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The Enterprise Centre

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THE CHALLENGE TO SPECIFY A LOW CARBON INSULATION IN BUIDLING CONSTRUCTION: NEW BUILD AND REFURBISHMENT

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Certificate in Social Phenomenology

Recovery Insulation Ltd.
www.INNO-THERM.com

Recovery Insulation™ Ltd.

Co. No. 4616193

in partnership with S*chools & Homes Energy Education Project Ltd.*/SOLAR-ACTIVE.

Co No. 327 3416 Charity No.107 3347

MISSION STATEMENT

"If you improve quality costs will go down and value goes up"

W.E. Deming

InnoTHERM®

Recycled Cotton/Denim Insulation

Recovery Insulation Ltd established in 2002 by Schools & Homes Education Project/Solar-Active as a company/social enterprise [in 2016 became trading arm of Solar-Active] to manufacture a thermal/acoustic 'eco' low carbon non-itch insulation made from reuse/recycled cotton/denim.

Mētisse®

Sustainable insulation

Inno-therm®/Metisse®

Inno-therm®/Metisse® is a low carbon thermal/acoustic insulation manufactured from 80% recycled denim/cotton [85% is denim – 3 jean's/m² for 100mm thickness] with no melamine or phenolic resins.

The recycled cotton is sourced and manufactured by EBS Le Relais Metisse.

Specifying insulation

What are the economic benefits in specifically a non-monitory value of a low carbon insulation in its procurement supply chain?

Specifying insulation

We are often miss-informed that conventional insulation is cheap since it is subsidized and create a budget based on this miss conception.

Specifying insulation

In the specification of a thermal insulation by e.g. quantity surveyors and homeowners what are the reasons why often they do not take into consideration the CO_2 emissions used in the manufacturing supply chain?

Why is consideration only given to u-values, thermal performance and primarily cost.

Low carbon insulation

How can we become sensitized to consider that a low carbon insulation is more energy saving when taking into account energy use in the supply chain?

"Between 2.5 – 2.7 million tonnes of textiles consumed annually in the UK, over 70% is not collected for reuse or recycling or is simply unaccounted for."

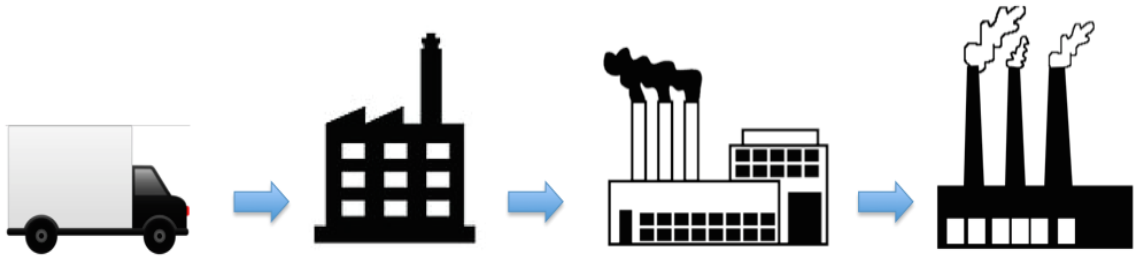
"It is estimated that 619kt consumed textiles is collected for reuse and recycling every year, and an additional 820kt of clothing and household textiles which is currently consigned to landfill could be diverted."[WRAP, May, 2014]

BENEFITS TO UK

It would be beneficial to UK to recycle cotton/denim that is ordinary sent to landfill or exported.

Srivasta, S.K., (2008 found that sound decisions that combine supply chain management and environmental concern are required for firms to make decisions.

