Carbon Net Zero

Where are we and what do we need to do?

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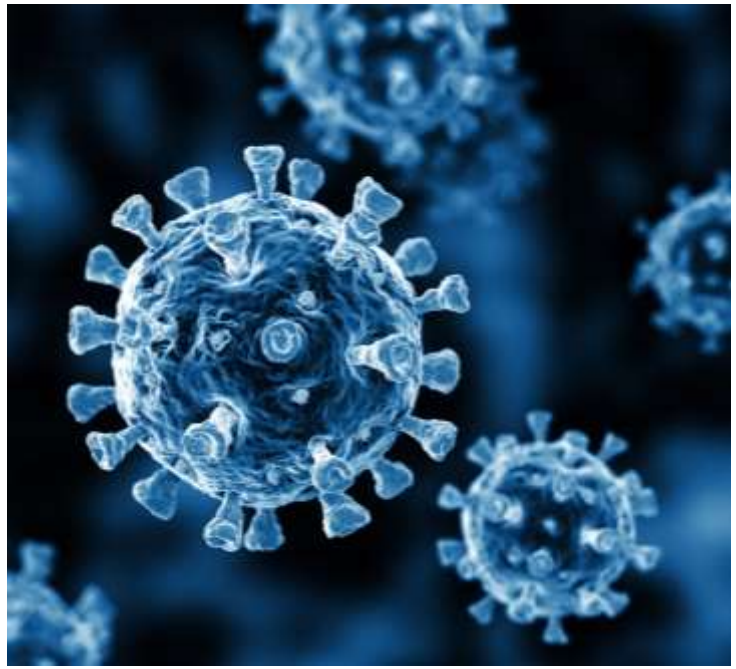
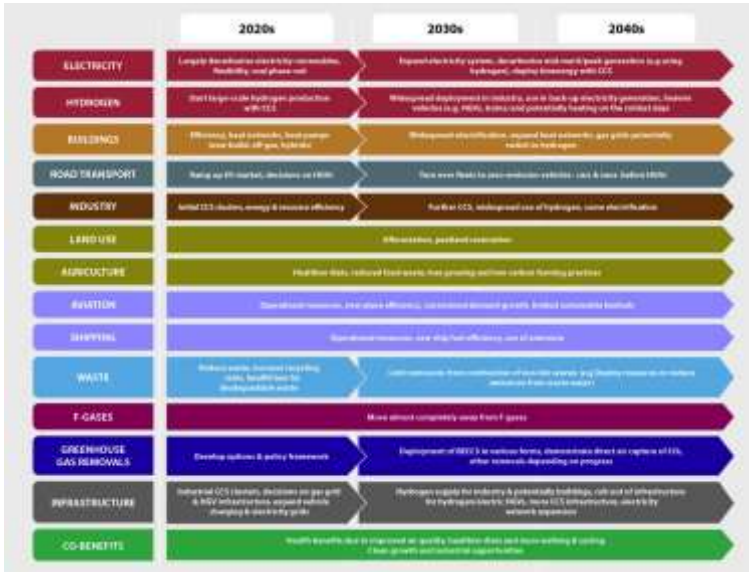
Where are we?


CAN WE DO SOMETHING
ABOUT CLIMATE CHANGE
...NOW PLEASE?

