Future Homes Hub

Operational and Embodied Carbon

HBF Technical Conference

19th September 2023

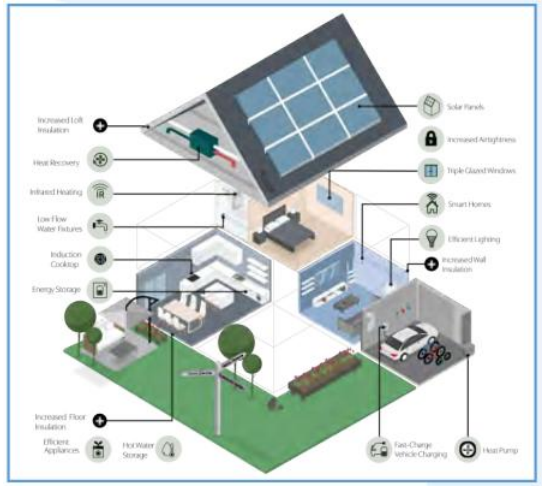
Adam Graveley, Head of Technical and Innovation

Delivery Plan & Roadmap

Published in July 2021

Summary of the goals

1



- High quality homes that are zero carbon ready

2

- Places and developments that are nature rich, resilient and healthy

3

- Production and construction methods that support this

4

- Business operations in line with Race to Zero

How the Hub operates

Output delivered by expert and task groups incorporating relevant stakeholders and industry specialists

Outputs include

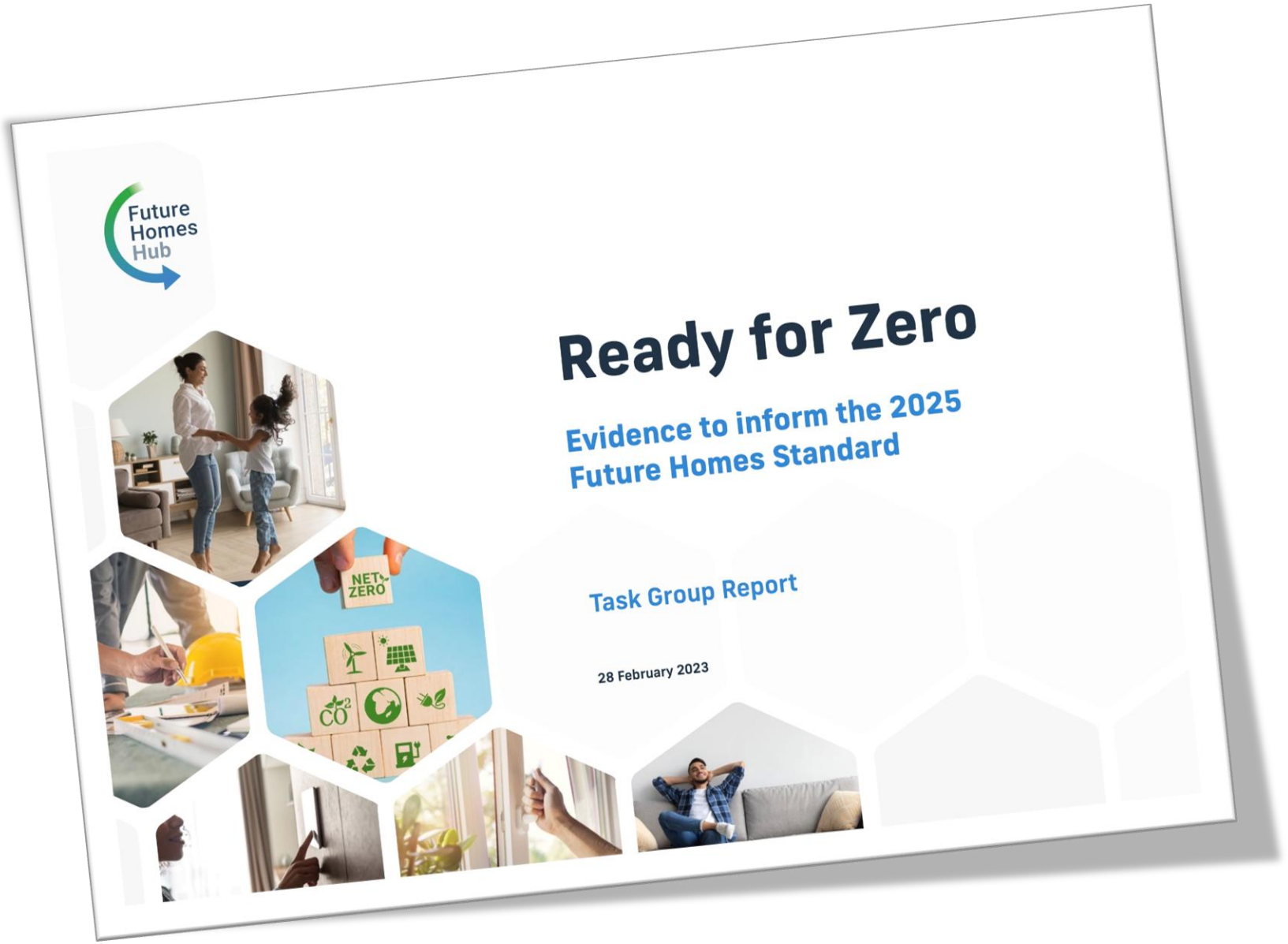
- Technical guidance and calculation tools
- Liaison with government and policy makers
- Sharing best practice/lessons learned

