nasjonalt fuktseminar 2011 – 7. april:

- Arrangeres i Oslo på UBC, Thon Hotel, Ullevål, www.ubc.no





TAKK FOR NÅ –
OG PÅ GJENSYN NESTE ÅR!!