

COPPICE CONSTRUCTION

George Fereday, associate teaching professor and technology co-ordinator for materials for manufacture and fabrication at the School of Art, Architecture and Design at the London Metropolitan University, describes the HomeGrownHouse project



The HomeGrownHouse exhibition took place in June
PHOTO: STEVE BLUNT, LONDON METROPOLITAN UNIVERSITY

Sweet chestnut is a durable, straight growth, dimensionally stable timber well suited to use in buildings. However, very little UK-grown sweet chestnut roundwood is used in construction. The majority is converted into fencing or simply burnt as biomass.

HomeGrownHouse (HGH) is a research project challenging this status quo by exploring new, value-added uses for coppiced sweet chestnut in buildings in the south-east of England (see p34).

Kent and Sussex have among the highest numbers of new start building projects in the UK, alongside the most regional abundance of coppiced sweet chestnut. Yet the opportunities this presents for sustainable local timber use are being missed.

The UK imports 80% of its wood products and rates of woodland management in Britain are low, with only 59% of UK woodlands under active management. Many formerly coppiced woodlands have fallen out of regular harvest cycles, are more prone to diseases and pests, and contain a mixture of small, medium and large diameter trees with few markets.

With the HGH project we are addressing these issues by designing building components specifically with a range of small, medium and large diameter roundwood in mind. We designed this 'kit of parts' for disassembly and re-use and all cut components were sawn efficiently to reduce

waste during milling. This low-waste, high yield philosophy means the components are cost-competitive with traditional imported alternatives.

To achieve milling efficiency, we collaborated with industrial partner WoodMizer, which is market leader in mobile sawmilling. The company helped test new radial cutting techniques for repeatability, ensuring they could be reproduced on other machines elsewhere in the UK.

When coppiced (cut back to just above ground every 15-30 years), the sweet chestnut tree re-grows multiple, straight lengths of roundwood from each stump or 'stool'. Coppicing is also naturally regenerative, meaning that there is no need for replanting of saplings, and harvesting in this way encourages higher levels of biodiversity than in other monoculture woodlands, by opening up the woodland floor to sunlight.

Coppice forestry also creates skilled rural jobs. By designing in a way that links forestry practices, ecology and construction from the outset, the HGH project has forged new connections that contribute to a holistic, sustainable and local timber supply chain.

OPEN-AIR EXHIBITION

In June this year we exhibited five prototype buildings systems on the Birling Estate in north Kent as a demonstration of the HGH

applied research. During the exhibition our 'kit of parts' was presented within the coppice woodland from which the material was harvested. The timber structures were also exhibited alongside the forestry machinery used to harvest and extract the roundwood. The setting, machinery and prototypes combined to communicate the links between ecological woodland management practices, high quality locally grown timber, and sustainable building design.

HGH PROJECT IMPACTS

1. The evolution of sustainable architecture made from locally sourced timber.
2. The local community by supporting skilled forestry and timber processing jobs.
3. Student researchers studying sustainable construction at London Metropolitan University.
4. The biodiversity, health and productivity of the woodlands by encouraging active coppice management
5. A net-zero carbon economy and the housing crisis.

FUNDING

The HGH project was funded by London Metropolitan University through support from HEIF (Higher Education Innovation Fund).

PROJECT COLLABORATORS

- George Fereday, London Metropolitan University, principal investigator
- Guy Nevill, Birling Estate
- Dougal Driver, Grown in Britain
- Nick Meech, designer and maker
- Harri Lewis, Jack Munro, Mule Studio
- Dave Biggs, WoodMizer UK ■

FURTHER INFORMATION

More information and the project URL can be found here:

