

# NEES Project

Natural Energy Efficiency and Sustainability

## Combating Climate Change by Natural Building

Templepatrick

17.10.13



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Education Facilitator NEES

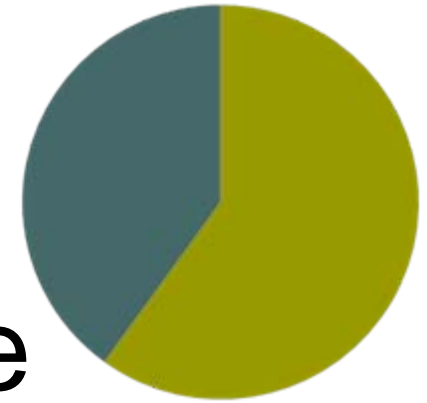


**ucc**  
Coláiste na hOllscoile Corcaigh, Éire  
University College Cork, Ireland

**CIT** CORK  
INSTITUTE OF  
TECHNOLOGY  
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ

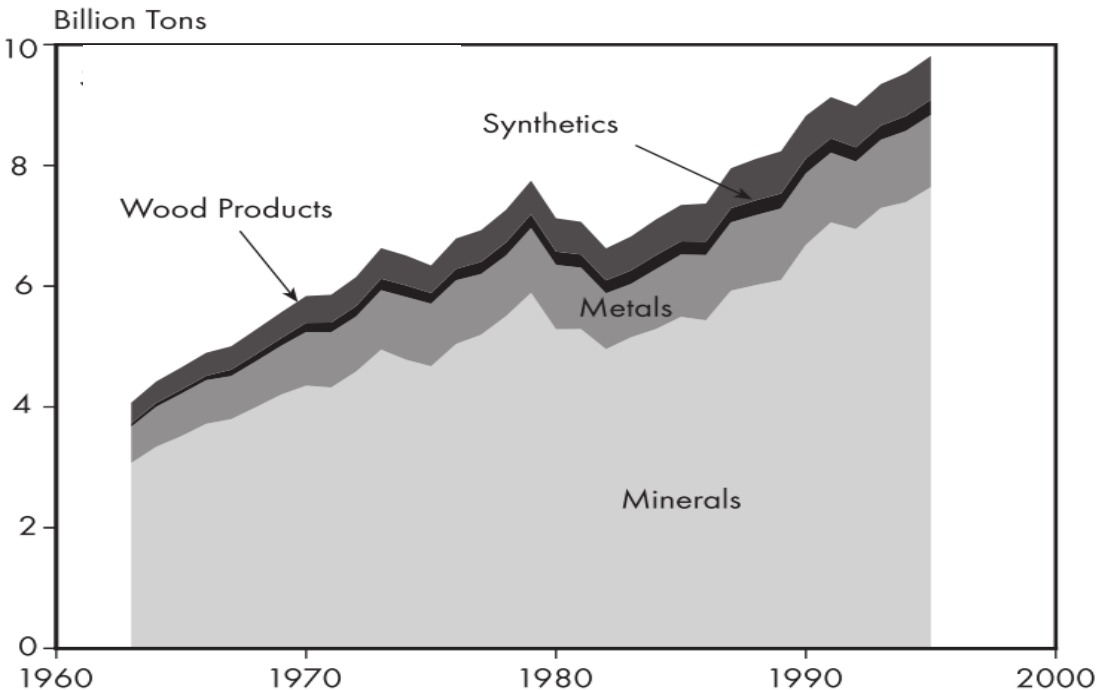


Life cycle of buildings accounts for  
40% of total global energy <sup>(1)</sup>



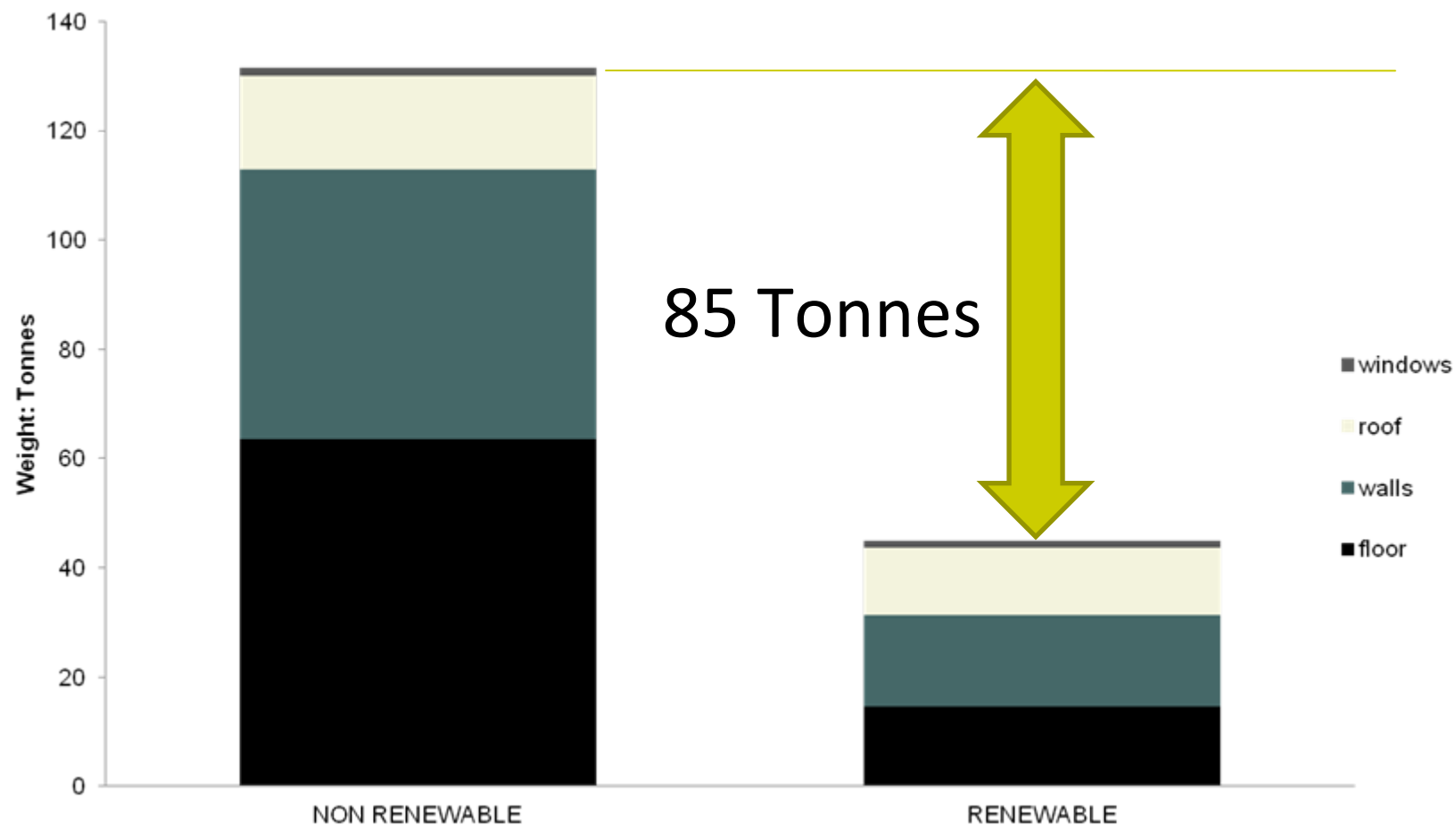
# Material Resource

**World Materials Production, 1963-95** <sup>(3)</sup>



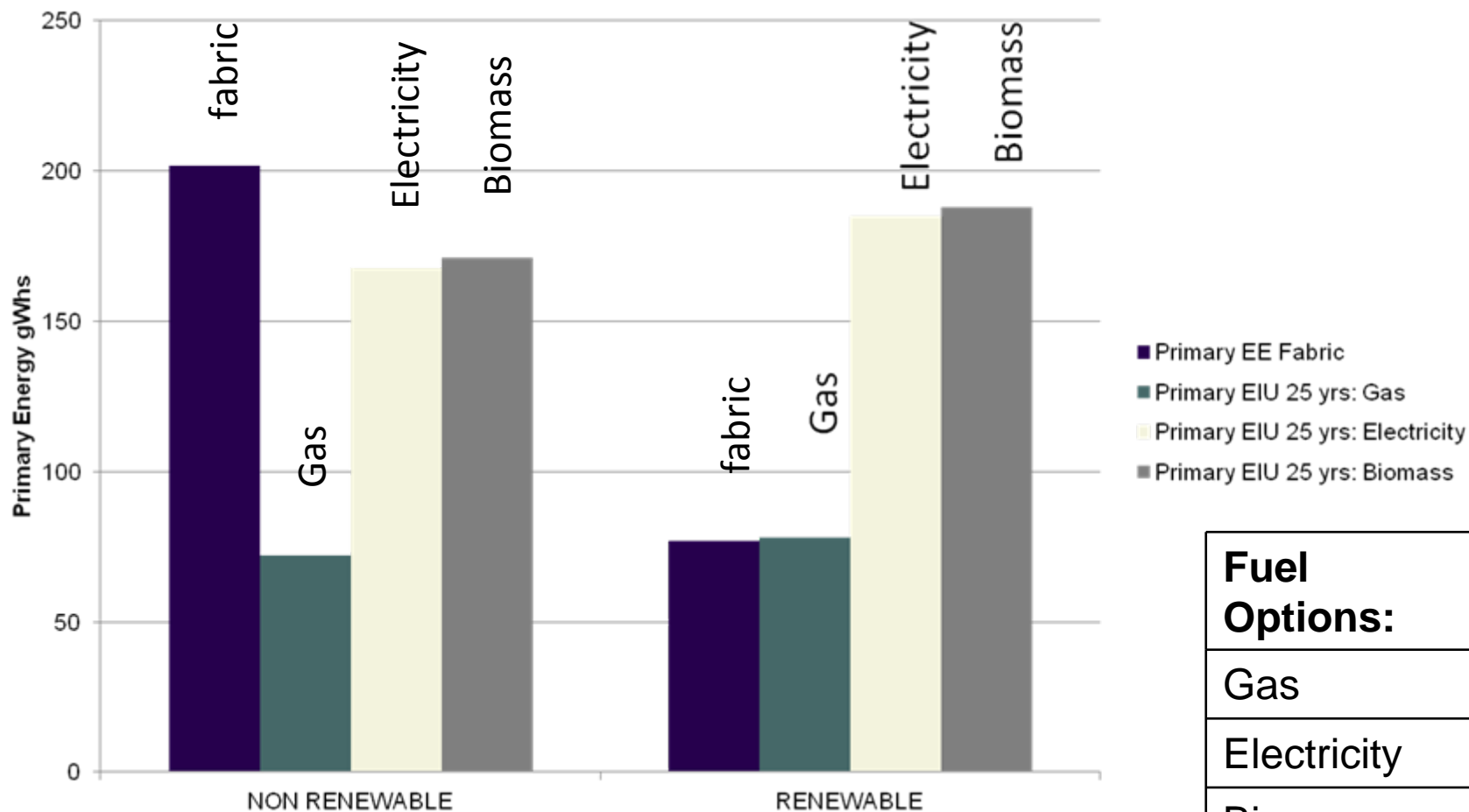
In Europe  
Construction  
accounts for  
4.8 tonnes of  
mineral extraction  
per person  
per annum <sup>(2)</sup>

