



## Session A2: Sustainable buildings – a reality

### Presentation Title: Passive Housing in Europe

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#### Executive Summary:

Greenhouse gas emissions must be limited to no more than 2 – 3 ton CO<sub>2</sub> per capita. The passive house offers the answer for buildings, with a very low energy demand whilst at the same time achieving good living comfort. It offers the basis for a renewable energy society.

#### Abstract:

Greenhouse gas emissions must be changed so that every citizen in the world causes no more than 2 – 3 ton CO<sub>2</sub> per capita. Energy conservation, renewable energy application, and the creation of social environments are key for the creation of a sustainable society.

The term 'passive house' refers to a specific construction standard for residential buildings with good comfort conditions during both winter and summer, without traditional heating systems and without active cooling. Typically this includes a high level of insulation and air-tightness of the building, whilst a good indoor air quality is guaranteed by a mechanical ventilation system with highly efficient heat recovery.

TRECO is a project-network involving co-operation between the members of a group of Social Housing organisations from several European countries. Each partner has identified a construction or renovation project for which the works and materials are to be sourced according to principles of sustainability, and which is intended to achieve a higher than usual standards of energy efficiency.

This may involve measures to reduce the energy demand or the installation of efficient technology or both. Innovation plays a part in the project but the most important objective is to achieve replicability and a wider use of the lessons learnt.

TRECO collects experiences from all phases in the development and use phase of buildings, in order to identify ways forward in achieving social sustainable housing.

Where do we stand, in terms of energy demand for space heating:

- existing building stock: 200 kWh/m<sup>2</sup>
- standard renovation: 100 kWh/m<sup>2</sup>
- new homes: 50 kWh/m<sup>2</sup>
- 3 liter house: 30 kWh/m<sup>2</sup>
- passive housing: 15 kWh/m<sup>2</sup>

The two remaining energy uses in passive house require:

- Low energy domestic hot water system (read as solar collector for DHW)
- Low energy electrical appliances (devices with real on/off buttons, connecting drying, and washing to heating and ventilation)

Why should we require passive houses ?

- Need for a robust standard, which may survive next 50 years
- New distributed energy generation does not come in large quantities
- Small energy demand can be met by high % renewable energy

Towards zero emission

- Passive House standard to achieve low energy demand
- On site renewable energy to cover a significant part of the energy balance
- Off site renewables help improve the overall performance of the energy grid

TRECO European Housing Associations choose for Passive Housing

- Alingsashem, Sweden: 100% of stock
- Midland Heart, Coventry: 25% of new
- Aramis, The Netherlands: 100's passive renovation
- Logirep, France: Pilot demonstration in Paris

Conclusion

- Low carbon legislation will come
- House Builders have got new competitors: the new energy providers
- The question is who will benefit: the House Builders or the energy providers
- And what the costs of living shall be
- Passive House offers the answers for both.

### **Resumé:**

Chiel Boonstra has been trained as an architect at the Technical University Delft, and has worked for over 20 years as an energy consultant.

He is currently running TrecoDome, his own consultancy, and is employed as senior consultant at DHV. He is involved in the International Solar Cities Initiative where he acts as Secretary-General.

### **Recommended reading:**

[www.passivhausprojekte.de](http://www.passivhausprojekte.de)

[www.trecoDome.com](http://www.trecoDome.com)