Supply chain Carbon Map for P1



Clothing Collection

Sorting

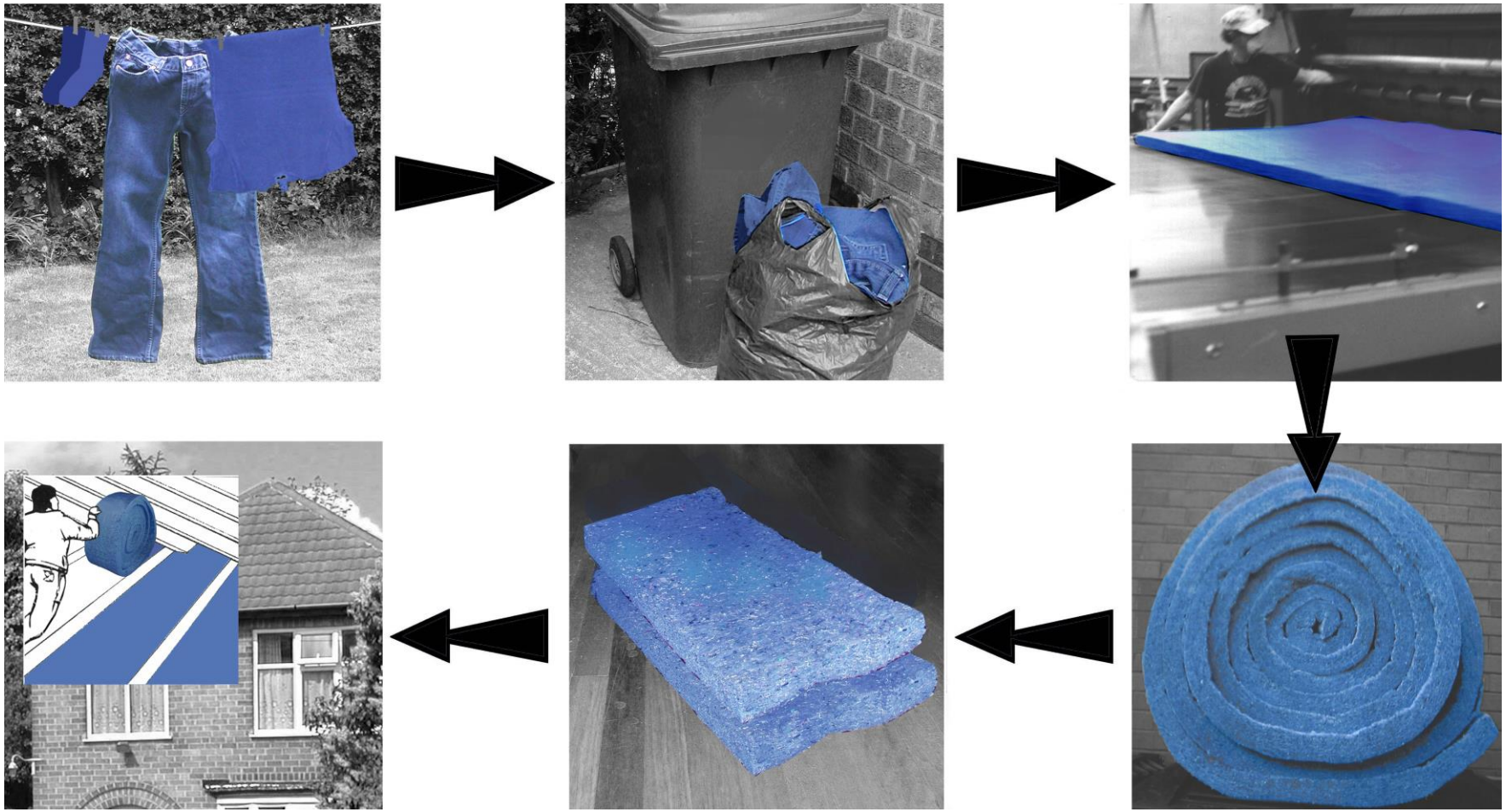
Fraying

Products Treatment

Polyester Fibres

Treatments
transport
Application of treatments
transport
transport
Fiber production
Wastes (recycled)
transport

MANUFACTURING PROCESS



INNO-THERM lamda value of 0.039 W/mK for both **20 kg/m3 and 25 kg/m3 density** products.

Translates into a typical U-value for 240mm depth of material = **0.16 W/ m²K**

R value - .24/0.039 = 6.15

U value – 1/6.15 = 0.16

A U value 0.16 W/m²K. is required for roof application to obtain UK building regulations.

