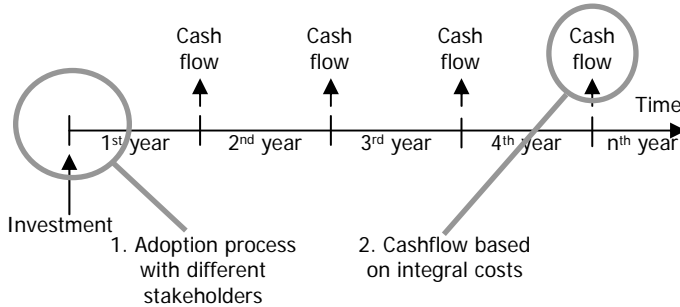


Profit of exergy in the built environment

Combining management, historical and technical research

Subject

Sustainable development receives world wide attention. Decreasing the energy consumption in real estate is an important component to realize sustainable building. This research project aims to contribute to sustainable building by investigating the potential financial benefits of exergy saving techniques.



Goals

A. Management research on investments

In building processes a common problem regarding exergy saving investments is that the stakeholders who benefit from them not necessarily include the investing stakeholders. Our goal is to provide a model that gives more insights in how the stakeholders are related to each other (see Figure 1).

Fig 1: Visualization of the financial aspects of exergy saving investments.

B. Historical research on buildings physics

Little is known about the potential financial benefits of exergy saving techniques. The increase of the value of real estate due to applied exergy saving techniques has received little attention. The magnitude of investments in lowering the energy consumption of buildings is strongly depending on their physical state. Therefore the energy performance of buildings will be analysed (see Figures 2 & 3).

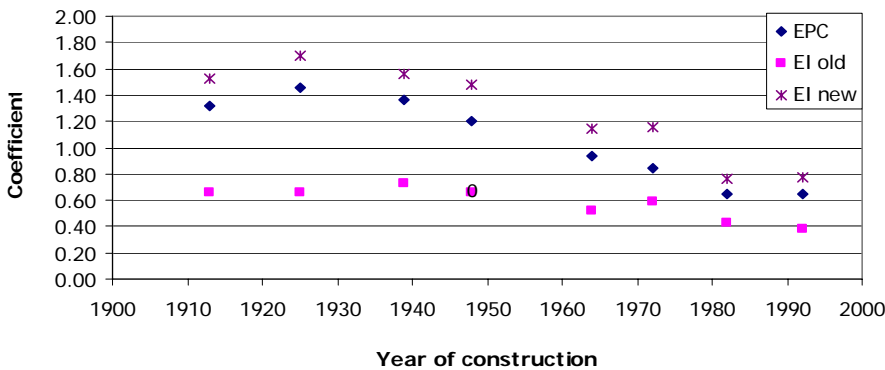


Fig 2: Results from the historical research on the energy performance of residential real estate.



Fig 3: Thermographic research on a case object from the early eighties.

C. Technical research on passive solar energy

Field experiments on the thermal mass of concrete constructions to use passive solar energy more efficient will be conducted (see Figure 4). The experimental test will focus on the use of Phase Changing Materials in combination with high performance insulation and glazing.

Expected Results

The obtained insights in financial benefits need to result in a better adoption of exergy saving techniques. The possibilities to interfere effectively in the building process will be enlarged by specifying the benefits and costs for specific stakeholders.

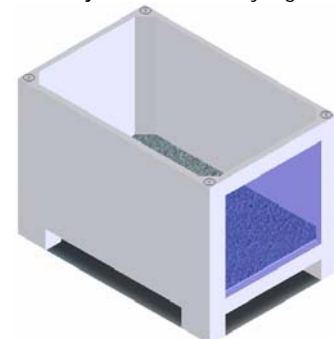


Fig 4: Test box for field experiment.

Profit of exergy in the built environment Combining management, historical and technical research

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Subject

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Preferred Partners Applications / Sponsors

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Prime Publication

Entrop, B., J. Brouwers, 2008, *The profit of exergy in the built environment*, World Sustainable Building Conference 2008, September 21-25, Melbourne, Australia

Entrop, B., J. Brouwers, A. Reinders, 2008, *Field experiments on the use of phase changing materials, insulation materials and passive solar radiation in the built environment*, World Sustainable Building Conference 2008, September 21-25, Melbourne, Australia

Entrop, B., J. Brouwers, G. Dewulf, J. Halman, 2008, *Decision making processes and the adoption of energy saving techniques in residential and commercial real estate*, World Sustainable Building Conference 2008, September 21-25, Melbourne, Australia

Entrop, B., J. Brouwers, 2008, *Influence of past policies on today's energy saving initiatives*, World Sustainable Building Conference 2008, September 21-25, Melbourne, Australia

Research Period

January 2006 - December 2010



Fig 1: Thermographic research on a case object from the early eighties.