

CITY LIVING

Building Homes for the Future NOW

15 Years of Passivhaus

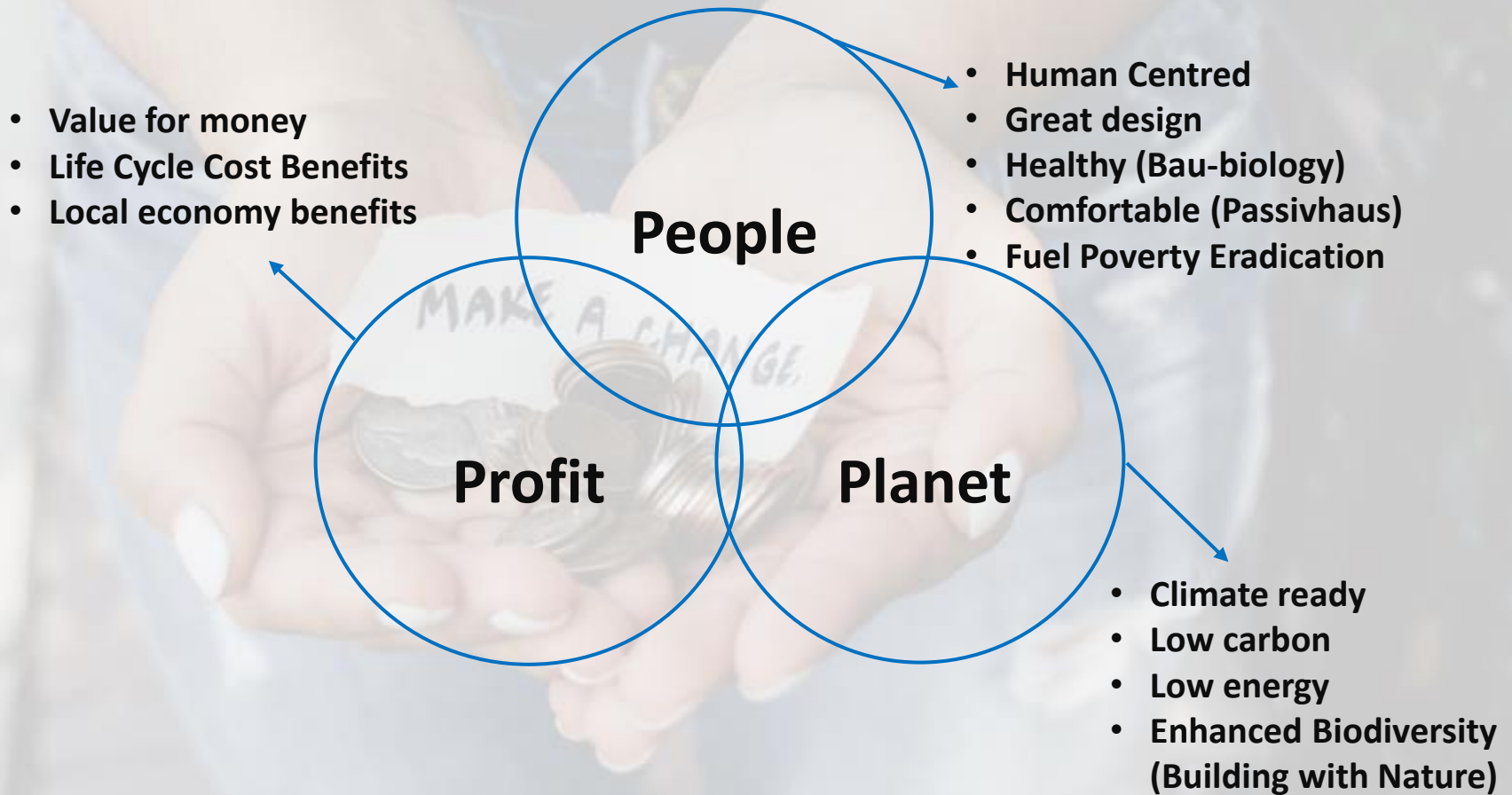
18 March 2022

- **Exeter's approach to Development**
- **15 years of Passivhaus Development in Exeter**
- **Passivhaus – Quick Overview**
- **Closing the Performance Gap**
- **The De-carbonisation Challenge**
- **Climate Challenge**
- **Business Case**

Triple Bottom Line Approach



Triple Bottom Line Approach



ECC / ECL Passivhaus Developments completed to date





The First Multi-residential Passivhaus Development In the UK 2010





Edwards Court:

The First Passivhaus Extra-care Home in the UK

Edwards Court



St Sidwells Point Leisure Centre



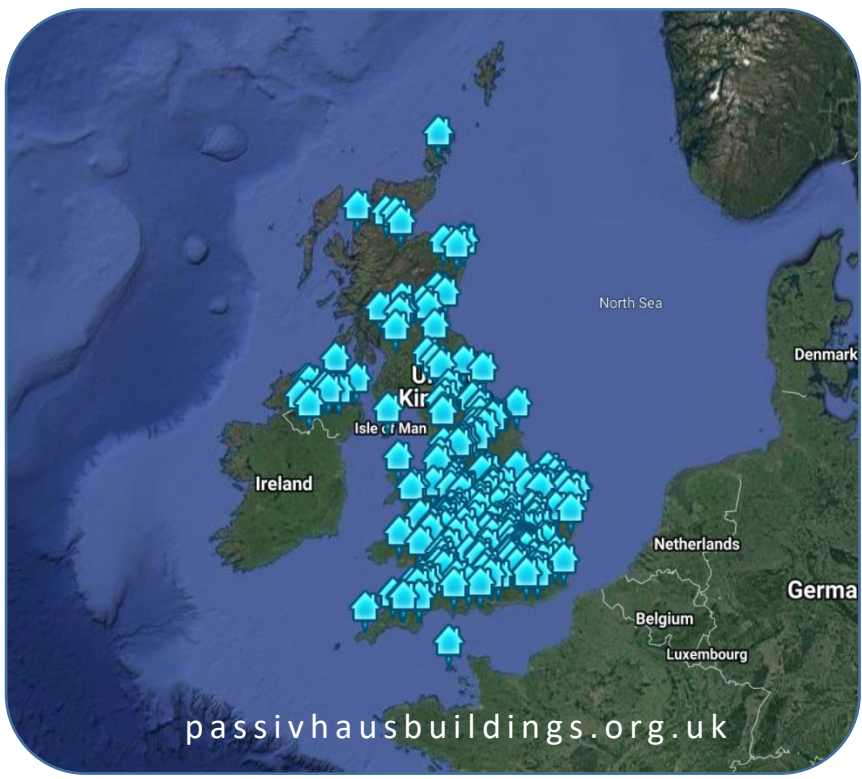
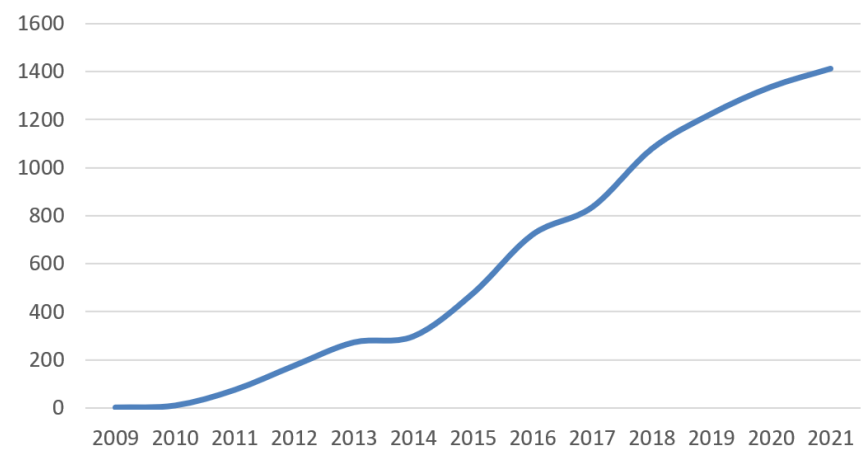


