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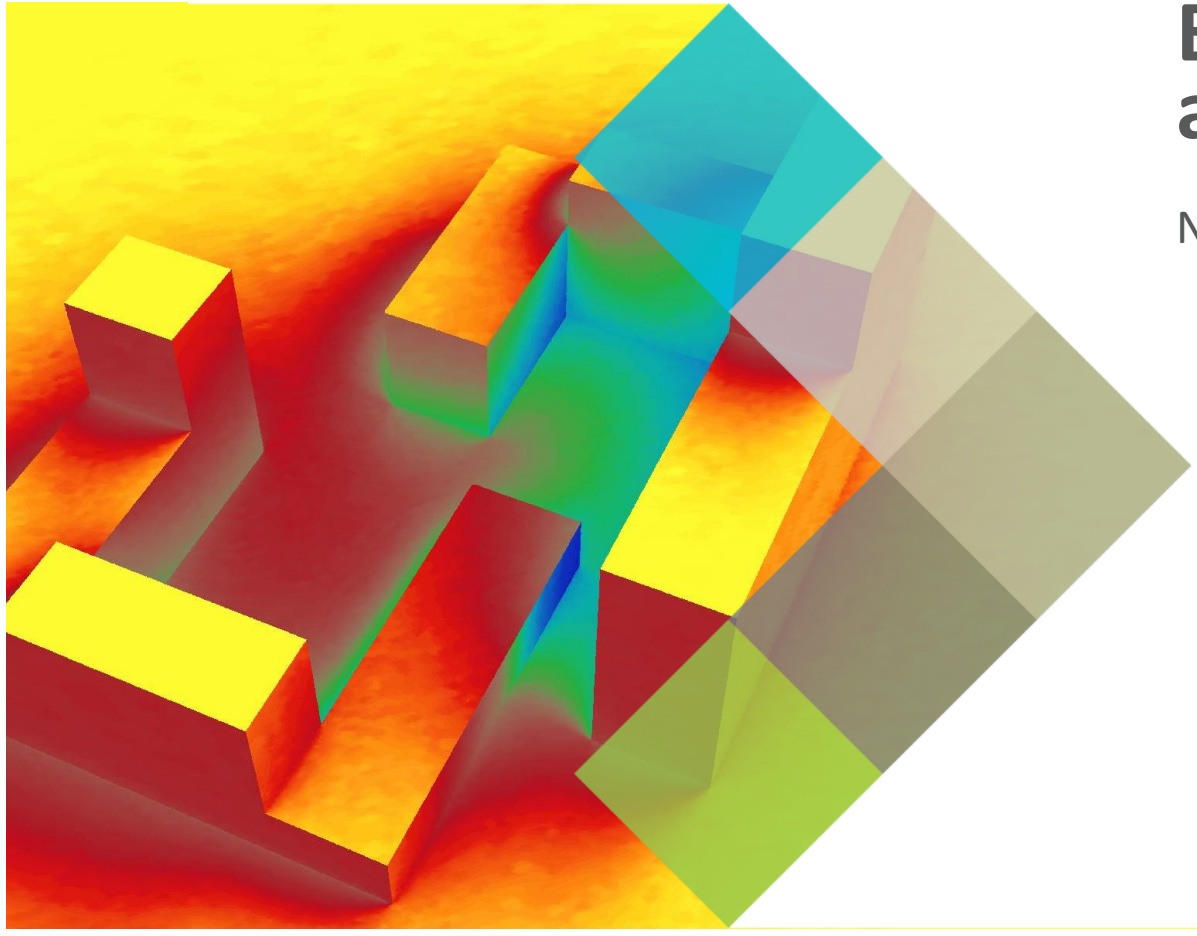

Equipping homes for a low-carbon future

New Homes

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18th January 2018

Background to Hodkinson Consultancy

- A specialist energy & environmental consultancy for planning and development.
- Our aim is to provide innovative and cost-effective strategies that respond to increasing demands for quality and construction efficiency.
- Formed in 1999, now employee owned, we provide a range of specialist technical services from planning applications through to post-construction assessments.