270mm thickness of insulation is required and is based on conventional mineral fibre insulation with a thermal conductivity of 0.044 W/mK.

Principles of a Circular Economy.

Energy use in the supply chain [e.g. recycling of denim] and full life cycle costs needs to be taken into account to follow principles of a Circular Economy.

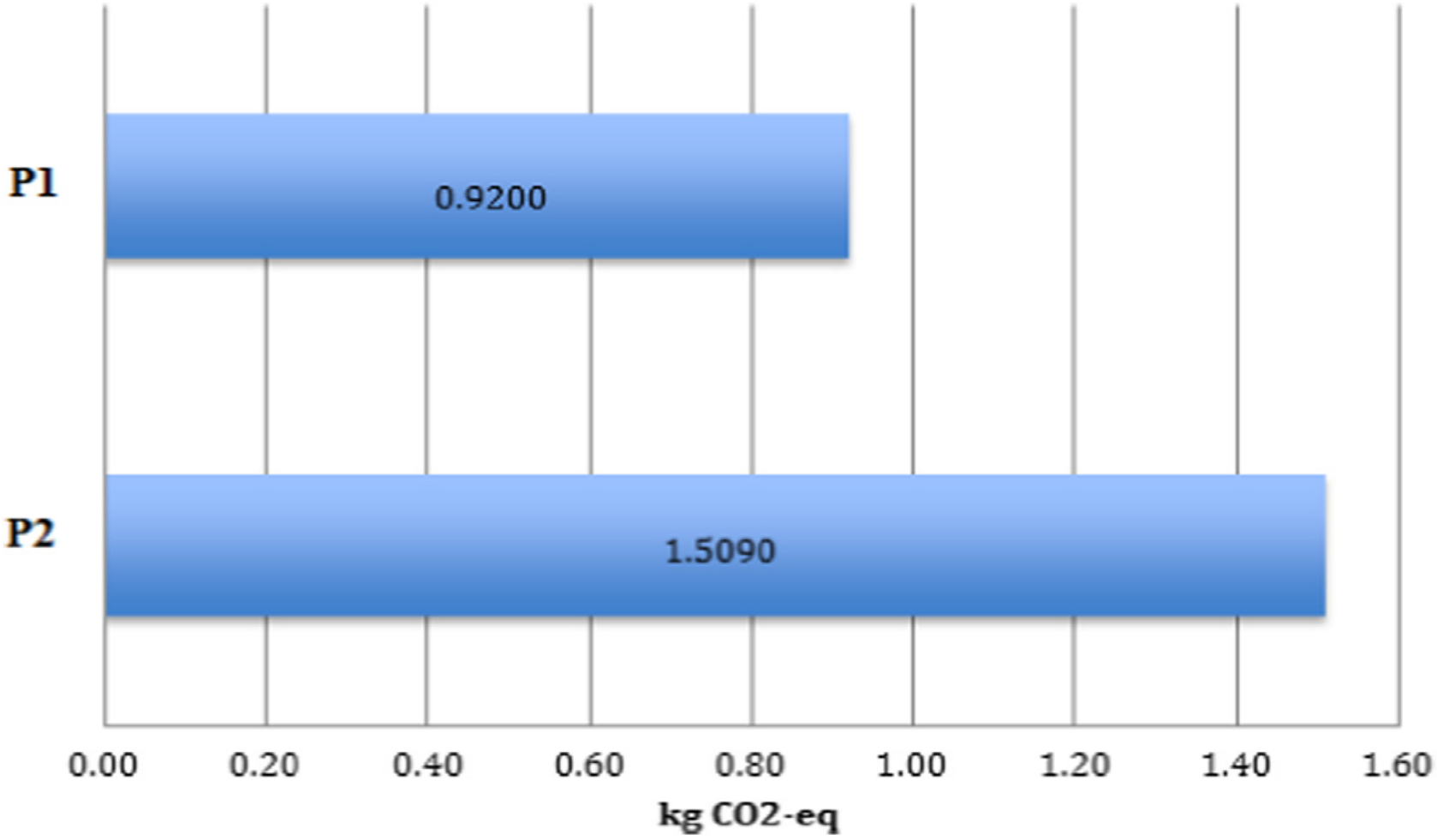
(Ellen Macarthur Foundation, 2013)

In an economy that no longer has a cost for Co_2 why should developers care about low carbon products?

