



Aalborg Universitet

AALBORG UNIVERSITY  
DENMARK

## Net Zero Energy Buildings

### *Calculation Methodologies versus National Building Codes*

Marszal, Anna Joanna; Bourrelle, Julien S.; Gustavsen, Arild; Heiselberg, Per; Musall, Eike; Voss, Karsten

*Published in:*  
EuroSun 2010

*Publication date:*  
2010

*Document Version*  
Publisher's PDF, also known as Version of record

[Link to publication from Aalborg University](#)

#### *Citation for published version (APA):*

Marszal, A. J., Bourrelle, J. S., Gustavsen, A., Heiselberg, P., Musall, E., & Voss, K. (2010). Net Zero Energy Buildings: Calculation Methodologies versus National Building Codes. In *EuroSun 2010: Book of Abstracts* (pp. 22). EuroSun 2010.

#### **General rights**

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- ? Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- ? You may not further distribute the material or use it for any profit-making activity or commercial gain
- ? You may freely distribute the URL identifying the publication in the public portal ?

#### **Take down policy**

If you believe that this document breaches copyright please contact us at [vbn@aub.aau.dk](mailto:vbn@aub.aau.dk) providing details, and we will remove access to the work immediately and investigate your claim.

## **“Low Cost & Low Tech” Plus Energy Primary School and Gymnasium**

***Mr Ingo Lütkemeyer<sup>1</sup> Mr Gustav Hillmann<sup>2</sup> Mr Hans-Martin Schmid<sup>2</sup>***

*<sup>1</sup>IBUS Architekten und Ingenieure, Niederblockland 7, 28357 Bremen, Germany*

*<sup>2</sup>IBUS Architekten und Ingenieure GbR, Caspar-Theyß-Str. 14a, 14193 Berlin, Germany*

This project shall demonstrate that it is possible to realize a Plus Energy Primary School without increased costs in comparison to a “normal” new school building. The basic approach was to optimize the architectural design in order to permit a lean building with a simple, easy controllable and low maintenance engineering system. A sustainable, ecological concept can be implemented by using renewable sources. A photovoltaic plant will compensate the energy demand by feeding into the local grid. With the financial support by a project of the German Government (EnOB), different innovative components and products can be applied and monitored. The results of the different research areas will be documented and can be used for future projects.

## **Net Zero Energy Buildings - Calculation Methodologies versus National Building Codes**

***Ms Anna Joanna Marszał<sup>1</sup> Mr Julien Bourrelle<sup>2</sup> Mr Arlid Gustavsen<sup>2</sup> Mr Per Heiselberg<sup>1</sup>  
Mr Eike Musal<sup>3</sup> Mr Karsten Voss<sup>3</sup>***

*<sup>1</sup>Aalborg University, Sohngaardsholmsvej 57, 9000 Aalborg, Denmark*

*<sup>2</sup>Norwegian University of Science and Technology, Alfred Getz vei 3, NO-7491 Trondheim, Norway*

*<sup>3</sup>Bergische Universität Wuppertal, Haspeler Straße 27, 42285 Wuppertal, Germany*

The International Energy Agency (IEA), through the Solar Heating and Cooling Programme (SHC) Task 40 and the Energy Conservation in Buildings and Community Systems Programme (ECBCS) Annex 52 [1], works towards developing a common understanding and setting up the basis for an international definition framework for Net Zero Energy Buildings (NZEBs). The understanding for such buildings and how the NZEB status should be calculated differs in each of the participating country. Within the task activities, the participants surveyed and compared the variables used for calculation and each country's national calculation methodologies. This paper first presents an overview of NZEBs energy calculation methodologies proposed by organisations representing eight different countries: Austria, Canada, Denmark, Germany, Italy, Norway, Switzerland and USA. The variables used in each methodology are reviewed and their relative importance assessed. The paper concludes with the results of a survey where each of the participating country were asked to compare their own NZEBs against each methodology.