Our Work


Riverlight | St James


Hathaway House | Healey Development Solutions Ltd


Oval Gas Works | Berkeley Homes


Royal Arsenal Riverside | Berkeley Homes

190 Strand | St Edward


Valentine Place | Crest Nicholson


Acton Gardens | Countryside

Our Services

Energy & Environmental Planning

- Acoustics & Environmental Noise
- BREEAM Communities
- Daylight Sunlight
- Energy Statements
- Environmental Impact Assessments (EIA)
- Health Impact Assessments
- Lighting Pollution
- Noise Reports
- Overheating Analysis
- Planning Policy Advice
- Planning Pre-Assessments
- Renewable Energy Feasibility Studies
- Specialist Environmental Reports
- Sustainability Statements
- Zero Carbon Homes

Energy & Environmental Design

- Acoustic Design
- Alternative Methods of Construction
- Building Acoustics
- District Heating Advice
- Façade Optimisation
- Home & Building User Guides
- Inclusive Access
- Indoor Air Quality
- Overheating Analysis
- Passivhaus
- Post Occupancy Evaluation
- Secured by Design
- Solar Design
- Sustainable Drainage
- Thermal Bridging
- Utilities
- Water Use

Assessment & Compliance

- Air Tightness Testing
- BREEAM
- BREEAM Domestic Refurbishment
- CDM Advisor
- CDM Principal Designer
- Code for Sustainable Homes
- Home Quality Mark
- Passivhaus
- SAP
- SBEM
- Sound Testing

Background - why homes?

- Climate Change Act (2008): Greenhouse Gas emissions to be 80% of pre-1990 level
- Residential Sector accounts for 23% of end user emissions
- Carbon Plan required Zero Carbon homes from 2016 to deliver this target
- Zero Carbon target delayed in 2015