Overview of current projects

Sustainability and performance	Homes and Construction	Place and Nature
Create the enabling framework for UK homebuilders to be recognised as sustainable businesses	*High-quality homes that are zero carbon and sustainable*	*Developments that are consistently low-carbon, nature-rich, resilient, healthy, well-designed and beautiful*
Oversight of the roadmap	**Building regulations 2021**	*Biodiversity net gain*
Corporate level metrics	**Future Homes Standard 2025**	*Placemaking and planning reform*
Sustainability plans, templates and ESG	**Embodied and whole-life carbon**	*Water neutrality*
Valuation of sustainable homes	*Water efficiency*	
	Building Performance Evaluation	
	Tests and Trials	

Ready for Zero

Evidence to inform the 2025 Future Homes Standard



Future Homes Hub

You can see Ready for Zero Task Group Report on our website

www.futurehomes.org.uk

Direct download link here

Refining the FHS 2025 Task Group

Future Homes Standard – what should it be?

In numbers:

- **170 people**
- **20 work groups**
- **8 weeks**
- **2 Day in-person meeting**
- **Lots of effort!**

Future Homes Hub FHS request

Refining the 2025 Future Homes Standard

Future Homes Hub Task Group

Terms of Reference

25th August 2022

Introduction

The Government has committed to consulting on the Future Homes Standard in Spring 2023. The Government have committed that the Future Homes Standard will deliver zero carbon ready homes, with low carbon heating and high fabric standards, that will require no future retrofitting.

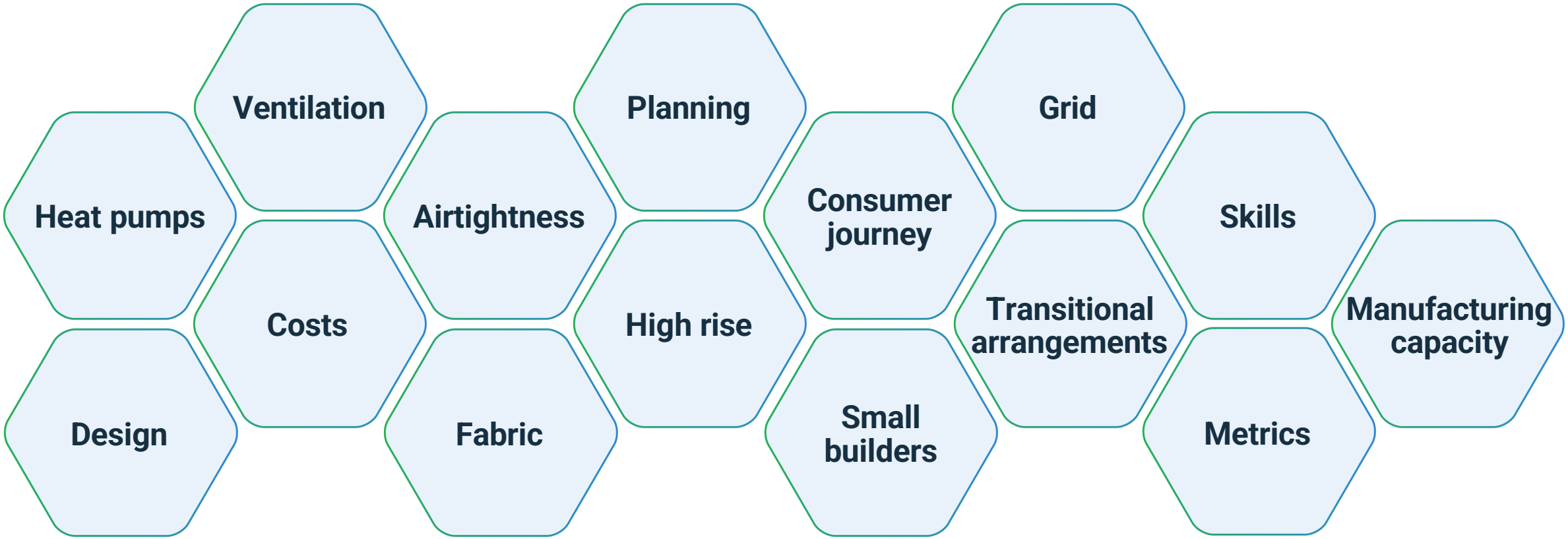
" The Future Homes Standard is likely to be the biggest jump in energy efficiency of our new homes in a generation."