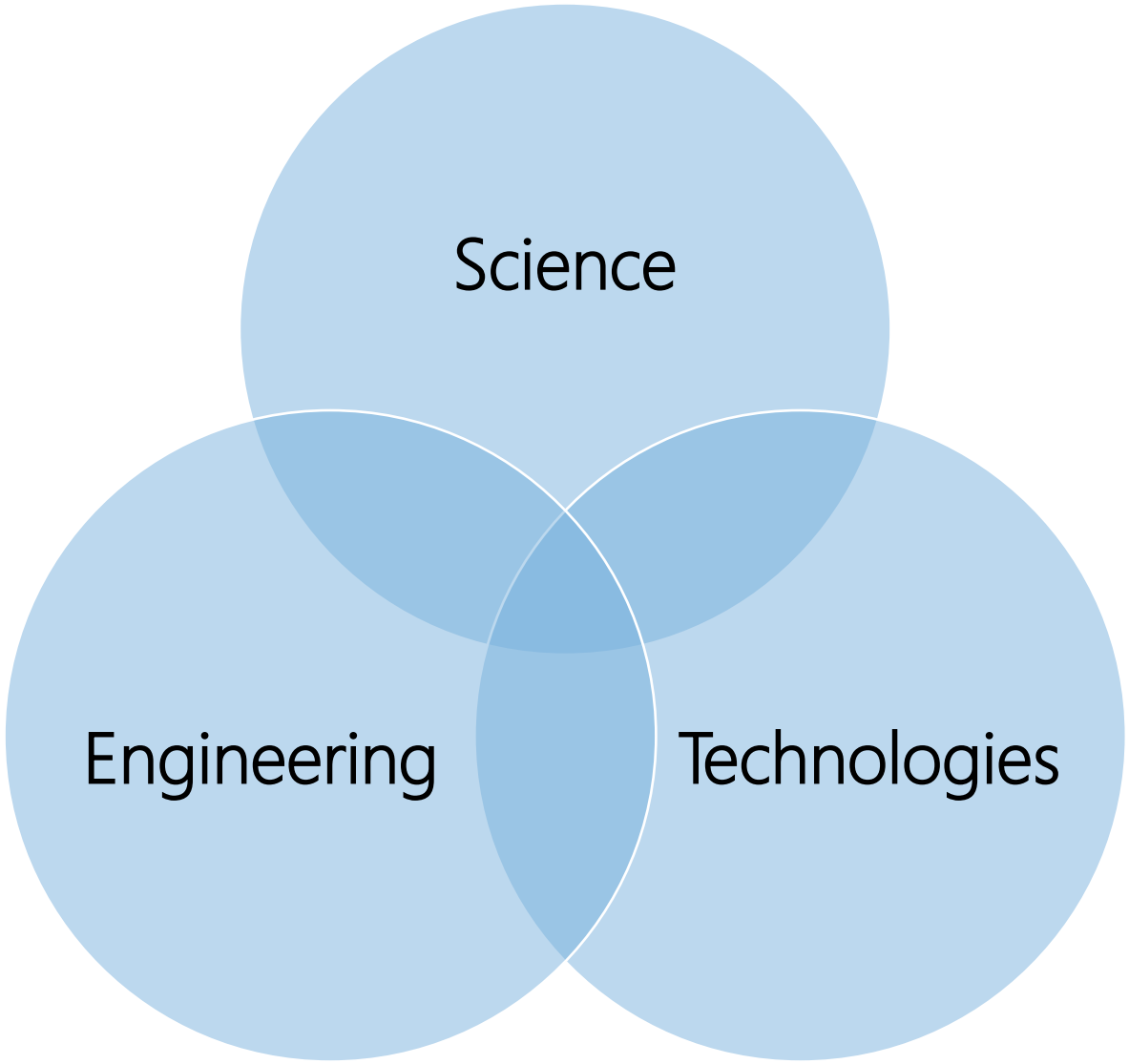

Net Zero 2030
1
Maximise renewable energy sourcing
2
Reduce our property footprint
3
Optimise travel "digital-first"
4
High speed trains vs short haul air travel
5
Fuel-efficient aircraft for long haul travel
6
Energy efficiency site improvements
7
Verified offsetting schemes for residual emissions



