



HODKINSON

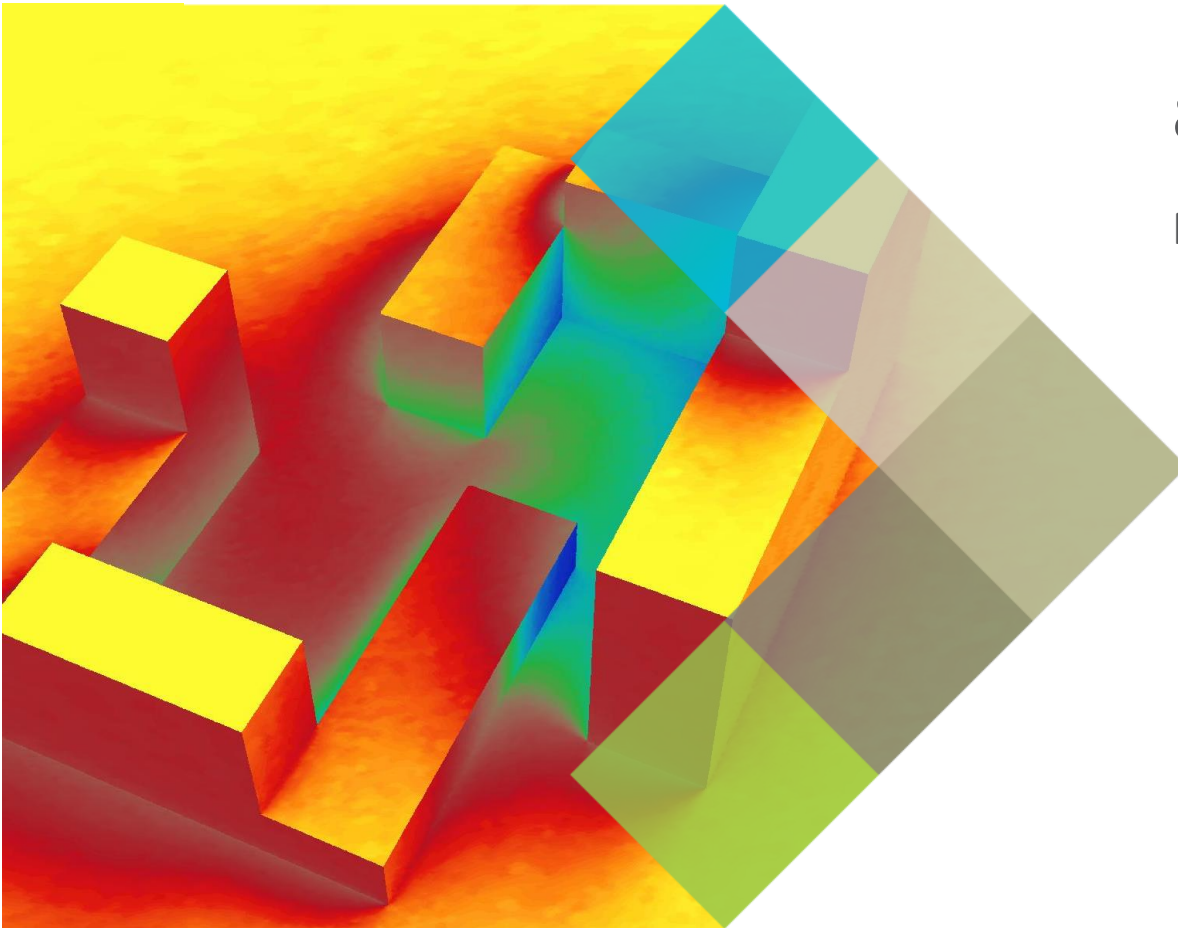
Equipping homes for a low-carbon future

New Homes

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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



