CITY LIVING

Delivering Sustainable Energy Efficient Developments

EXETER
LIVE BETTER

The Exeter City Council Way
Tuesday 6 November 2018

Exeter
City Council

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1. Overview of new build
2. Environmental Factors:
   - Low energy (Passivhaus)
   - Healthy
   - Climate ready
3. Commercial Sustainability
4. Exeter City Living Developments
5. Questions

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Overview of New Build

2009 to date

Rowan House

2009

Knights Place

Barberry Close

2015

Silverberry Close

Reed walk

Development Pipeline

Vaughan Road

2018

COB Wave III

2018

Extra Care

2018

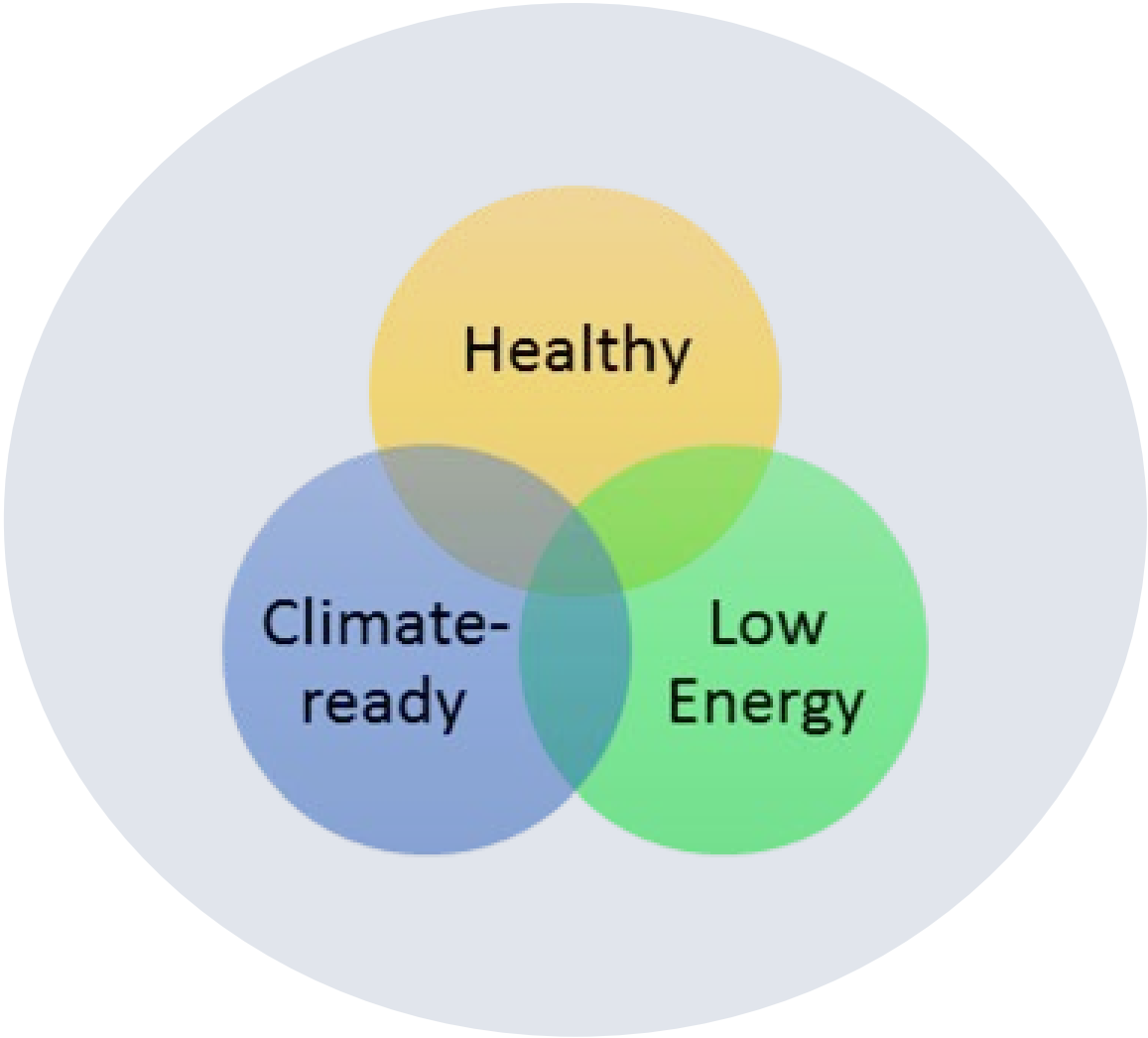
St Sidwell's Point

&

Bus Station

2018

Environmental Factors



Low Energy (Passivhaus)

What is Passivhaus?

- a rigorous **energy** standard
- a rigorous **comfort** standard
- a rigorous **quality** standard

What is Passivhaus?