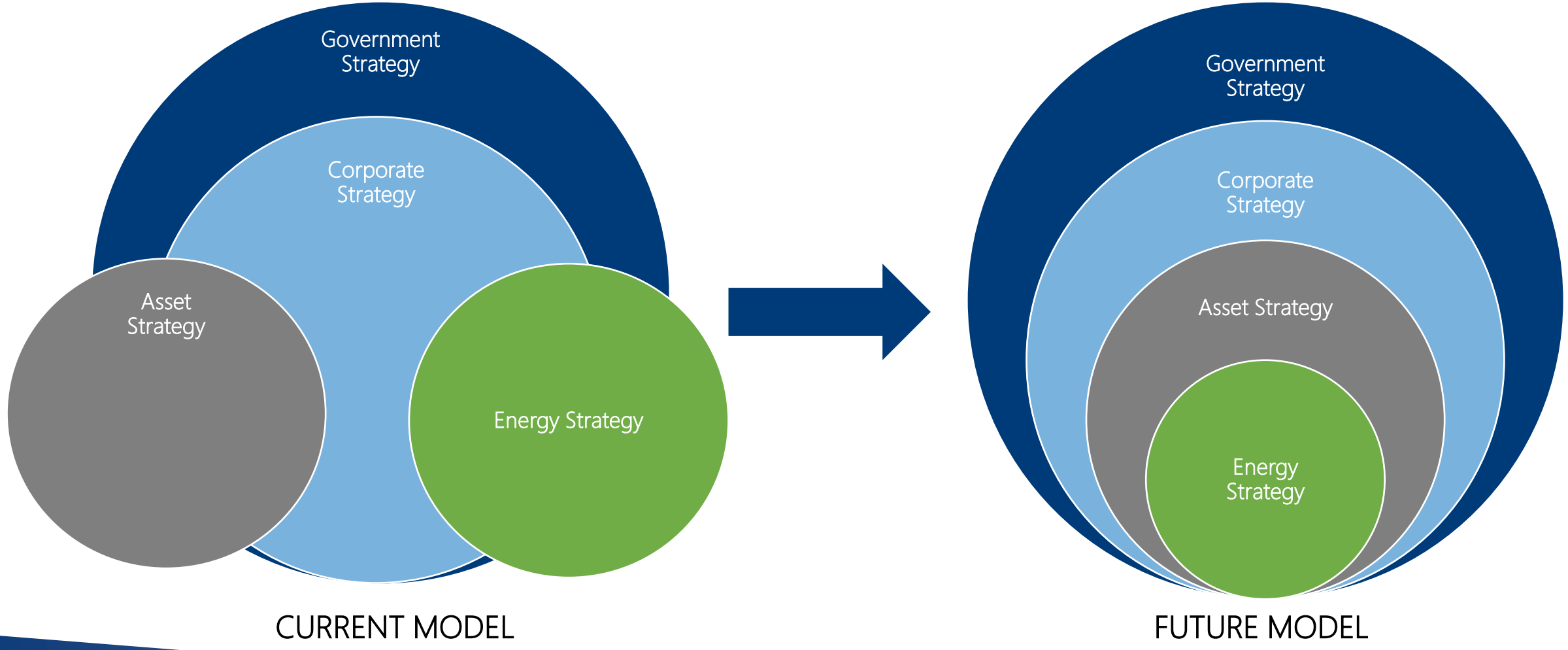
What do we need to do?



But how do we do that?



Strategic Property Model



Stakeholder Analysis – Influencing the agenda

STAKEHOLDER	ROLE	FROM PROPERTY STEWARD TO CLIMATE STEWARD
Political	Strategy adoption & implementation	Actively link schemes to strategy; demonstrate the "value" of the scheme (spend to save)
Economic	Facilitate Carbon Reduction Schemes	Promote integrated ways of financial modelling; whole life costing including Carbon cost / offset value
Sociological	Enhancing communities & modelling change	Reducing carbon footprint; influencing supply chain; Sharing risk
Technical	Promotion of smart technologies	Integrate design innovation and retro-fit technologies
Legal	Provide the Statutory and Regulatory Framework	Integrate legal, planning and building regs knowledge at the start of any scheme
Environmental	Promote and manage greater energy sustainability	Upskill on digital / smart infrastructure to maximise each scheme

So where do we start?

- The size of the NZC challenge and opportunity?:-
  - Housing accounts for circa 30% of the UK total emissions (Heat, Electricity)
  - 2008 to 2018 domestic end user emissions fell by 35% - decarbonisation of electricity, with gas and solid fuel emissions reducing by 15%
  - Non-domestic buildings - poor data on exact contribution ~12%
  - But… Local Authority 'Direct Control' estate is only 2-5% of total area emissions and have powers or influence over circa 1/3 of all emissions
  - ~60% of emissions reductions to achieve the Governments 6th Carbon Budget (2033-37) will need to come from societal and behaviour change, pure technology only ~40%

- Reducing these emissions from Buildings requires a combination of:-
  - New buildings - Net Zero Carbon, national frameworks / planning policies
  - Deep retrofitting existing buildings to minimise their emissions and decarbonising heat
  - Providing low or zero carbon energy infrastructure to supply buildings