## Weight Comparison





## Embodied Energy Comparison fabric & operational energy 25 yrs



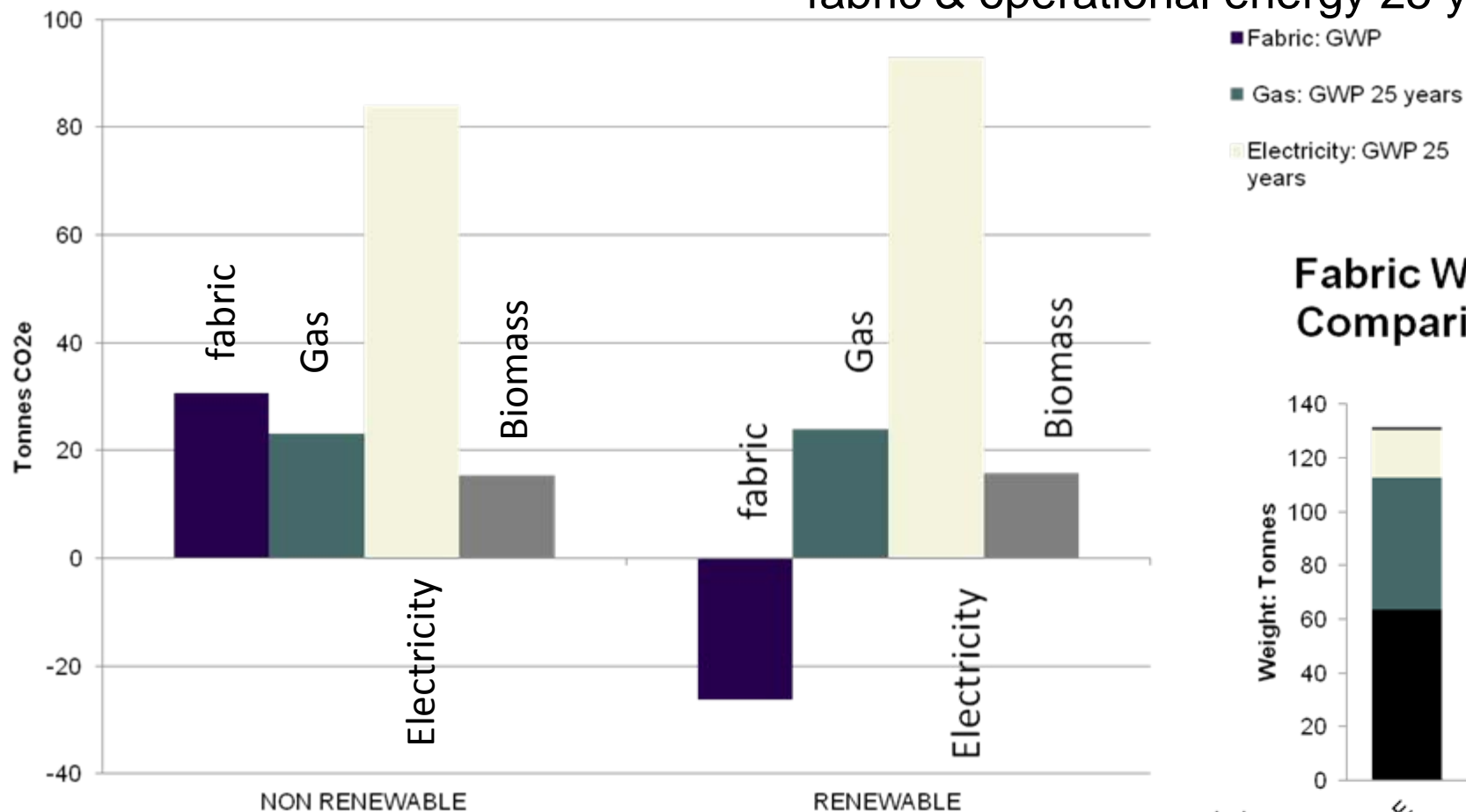
### Fuel Options:

Gas

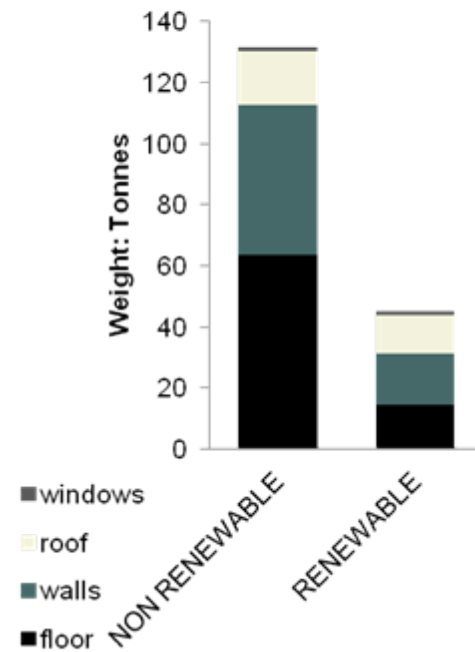
Electricity

Biomass

## Global Warming Potential Comparison fabric & operational energy 25 yrs



## Fabric Weight Comparisons



# Northern Periphery Programme 2007- 2013

NUTS 3 regions belonging,  
entirely or partially, to the  
Northern Periphery Programme

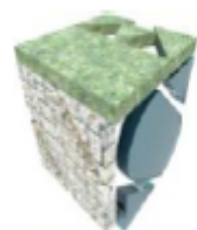
-  in EU Member States
-  Outside the EU
-  Northern Periphery area
-  National boundary







ARCTIC TECHNOLOGY CENTRE



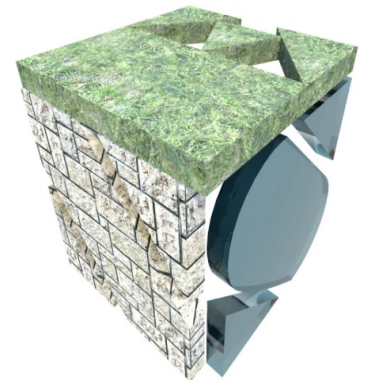
Innovatively investing  
in Europe's Northern  
Periphery for a sustainable  
and prosperous future



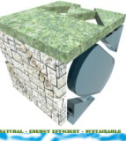
European Union  
European Regional Development Fund

## *NEES Mission*

***Identify and promote products and services that improve energy efficiency in existing domestic buildings, that make use primarily of renewable or recycled materials and of services based on natural processes, which originate or are normally accessible in the Northern Periphery Programme Region, and have the potential for being mainstreamed and commercially disseminated inside and outside the region.***







## NEES Work Programme 2011 - 2014

- **WP1 – Project Management** – Cork Centre for Architectural Education (CCAIE), Ireland
- **WP2 – Determining Products, Services, Opportunities and Barriers** – Glasgow Caledonian University (GCU), Scotland.
- **WP3 – Benchmarking Best Practices** – University of Umea, Sweden.
- **WP4 – Exchange of Best Practices and Long Term Strategy** – University of Ulster, Northern Ireland.
- **WP5 – Pilot Project** – South Kerry Development Partnership (SKDP), Ireland.
- **WP6 – Training and Support** – Arctic Technology Centre (ARTEK), Greenland.
- **WP7 – Dissemination** – University of Umea, Sweden



[illegible]

- **6 Full Partner meetings**
- **Local Meetings**
- **Skype Meetings**
- **8 Study Visits**
  - 2 in Cork
  - 2 in Umea
  - 1 in Co. Down,
  - 2 in Clairemorris,
  - 1 in Sisimut)



# WP2 Identifying Best Practice NEES criteria for benchmarking Best Practices

- **Resource Efficiency**

energy efficiency , waste reduction, ease of working and maintenance, local availability , processing and disposal at end of life.

