

# Picking the lowest hanging fruit

Energy efficient buildings:  
the most profitable  
CO<sub>2</sub> saving

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# The Rockwool Group – why are we here?

- The world's leading manufacturer of stone wool
- 23 factories in 15 countries & sales worldwide
- 200 million tonnes of CO<sub>2</sub> is the lifecycle saving of this years Rockwool insulation
- A typical Rockwool insulation product saves over 100 times the CO<sub>2</sub> emitted in its lifecycle



# Better energy & CO<sub>2</sub> efficiency Why?



# Why save energy?



- Reduce global warming
- Security of energy supply
- Cut energy costs
- International competitiveness
- Cleaner air, better health

# The last oil

- 4 countries control most of the world's oil reserves
- 3 countries control most of the world's gas reserves
- Energy demand is growing, reserves are declining
- 80% of the oil producing nations are facing, or already struggling with, declining production
- EU energy imports will increase from 56% to 70% if nothing is done



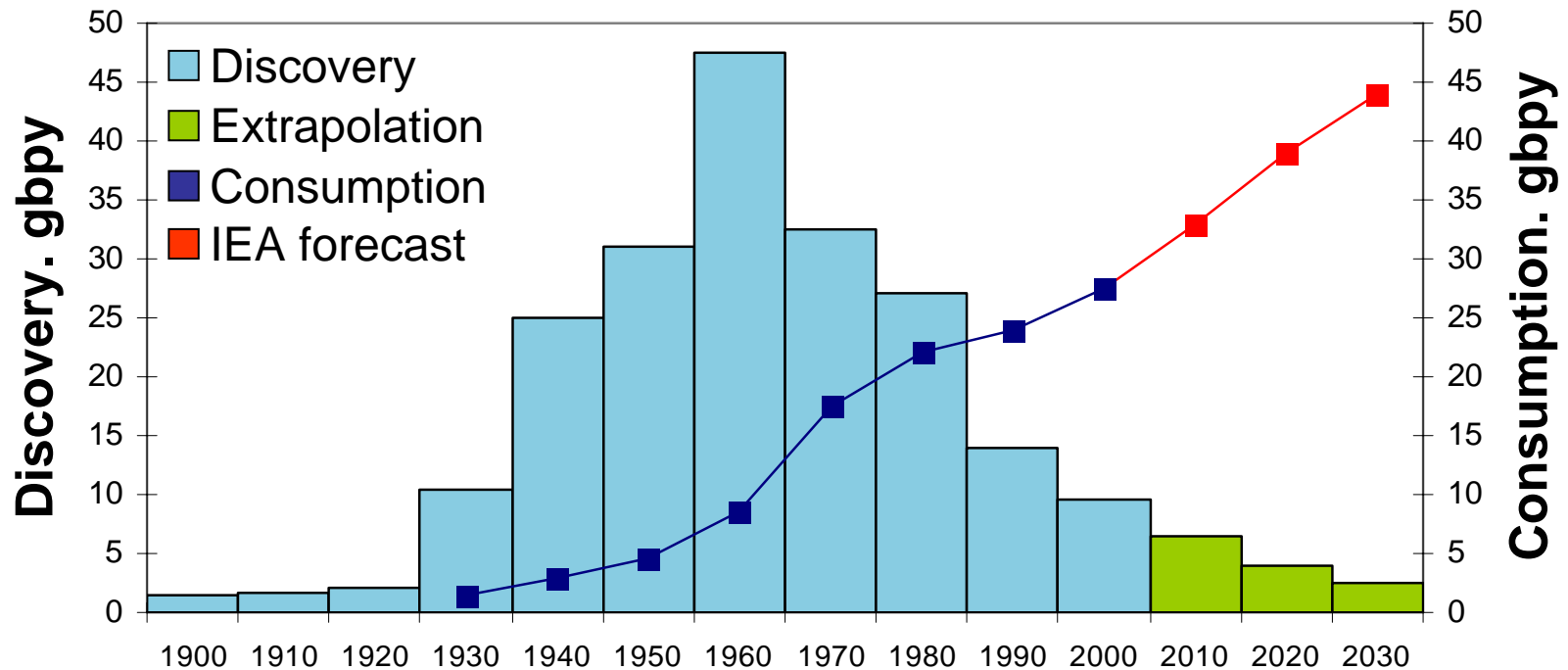
Sources: ASPO, BP, EU

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# How long will our resources last?