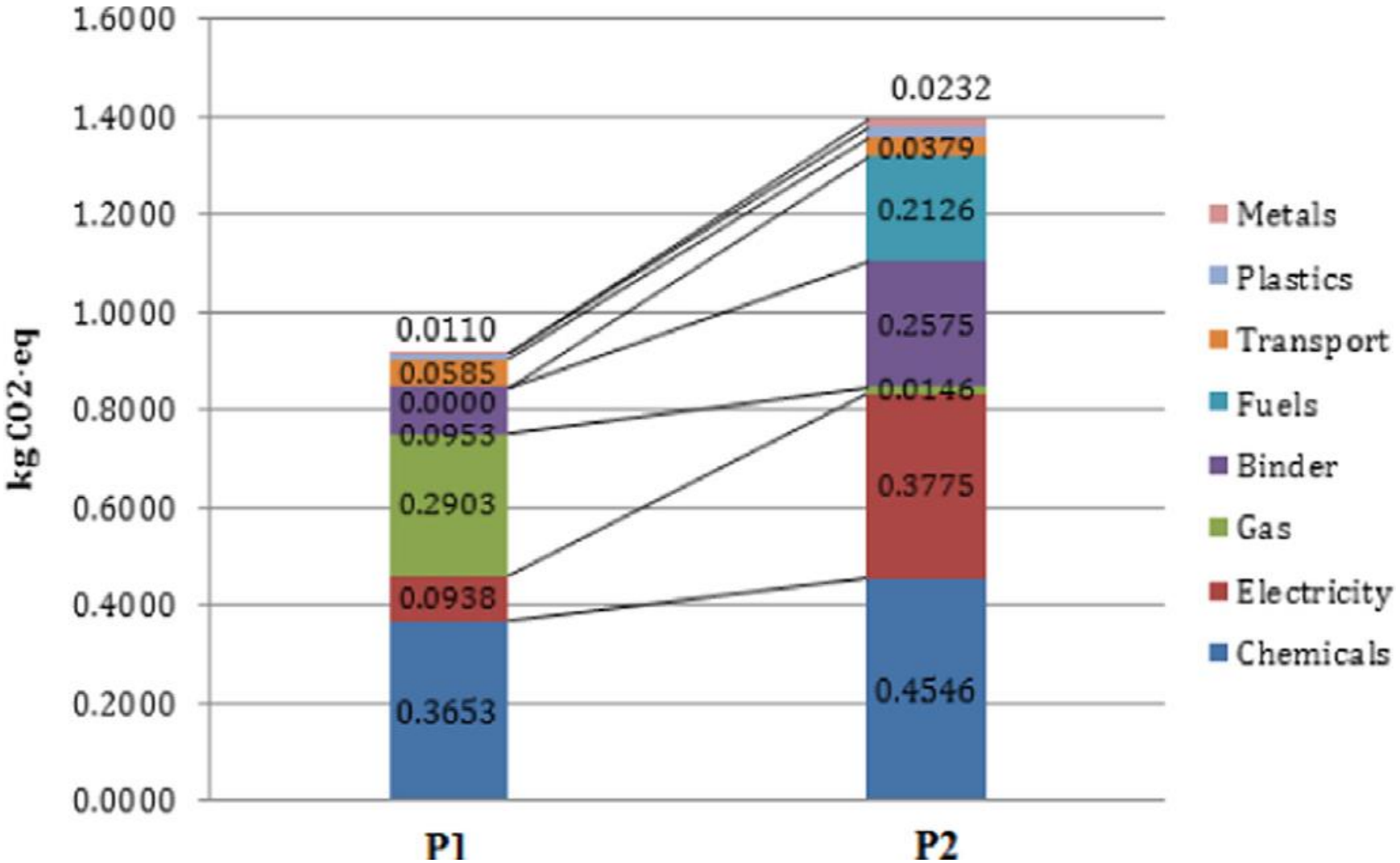
LCA study found environmental advantages from natural fibre insulation [NFI] materials.

