

HS2 could provide green energy to hundreds of new homes

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In an innovative first, engineers developing the HS2 super-hub at Old Oak Common in north west London are proposing plans to tap heat from the brakes and engines of high speed trains to heat water and power central heating of up to 500 new homes that could be built nearby.

The scheme would see 5 air source heat pumps draw warm air from the railway's tunnels, where the waste heat from trains is usually extracted by traditional ventilation systems and seeps into the ground surrounding the tunnels.

Instead HS2 Ltd's plans would see waste heat fed into a local District Heating System. The new HS2 station at Old Oak Common is set to be the UK's best connected rail interchange, with an estimated 250,000 people passing through every day. It will help kick-start the UK's largest regeneration project, which aims to transform the former railway and industrial area, into a new neighbourhood supporting up to 65,000 jobs and 25,500 new homes*.

HS2 innovation manager, Pablo García, said:

HS2 is so much more than a railway. By taking a long term view of how the benefits of investing in the new high speed railway can be shared, we're investigating how to provide sustainable, low-carbon heating and hot water to up to 500 new homes.

Near Old Oak Common we're building a crossover box. This is an underground hall that houses a points junction to enable trains to arrive and depart from any of the station's platforms.

Our plans would see warm air pushed into the crossover box by trains, in effect acting like pistons. It then rises to be harnessed by air source heat pumps, converted into hot water and transported to homes by insulated pipes.

Based on current energy price forecasts, HS2 estimates that the investment in waste heat recycling system would pay for itself after just 4 years.

Compared to gas boilers being used in the homes, recycling heat generated by trains' engines and brakes could reduce the carbon footprint of 500 houses by more than a fifth (22%).

Plans are at an early stage but the technology is proven. As the project progresses HS2 Ltd will work with local partners to make this aspiration a reality.

Pablo explained how Old Oak Common's crossover box is the only place on HS2's first section between London and the West Midlands capable of supporting waste heat recovery technology, but there may be further opportunities on the high speed network's Leeds and Manchester routes.

Our study focused on possible Phase One opportunities because its designs are most advanced. Designs for the second phase of the railway are at an earlier stage, and we hope to look at whether waste heat recovery technology could be deployed there too.

Currently more than 1,000 people are at work on HS2 across London, clearing the way for the start of construction.

At Euston and the future HS2 terminus at Curzon Street in Birmingham demolitions are well underway alongside the project's pioneering archaeology programme. Meanwhile clearance of the Washwood Heath site, the Birmingham location of the project's future network control centre and rolling stock depot, is also in full swing.

In total more than 7,000 jobs are currently supported by the HS2 project, both directly and in the UK-wide supply chain.