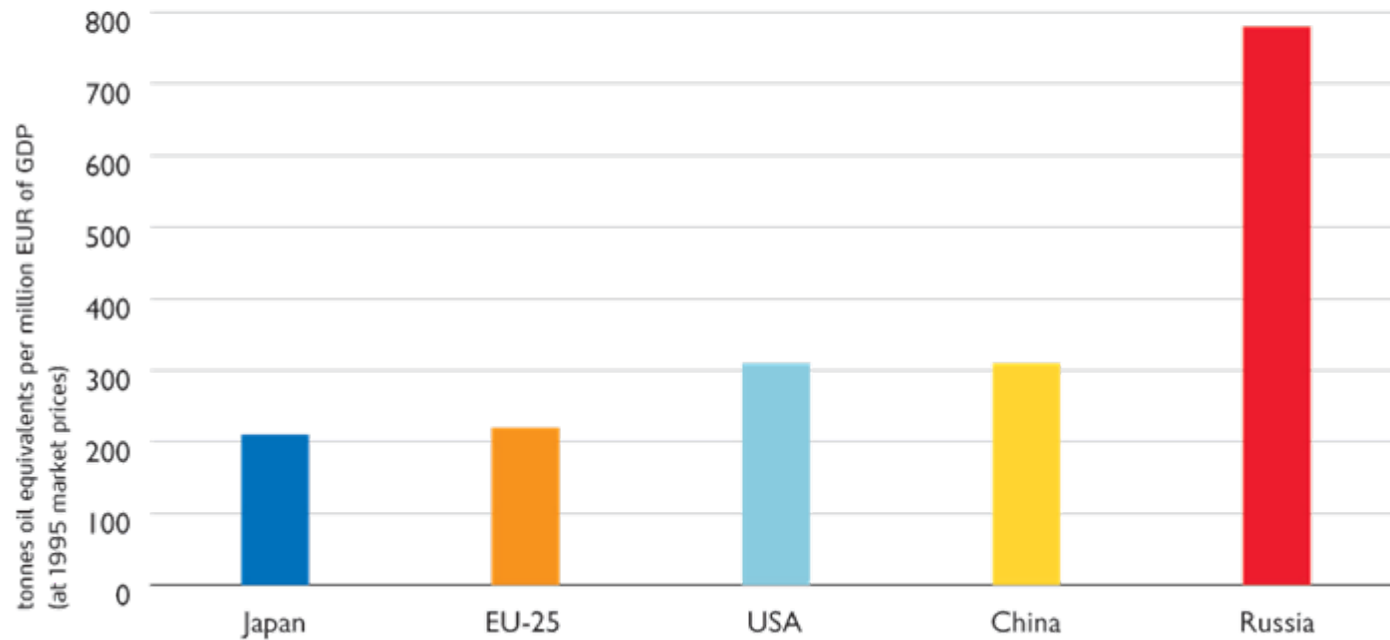
Most of our energy consumption is based upon non-renewable sources.  
We are becoming more vulnerable