- **Environment and health**

environmental impact, global warming potential, hazardous and polluting potential, impact on health, impact in biodiversity.

- **Sustainability**

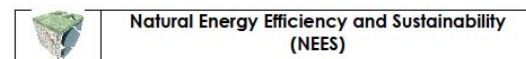
longer term sustainability of supply and distribution networks, 'bioregionalism', regional architecture, compliance with conservation legislation..

- **Enterprise**

Market issues, including costs of installation and maintenance, current turnover of the company / organisation, and the status of any existing competitors.

- **Scalability**

*future* market potential of products and services in light of current opportunities or barriers to achieving a greater market share, likely benefits of promoting the product or service through NEES.

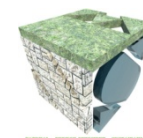


## Best Practice in Products and Services

Trading name of product / service: Ecocel
Type of product / service: Cellulose Fibre insulation manufactured in Cork from locally sourced recycled newspapers and paper.
Countries product / service is available in : Ireland
Contact name: John Egan
Address: Unit K8, Marina Commercial park.
Tel.: 00353 (0) 21 4324567 mobile 00353 (0) 87 2584487
Email: john@ecocel.ie
Website: www.ecocel.ie

### Disclaimer

Information provided in these pages are provided by the manufacturers and service providers. Please note, however, that your selection as NEES Best Practice cannot imply the Project's or Partner's endorsement of Products or Services provided by the selected Best Practice enterprises, but is a recognition of the standards achieved on the basis of evaluation of the information provided. We will be recommending to prospective users of products or services that they take independent professional advice to ensure that the product or service is appropriate to their project and region.





- **EcoCel (Cork)** – recycled cellulose multipurpose insulation.  
<http://www.ecocel.ie>
- **Green Roofs Ireland (Cork)** – Soil and sedum insulating roofs and walls.  
<http://www.greenroofsireland.co.uk>
- **FH Wetland Systems (Galway)** – integrated constructed wetlands for water treatment.  
<http://www.wetlandsystems.ie>
- **Mud and Wood (Sligo)** – training on the use of cob and other natural materials for construction.  
<http://www.mudandwood.com>
- **Advanced Timbercraft (Northern Ireland)** – Construction company specialised in the use of timber for construction.  
<http://www.advancedtimbercraft.com>
- **Locate Architects (Scotland)** architectural practice specialising in the use of timber and other natural materials.  
<http://www.locatearchitects.co.uk/practice.htm>

### NEES Best Practice

### Locate Architects


Dunblane, Scotland

[www.locatearchitects.co.uk](http://www.locatearchitects.co.uk)

**Urras Oighreachd Ghabhsainn**  
(The Glason Estate Trust)  
[www.galsontrust.com](http://www.galsontrust.com)

#### Natural

The building uses a Scottish-sourced timber frame without chemical preservatives, and organic painted timber cladding in preference to the cement rendered concrete block normally used on the Isle. The insulation used (lots of it!) is hemp and we used natural paints throughout. Scottish linoleum was used in preference to vinyl, and in other areas good quality hardwood was used to discourage the laying of carpets—which are bad for health as well as the planet.



#### Energy Efficient

Chris Morgan of Locate is a certified Passivhaus Designer and used his experience to design a building with high levels of insulation, thermal-bridge-free detailing and good airtightness. The building was the very first ever to be tested on the islands and achieved an excellent 0.77 mJ/hr/m³. Healthy heat recovery ventilation was used to claw back the remaining heat and as a result the building is warm and comfortable with very little expenditure of energy. What heat is needed is delivered from an underfloor system fed by a ground source heat pump, powered by a wind turbine, so the building is broadly carbon-neutral in heating terms. Whilst the wind is used positively to harness electricity, the building form, inspired by older vernacular buildings, uses a clipped and hipped roof form to reduce heat loss and strain from the powerful prevailing winds.



#### Sustainable

Very few natural materials are now available on the islands, so where possible and affordable we sourced natural materials from Scotland and UK. The whole building has been designed with the principles of 'Design for Deconstruction' in mind so that most waste is designed out at source. The building design allows for alterations and the replacement of building components with minimal disruption, which also reduces waste during maintenance cycles. Most components are either repairable, re-usable, recyclable or compostable so the building offers an almost zero waste investment. The project was commissioned by a community group who have led the community buyout of the estate and set about improving conditions and the economic situation for this remote and rural area. The building provides a hub for the organisation and local community and is at the centre of a raft of other improvements including a large, proposed wind farm scheduled for installation in 2013.