Catherine Adams, Director Net Zero (DLUHC)

Contender Specifications – at a glance

Elements	CS1	CS2	CS2a	CS3	CS4	CS5
Fabric (compared to 2021)	Little worse	Equal		Better	Much better	
Glazing	Double				Triple	
Air permeability	5	4.5 -5		3	1	0.5
Ventilation	dMEV			MVHR		
Space heating	ASHP		IR	ASHP		None
Water heating	ASHP	ASHP WWHR	Immersion	ASHP WWHR		ExAHP WWHR
Renewables	None	PV	Max PV + Battery	PV		

How would the contender specification be delivered at scale?



26 Recommendations for effective implementation

…but these 7 underpin the others:

- **Establish an Industry Government FHS Implementation Board**
  Sub groups: Consumer, Small Builder, Heat pump, Ventilation, Airtightness, Energy Flexibility
- **Announce key decisions as early as possible**
- **Provide a stable and consistent version of SAP11 in good time**
- **Provide sufficient Transitional Arrangements**
- **Establish and enforce new build homes competency schemes**
  Covering: airtightness, ventilation and heat pumps
- **Learn from UK and international leaders in net zero homes**
- **Develop performance measurement techniques**

Future Homes Hub

Sharing learning on low carbon homes across the industry

Future Homes Standard: sharing learning on low carbon homes across the industry

Mapping zero carbon homes projects

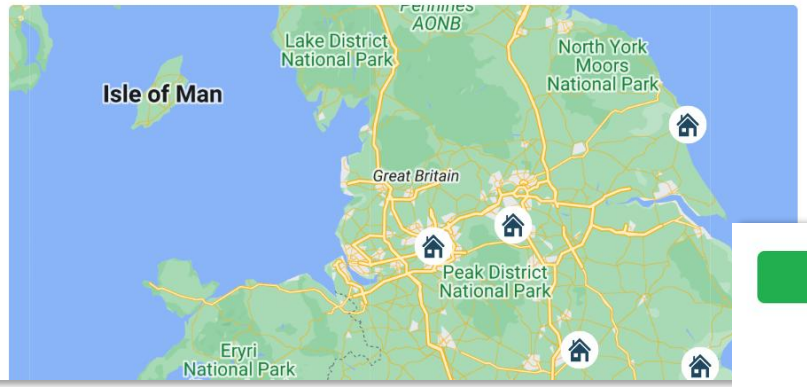
The following interactive map provides an overview of Future Homes Standard projects that are being delivered across the UK. Click on the icons in the map to find out more about specific projects.

HOUSES
APARTMENTS
MIXED DWELLINGS

ENERGY EFFICIENCY
BIODIVERSITY
WATER EFFICIENCY
PLACEMAKING
WHOLE-LIFE CARBON

Filter locations (name, address)

- [ ] Space heating: Air Source Heat Pump
- [ ] Space heating: Ground Source Heat Pump
- [ ] Space heating: Exhaust Air Heat Pump
- [ ] Space heating: Infra-red
- [ ] Space heating: Panel
- [ ] Space heating: District



- High level overview
- Design and construction intelligence
- Alignment with 3-year in-depth study by Homes England

Please click here to fill in the online survey

Homes England

ARCADIS

Submit your project [on the Future Homes Hub website]

