# First live deployment of hydrogen digger marks milestone in UK sustainable infrastructure



A hydrogen-powered digger has been deployed for the first time on a live construction site as part of the Lower Thames Crossing project, marking a significant milestone in sustainable infrastructure development. The 20-tonne JCB machine, which runs on hydrogen instead of diesel, has been operating near Gravesend in Kent to conduct ground investigation surveys. According to National Highways, the client for the project, this deployment represents the first use of such hydrogen-fuelled heavy equipment outside a test environment, saving more than one tonne of CO2 equivalent emissions in just its first four weeks of operation.

The digger, built by JCB in Staffordshire and supplied by Flannery Plant Hire, is fuelled by hydrogen provided by Ryze, a company founded by Jo Bamford, son of JCB chair Anthony Bamford. Skanska, the contractor delivering the Kent section of the project, is responsible for utilising the machine on site. This collaboration follows a successful trial earlier this year at Gallagher’s Hermitage Quarry in Kent, where hydrogen-powered machinery demonstrated safe and effective operations, including mobile refuelling infrastructure. The trial involved a JCB 540-180H Loadall model powered by a hydrogen combustion engine, which replaced a conventional diesel machine for masonry work.

The deployment forms part of National Highways' ambition to make the Lower Thames Crossing the first major UK infrastructure project to achieve carbon neutrality in construction. The £9 billion project includes a 23-kilometre road and tunnel linking Essex and Kent, set to double road capacity east of London across the Thames. Planning consent was granted in March, with construction expected to begin in 2026, subject to funding. The project aims to cut construction emissions by 70% and fully offset any remaining carbon impacts in line with industry best practices by the early 2030s.

National Highways has pledged to eliminate diesel from all worksites by 2027 and is preparing to award what is claimed to be the largest green hydrogen supply contract in UK construction history. Alongside hydrogen-powered machinery, the project will deploy electric plant and prioritise low-carbon materials, using the lowest-carbon available steel and concrete. Skanska is responsible for the Roads South of the Thames package, while Balfour Beatty holds the £1.2 billion Roads North of the Thames contract, although the latter work has been delayed until at least 2026.

The infrastructure project also prioritises biodiversity, promising to create six times more green space than its road footprint, including new woodlands, a million trees, two public parks, and seven green bridges. The majority of the route—approximately 80%—will be constructed in tunnels, cuttings, or concealed behind earthworks to minimise environmental impact.

Industry experts have welcomed these developments as pivotal steps toward net-zero construction in the UK. Matt Palmer, executive director for the Lower Thames Crossing at National Highways, described the live use of the hydrogen digger as “an incredibly exciting moment” for British construction. Meanwhile, Ben Goodwin, director of policy and public affairs at the Civil Engineering Contractors Association, highlighted the sector’s determination to meet the challenge of achieving a net-zero construction industry to support the UK’s transition to a high-growth, net-zero economy.

Skanska’s experience with hydrogen-powered construction is not limited to the Lower Thames Crossing. The company has also pioneered the use of hydrogen dual-fuel piling rigs on the HS2 high-speed rail project in London, reducing traditional fuel consumption by around 36%. This ability to integrate hydrogen into various construction operations underscores the growing momentum toward greener construction practices across major UK infrastructure projects.

As the Lower Thames Crossing project progresses, its commitment to innovative low-carbon solutions, including hydrogen-powered equipment and extensive environmental enhancements, positions it as a leading example of sustainable infrastructure development in the UK and beyond.