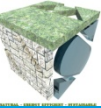


**Contact Locate**

Chris Morgan  
(+44) 1786 825 111  
[chris@locatearchitects.co.uk](mailto:chris@locatearchitects.co.uk)

[www.neesonline.org](http://www.neesonline.org)





- **Ecological Architecture(Scotland)**  
architectural practise specialising in the use of local timber and other natural materials  
<http://www.ecological-architecture.co.uk>
- **Enviroglass (Scotland)** Local community trust manufacturing paving elements from recycle glass locally sourced.  
<http://www.enviroglass.co.uk>
- **Inzievar Woodlands (Scotland)** company managing local native woodland, and sawmill for timber construction.  
<http://www.scottishwood.co.uk/Inzievarold.html>
- **Martinsons Gluelam (Umea)** – timer based construction element manufactured from wooden local timber glued together for strength.  
<http://www.martinsons.se/>





## WP3 Benchmarking Best Practices

Expert Panel to evaluate BPs' through 2 Public Calls.

Identified 14 Best Practices to date (6 in Call 1 and 8 in Call 2)

- **Martinsons Xlam (Umea)** – timber based construction element manufactured from local timber glued across the grain for extra strength.  
<http://www.martinsons.se>
- **Masonite Beams (Umea)** – Timber based construction elements made from timber beams/posts and intermediate resin board cross member for strength.  
[http://www.byggmagroup.se/dt\\_subfront.aspx?m=2339](http://www.byggmagroup.se/dt_subfront.aspx?m=2339)
- **SWECO (Umea)** – major architectural practice specialising in construction in timber, including larger structure like bridges, office blocks.  
<http://www.swecogroup.com/en/Sweco-group/Solutions/Buildings/>
- **The Hollies Centre for Sustainability (Cork)** – training centre giving practical training and demonstration of use of natural materials in building, including straw bales and timber construction (Segal System) <http://thehollies.ie/cob>



- **3 completed Pilot Projects in**
  - Sisimut, Greenland (Blue House)
  - West Cork, Ireland (Wooden House)
  - Claremorris, Ireland (Mayfield Pizza Oven)
- **3 Pilot Projects in planning or progress**
  - Clairemorris, Ireland (Community Centre)
  - Cloyne, Cork, Ireland (Parnell Cottage)
  - Aran Island, Ireland.
- **4 more Pilot Projects proposed**
  - 2 in Umea, Sweden
  - 2 in Aran Island , Galway, and Kerry, Ireland
- **Methodology for Evaluation**
  - SKDP is tendering evaluation methodology for Pilot Projects based on the NEES 5 Criteria





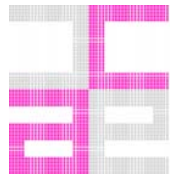


# A new home for Elixchel Lily





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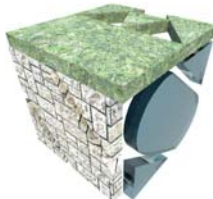


Cork School of Architecture

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CPD

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NATURAL - ENERGY EFFICIENT - SUSTAINABLE



Cork School of Architecture

GARTLAND ARCHITECTS

=

LIVE  
projects

LIVE  
projects



What are **LIVE**?  
projects





Relevance as an  
educational tool





Continual  
Professional  
Development

Summer  
Student  
W'kshops

Actions

## Specialists product seminar

Information session +  
participatory demonstration / workshop

CCAE  
Facilitation &  
research



Continual  
Professional  
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## Actions