CITY LIVING

UK Passivhaus 2022

>1490 complete, > 7000 underway

Case studies can be viewed at:
<http://bit.ly/PHTprojects>

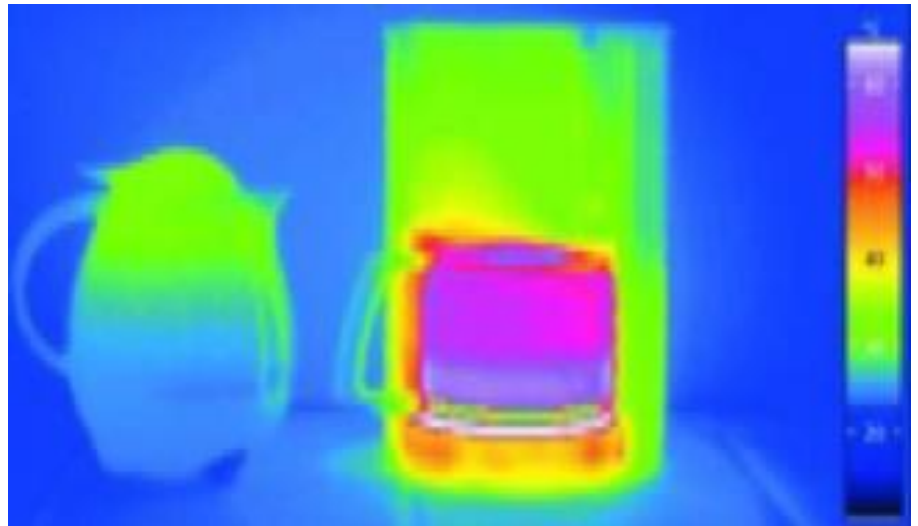


1490+ CERTIFIED UNITS
340 CERTIFIED PROJECTS

MORE THAN **7000** UNITS UNDER DEVELOPMENT

260+ PROJECTS UNDER DEVELOPMENT

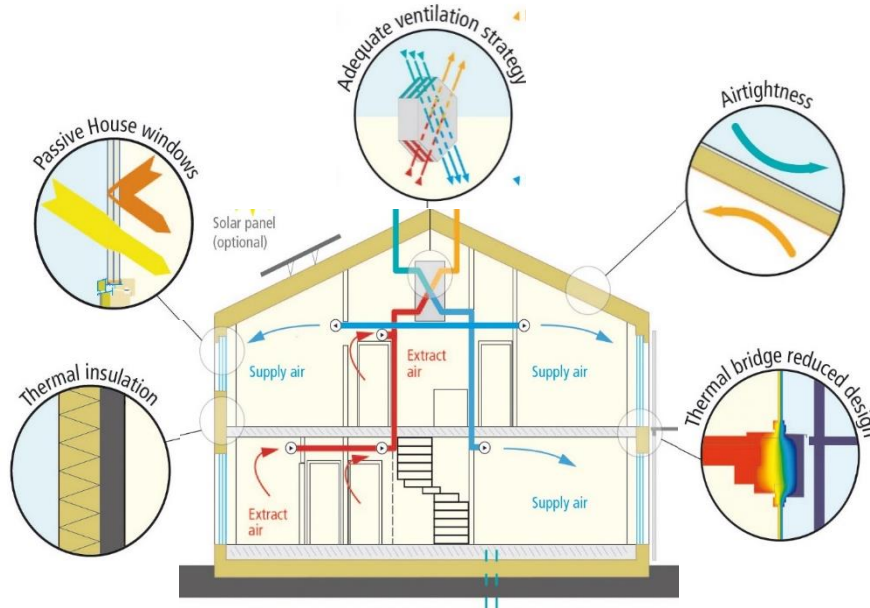
What is Passivhaus?



The Passivhaus Institute defines three sets of criteria that a building has to comply with to meet Passivhaus standard:

- Energy Criteria
- Comfort Criteria
- Hygiene Criteria

Passivhaus – How does it work?