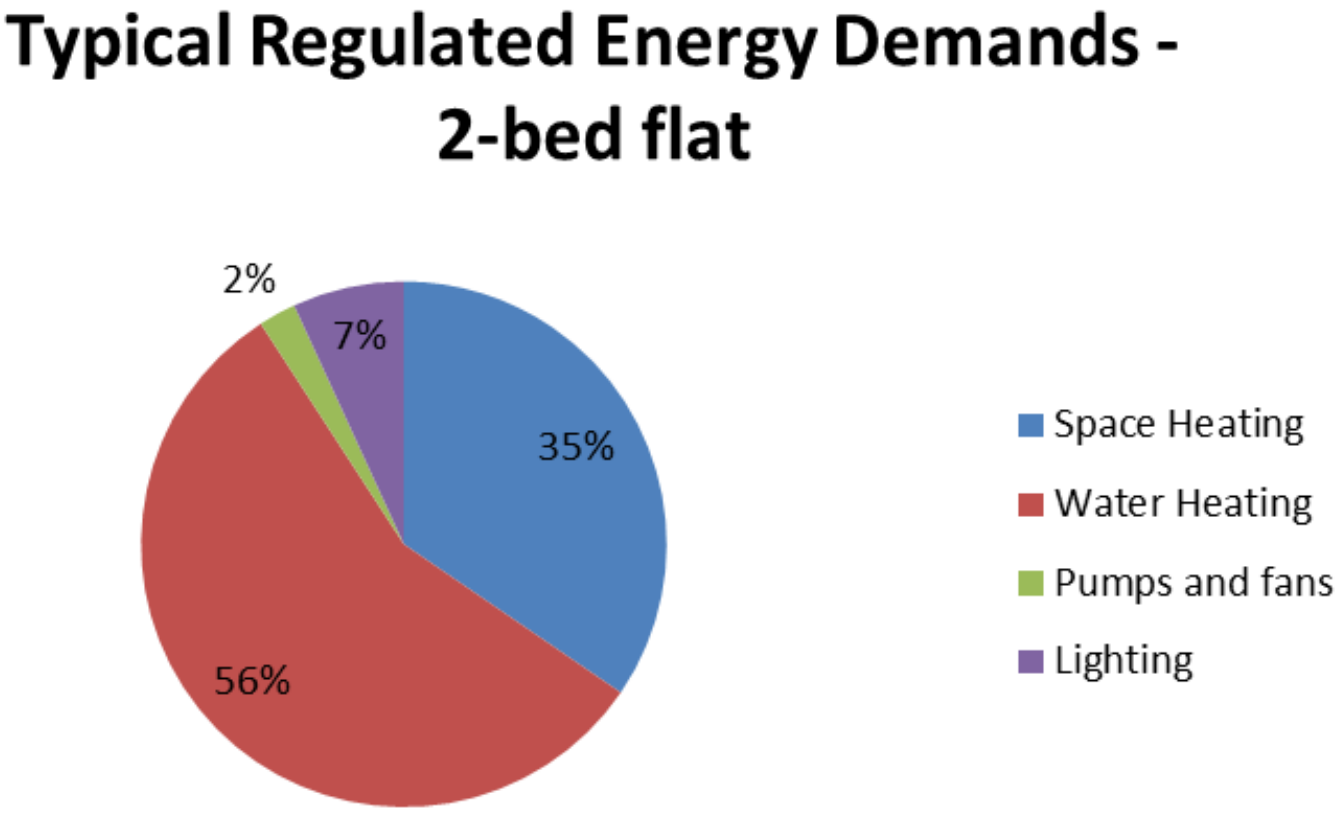
HM Government

Carbon Plan

Background - why new build?

- c.30 million total homes by 2050
- 250,000 new homes/yr required
- A further 8 million new homes yet to be built

Background – why heat?



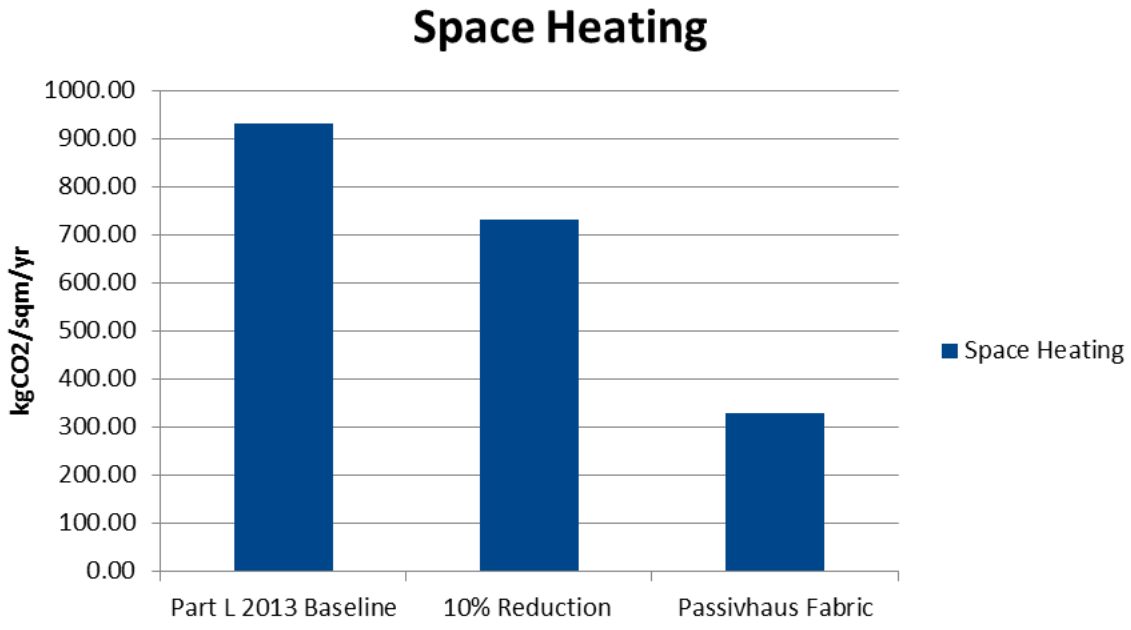
Success Criteria

How can we judge the success of energy strategies for new-build homes?