- developed in Germany between1988 and 1990 by Wolfgang Feist, a building physicist
- in response to concern that buildings were not performing as predicted
- Passivhaus Institute was founded in 1996 to promote and control the standard through certification
- 1,000 + passivhaus certified buildings in UK

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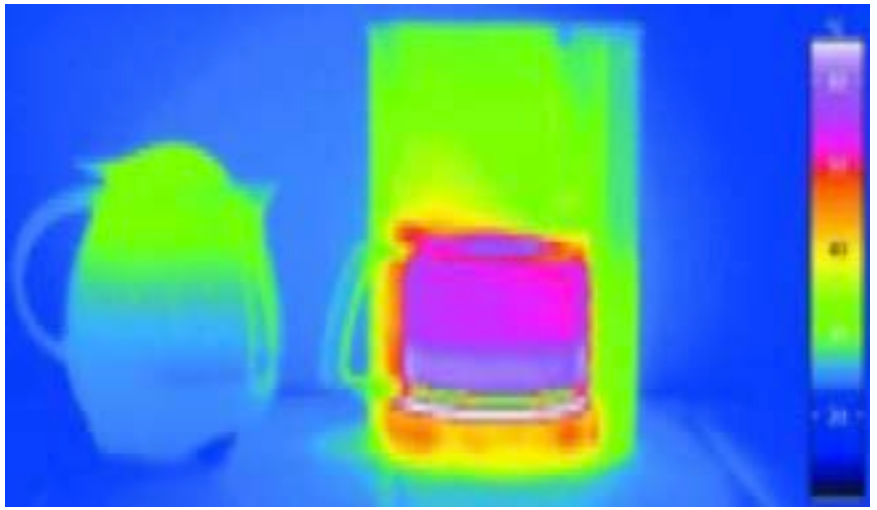
What is Passivhaus?



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How do you achieve Passivhaus?

- design the orientation and form of the building to optimise solar gain and improve day lighting
- improve the building fabric - eliminate thermal bridging, increase insulation, airtightness and window specification
- use MVHR to ensure sufficient ventilation, whilst avoiding unnecessary heat loss in winter

How do you achieve Passivhaus?

- use PHPP to demonstrate design achieves standard
- monitor construction carefully
- supply PHPP modelling, evidence from air test, and proof of supply of key products to Certifier
- Certifier assesses compliance and issues certificate

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Why Passivhaus?

It works!

"I love the fact that the flat is warm all the time and whenever I come in from outside it is always nice and warm unlike any other building I have been in"

" I have never felt uncomfortably hot or cold a single day since moving in"

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Why does Passivhaus work?

- it does not rely on complicated technology
- simply ***good design*** and ***good construction***
- underpinned by ***rigorous certification***

Why does Passivhaus work?

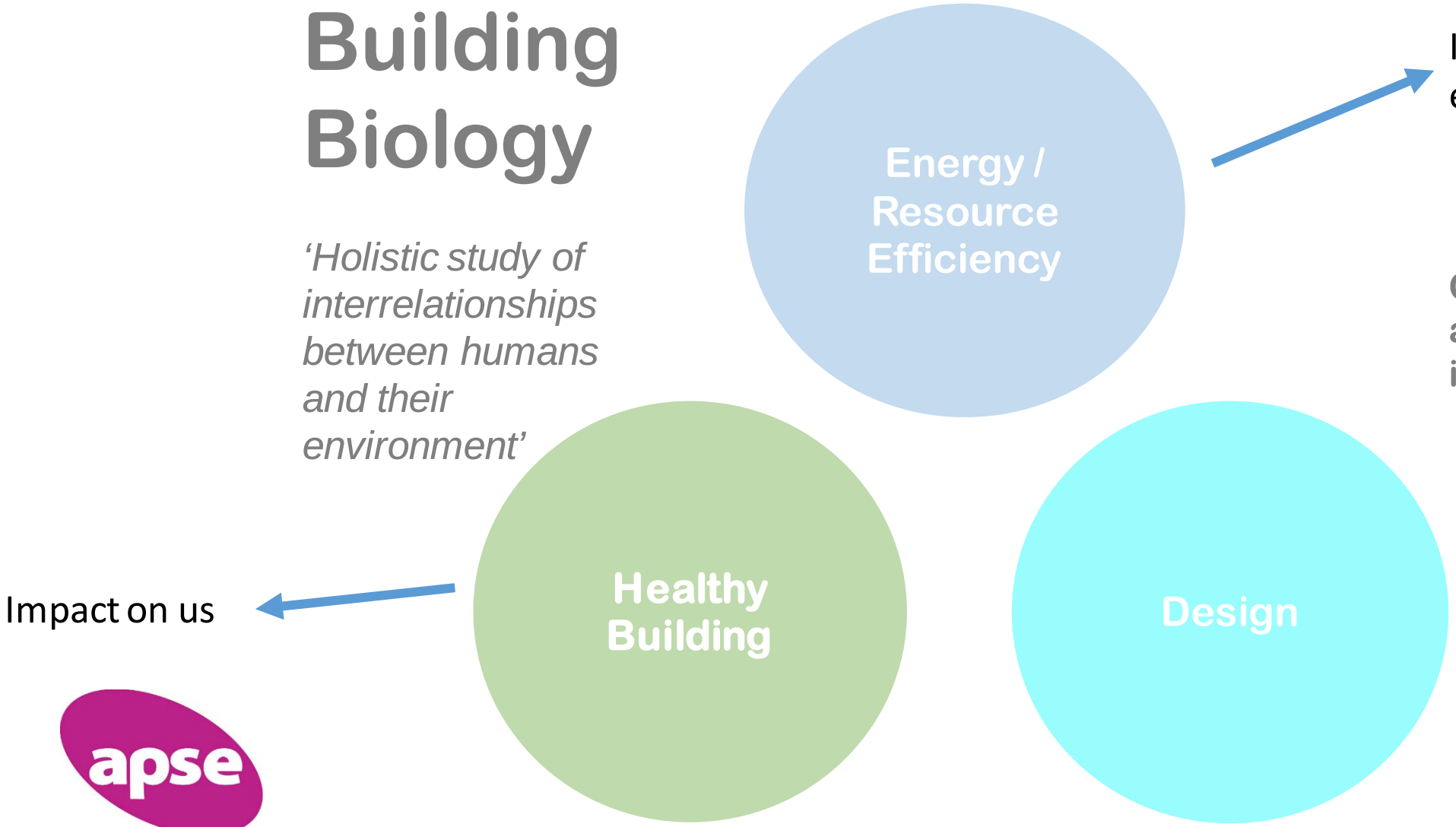
- based on sound building physics and on the evidence of what ***actually works***
- based on ***reducing energy, by design***, instead of offsetting carbon, by add-on
- encourages integrated design, and a rigorous discipline, that delivers ***buildings that work***

