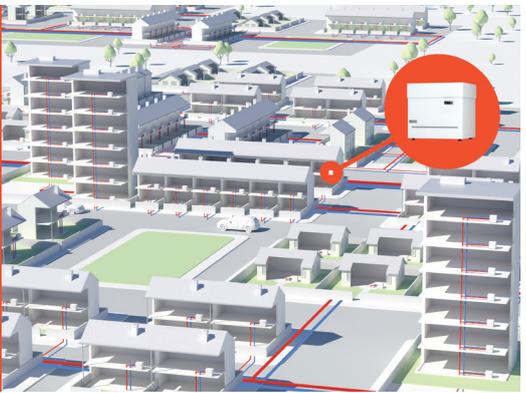


NEW BUILDS

# Cut carbon, costs and hassle.

How to be carbon compliant for less, with scalable, low cost, and ultra-low carbon fifth generation district heating systems featuring Kensa’s ambient shared ground loop arrays and decentralised heat pumps.

## What is the most cost effective way to be carbon compliant?

<p><b>EXAMPLE 1</b></p> <ul style="list-style-type: none"> <li>✓ Gas CHP</li> <li>✓ Higher insulation levels</li> <li>✓ Triple glazing</li> <li>✓ MVHR</li> </ul> <p style="font-size: 2em; font-weight: bold; text-align: center;">30%</p> <p style="text-align: center;">CO<sub>2</sub> SAVING</p>	<p><b>EXAMPLE 2</b></p> <ul style="list-style-type: none"> <li>✓ Gas CHP</li> <li>✓ Solar PV</li> </ul> <p style="font-size: 2em; font-weight: bold; text-align: center;">30%</p> <p style="text-align: center;">CO<sub>2</sub> SAVING</p>	<p><b>EXAMPLE 3</b></p> <ul style="list-style-type: none"> <li>✓ Ground source heat pump</li> </ul> <p style="font-size: 2em; font-weight: bold; text-align: center;">70%</p> <p style="text-align: center;">CO<sub>2</sub> SAVING</p>	
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Ground source heat pumps with shared ground loop arrays are a cheaper and easier way to achieve carbon reduction targets over and above building regulations.

For developers working to achieve more than 30% carbon savings compared to building regulations, SAP 10’s reduction of the carbon emissions for electricity to 233gCO<sub>2</sub>/kWh, similar to those of gas, means ultra-efficient ground source heat pumps have emerged as a simpler, more effective and efficient heating system compared to traditional district heating measures such as gas CHP.

Under SAP 10, the carbon saving for ground source heat pumps compared to gas CHP is up to 70.9%. This makes carbon compliance easier, and cheaper, avoiding the costly addition of energy saving measures, which gas CHP systems or less efficient electric systems will otherwise require. The cost to be carbon compliant with traditional district heating measures has therefore increased, whilst costs have decreased for those specifying ground source heat pumps.

“(Kensa’s) communal ground loop with individual heat pumps appears to be the most economic solution of all and is also compliant with London’s key objectives in terms of air quality and carbon emissions. It combines several advantages: it is very energy efficient and does not require dedicated heat metering and billing.”

**Greater London Authority**  
‘Low Carbon Heat: Heat Pumps In London’  
(Etude, September 2018)

### Building the carbon case: A worked example

1,500-unit new build development featuring Kensa shared ground loop arrays and ground source heat pumps (GSHP):

	GSHP with shared ground loop arrays	Gas CHP (incl. infrastructure & HIU)
Installation cost	£8,000	£6,500
Carbon offset*	£871	£4,093
<b>Total</b>	<b>£12,556,500</b>	<b>£15,889,500</b>

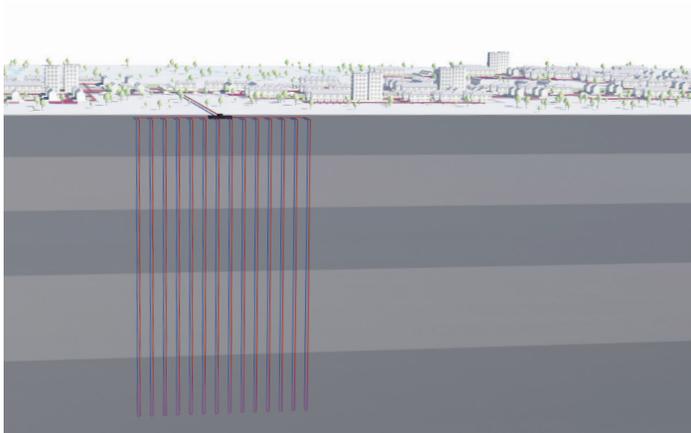
\* Based on SAP 10 carbon figures and £95 per tonne of carbon.

# Redefining district heating

## 5th Generation District Heating

Shared ground loop arrays - decentralised heat pumps and ambient temperature distribution loops - offer a scalable low cost low carbon solution.

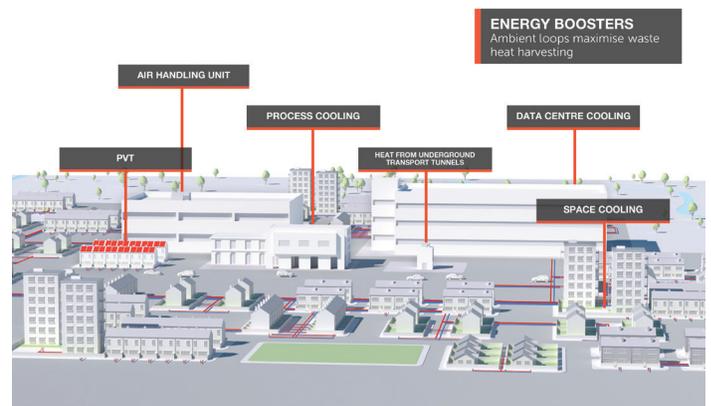
A proven alternative to traditional district heating.



## Shared Ground Loop Arrays

Kensa's shared ground loop designs out all issues associated with traditional district heating.

- ✓ Eliminates all system distribution losses, improves efficiency, reduces running costs, removes risk of over heating
- ✓ Ambient loop can provide heating & cooling
- ✓ Heat pumps optimised for each building
- ✓ Billing for heat individual to end user
- ✓ No requirement for complex metering & billing platform for domestic properties
- ✓ Lowest possible cost of heat to the end user
- ✓ Low standing charges



## Zero Carbon Future

Ground source heat pumps are smart grid ready, offering opportunities for aggregated energy supply.

- ✓ Integrates with smart controls to optimise for even lower running costs and increased carbon savings
- ✓ Multiple heat source options (open loop, aquifer, mine water)
- ✓ Ground loop allows the flexibility to integrate additional energy sources (waste heat from data centre cooling, underground, PV-t), and is the most effective form of energy store / transfer
- ✓ Zero carbon future with the decarbonisation of the grid

## Kensa Contracting

The UK's Award-Winning Ground Source Heat Network Delivery Partners & Contractors.