## Comparison between oil discovery and consumption



# Energy intensity & competitiveness

## Energy intensity (2003) - adjusted for purchasing power parity



Source: Enerdata/Eurostat

# Buildings are the biggest energy consumer and a major CO<sub>2</sub> polluter

**33%**

of all energy in EU is used for **transport**



**27%**

of all energy in EU is used by **industry**



**40%**

of all energy in EU is used by **buildings**



2/3 of energy consumption in buildings is used for heating and cooling

Up to 90% of this expensive energy is needlessly wasted

# Less energy waste or more power plants?



**It's more costly to build new power plants than to save energy**

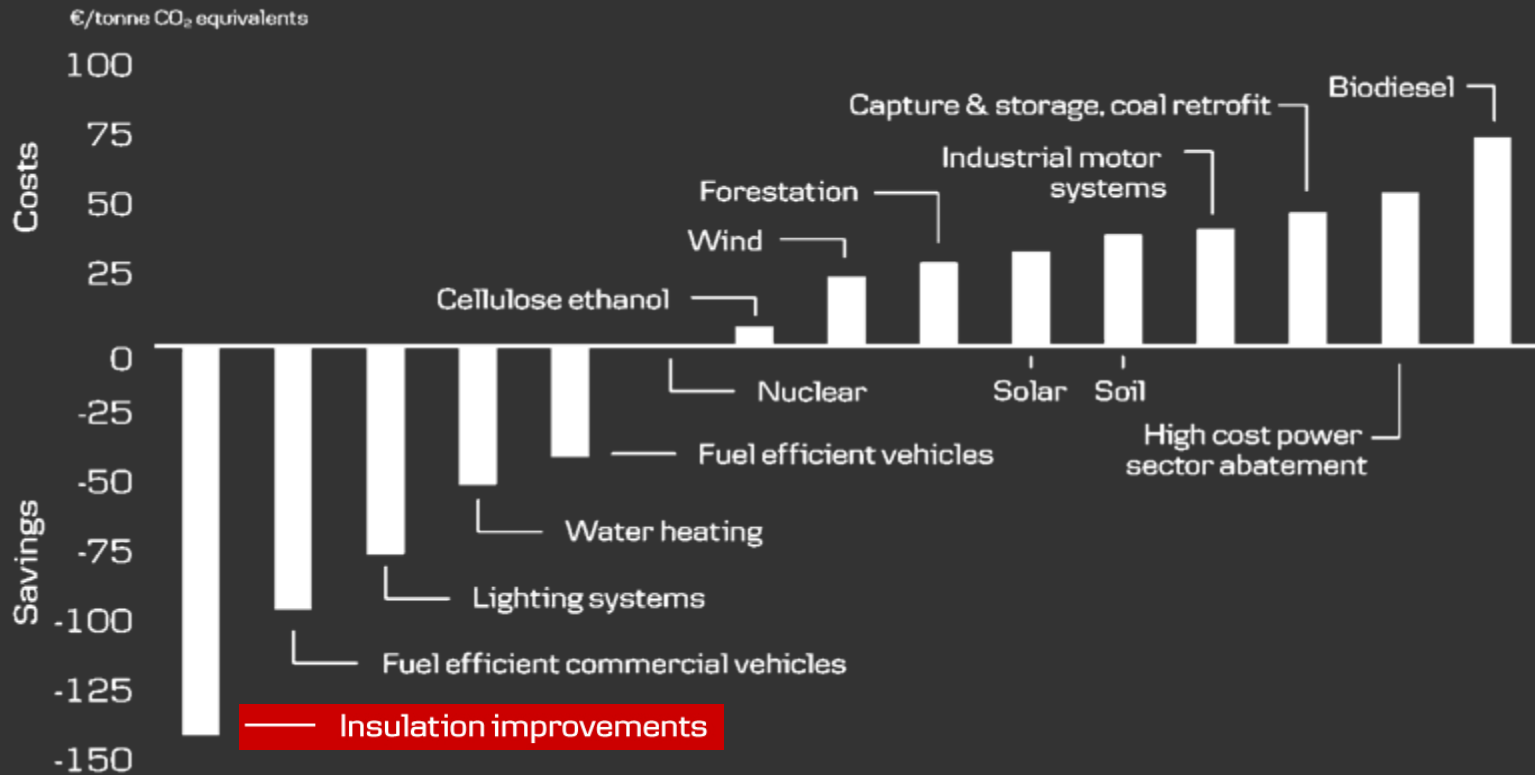
**The cost of saving a unit of electricity is 2.6 Euro cents compared to a price of delivered electricity of 3.9 Euro cents**