Future Homes Hub

Embodied and whole life carbon

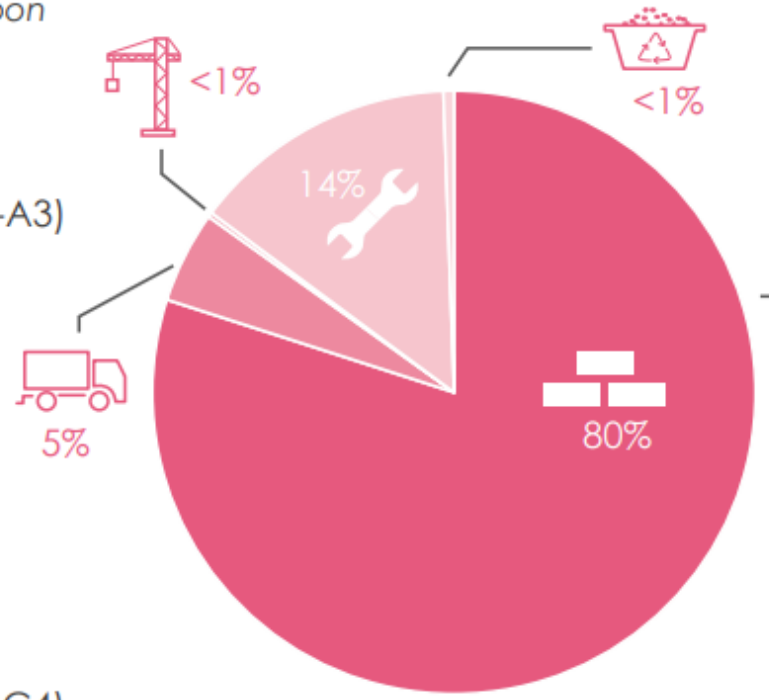
What is whole life carbon?

Operational energy

Embodied carbon

Focus on reducing embodied carbon for the largest uses:

- Products/materials (A1-A3)
- Transport (A4)
- Construction (A5)
- Maintenance and replacements (B1-B5)
- End of life disposal (C1-C4)



Average split of embodied carbon per building element:

30% - Superstructure

27% - Substructure

20% - Internal finishes

17% - Façade

5% - MEP

Reduce embodied carbon by 40% or to:

<500 kgCO$_2$/m^2

Area in GIA

Credit: LETI Climate Emergency Design Guide

Preparing the new homes sector for mainstream measurement of WLC

- Government will consult during 2023 on the policy framework for Whole Life Carbon
- Meanwhile the Future Homes Hub will work with homebuilders, manufacturers, Government bodies and other experts to prepare for mainstream measurement and reduction of Whole Life Carbon.

Workstreams

1. Development of a simple tool
2. Measurement and disclosure – pilot programme
3. Comparative study – low carbon options
4. Support EPD data being available and easily comparable

Available on the Future Homes Hub website

Simple tool brief

Version 1

Version 2

		Short term (priority)	Medium term	Long term
Scope	Buildings elements	Architectural, structural, MEP allowance	MEP detailed: include EV chargers, ASHP & MVHR	Infrastructure, uncommon building features
	Dwelling types	Individual buildings; limited dwelling types	Aggregate across dwelling types as stepping-stone to site wide	Housing development / site wide carbon impacts
	Life-cycle stages	LCA Stages A, B, C, biogenic carbon	LCA stage D	
Inputs	Inputs	Basic building quantities	Ability to add custom quantities. Units of measurement: mass (kg), volume (m3), area (m2), linear (m)	
	Build-ups	Library of most common element build-ups. No custom build-ups.	Increasing library of element build-ups & ability for user to add new construction types and build-ups.	
	Materials	Library of most common materials. No custom materials.	Increasing library of materials & ability for user to add custom materials	Link to BECD product database
Outputs	Outputs	Graphical and detailed output Auditable, transparent results		
				Analysis tools to analyse collated project data
				Confidence score reflecting assumptions made
				Support reporting of Scope 1-3 emissions
		Option comparisons		Tool highlights potential carbon reductions
	Benchmarks	Comparison with static industry benchmarks	Comparison with FHH benchmarks	Customisable benchmarks Link to BECD entity database
	Methodology	Follows FHH proposed assessment framework for new homes and RICS PS		Supports GLA and other Local Authority planning requirements
	Extensions			Integrated with SAP ?
Data	Impact data	FHH generic data set for new build homes	Ability to use custom EPDs	Link to online database of EPDs
Software platform	Software platform	Standalone, e.g. MS Excel	Excel or web-based	Linked to dynamic data sets, e.g. web-based
	Cost	Free of charge to developers		
	Updates		FHH generic data set regularly updated	All functionality regularly updated