Dispelling Passivhaus myths…

- You can open the window
- It is not just a German standard
- It doesn`t dictate construction method
- It is not just a domestic standard
- It doesn`t exclude other standards e.g. BREEAM
- It does not need to be more expensive

Building Biology

'Holistic study of interrelationships between humans and their environment'



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ecodesign.co.uk
GALE SNOWDEN
exclusively low environmental impact design since 1992

Building Biology

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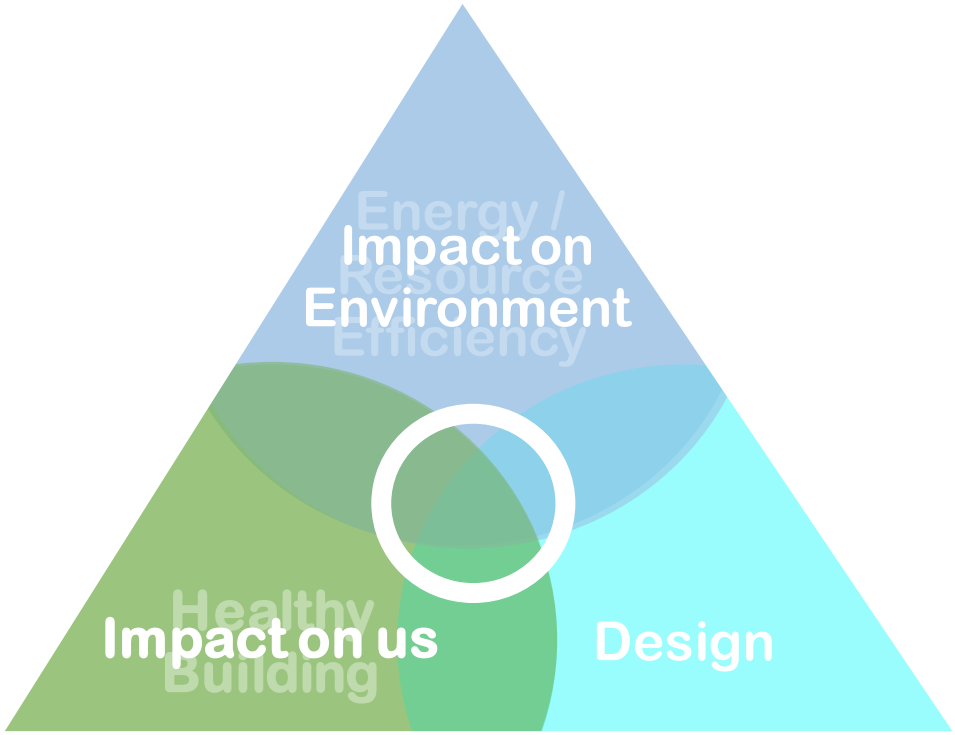

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Healthy Buildings

Our living environment is defined by the spaces and buildings we have created for ourselves

'Safety First!'
We take great care when it comes to
… what we eat …
… where our food comes from …
… what we give to our children …
… how we keep fit etc…