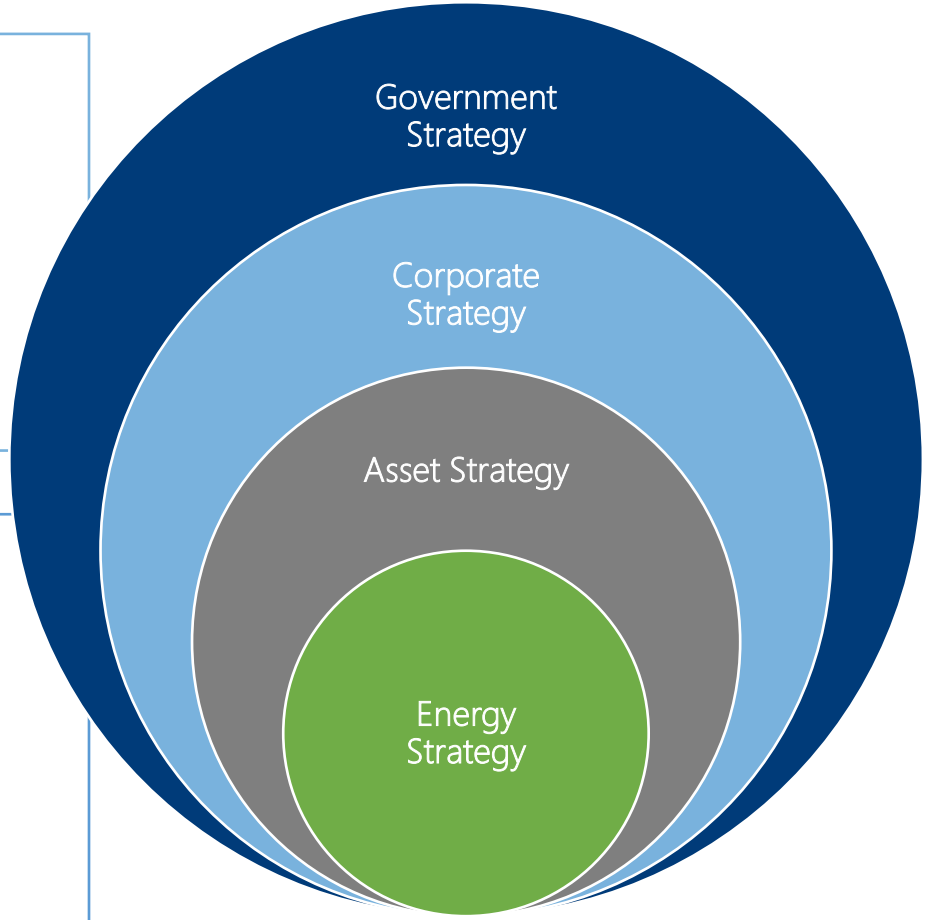
Retrofit & Energy Infrastructure

Site Prioritisation:-

- Asset Strategy – disposals, redevelopment?
- Asset performance – Benchmarking (CIBSE TM46), EPC's (MEES)?
- Largest energy consumers – Top 10..20..?
- Existing capital maintenance programmes (CMP's)
- Fossil fuel displacement – e.g. decarbonisation of oil and gas v heat pumps?
- Availability of existing funding – PSDS, Salix Loans, ERDF (Eastern New Energy)

Technology Fit:-

- Desktop and site energy audits (BS 16247) – Part 2 Buildings (fabric & M&E)
- Existing condition data
- Project costs, lifecycle assessment, energy, carbon and cost savings
- Green technology integration with existing CMP's
- Area-wide energy opportunities – heat networks, on-site and off-site solar.....
- Project deployment and procurement strategy - ESPO, RE:FIT...