- Environmental performance
- Affordability
- Reliability
- Comfort
- Deliverability

Energy Efficiency Challenges

> There is significant scope to further reduce residential heating demand beyond current new-build standards



Energy Efficiency Challenges

> Significant challenges when reducing space heating demands:

- Cold Bridging
- Overheating
- Ventilation and air quality
- Daylighting
- Quality of work

> Complex design decisions required at an early stage:

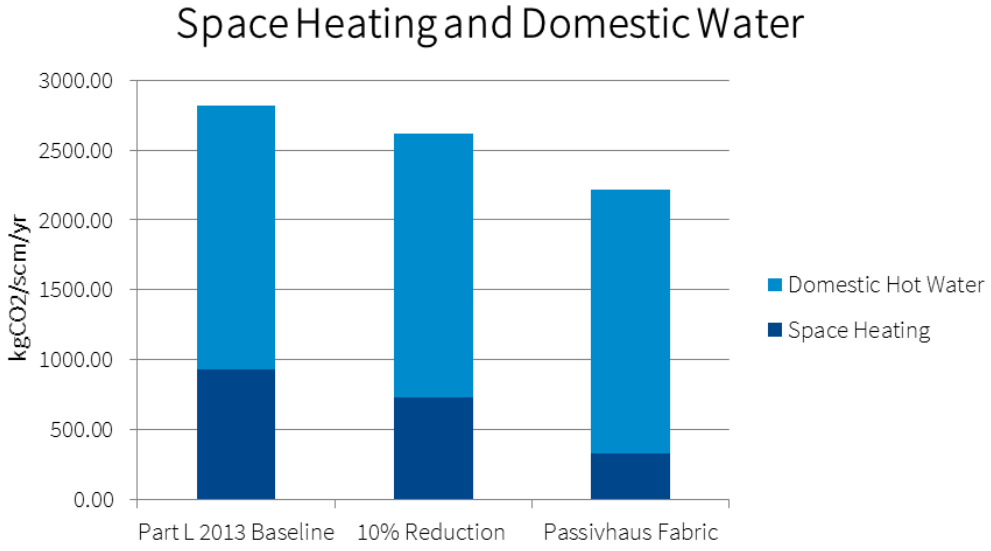
- Orientation
- Massing
- Glazing proportions
- Shading

Supply of heat

> Dwellings will always require a small amount of space heating and will maintain a significant domestic hot water load

> Supply of this heat must be decarbonized by 2050

> The solution is far from clear, so a risk-based approach is needed in new-build housing