But … **when it comes to construction?**

The focus is only very rarely on the human being, their health or well-being but often purely cost driven:

- economic viability
- low maintenance costs
- short payback times
- health & safety costs during construction

Nutrition information			
Typical values	Per 100g	Per ¼ pot	% based on GDA for women
Energy	256 kJ 61 kcal	320 kJ 76 kcal	 3.8%
Protein	4.9g	6.1g	13.6%
Carbohydrate of which sugars of which starch	6.9g 6.9g nil	8.6g 8.6g nil	3.7% 9.6% -
Fat	1.5g	1.9g	2.7%

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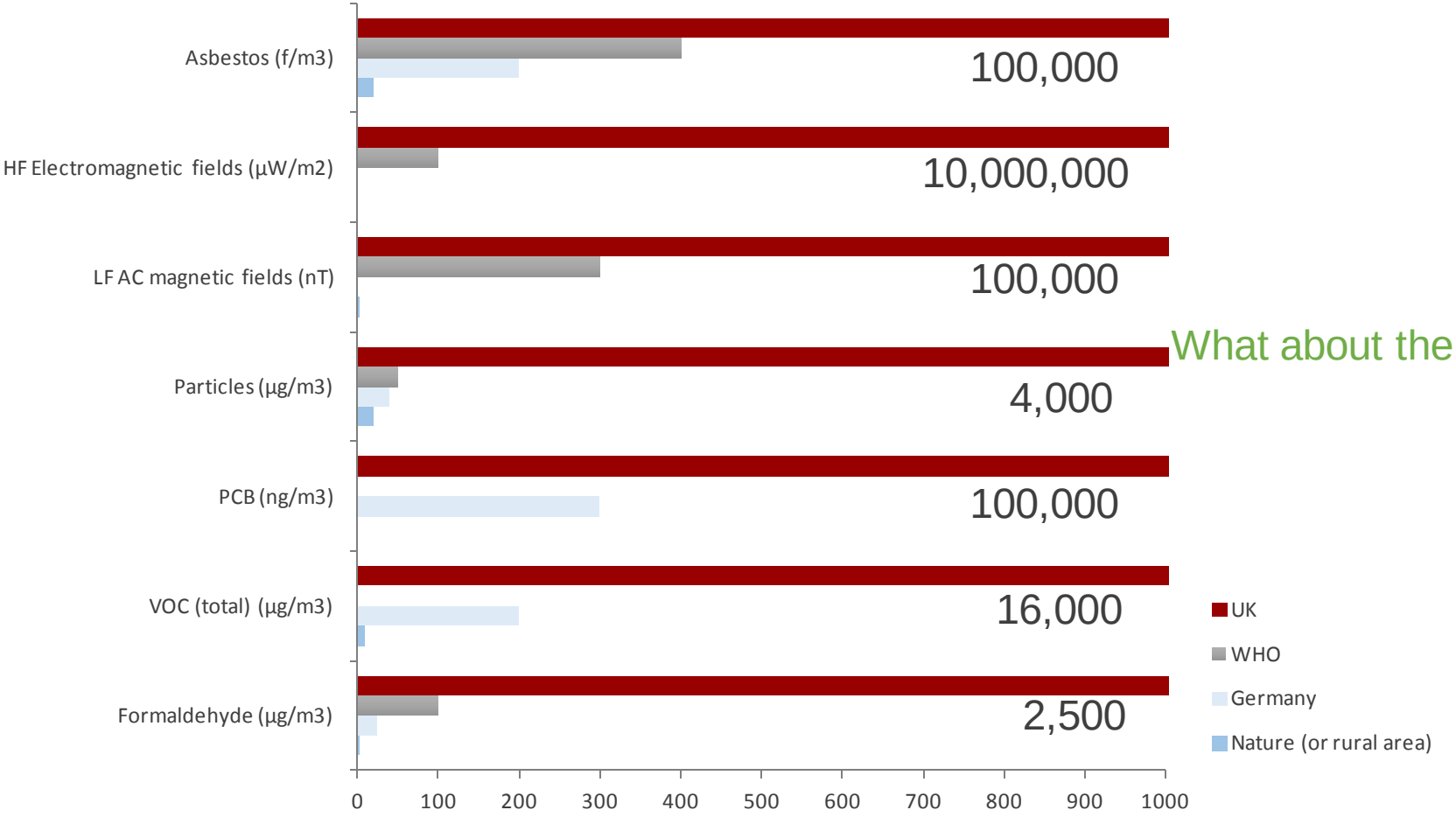
Healthy Buildings

Recommended limits for a range of substances classified as either '*carcinogenic (1)*' or '*possibly carcinogenic (2a)*' by the WHO.



What about the UK?