The main area is that of Global-warming potential (GWP100) due to renewable carbon sequestered in the material that reduces amount of Co_2 in the atmosphere.

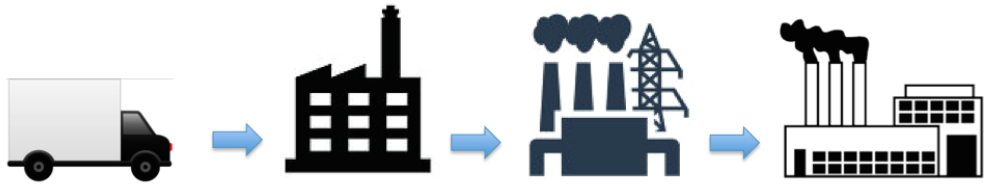
Comparative levels of emissions by P1 and P2 supply chains.



Breakdown of carbon emissions hotspots in P1 and P2 supply chains.



Supply chain Carbon Map for P2



Transport

Infrastructure

Electricity

Chemicals

Binder

Improvements to reduce carbon emissions

1. Replacement of bi-component
2. Reduction in density.
3. Reduction in flame retardant use.

European Eco label

The research assisted to evaluate insulation materials to create a simple energy rating index much like the European Eco label that provides an A-G rating required for all electrical.

Criteria devised in the evaluation

- LCA completed
- Lamda, R and U-values
- Density and thickness
- Follow circular economy
- Energy used in manufacturing process [e.g. renewable energy

Criteria devised in the evaluation

- Energy use in transport & size of trucks
- Binder used and source
- Fire retardant used, source and rating
- Recycled components
- Can insulation be recycled at end of life?

“I cannot imagine a better material for the majority of thermal insulation requirements. As its installation requires the minimum of skills and no specialist safety equipment during the process.”

Jonathan Clennell, Home owner

Research has found

Correlation between poorly conceived energy saving measures and Indoor air quality

Rise in asthma and allergic diseases in the U.K. (Sharpe et al., 2015)

LOW CARBON BUILDING PROJECTS

- 1. South Yorkshire Energy Centre, Sheffield
- 2. Genesis Eco-Building – Somerset College of Design & Technology
- 3. Torfaen (South Wales) Eco Building
- 4. Hemphill Hall, Nottingham (a listed building refurbishment)
- 5. The Materials and Engineering Research Institute [MERI], Sheffield ‘eco-house’ project.
- 6. Barnsley College Think Low Carbon (TLC) Centre
- 7. Bradford Enterprise Park in conjunction with Modcell
- 8. Eve Saint Lauren Oxford St. refurbishment
- 9. Cultybraggan Camp, Hut 1, Comrie, Perthshire
- 10. Castle Hill School, North Yorkshire **– straw bale**

"With INNO - THERM we have found a product that happily answers four of our objectives as the product is manufactured in the UK, creating employment opportunities and producing an environmentally friendly insulation. In fact as ***INNO - THERM has slightly better thermal properties we were able to reduce the timber stud sizes, which in turn offset some of the cost while still achieving very good U – values.*** *"*

Nick James – White Design Architects

whitedesign

The Torfaen Eco-building is designed to promote innovation and sustainable building practises through their use in the realisation of this ground breaking project. INNO – THERM forms part of the buildings insulation in line with the project's environmental objectives.

"We used INNO - THERM because of it's environmental credentials. It was a breathable product which was cheaper than other naturally based insulation materials, while proving suitable for the application. The recycled content was also a factor which we saw as favourable. While it had not been used a great deal over here we felt that its track record across the pond was sufficient." Gil Schalom-Mark Stewart Architects

msarchitects

Genesis is a £2.5 million educational resource that displays sustainable construction methods and materials. INNO – THERM is used within the project as a thermal insulation material.

genesis

Inno-therm installed for acoustic application by an International Broadcasting Centre for their Olympic venues in 2012 & 2014. There has an embargo on promoting/marketing this fact. It will be used again in Rio 2016

Acknowledgments

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