# We can save CO<sub>2</sub> and money

*McKinsey/Vattenfall*: Insulation is the lowest hanging fruit

Average gain: € 130 per tonne saved CO<sub>2</sub>

1.6 gigatonnes of CO<sub>2</sub> annually = Russia's emissions



# Sustainability – World perspective

- 50% of world population now live in urban areas (3.6 billion)
- In 2030 70% of world population will live in urban areas (5 billion)
- More than 1 million people move to urban areas every week (primarily in Asia and Africa)
- Affordable and sustainable housing for these people should be a main priority



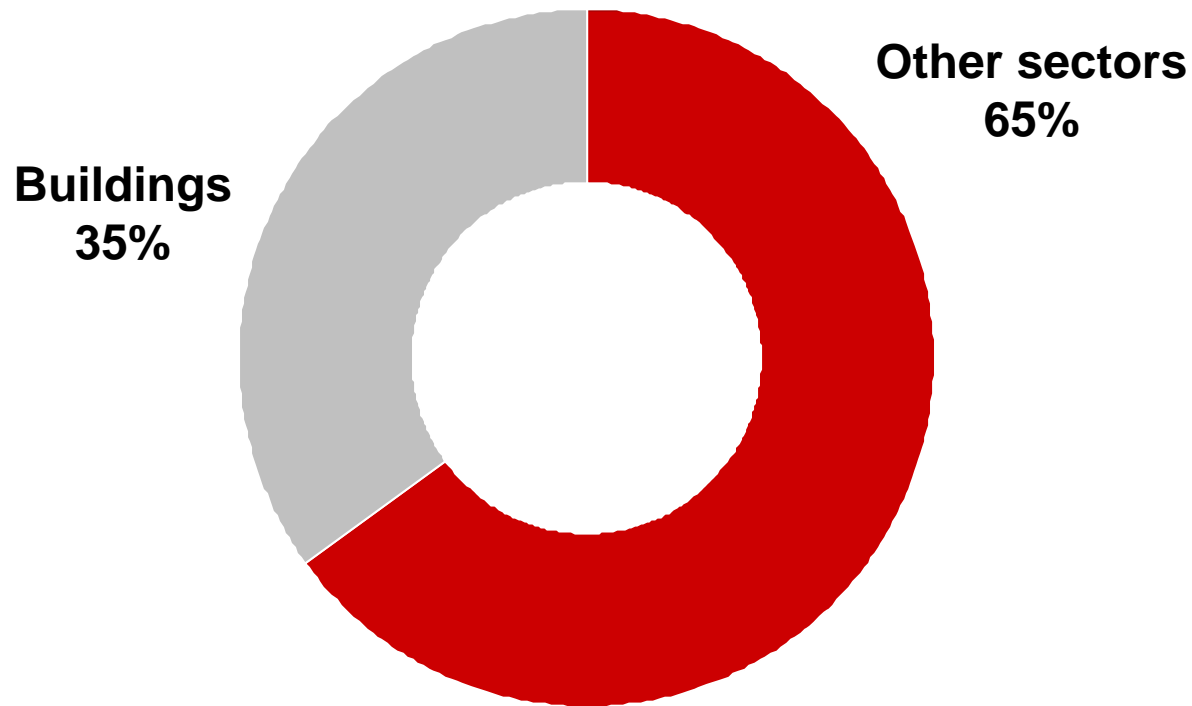
# Sustainability – World perspective

- New constructions in Asia and Africa are based upon old Western building traditions and are not optimized with regard to indoor comfort
- Intensive use of air condition and heating equipment whenever the economical conditions allow this



# CO<sub>2</sub> emissions from buildings

(incl. from use of electricity, 2005)

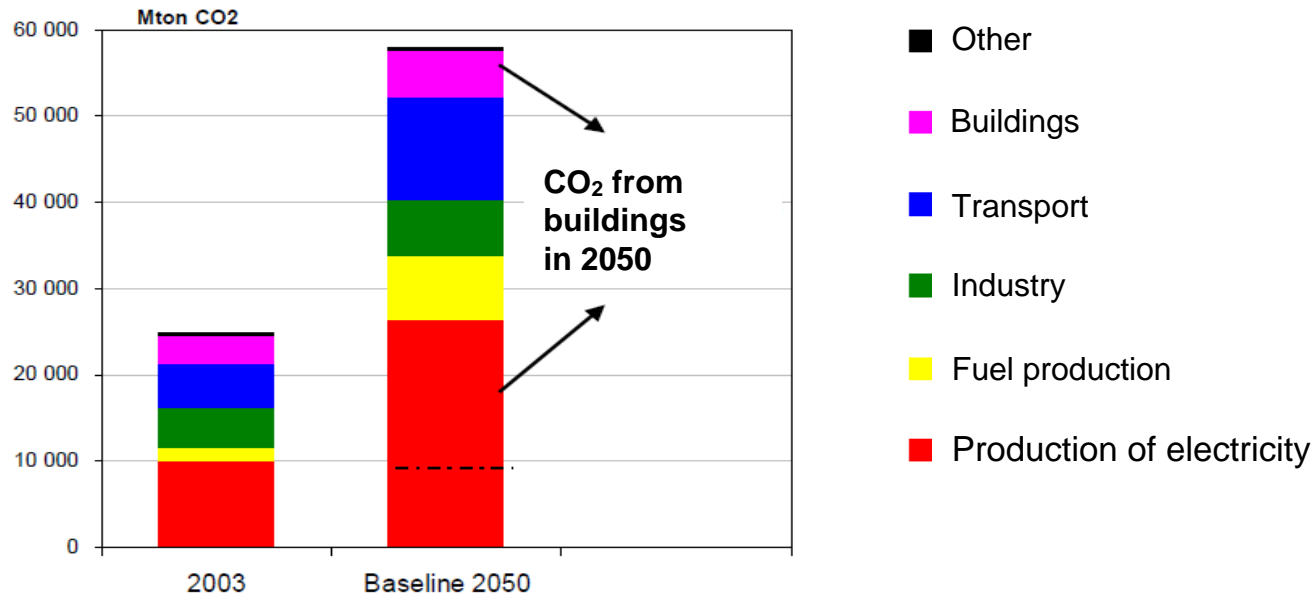


Source: International Energy Agency

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# In 2050 buildings alone will emit almost the same amount of CO<sub>2</sub> as all sectors do today *if business as usual*