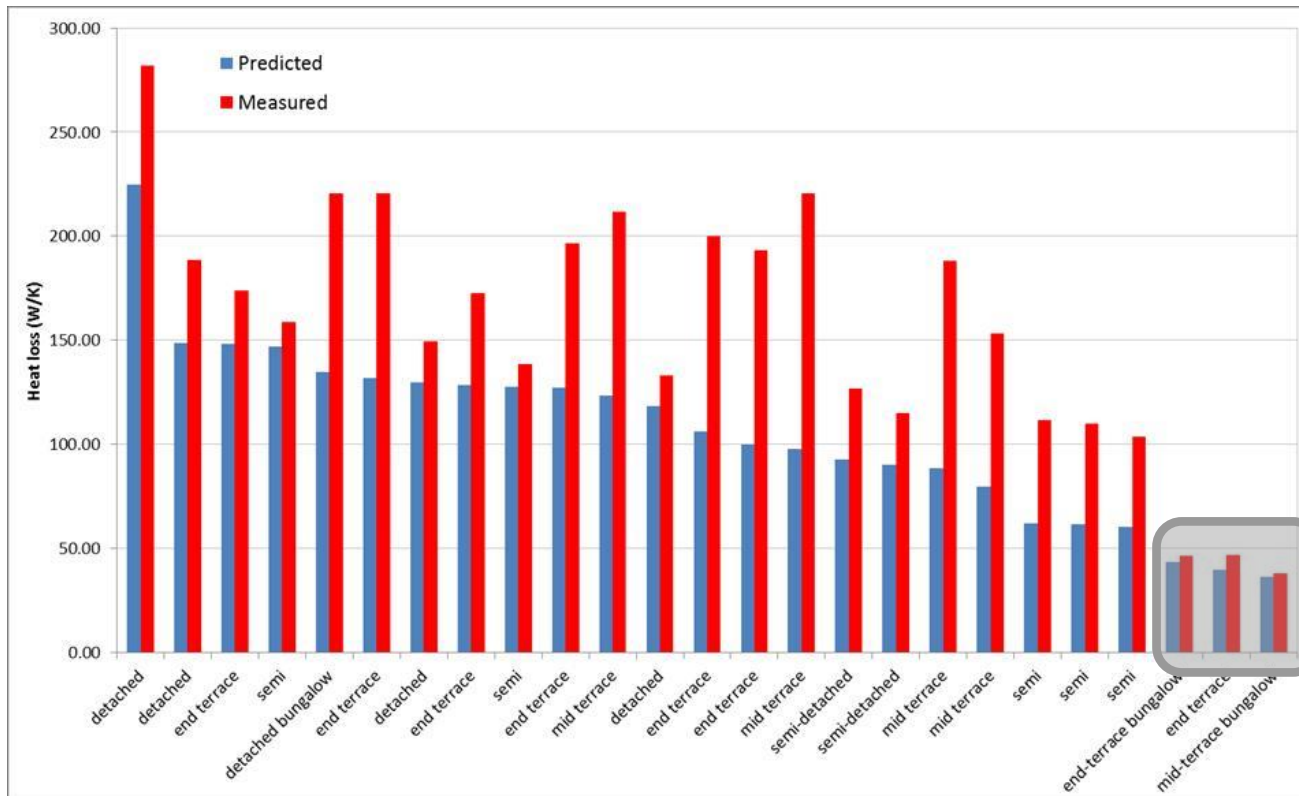
- Insulation
- U value $< 0.15 \text{ W/m}^2\text{K}$
- Continuous Air Tight Barrier
- Reduced Thermal Bridging! (following the PH method)
- High performance Windows and Doors
- MVHR $> 75\%$ efficient
- Optimised Solar Orientation
- Compact Building Form

Passivhaus

Why does it work?

Low/zero carbon performance monitoring

Comparison of predicted and actual energy demand of low energy buildings completed between 2011 and 2017



- Definition of 'low/zero carbon' varies widely
- All projects failed to predict the energy demand

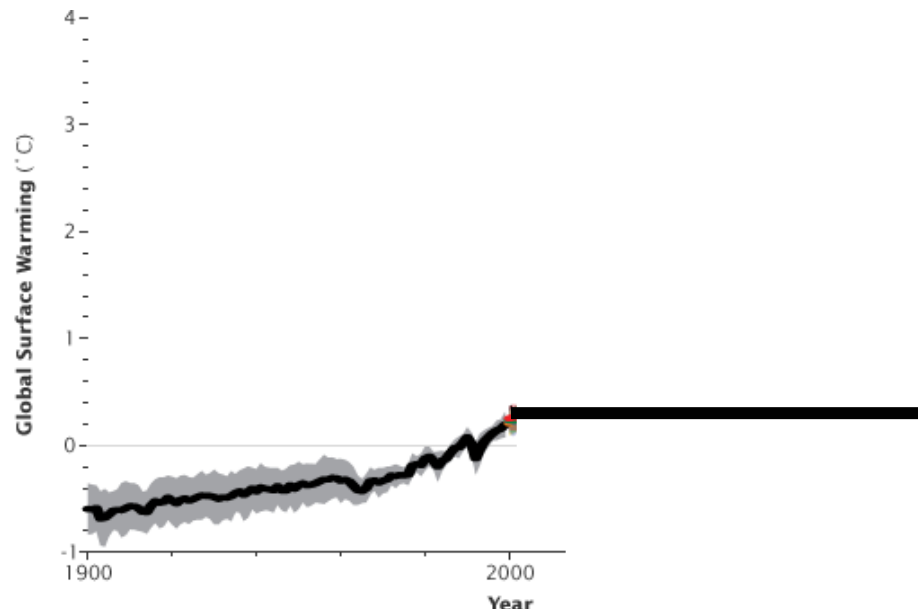


Co heating test results (Centre for the Build Environment, Leeds University)



Climate Change What's coming?