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

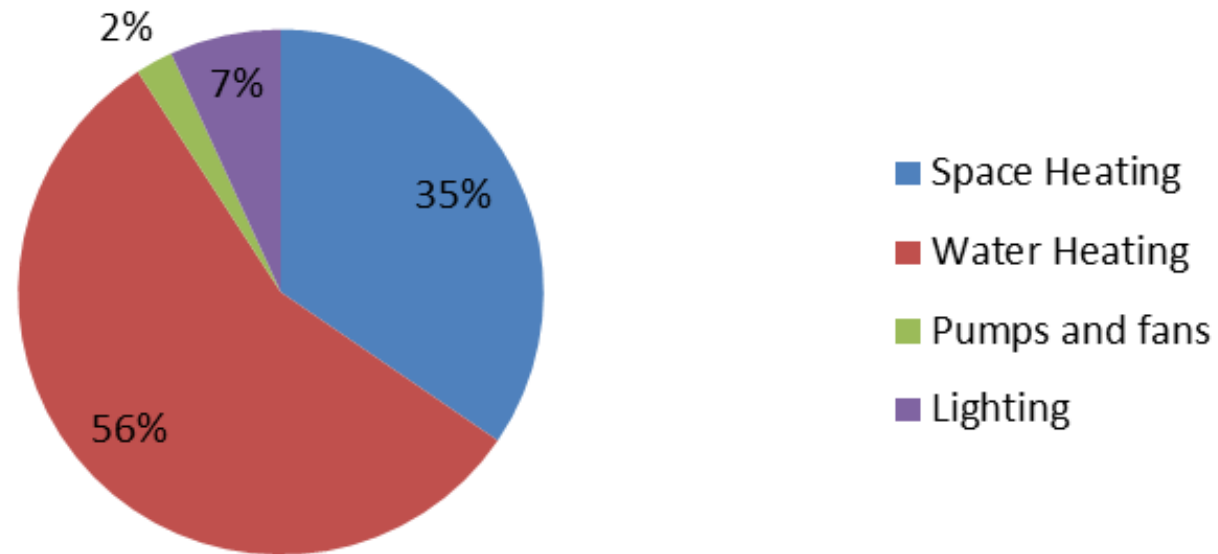


Background - why new build?

- > 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?