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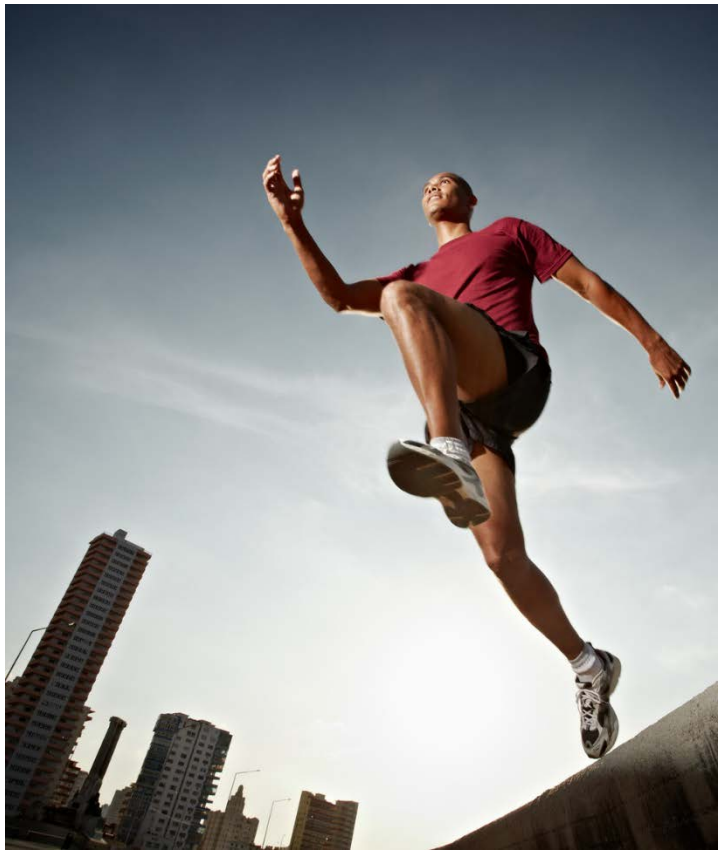
Healthy Design – Why bother?

On average we spend about **90% of our time indoors** and 30% of our time in bedrooms

At these exposure times **even low concentrations** of harmful substances **affect our health** in the long term and can cause chronic diseases. More vulnerable inhabitants like children and elderly persons are particularly exposed to this risk

Bau Biology is about managing this risk and reducing it where possible



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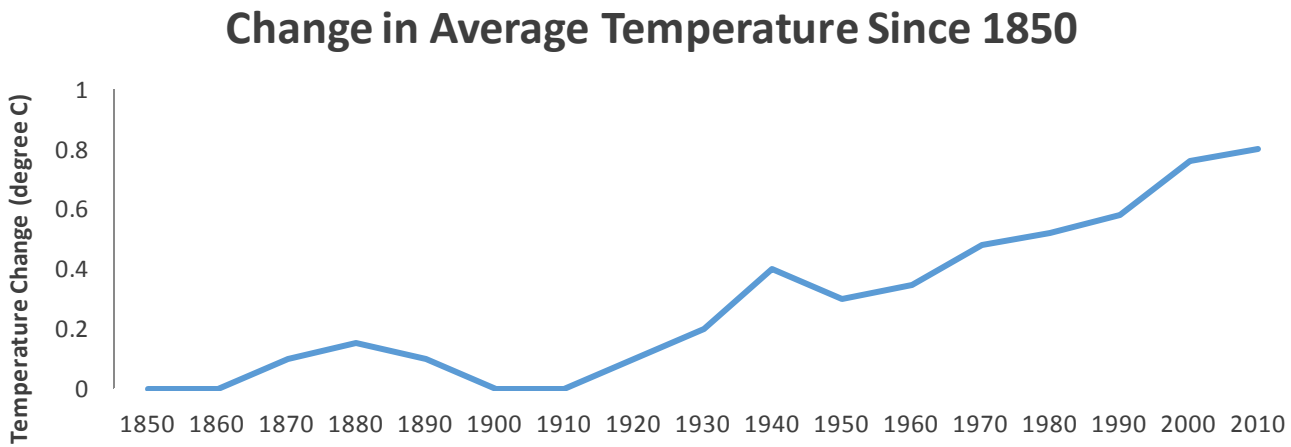
Climate Change

What is predicted for the UK?

