

Ian Pritchett's presentation slides can be viewed [here](#), and the following points were noted during his presentation :

- The company was set up 10yrs ago, and is now majority owned and funded by M&G – an international savings and investments company, allowing them to make longer term strategic decisions.
- They only build Zero Carbon homes, and are aiming to deliver 10,000 homes by 2035.
- Ian noted that the definition of Zero Carbon homes is not set in stone, and there are lots of different definitions.
- Greencore take a fairly extreme approach, and in January 2020, they set out to build 500 Climate Positive homes by 2025.
- They currently have over 500 homes in the planning stage.
- The reason for building Climate Positive homes is to try and tackle the current climate crisis, and reduce the CO<sub>2</sub> emissions being released into the atmosphere.
- Record high temperatures continue to be broken, with highs of 40° being recorded in the UK last year.
- At the COP conference in Paris in 2015, most of the governments agreed to set targets for carbon emissions, interpreted in the UK as a Carbon Budget, managed by the Climate Change committee.
- The Tyndall Centre for Climate Change Research has published the carbon budgets for each Local Authority in the UK
- Oxfordshire has a budget of 26.3MT of allowable emissions (up to 2100)
  - Cherwell District Council 7.3MT
  - West Oxfordshire District Council 3.7MT
  - South Oxfordshire District Council 5.6MT
  - Vale of the White Horse District Council 5.2MT
  - Oxford City Council 4.5MT
- That Carbon Budget has to cover Industry, running existing buildings, transport, agriculture, and new buildings.
- Embodied Carbon - the carbon emissions that come from the extraction (quarrying, mining), processing (firing bricks), and transport of building materials to building sites is not measured or regulated in any way.
- There is an assessment that says that the embodied carbon of buildings is around 10% of UK carbon emissions, but it isn't included in any of the carbon budgets.
- An average 3 bed house constructed with blocks and bricks would be responsible for over 100T of CO<sub>2</sub> emissions at the construction stage. Some of the big PLC building companies are up to twice that level.
- Once built, those homes would emit between 3 and 5T of CO<sub>2</sub> per year.
- This trend can't continue if we are to reach the 2050 CO<sub>2</sub> reduction goals.
- The larger figure of Embodied Carbon Emissions can be tackled by using green energy during the extraction and processing stages, or/and by using materials that lock up CO<sub>2</sub> to build the homes.
- Bio-based materials such as timber, hemp, flax etc absorb CO<sub>2</sub> from the air as they grow, and turn it into cellulose during the photosynthesis process. That cellulose forms the building blocks of timber and natural fibre insulation.
- It takes 1.8kg of CO<sub>2</sub> to make 1kg of cellulose – the more bio-based material we use, the more carbon emissions we save, and the more carbon we lock up.
- If they weren't used for buildings, the trees would eventually die, with the CO<sub>2</sub> being released back to the atmosphere.
- Greencore use wood from sustainably managed forests, where 2 trees are planted for every tree cut down and used for building construction.
- There are 100,000 new houses planned for Oxfordshire in the next 10 years and if they aren't build to Zero Carbon standards, 80% of Oxfordshire's carbon budget may be squandered, and those homes would need to be upgraded to future standards before too long.
- If the PLC building companies continue to build as they are currently doing, we will use 100% of the budget by 2029.
- Greencore are trying to tackle the issues by using Bio-based materials. They produce a closed panel timber frame that is insulated with hemp-lime and wood fibre insulation. This is a breathable construction, which is also airtight – similar to the Gortex system used in clothing & footwear.
- For every square meter of panel, 30 m<sup>3</sup> of CO<sub>2</sub> is locked up.
- Flooring is made of cross-laminated timber, and all of the super structure components are built in the factory rather than on site.
- Onsite, the foundations are all insulated 'rafts' (polystyrene & low carbon concrete), and there has been some 'piling' required for the HNCLT site due to the high clay content, which could expand during very wet conditions.

- Greencore were pleased to support and work with HNLC on this special project for the following reasons:
  - It is Community-led
  - It was the 1st project to go through their new factory and allowed them to streamline processes
  - It's Climate Positive – not just Zero Carbon
    - Embodied carbon
    - Low energy use
    - Renewable energy generation to meet 100% of energy use
  - It has a smart microgrid (the first one) that includes the existing Sports & Social Club PV
  - Monitoring will be possible through the microgrid – providing valuable data about the energy consumed by the homes
- Ian outlined the Greencore 'secret formula' as follows:
  - Bio-based materials used to 'lock up' or sequester carbon
  - Passivhaus thermal performance including:
    - High levels of insulation
    - Design out thermal bridging
    - Excellent airtightness
    - Triple glazed timber windows
    - Heat recovery ventilation
    - Electric heating, hot water and cooking
    - PVs used to generate electricity, batteries to store it and micro-grid to optimise distribution
- Ian ended his presentation with the following information :
  - If all houses in the UK were built this way, we could save 600 million tonnes of CO<sub>2</sub> emissions over the next 30 years.
  - This is equivalent to 5% of the UK's emissions during this period.
- One of the aims of Greencore is to demonstrate that things can be done differently, and projects like this one are an important part of creating our future.

What do governments need to do to make Zero Carbon homes the 'norm' (bearing in mind that they receive around 40% of their donations from the major housebuilders)?

Section 106 contributions, Community Infrastructure Charges and Stamp duty (all agreed at the point of planning approval) could be linked to energy performance (as they do for road tax).

Land value and vested interests will be major stumbling blocks.

Cathy thanked Ian for his very informative presentation.