

Green – Greener - Greenest

New in-depth life cycle assessment highlights insulation as a major sustainable technology.

All insulation is good for the environment - it saves energy and thereby also contributes to reducing air pollution from the combustion of fossil fuels. Buildings are the major energy consumer, accounting for more than 40% of the total energy consumption in the EU. Most of the energy (68%) used by an average EU household is for heating purposes. So insulation is a key technology for saving energy and for sustainable development. But exactly how green is insulation? And are all insulation materials equal – or are some greener than others?

100 fold energy savings

“The insulation of buildings can save more than 100 times the environmental impacts associated with the production and disposal of the insulation products themselves”, says Anders Schmidt from FORCE Technology/dk-TEKNIK.

Behind this impressive figure lies months of detailed calculations. The environmental impacts of every single component in the lifecycle of insulation materials have been analysed. The cradle to grave assessment includes the extraction of raw materials, transportation, production processes, installation, use and finally disposal. Making correct Life Cycle Assessments requires skill and precision. This analysis was performed according to ISO 14040 quality standards and was subject to third party scrutiny and a peer review, before being published in The International Journal of Life Cycle Assessment.

‘Bio’ can be less environment friendly

For decades, stone wool has been one of the most popular insulation materials. However, during recent years, producers of organic insulation materials have claimed to have a more environment friendly alternative. Does this claim hold true?

“Many people believe that the emerging insulation products such as flax and paper wool, which are based on biological cellulose materials, are more environment friendly than products based on natural mineral resources such as stone wool. So I was surprised that flax insulation performed so badly. In many people’s eyes, it’s a natural material”, says LCA specialist Anders Schmidt.

So here are some pertinent figures. Compared to stone wool, it costs up to 2 1/2 times more energy to produce flax insulation, and 25% more to produce paper wool. Although paper wool is made of recycled newsprint and flax is a renewable crop, in principle a CO₂ neutral material, they still embody and need energy for their manufacture as insulation products. The additives necessary also have a strong environmental impact. For instance, flax insulation products contain around 15% plastics as a binder. These plastic additives alone claim almost the same amount of energy as is needed in order to manufacture a kilogram of stone wool.

In general flax insulation performs less well than the two alternatives. In some areas, such as emissions to air, paper wool performs better than stone wool. But when it comes to occu-



Ungreen waste of tax payers' money?

Misunderstood green intentions? The insulation industry association in Germany, FMI, has initiated a law suit against the EU Commission, which endorsed that the German government has decided to subsidise flax insulation. But flax insulation is clearly not the most environment friendly insulation as Life Cycle Assessments transparently document.

A wider use of Life Cycle Assessments could mean better political decisions based on knowledge – rather than gut feelings - about the best environmental alternatives.



pational health issues stone wool has a notable advantage.

“The less bio-persistent HT stone wool products are seen to be the safest alternatives”, says Anders Schmidt.

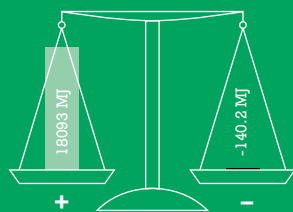
Stone wool has low potential for dust exposure and, based on thorough scientific studies, the International Agency for Research on Cancer (IARC) in 2001 classified stone wool fibres as ‘not classifiable as to their carcinogenicity to humans (group 3)’. IARC also concluded that the HT stone wool disappears from body tissue much more rapidly (are less bio-persistent) than older products and has been found to be non-carcinogenic in tests for carcinogenicity. Similar documentation is not available for cellulose insulation.

Further problems for users of biological insulation materials are high dust exposure levels and, with paper wool, the presence of toxic flame retardants - borax and boric acids.

“To sum up, our Life Cycle Assessment has shown that all insulation materials offer great benefits to the environment. But the biological products flax and paper wool cannot per se be characterised as being environmentally preferable to the mineral product stone wool”, concludes Anders Schmidt.

Thomas Nordli
Group Communications

Rockwool Eco-balance: Energy



Saved in life-cycle Used in life-cycle

Positive Eco-balance

A typical Rockwool insulation product can save more than 100 times the energy used in its manufacture, transportation and disposal. Saving fossil fuels also helps to reduce global warming, acid rain and smog.

Life-cycle assessment of savings (+) from product use and emission/consumption (-) during production of 1 m² 250 mm loft insulation produced and installed in Denmark and used over 50 years.

Source: FORCE Technology/dk-TEKNIK.