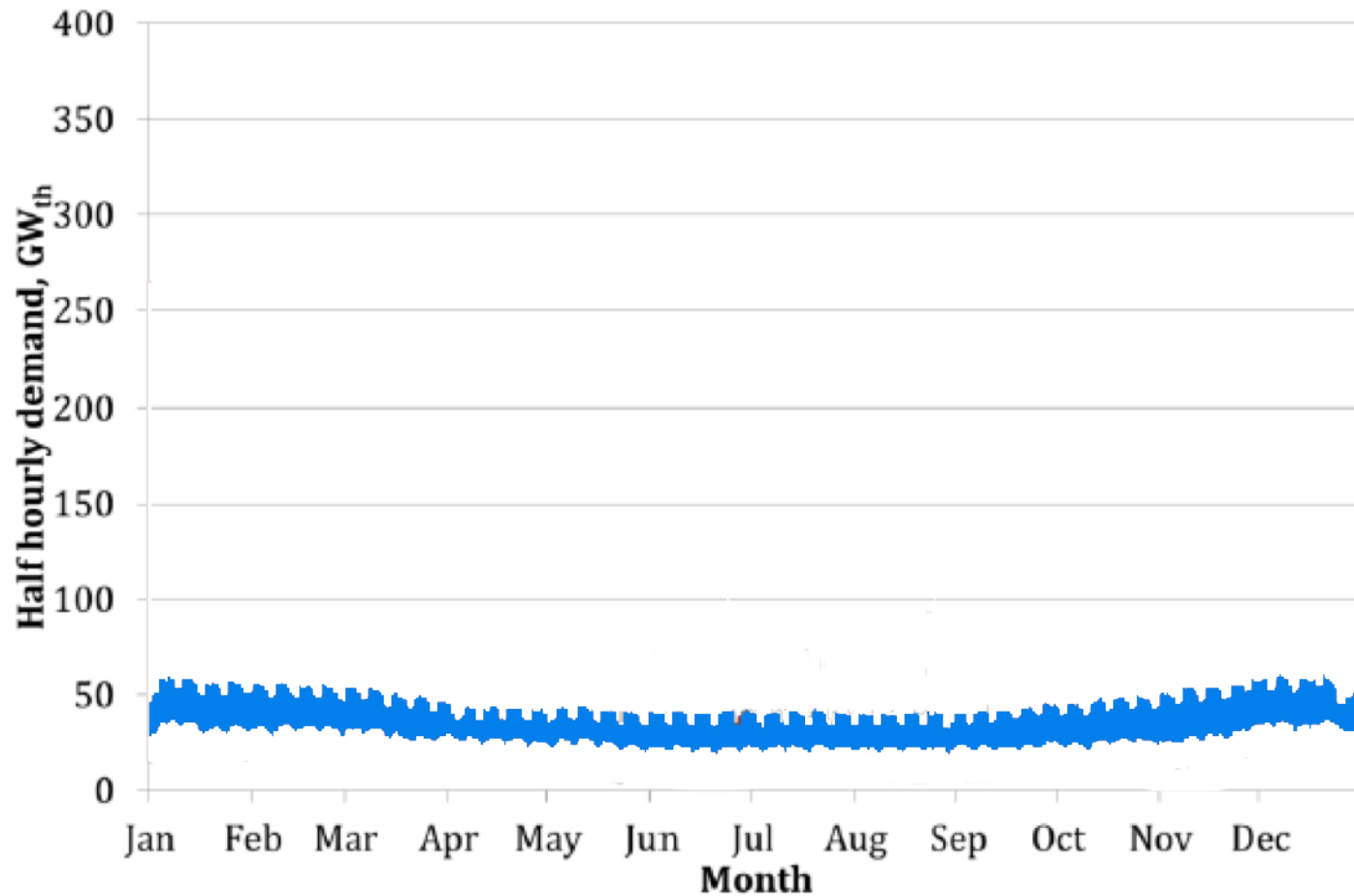
- Since 1960's the average temperature in UK has risen
- Average summer temperature increase of 4-6 degree by 2100
- Increase in UV radiation
- Events of extreme rainfall and flooding have become more frequent and this trend is predicted to increase



ECL requires future
Designers use
probabilistic data
'as is' static data
developed by
Exeter University