Typical Regulated Energy Demands - 2-bed flat



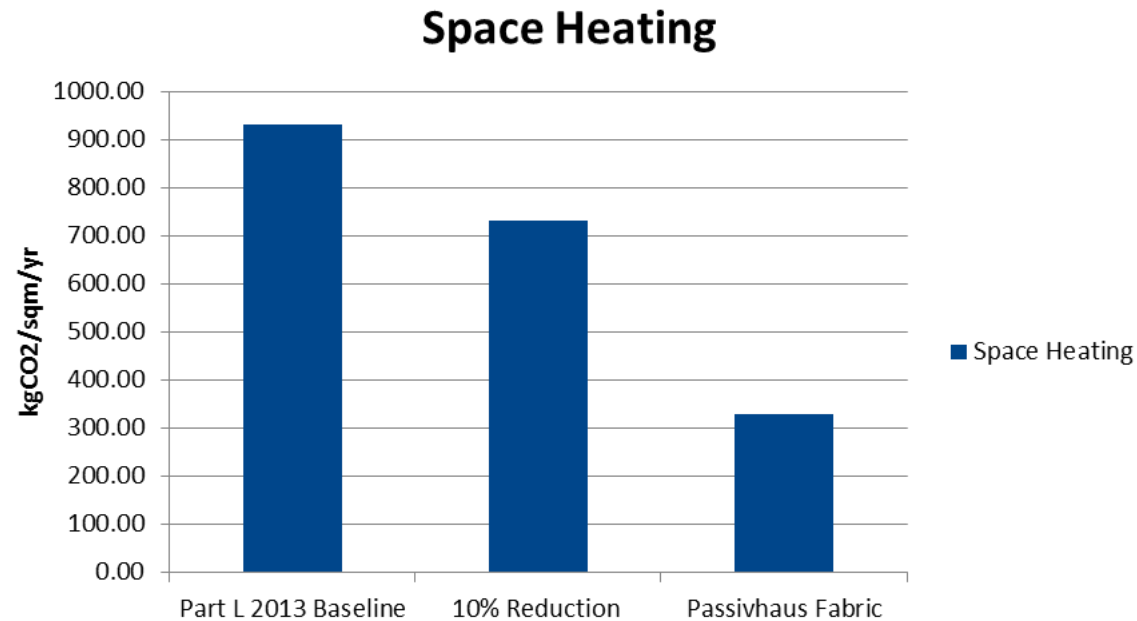
Success Criteria

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

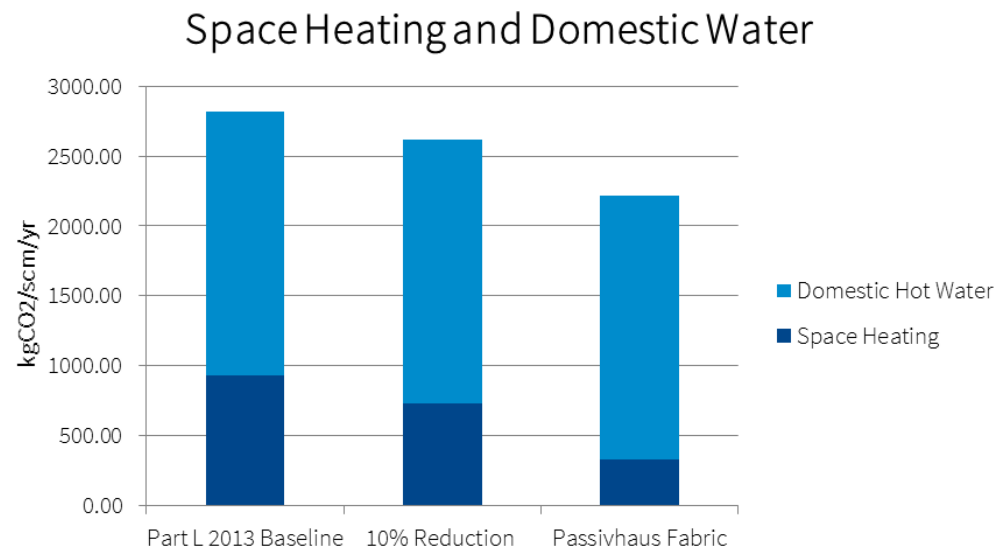
> Complex design decisions required at an early stage:

- 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

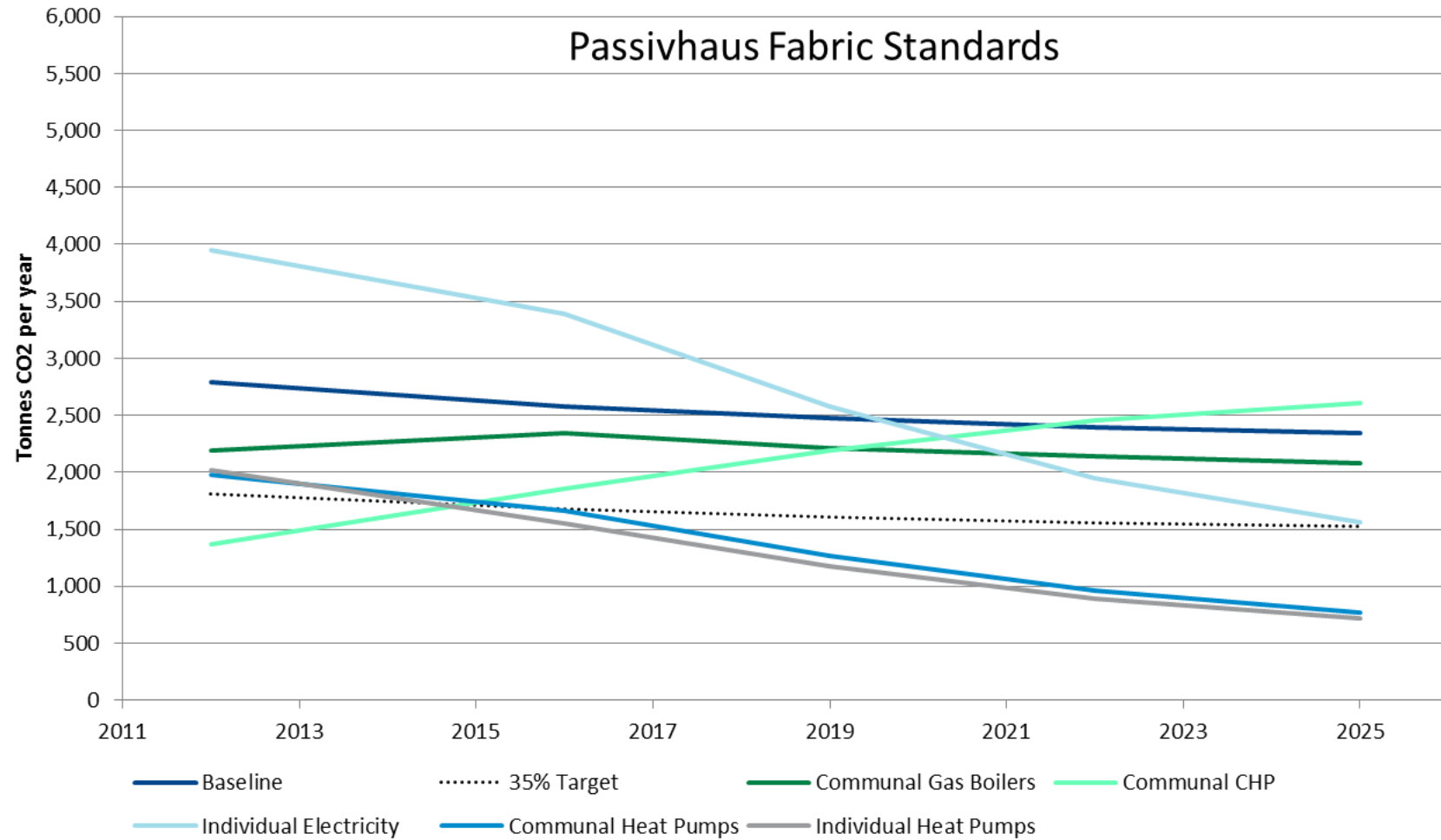


Supply of heat

- > 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	<ul style="list-style-type: none"> • Key to meeting targets • Reduces fuel costs • Can provide high quality homes 	<ul style="list-style-type: none"> • How is hot water addressed in high density dwellings? • Can lead to poor quality homes if bad design
Continued use of gas grid	<ul style="list-style-type: none"> • Cheap fuel source • Extensive supply available • Can meet peak heat demands 	<ul style="list-style-type: none"> • Gas decarbonisation far from guaranteed • Grid upgrades required • Security of supply
Electricity	<ul style="list-style-type: none"> • Flexible power source for heat pumps, resistance heating etc. • Can lead to efficient heat delivery • Rapidly decarbonising 	<ul style="list-style-type: none"> • Insufficient supply • High cost option • 50% generation increase required • 1000% increase in storage required
Waste Heat	<ul style="list-style-type: none"> • Already sufficient to meet demand 2 times over • Increased thermal generation of electricity to meeting heat pump loads will increase waste heat 	<ul style="list-style-type: none"> • How to get heat to customers? • Supply is not yet guaranteed • Requires significant infrastructure investment