## Global CO<sub>2</sub> emissions 2003-2050



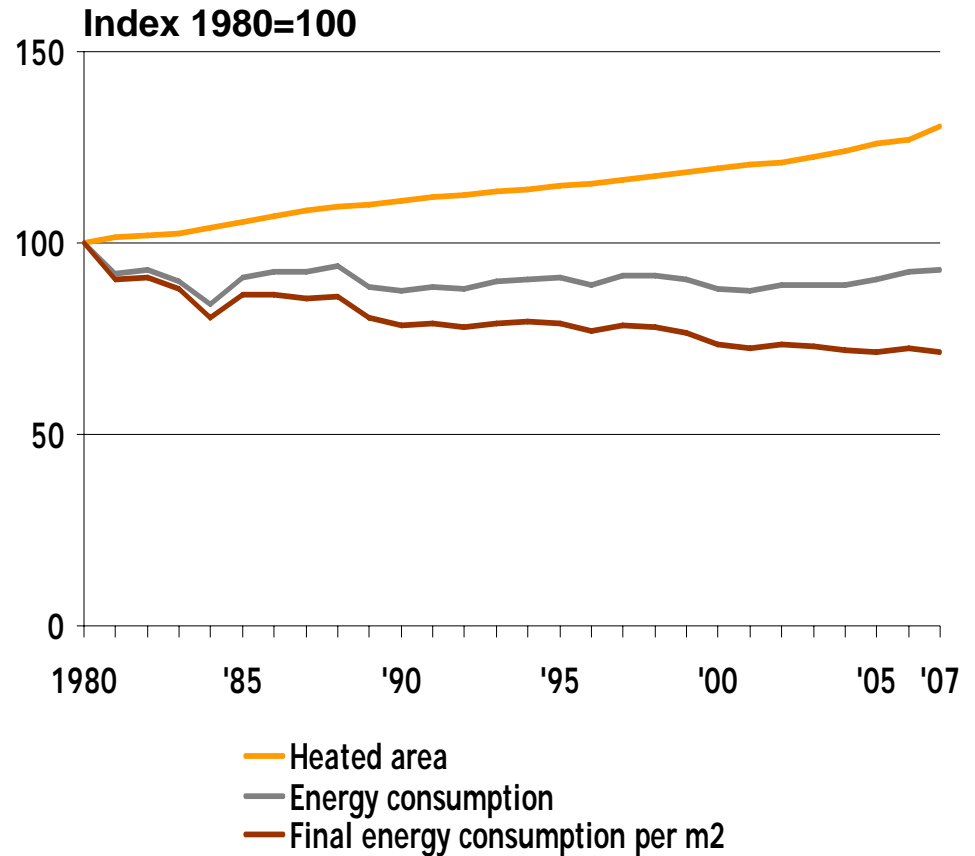
# Doing more with less energy

The Danish example: growing quality of life together with less energy

*Energy consumption for heating in residential buildings*

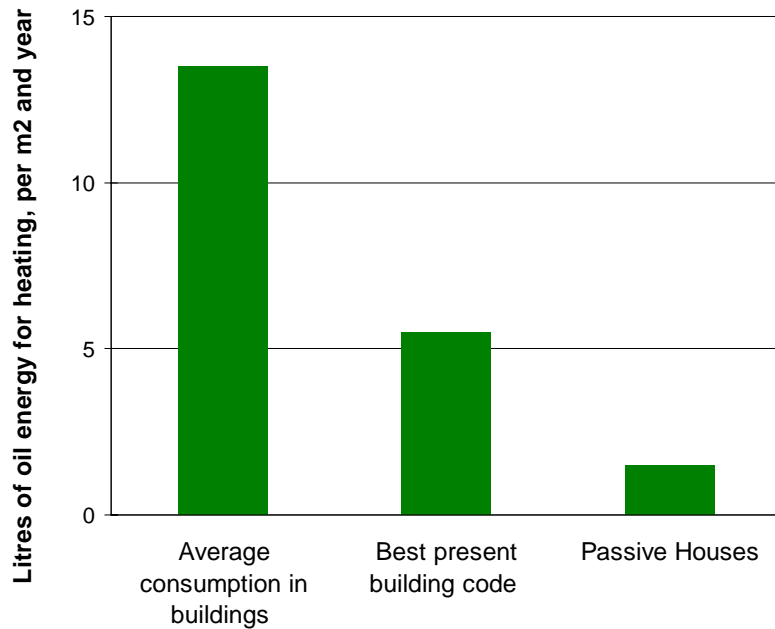
From 1979-84 Denmark reduced heating demand per m<sup>2</sup> by 20% due to:

- Building codes
- Professional advise
- Information campaigns



# Why energy efficiency of buildings matters

It is possible with existing and proven technology to have buildings with a fraction of the present average consumption!



Sources: EU Commission, DK building regulations and [www.passivhaus.de](http://www.passivhaus.de)

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# It's extremely costly NOT to modernise energy efficiently



Every year energy waste worth € 270 billion (almost € 500/person) and 460 million tonnes of CO<sub>2</sub> pollution could be saved cost effectively. More than 500 000 jobs could be created in Europe alone.