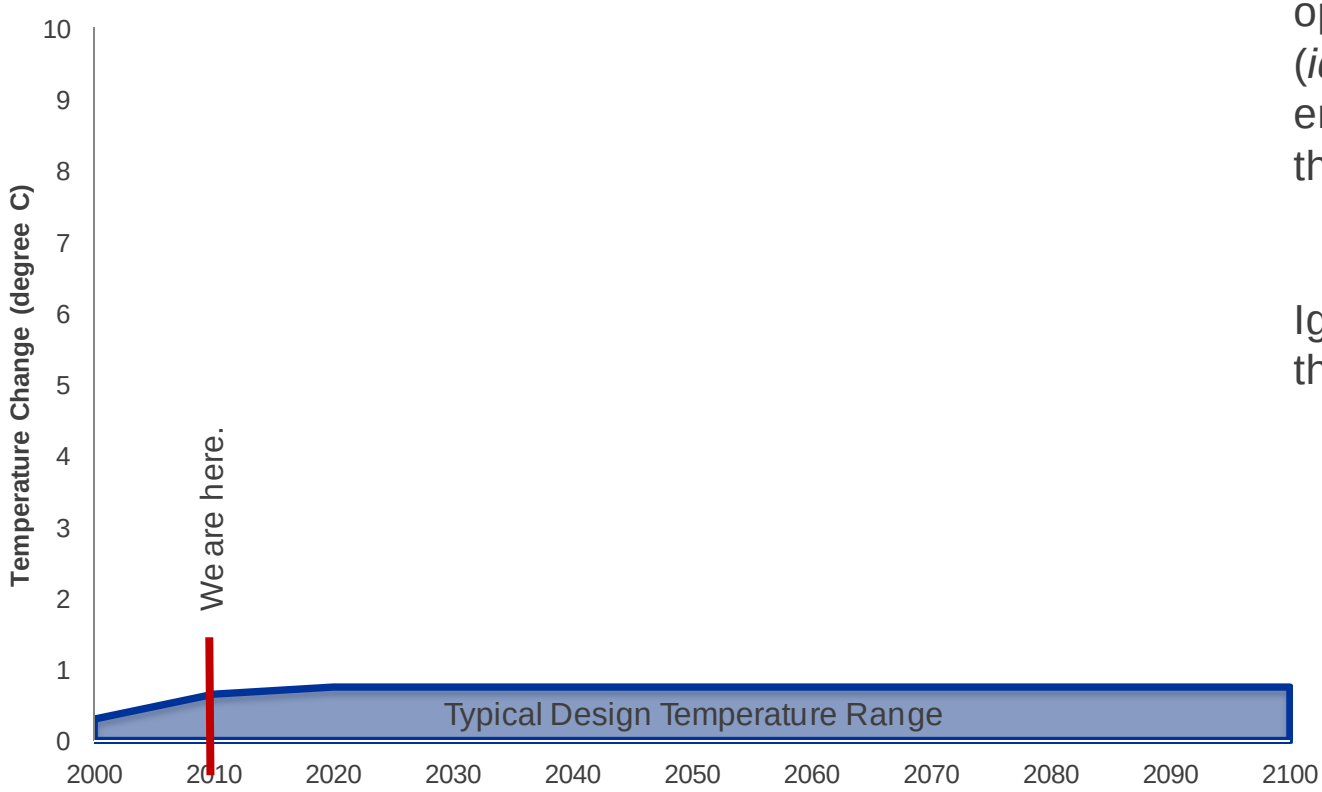
- Since 1960's the average temperature in UK has risen
- Average summer temperature increase of 4-6 degree by 2100
- Increase in UV radiation
- Events of extreme rainfall and flooding have become more frequent and this trend is predicted to increase



Overheating

What about climate change?

Building designers typically use weather data that is based on past experience to predict the future performance of a building.



The building is then designed to maintain optimum comfort and (*ideally*) to use minimal energy over the lifetime of the building.

Ignoring the evidence that the climate is changing.

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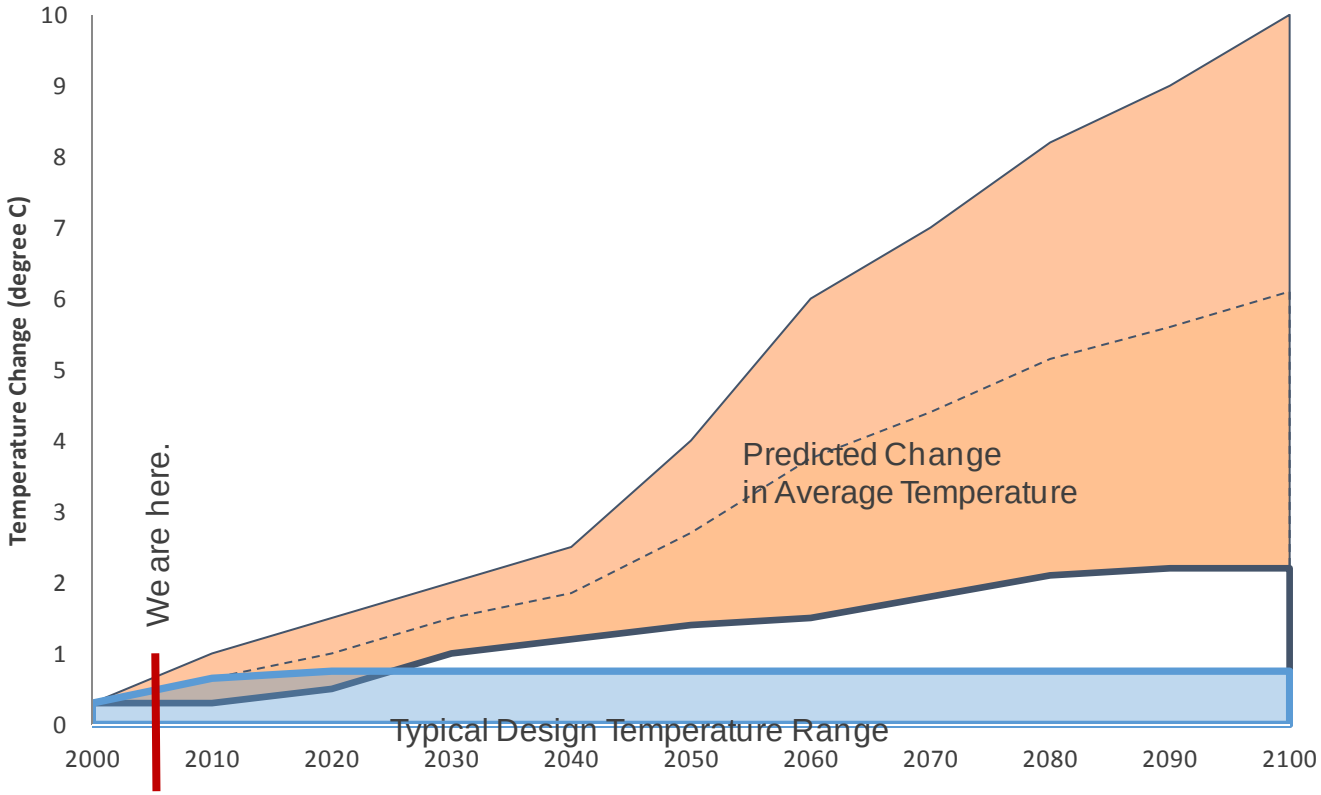


