

Natural Energy Efficiency and Sustainability (NEES)

Pilot Project: The Wooden House, Rossnagoose, Skibbereen, Co. Cork

Solar extension and retrofit of wooden cabin

1. Description of the Project

The Wooden House is a prefabricated log cabin, made of interlocking sewn logs of cedar timber, 8" thickness prefabricated kit house, designed by Sylvan Homes in Scotland, and standing on a strip concrete foundation, with a floor cavity. It has a ground floor with a bedroom, bathroom, open living room/dining room and kitchen, and a second floor in the roof with 2 further bedrooms and a bathroom. It has a concrete tiled roof. Before works the property had no insulation on the ground floor and only metal sheet insulation in the roof and under the floor.

The house was built in 1991 by the then owner, on a self-build basis with some skilled input from the manufacturers and local builders. There are few wooden houses in Ireland, as they are considered "inappropriate" for the climate. Older houses are of stone or concrete and very damp. The house is situated in the countryside in Aughadown Townland, 3 miles outside Town of Skibbereen.

The nature of works was the construction of an extension to the West of the house, to house a new separate living room, and of solar conservatory to the South West, to house a new kitchen. The extension is timber frame; cellulose filled, has a soil roof and stands on block strip foundations. The solar conservatory also timber built, cellulose filled and stand on wooden piers, with sedum roof and skylights. There is also external hempcrete cladding on the North and East walls.

- Promoter: Jose Ospina, owner
- Funder: Jose Ospina, owner
- Architect: Tony Cohu (Bantry -Cohu/371418370
- Builder: David Simmonds (Skibbereen) <http://www.linkedin.com/pub/david-simmonds/2b/256/165>
- NEES Products: EcoCell (cellulose). Aru Green (sedum roofs), Steve Allin (Hempcrete) Timber Frame Building (David Simmonds) Triple glazed windows (Munster Joinery)
- NEES Services; Tony Cohu, Architect) <http://www.zoominfo.com/p/Anthony>
- Other relevant natural products or services; John O'Sullivan Surveying Services:

2. Contribution to Resource Efficiency

No detailed calculation made of carbon and energy savings, although both are likely from the additional insulation added. This includes 12" of cellulose on the West and South West walls and 8" of hempcrete on the North and East walls. The construction work and the external cladding are timber frame and hempcrete, which is easy to maintain and repair. There are no added mechanical or synthetic installations. The life span of the property is estimated at 100 years. There are no major maintenance issues. The cellulose insulation is recycled paper, the hempcrete and sedum and soil roofs are natural or renewable materials. Most materials used are biodegradable or easily recycled. There are no chemical/mechanical processes required in construction. The environmental impact of construction and retrofit is minimal and most materials used, e.g. timber, cellulose, plants for the roof, lime, are



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carbon capturing
3. <u>Environment and Health</u>
<p>90% of the materials used are natural renewable or recycled materials. Very few materials used are synthetic and none are hazardous. Timber and lime is purchased locally, plants used on the roof are found locally. Cellulose insulation is made from recycled paper in Cork City. The carbon footprint of the extension and solar conservatory is unknown, as no calculations have been made. Construction is in compliance with building regulations for extensions. There are no hazardous waste issues involved in construction or end-of-life disposal. The building involved minimal disruption to land and biodiversity. No hazardous or polluting substances were used. Only hand tools were used for construction with the exception of a small digger and a motorised lift for putting solid and sedum on roof. There will be health benefit arising from better insulation, better air tightness, and extra light and air from solar conservatory. The extensive use of natural materials and lime means that the building is highly carbon capturing.</p>
4. <u>Sustainability</u>
<p>The property is embedded in the natural environment and reflects this environment in the materials used. It is not traditional of the location, as wooden building is very unusual, but growing, in Ireland. The materials are of local origin as far as possible, but there is no local availability of materials like construction quality timber and hemp. Lime, soil, and plants used however are locally sourced. There will be some impact in the import of materials, but this is not high and unavoidable at the moment. The cellulose insulation used is certified through a NSAI Agrément. The hempcrete is not certified, and there is no certification used for green roofs to our knowledge. There are no evident impact issues involved in design and there is no conservation legislation applying. Materials for timber framing are readily available, cellulose is available from Cork City at competitive pricing, and sedum roofs and hempcrete installation require specialist services that are available in the region. However, the craft persons providing these services, e.g. with the required skills, are few.</p>
5. <u>Enterprise aspects</u>
<p>The retrofit and construction undertaken is low carbon and carbon capturing, and around 80% of materials used are renewable. No social enterprises were involved in the retrofit, but a number of SMEs carried out most of the works involved. These included:</p> <ul style="list-style-type: none">- Eco Cell (cellulose insulation) Cork – NEES Best Practice- Aru Green (green roofs) Cork - NEES Best Practice- Steve Allin Hempcrete, Kenmare, Kerry – NEES Best Practice candidate- David Simmonds Sustainable Builder, Skibbereen, Co. Cork – NEES Best Practice candidate- Tony Cohu, Architect, Coomhola, Borlin, Bantry – NEES Best Practice candidate



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- John O'Sullivan, Surveyor, Planning Consultant, Glengarriff, Bantry

All of these are typical of the small companies and practices that work in this field. In addition to them, up to 4 other local workmen were employed. These SMEs work on a localised small-scale basis, due to scarce resources for expansion and marketing.

6. Scalability

The approach taken to retrofit and extension could be replicated easily on a one-off basis in this and other region, subject to the availability of similar tradesperson in other areas. It is not likely that the SMEs involved could carry out more than one of these jobs at a time given current capacity. If a significant scaling up was considered, it would have to be on the basis of a guaranteed new-build or retrofit programme. As this type of approach is not currently supported by Government retrofit schemes, this is not likely to happen. For this to be taken on board as an alternative approach to retrofit, a major change in approach on the part of bodies like Sustainable Energy Authority of Ireland and the National Standards Authority of Ireland would have to take place. Companies such as Eco Cell and Aru Green would have to receive support from bodies like Enterprise Ireland in terms of scaling up their operations, something that is unlikely to happen at present due to the limited demonstrated market (especially public market). A significant social housing development programme that aimed at low-carbon, low energy housing could be a basis for promoting these products and services. Such as the self-build programme that was supported in England in the late 80@s and early 90's. (see <http://www.zoominfo.com/p/Anthony>)> However, this is unlikely at present due to the lack of tangible evidence for and recognition and promotion of this approach.

7. Conclusions

The Wooden House project demonstrates in a small way that a more sustainable approach to low-carbon retrofit in Ireland is possible and viable. However, the possibility of scaling up this approach at present is limited, due to the lack of official recognition of the potential of renewable or recycled materials in Ireland, and the lack of any retrofit or new development programmes that aim at low-carbon solutions. This Pilot represents a starting point and a sampling of some of the approaches and technologies that could be applied in a more significant pilot or programme, and one that should involve access to funding for testing and measurement of results. This will to a certain extent be achieved in the Cloyne Pilot project, developed by Cork Centre for Architectural Education. It is also recommended that further Pilot Projects be undertaken along these lines, to continue scaling up and documenting the viability of this approach.

Jose Ospina
Project Manager
NEES Project
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