Specialists product seminar

Information session +  
participatory demonstration / workshop

CCA  
Facilitation &  
research

Diary of a  
building  
/  
Furniture  
Team

Credits  
towards  
existing  
Modules



Continual  
Professional  
Development

Summer  
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W'kshops

## Dissemination Team

record of site works

- CCAE website
- open access web publication

## Actions

### Specialists product seminar

Information session +  
participatory demonstration / workshop

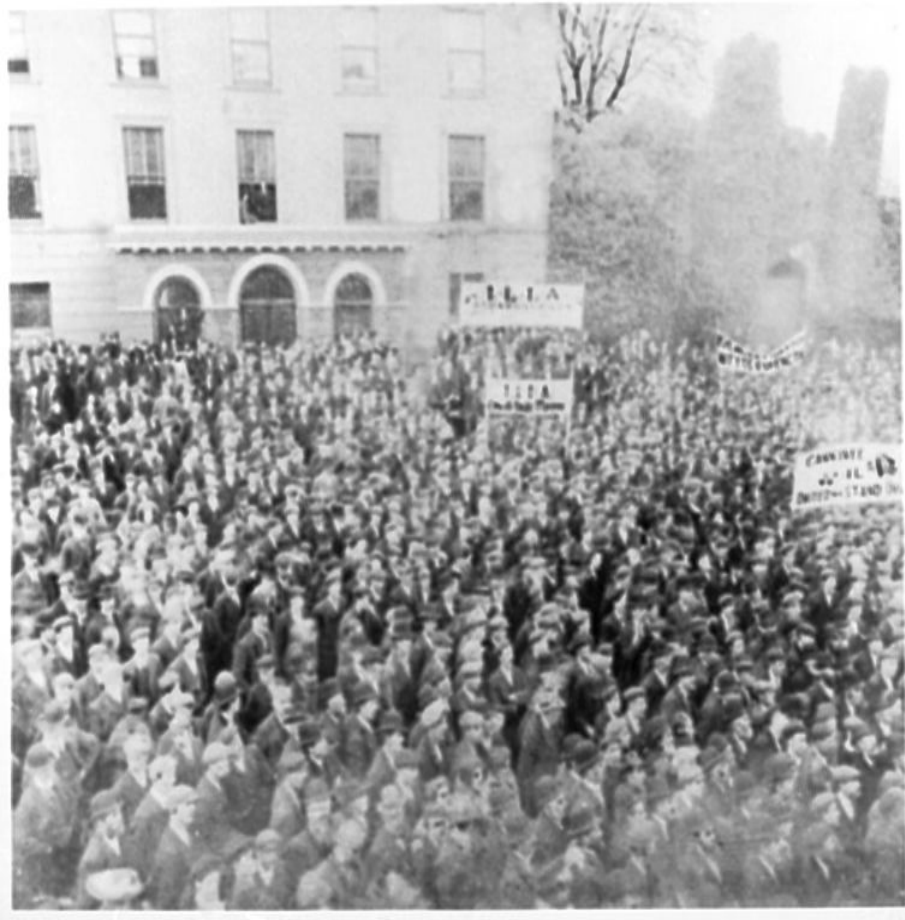
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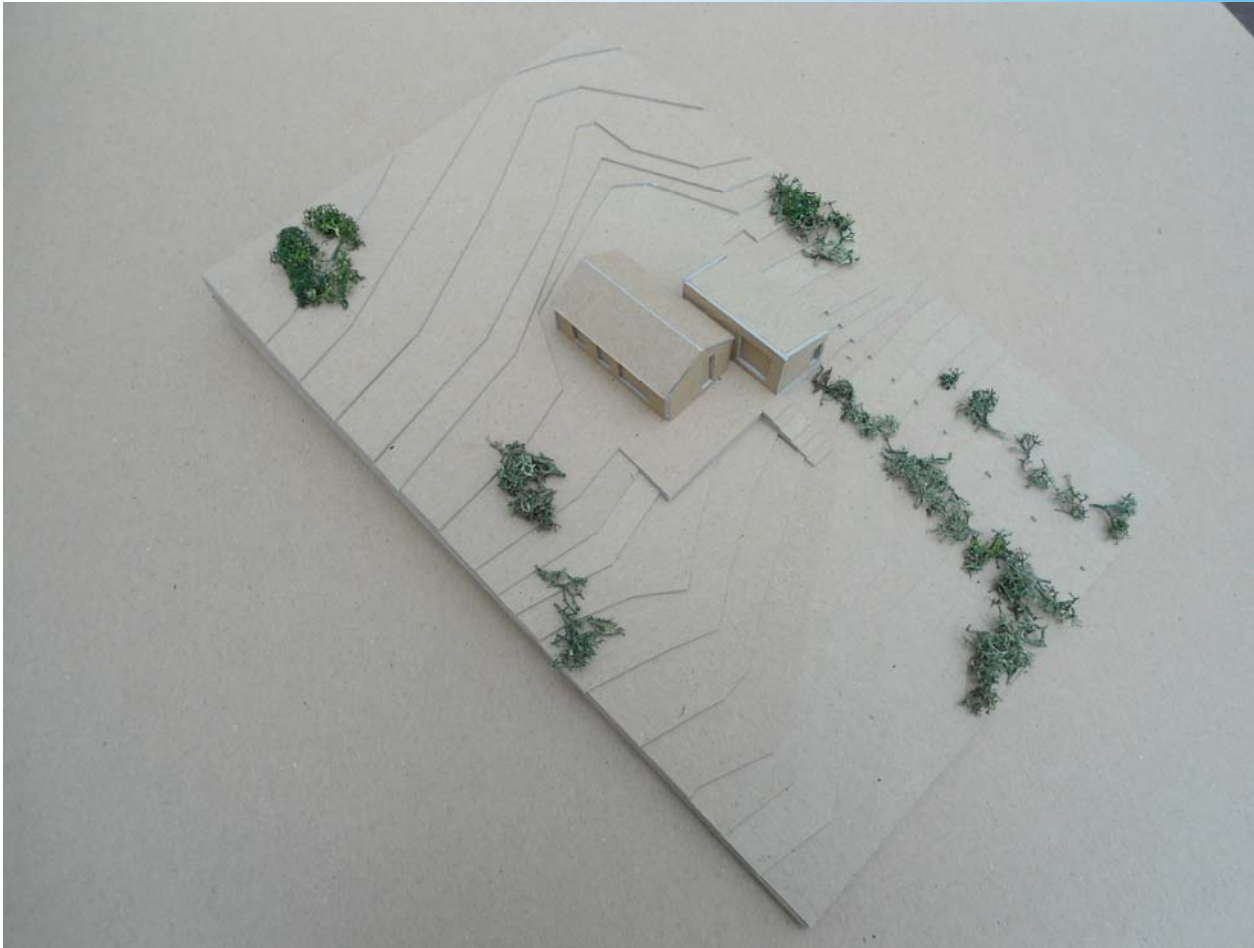