ECC uses probabilistic future weather data from Exeter University's *Prometheus Project* which were derived from the latest climate projections for the UK (UKCP09).

The projections are probabilistic in nature instead of deterministic so as to allow users to assess the level of risk.

Commercial Sustainability

Passivhaus Cost Effectiveness – Cost Overview

- 10-23% uplift – Aecom Cost Report
- 15% uplift to Building Regs 2010 – Passivhaus Institute
- 0-15% uplift – Passive House+ Magazine

- Caution needs to be taken in using these as it relies on having a clearly defined base cost (cost excluding Passivhaus), which can be influenced by the following;

a. Building Regulations
b. Secure by Design
c. Procurement Strategy
d. Design (Bespoke vs Standard)
e. Planning Requirements
f. Physical Site Constraints / Abnormals
g. Performance (did the base cost projects actually perform to Passivhaus standards?)

- Exeter City Council have developed residential (£1,145/m2) within conventional build cost range (£618-£1,330/m2).

Passivhaus Cost Effectiveness

Cost Drivers

Cost Increase	Cost Decrease
Better quality components	Compact forms
Air tightness products	Simpler systems
Ventilation system	Simpler controls
Attention to detail	

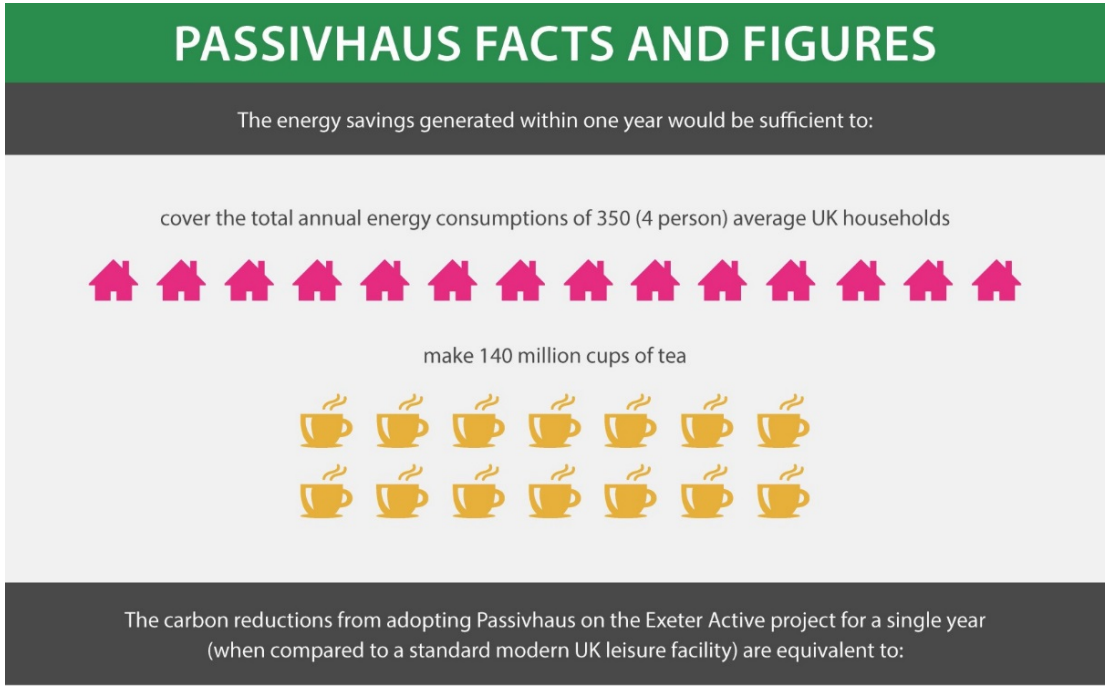
Early stages of design development is where the cost uplift can be limited with cost effective design decisions such as orientation, compact form etc.