*Sources: Ecofys & EURIMA*

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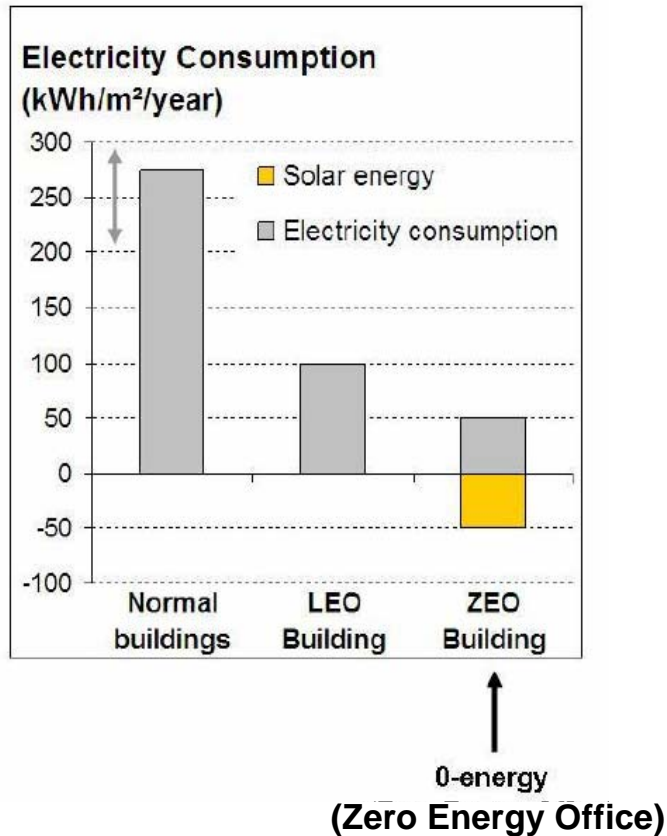
# Buildings for the future

- A building can last 100 years or more
- Short-sighted energy inefficiency is costly
- Even in Denmark, in 75% of surveyed houses it is economical to insulate and improve energy efficiency



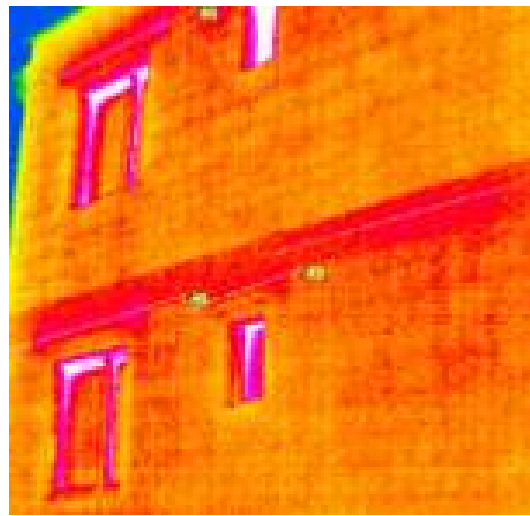
# Insulation works worldwide: in hot countries too

## - The Malaysian example



# From grey past to brightgreen future - a Polish example

- Energy modernisation needed for 800 000 bungalows that were constructed from the 1960's to the 80's
- Rockwool demonstration project in 2008 in Zielona Gora
- Energy consumption before: 200-500 kWh/m<sup>2</sup>/year
- After: 80-100 kWh/m<sup>2</sup>/year



# Passive house – an Italian example

Energy consumption 14 kWh/m<sup>2</sup>/year

## **Insulation:**

roof: 240 mm

wall: 300 mm

Heat pump

## **Comfortable indoor temperature:**

Summer 23°C (outside 36°C)

Winter 21°C



# Key recommendations

- Strengthen energy requirements considerably
- Make the Passive House our standard choice (mandatory in new UK buildings from 2013)
- Always make building renovations energy efficient
- Make public buildings energy efficient role models
- Provide one-stop energy efficiency packages for home-owners
- Provide up-front financing



# The vision: energy producing buildings



# BUILD A BETTER FUTURE



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