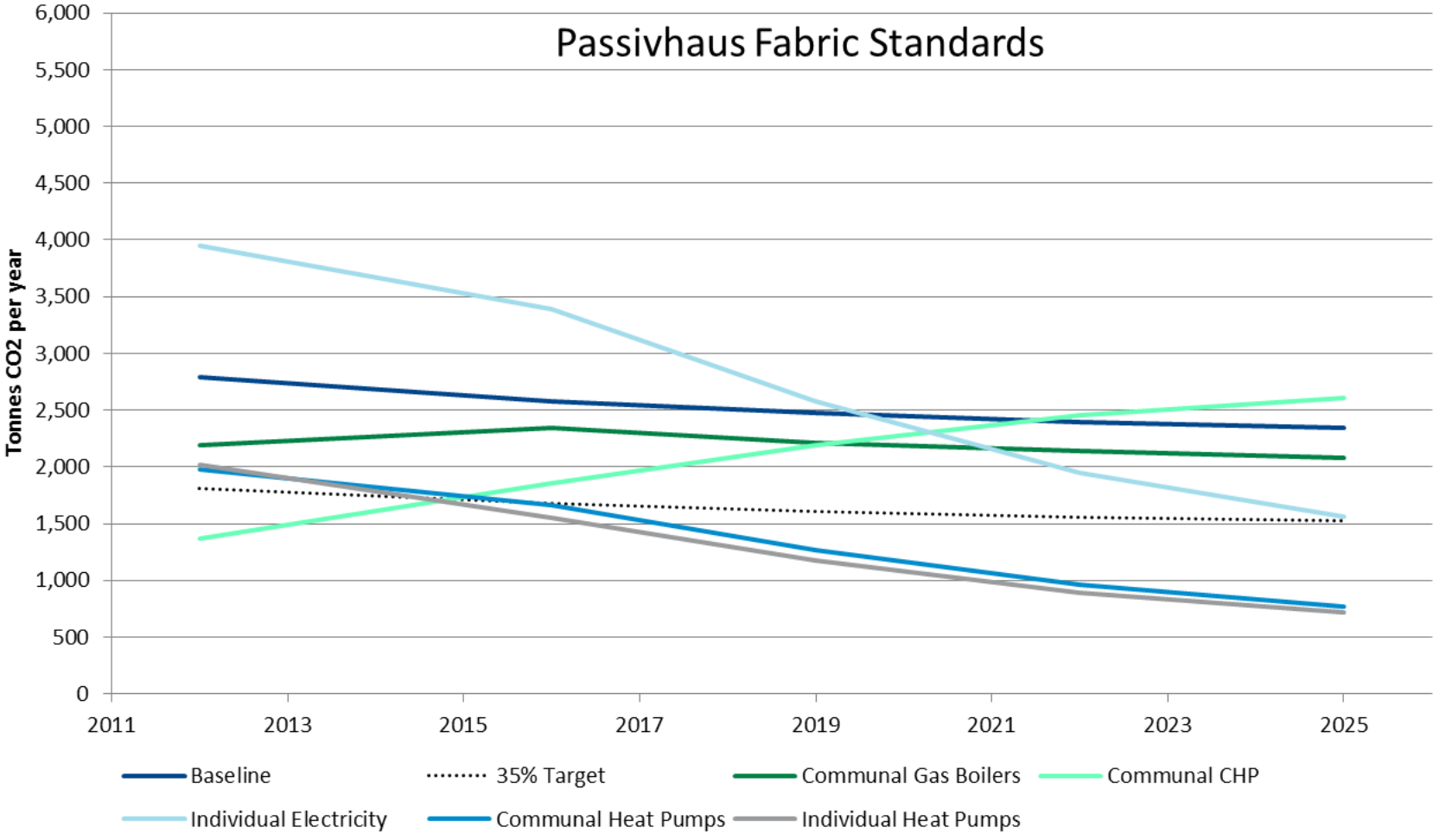
Supply of heat

> Electricity is decarbonising quickly, but supply and infrastructure challenges remain

> Gas is not – there is no clear pathway to low carbon gas currently being implemented

	2012	2016	2019	2022	2025
Gas Carbon Factor ($kgCO_2/kWh$)	0.216	0.208	0.208	0.208	0.208
Electricity Carbon Factor ($kgCO_2/kWh$)	0.519	0.398	0.302	0.229	0.183

Supply of heat



Supply of heat

	Pros	Cons
Ultra energy efficient dwellings	• Key to meeting targets • Reduces fuel costs • Can provide high quality homes	• How is hot water addressed in high density dwellings? • Can lead to poor quality homes if bad design
Continued use of gas grid	• Cheap fuel source • Extensive supply available • Can meet peak heat demands	• Gas decarbonisation far from guaranteed • Grid upgrades required • Security of supply
Electricity	• Flexible power source for heat pumps, resistance heating etc. • Can lead to efficient heat delivery • Rapidly decarbonising	• Insufficient supply • High cost option • 50% generation increase required • 1000% increase in storage required
Waste Heat	• Already sufficient to meet demand 2 times over • Increased thermal generation of electricity to meeting heat pump loads will increase waste heat	• How to get heat to customers? • Supply is not yet guaranteed • Requires significant infrastructure investment

Supply of heat - challenges

> Building Regulations Part L needs to be updated to reflect lower carbon electricity

> Energy efficiency must improve through standards and build quality.