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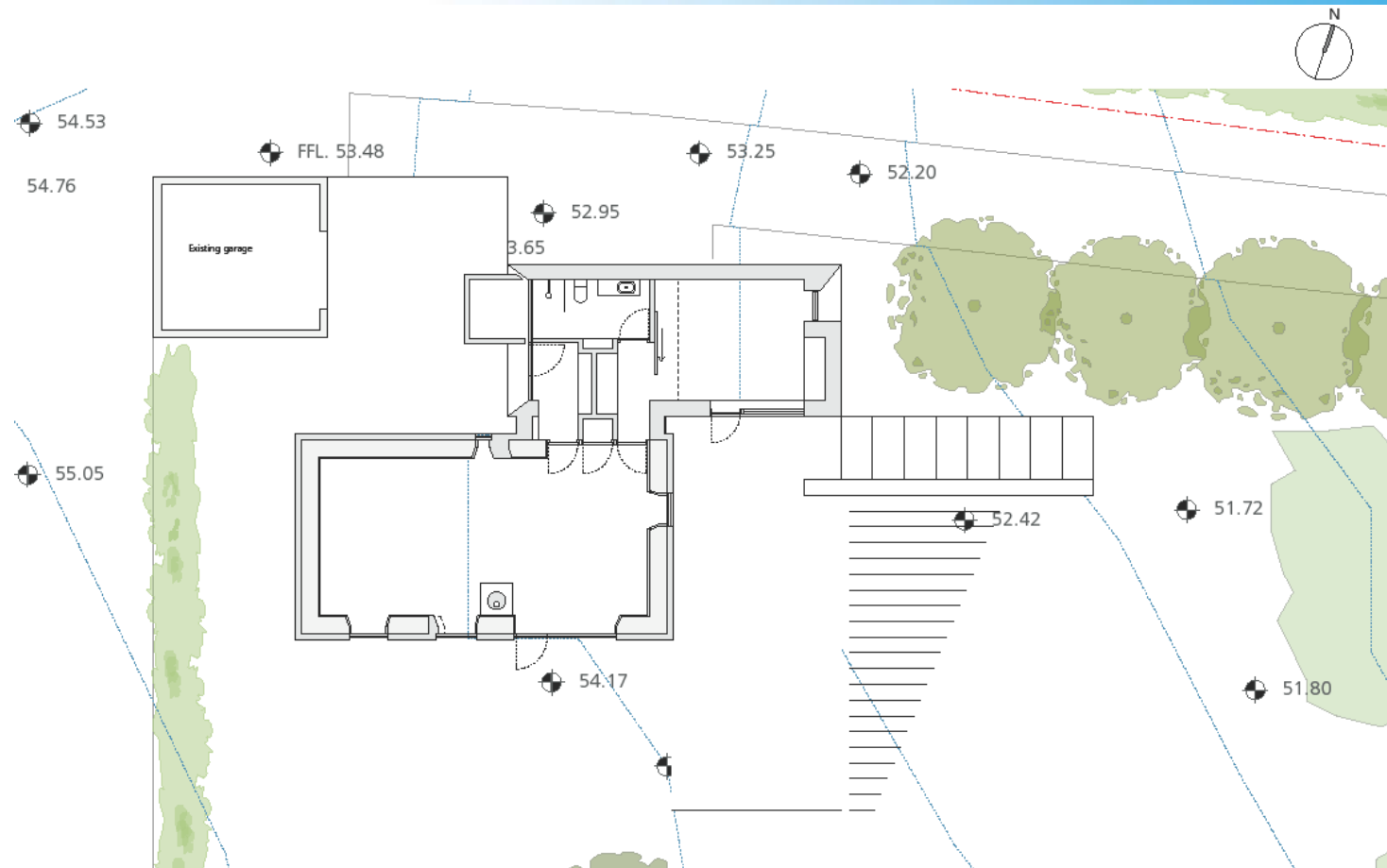


## Historical Context



## Design

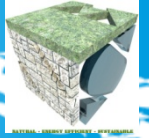




Design



# 4 Key Priorities



## **1. Clarify NEES message**

Natural materials and processes are more sustainable, help the environment, need less energy, produce less waste.

## **2. Consolidate the NEES approach**

Web Site, BP information, Vocational Training Course and Manuals, Pilot Projects, etc.

## **3. Develop a sustainable model**

Develop sustainable consultancy structure to allow NEES Principles to be applied to development projects

## **4. Mainstream and disseminate**

Ensure that NEES approach continues, through Network and consultancy, new EU Projects.