





European Regional Development Fund

## **HUDSON**Architects

## **CobBauge:** UK Housing and the future







## Summary

- Housing Crisis
- Housing Issues
- Reducing Energy
- The Future





#### Housing Crisis

• 3m houses needed to be built in the UK over the next 20 years according to a report by Shelter UK



#### **Housing Crisis**

 Our housing supply is broken. It does not seem possible to build that quickly in the UK

## French housing context

- 35% of new owners buy in rural area, close to urban area
- the incomes of non-owner households are becoming more modest



Champ : France métropolitaine, hors ménages dont la personne de référence est étudiante, hors ménages déclarant des revenus négatifs. Note : les points composant les courbes (1984, 1988, 1992, 1996, 2001, 2006 et 2013) représentent les éditions successives des enquêtes Logement. Source : Insee, enquêtes Logement.

## French housing context



- social housing accounts for 17% of the main residences. This share is constantly increasing
- a growing demand from social landlords for high-performance, comfortable and easy-to-use housing to limit costs for tenants and maintenance costs

#### Outrage as help-to-buy boosts Persimmon profits to £1bn

Builder condemned for making massive gains from taxpayerfunded programme



A Housebuilder Persimmon has reported full-year profits of £1.09bn. Photograph: Sam Frost/The Guardian

Housebuilder Persimmon made a record-breaking £1bn profit last year equal to more than £66,000 on every one of the homes it sold - with almost half of its house sales made through the taxpayer-funded help-to-buy scheme.

#### Housing Issues – Poor Quality

- Dispatches, a television documentary commissioned an independent inspection of a brand-new Persimmon home
- 295 snags
- 70% so serious that they fell outside of building regulations 'tolerance' limits
- 70% of customers do not want a house built by the dominant housebuilders

# **FUTURE HOMES** BUILDING THE HOMES AND COMMUI IFS BRITAIN NEEDS

#### Housing issues-listening to the consumer

- RIBA's Future Homes Commission pointed out how small many British homes are by European standards.
- Little research into what people want from their homes.
- Few in the housing sector bother to ask what residents need.
- The RIBA commissioned research on how people live today and what they want from a home (published in The Way We Live Now in 2012).

#### Key issues from this report:

- The amount and use of space within the home
- A large communal area for eating, socialising and entertaining
- Natural light
- Privacy from neighbours and from others within the home
- Reasonable control of noise within and between households
- Room for change flexible homes
- Outdoor space
- Energy efficiency



MPs have approved a motion to declare an environment and climate emergency.

#### Housing issues – Climate crisis

- UK public are increasingly concerned with climate change
- Buildings in construction and use are responsible for nearly 40% of CO2 emissions (source IEA)
- Many companies, councils and the UK parliament have declared a 'climate emergency'

	GREEN STREET	EQUIVALENT 3 BED NEW BUILD	3 BED BUILT IN THE 1960s
Main Heating	£16	£135	£350
Hot Water	£118	£140	£350
Cooking	£70	£70	£70
Lights appliances	£507	£507	£507
Standing Charges	£144	£144	£144
Saving from generation	286	0	0
Estimated monthly running cost	£47	£83	£118
Total annual running cost	£569	£996	£1,421

#### Reducing Energy in use

Case Study : Green Street in The Meadows, Nottingham (The Future Homes Commission, RIBA)

- Reduced energy for heating
- A step to ending fuel poverty







#### Concrete: 0.159





Rammed earth: 0.023

#### Reducing Energy in construction

The low embodied energy of rammed earth illustrated the low energy potential of earth construction



Brick: 0.24



Steel: 1.37

Embodied carbon

(kg CO<sup>2</sup>/kg)



# Sub soil: an abundant resource largely to cover many of the material needs

- Study done in Britany on macroscale orders of magnitude of the volume of available soil resource for cob :
  - The volume of soil available for vernacular cob technique in Brittany was estimated at 6.8 billion m3, i.e. 8.8 billion tonnes, and represents 23% of total soils of Brittany.
  - The estimated proportion of the resource already consumed by past builders is 0.03%.
  - The hypothetical consumption of the entire resource would enable the construction of 88 million homes and if all housing of Brittany were made of cob, 2.1% of the resource would have been consumed.

These figures illustrate the huge availability of earth material.

Rediscovering of vernacular adaptive construction strategies for sustainable modern building -Application to Cob and Rammed Earth – Erwan HAMARD – PhD thesis - 2017



## BUILDING IN COB, PISÉ, AND STABILIZED EARTH

### The Future – a parallel with the past

- Interesting parallel with previous 20th century history
- CobBauge could be a 21<sup>st</sup> century answer



- VERSUS HERITAGE FOR TOMORROW
- Vernacular Knowledge for Sustainable Architecture



- Earth construction has very low embodied energy
- It out performs lightweight low energy buildings in terms of thermal mass and acoustics



#### The Future – Technology

- Low technology
- Doesn't rely on technology for performance
- No eco-bling!



#### The Future – Affordability

- Hassan Fathy believed architecture was for the people
- He built high numbers of earth buildings



Earth building in a larger context Hassan Fathy

#### The Future – Scaling and density

- A prime motivation of Fathy's use of earth on a wide scale was cost
- He developed plans for large scale implementation



#### The Future – Density

- Abobe and cob can provide opportunities for communities and efficient infrastructure
- Earth construction is well proven in this respect



## The Future – Public Housing

Exeter City Council leading by example with all new Council buildings being:

- Very low energy certified to the International Passivhaus Standard
- Healthy meet the German Building Biology (IBN 2015) Principles
- Climate Ready designed to be climate resilient to at least 2080 Integrated within a sustainable landscape – buildings are set within a permaculture integrated landscape.



#### The Future – Creativity

- The approach to the future is being creative with low energy solutions
- Not high technology



#### The Future – Working with the environment

- Gaia principles
- Self-regulating, complex system that helps to maintain and perpetuate the conditions for life on the planet



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