Driving Change De-carbonizing the UK energy grid



Total UK electricity vs heating demand (gas)



Driving Change De-carbonizing the UK energy grid

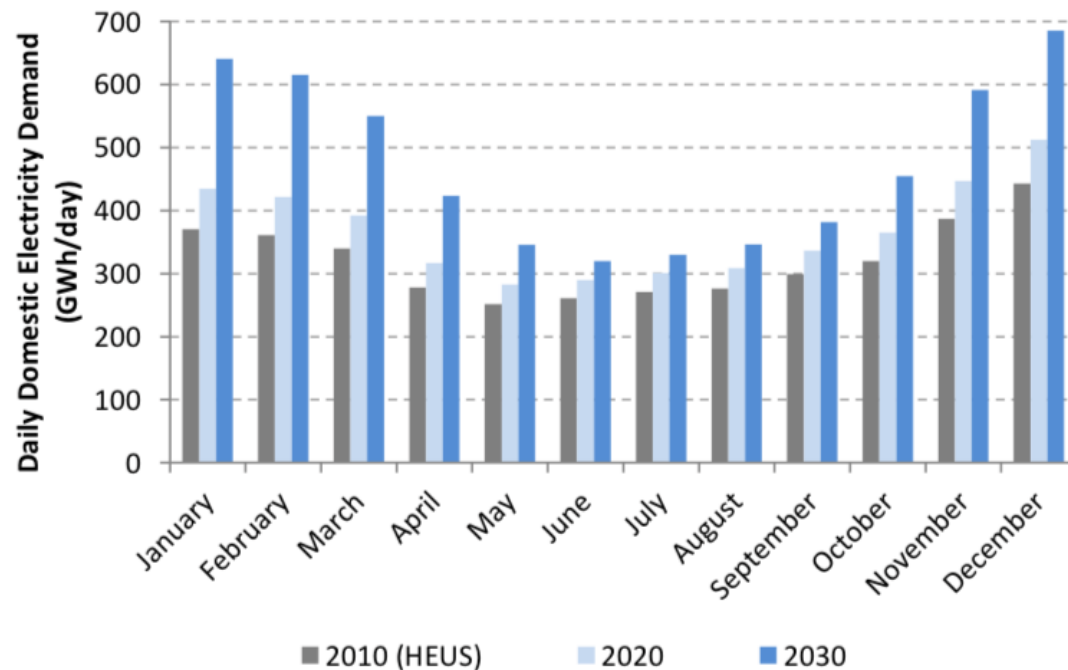
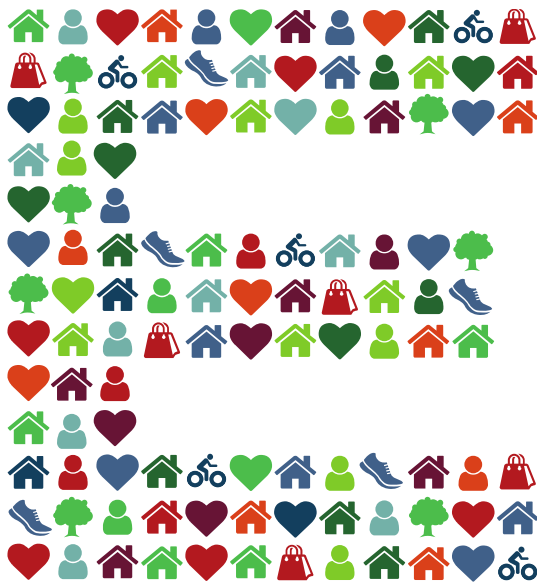


Figure 2: Forecast average daily electricity demand from domestic consumers, under the DECC High Uptake Scenario (i.e. high uptake of electric vehicles, heat pumps, solar PV and small-scale wind) compared to the 2010 HEUS monthly averages. By 2030, demand on an average day in December increases to more than double that of demand on average days in the summer months.



Business Case

- Lifecycle Cost Benefits
 - Energy Cost Savings
 - Retrofit Avoidance & Climate Resilience
 - Fabric Performance
- Tenant Satisfaction & Asset Management Benefits
 - Fuel poverty eradication
 - Less voids
 - Reduced anti-social behaviour
 - Enhanced health benefits
- Marketability & Sales Premium



CITY LIVING

Emma Osmundsen
Managing Director
Exeter City Living Ltd



emma.osmundsen@extercityliving.co.uk



Emma Osmundsen



@EmmaOsmun