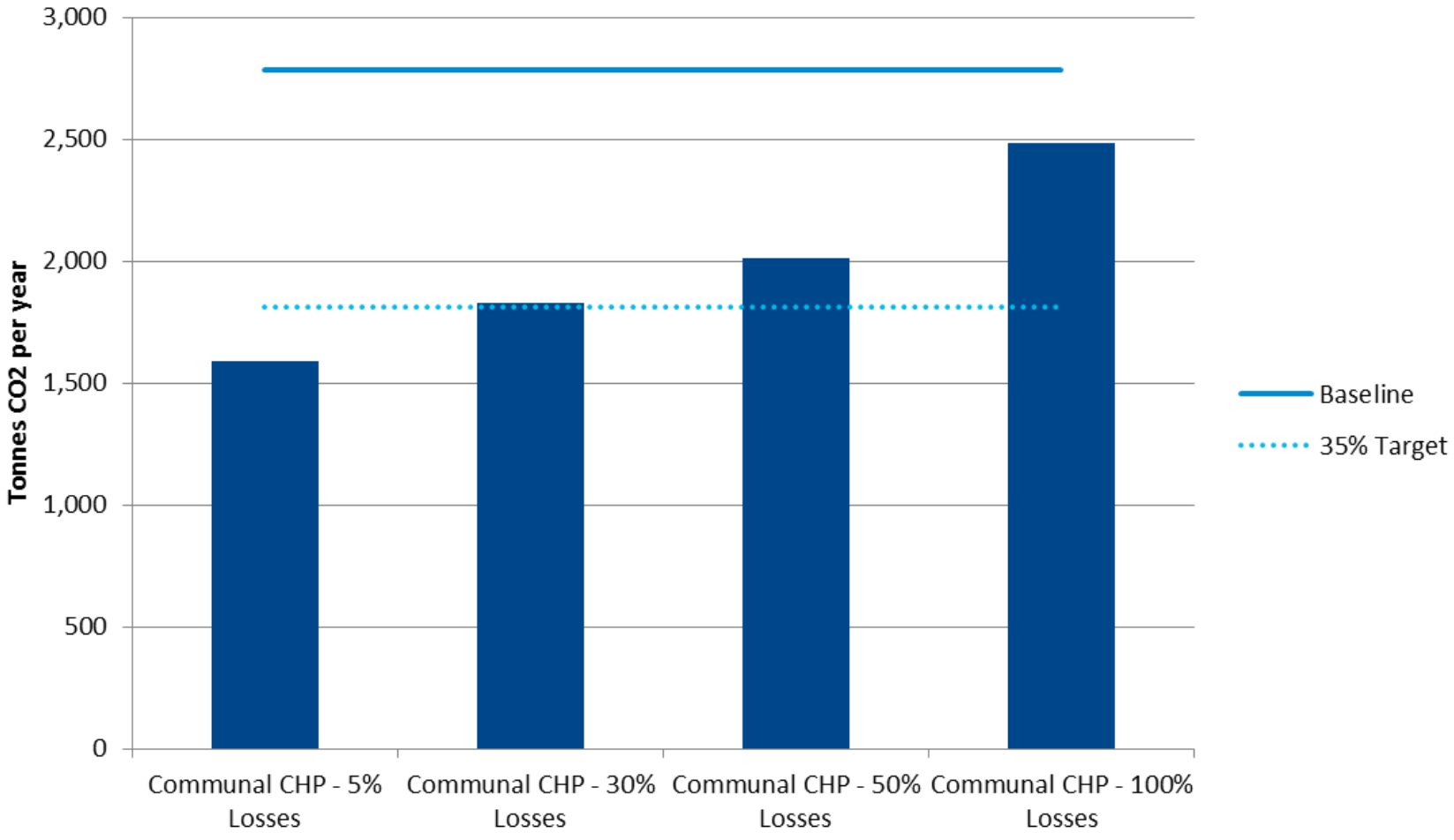
> Heat pumps will form part of the solution in low density areas.

- Size must be reduced through demand reduction (energy efficiency, solar etc)
- Incentives required to increase uptake

Supply of heat - challenges

- Heat networks are key, but face significant challenges:
  - Heat losses and network efficiency

Supply of heat - challenges



Supply of heat - challenges

- Heat networks are key, but face significant challenges:
  - Heat losses and network efficiency
  - Leadership on supply of low-carbon, waste heat
  - Clarity on role of gas Combined Heat and Power
  - Greater regulation and consumer protection
  - Improved skills

Contact us

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