Working groups to agree the methodology

- Working group 1: Defining the elements / buildups / material categories
- Working group 2: Identifying the relevant generic A1-A3 data and sources
- Working group 3: Identifying the modelling assumptions and conventions for new homes

- Working group 4: Comparative study – low carbon options

- Working group 5: User interface and beta testing

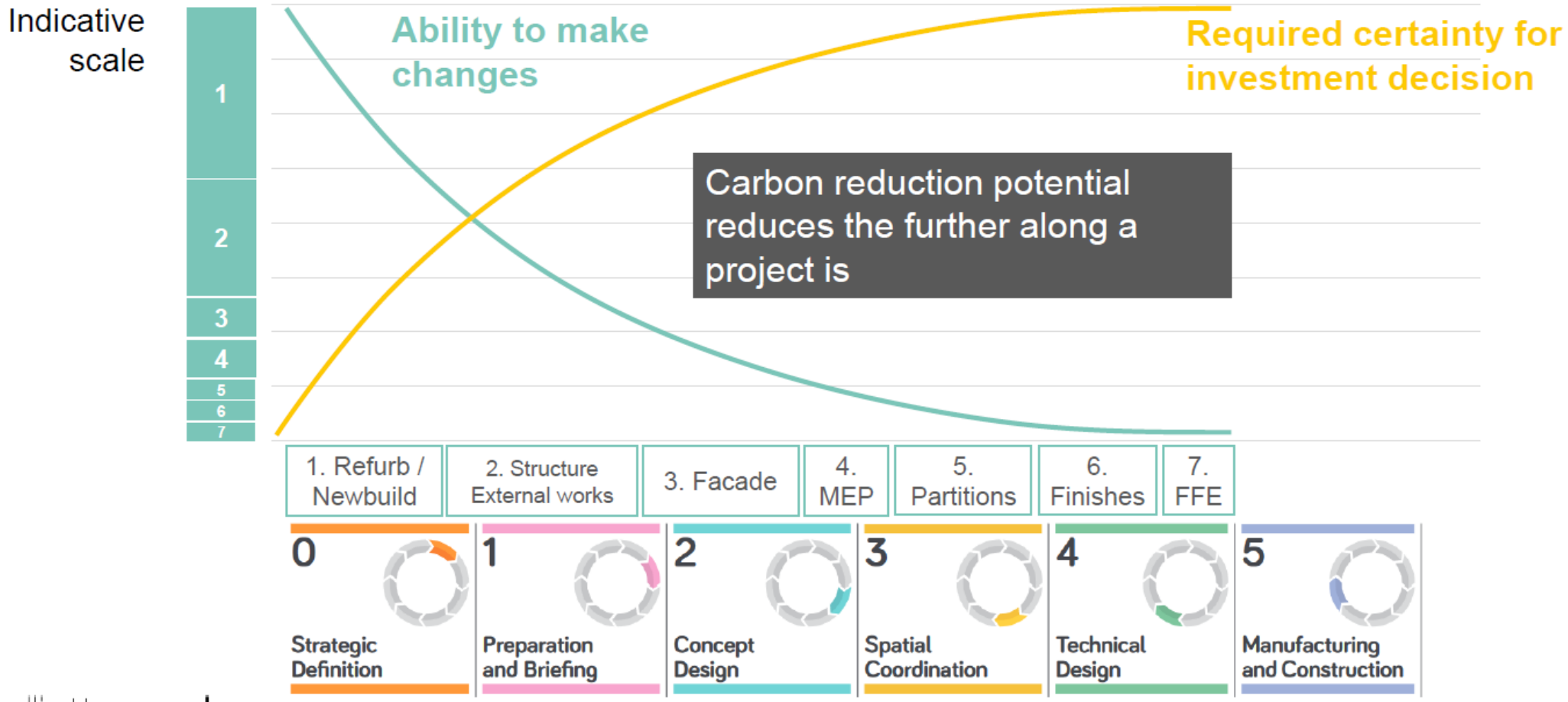
High level programme

v1 beta version in Dec ‘23

v1 launch version in Mar ’24

v2 updated version in Jun ‘24

Remember: Carbon reduction potential at early stages



elliottwood FeildenCleggBradleyStudios

www.futurehomes.org.uk