The cost uplift is influenced by key drivers, which must be focused upon and optimised from the outset of design development.

Financial Savings

	Energy saving
Residential	90%
Commercial	70%

- Revenue costs reduced
- Life cycle costs reduced
- Capital costs can avoid premium



Ensuring Commercial Sustainability

- Right Client Brief – clear, concise & exact
- Right Consultancy Team – Experienced, qualified & motivated
- Right Design
- Right Contractor – Exeseed Framework
- Right Contract Form
- Post – Completion Monitoring

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Rowan House

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Knights Place

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Barberry Close

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Silverberry Close

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Reed Walk

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Vaughan Road

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St Loyes Extra Care

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St Loyes Extra Care

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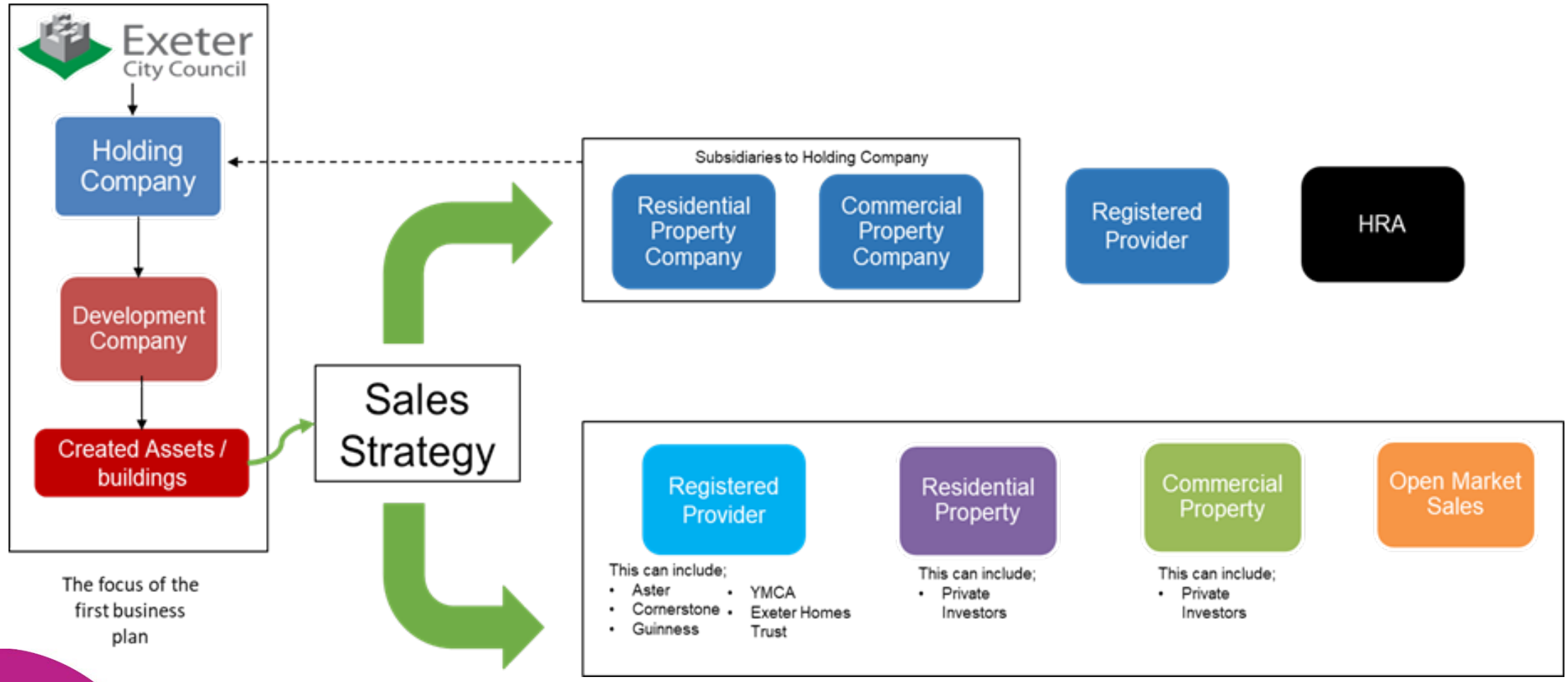
St Sidwell's Point

Exeter City Council

Exeter City Living Ltd



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Any Questions?

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