Example Retrofit Project 1

Peterborough City Council:

- 2030 Target to be NCZ
- Top 10-consuming buildings - ~12.5 MWh, 2,640 T CO2e (23% of Gross Emissions)
- Desktop and site energy audits - ~20% reduction
- LCSF Funding to extend work for heat decarbonisation + 4 additional buildings
- Integration with PCC's Integrated Renewables Infrastructure (PIRI) Project
- Opportunity extended to over 5.4 MWh and 1,000 T CO2e savings
- Specific projects TBC

	Lean Proposals - Reducing Energy Use													Clean Proposals - Supply Energy Efficiently		Green Proposals - Using Renewable Energy		
	Lower / raise set point temperatures	Set up scheduleing / lock AC out temperatures	Install absence/present detection lighting control & daylight sensors where appropriate	Install sub-metering and monitor energy usage	Introducing building management systems (BMS) or smart meters	Time switch controls to water or heaters	Time switch controls to over-door heaters	Replace LED lighting where not fitted	Create a draught lobby at building entrance or other relevant location	Draught proofing by introducing automatic door closers, sealing gaps around doors and windows and installing/ replacing weather stripping	To control glare and heat gain, it should be considered to add solar control film.	Increase the level of insulation (if) correctly the current insulation within the roof space.	Upgrade of building fabric, increasing u- values of existing building envelope	Installation of more efficient gas boilers (at end of current boiler life)	Installation of a CHP System	Installation / upgrade of a solar thermal system.	Installation / upgrade of solar PV system	Workplace Electric Vehicle (EV) Charging Facilities
Bushfield Leisure Centre	✓	✓	✓	✓				✓	FIR				FIR	✓				✓
Central Library	✓	✓	✓	✓	FIR			✓		FIR	FIR		FIR	✓			✓	✓
City College	✓	✓	✓	✓	FIR	✓		✓		FIR	FIR		FIR	✓			✓	✓
Clare Lodge	✓	✓	✓	✓				✓				✓	FIR	✓	✓		✓	✓
Hampton VP Fitness & Leisure	✓		✓	✓			✓	✓		FIR					✓ (Or PV)	Maint.	✓ (Or CHP)	✓
Jack Hunt Pool	✓	✓	✓	✓				✓	FIR				FIR	✓				✓
Key Theatre	✓	✓						✓									✓ (Maint.)	✓
Museum & Art Gallery			✓	✓				✓	FIR	FIR			FIR	✓			✓	✓
Regional Fitness and Indoor Swimming Centre	✓	✓	✓	✓				✓					FIR	✓		FIR	FIR	✓
Sand Martin House																	✓	

Example Retrofit Project 2

Norwich City Council – City Hall

- Existing capital funding allocated for replacement of life-expired gas boilers
- LCSF secured to explore options for integration of ASHP's to displace gas consumption
- Two ASHP potential feasibility options identified to displace ~25-50% of gas;
- Significant funding secured through PSDS Phase 1 including glazing improvements for noise attenuation of ASHP's;
- Grade listed building so planning issues need to be overcome;
- Detailed design ongoing for location, loadings, sound attenuation etc..

Norwich City Council – Goldsmith Street

- Drivers & lessons learnt on Passivhaus schemes
- Goldsmith Street, the first social housing scheme in history to win the Stirling Prize
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- Over 1,000 more Passivhaus homes in pipeline
- Councils are starting to build some of the best quality, sustainable housing in the country

Why Passivhaus?

- Reducing TA waiting list, eliminating fuel poverty and meeting councils' zero carbon targets (2030)
- Build 'carbon ready' homes now (2025 Part L), avoid expensive retrofit costs
- Reducing fuel poverty helps reduce overall poverty (residents can heat their two-bed homes for £150 a year)
- Residents love Passivhaus and don't tend to move – creates a real sense of community
- Outside playing areas for children, neighbours socialising - even more important post- Covid

Building the business case

- Passivhaus can be more risky and expensive
- 5-10% uplift in costs
- Value for money Vs. Capital cost – lower fuel bills, longevity of properties, future proofing assets, less voids etc.
- Demonstrate wider social, economic and environmental benefits
- Sold Passivhaus to Members with resident feedback - tenants are the greatest advocates of Passivhaus
- Academic bodies currently looking at soft metrics to measure Passivhaus benefits (education attainment, health, wellbeing etc.)

Key lessons learnt

- Building form / orientation important
- Landscape just as crucial as housing (this is what fosters sense of community)
- JCT traditional contract (architect regains control)
- Easier to use a contractor who already has experience with Passivhaus, Fabric First Framework
- Find advocates of Passivhaus to share knowledge / get internal buy-in
- Education is important - bust Passivhaus myths