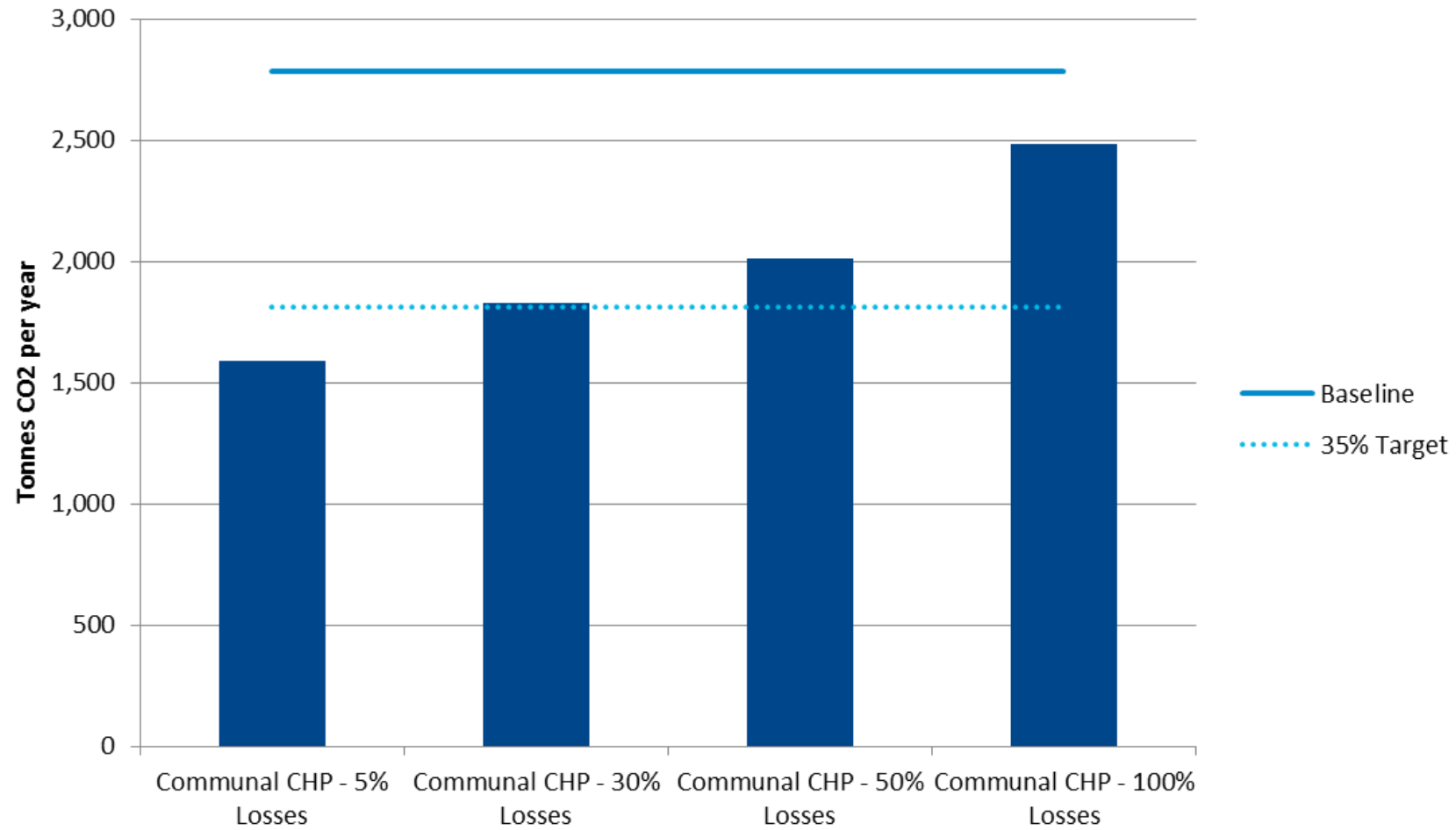
Supply of heat - challenges

- > 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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