### 📌 Reference Map:

* Paragraph 1 – [[1]](https://www.constructionnews.co.uk/supply-chain/skanska-uses-hydrogen-digger-in-global-first-on-lower-thames-crossing-02-10-2025/), [[2]](https://www.traffictechnologytoday.com/news/electric-vehicles-ev-infrastructure/world-first-lower-thames-crossing-deploys-hydrogen-powered-digger.html), [[3]](https://www.constructionenquirer.com/2025/10/02/worlds-first-hydrogen-digger-starts-prep-for-thames-crossing/), [[4]](https://www.gbnews.com/lifestyle/cars/lower-thames-crossing-roads-southeast-project), [[7]](https://nationalhighways.co.uk/our-roads/lower-thames-crossing/news-and-media/hydrogen-powered-construction-a-step-closer/)
* Paragraph 2 – [[1]](https://www.constructionnews.co.uk/supply-chain/skanska-uses-hydrogen-digger-in-global-first-on-lower-thames-crossing-02-10-2025/), [[3]](https://www.constructionenquirer.com/2025/10/02/worlds-first-hydrogen-digger-starts-prep-for-thames-crossing/), [[7]](https://nationalhighways.co.uk/our-roads/lower-thames-crossing/news-and-media/hydrogen-powered-construction-a-step-closer/), [[6]](https://www.skanska.co.uk/about-skanska/news-and-events/press-releases/272082/ULEMCo-and-Skanska-pioneer-the-first-real-world-use-of-hydrogen-dualfuel-piling-rig)
* Paragraph 3 – [[1]](https://www.constructionnews.co.uk/supply-chain/skanska-uses-hydrogen-digger-in-global-first-on-lower-thames-crossing-02-10-2025/), [[2]](https://www.traffictechnologytoday.com/news/electric-vehicles-ev-infrastructure/world-first-lower-thames-crossing-deploys-hydrogen-powered-digger.html), [[3]](https://www.constructionenquirer.com/2025/10/02/worlds-first-hydrogen-digger-starts-prep-for-thames-crossing/), [[5]](https://www.globalhighways.com/news/lower-thames-crossing-contracts-awarded-national-highways)
* Paragraph 4 – [[1]](https://www.constructionnews.co.uk/supply-chain/skanska-uses-hydrogen-digger-in-global-first-on-lower-thames-crossing-02-10-2025/), [[2]](https://www.traffictechnologytoday.com/news/electric-vehicles-ev-infrastructure/world-first-lower-thames-crossing-deploys-hydrogen-powered-digger.html), [[3]](https://www.constructionenquirer.com/2025/10/02/worlds-first-hydrogen-digger-starts-prep-for-thames-crossing/), [[7]](https://nationalhighways.co.uk/our-roads/lower-thames-crossing/news-and-media/hydrogen-powered-construction-a-step-closer/)
* Paragraph 5 – [[1]](https://www.constructionnews.co.uk/supply-chain/skanska-uses-hydrogen-digger-in-global-first-on-lower-thames-crossing-02-10-2025/), [[4]](https://www.gbnews.com/lifestyle/cars/lower-thames-crossing-roads-southeast-project)
* Paragraph 6 – [[1]](https://www.constructionnews.co.uk/supply-chain/skanska-uses-hydrogen-digger-in-global-first-on-lower-thames-crossing-02-10-2025/), [[4]](https://www.gbnews.com/lifestyle/cars/lower-thames-crossing-roads-southeast-project), [[3]](https://www.constructionenquirer.com/2025/10/02/worlds-first-hydrogen-digger-starts-prep-for-thames-crossing/)
* Paragraph 7 – [[1]](https://www.constructionnews.co.uk/supply-chain/skanska-uses-hydrogen-digger-in-global-first-on-lower-thames-crossing-02-10-2025/), [[6]](https://www.skanska.co.uk/about-skanska/news-and-events/press-releases/272082/ULEMCo-and-Skanska-pioneer-the-first-real-world-use-of-hydrogen-dualfuel-piling-rig)

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## Bibliography

1. <https://www.constructionnews.co.uk/supply-chain/skanska-uses-hydrogen-digger-in-global-first-on-lower-thames-crossing-02-10-2025/> - Please view link - unable to able to access data
2. <https://www.traffictechnologytoday.com/news/electric-vehicles-ev-infrastructure/world-first-lower-thames-crossing-deploys-hydrogen-powered-digger.html> - A British-made JCB hydrogen-fuelled digger has been used for survey work on the Lower Thames Crossing, marking the first live deployment of such machinery outside a test environment. The project aims to be carbon neutral in construction, with plans to eliminate diesel from worksites by 2027 and offset remaining emissions in the early 2030s. The Lower Thames Crossing will create a 23km road and tunnel between Essex and Kent, doubling road capacity across the Thames east of London. ([traffictechnologytoday.com](https://www.traffictechnologytoday.com/news/electric-vehicles-ev-infrastructure/world-first-lower-thames-crossing-deploys-hydrogen-powered-digger.html?utm_source=openai))
3. <https://www.constructionenquirer.com/2025/10/02/worlds-first-hydrogen-digger-starts-prep-for-thames-crossing/> - National Highways has hailed the deployment of a hydrogen-powered digger on the Lower Thames Crossing as a significant step towards carbon-neutral construction. The JCB machine, supplied by Flannery Plant Hire and fuelled by Ryze hydrogen, is being used by Skanska for ground investigation surveys near Gravesend in Kent. The project aims to eliminate diesel from worksites by 2027 and offset remaining emissions in the early 2030s. ([constructionenquirer.com](https://www.constructionenquirer.com/2025/10/02/worlds-first-hydrogen-digger-starts-prep-for-thames-crossing/?utm_source=openai))
4. <https://www.gbnews.com/lifestyle/cars/lower-thames-crossing-roads-southeast-project> - The deployment of a hydrogen-powered digger on the Lower Thames Crossing marks a crucial step forward for the £1 billion road and tunnel project, which gained planning approval in March. The initiative forms part of the crossing's ambitious environmental strategy, positioning the development as a pioneer in combining economic growth with net-zero objectives. Skanska, the delivery partner constructing the Kent portion of the route, will be utilising the hydrogen-powered machine for ground investigation surveys. The equipment, supplied by Flannery Plant Hire with hydrogen fuel from Ryze, has already prevented more than one tonne of CO2 emissions during its initial four weeks of operation. ([gbnews.com](https://www.gbnews.com/lifestyle/cars/lower-thames-crossing-roads-southeast-project?utm_source=openai))
5. <https://www.globalhighways.com/news/lower-thames-crossing-contracts-awarded-national-highways> - National Highways has awarded contracts for the Lower Thames Crossing project, including the tunnel contract to a joint venture comprising Bouygues Travaux Publics, Murphy, Balfour Beatty, and Skanska. The project aims to tackle congestion at the Dartford Crossing and drive economic growth by almost doubling road capacity across the Thames east of London. The Lower Thames Crossing is to use hydrogen-powered construction machinery. ([globalhighways.com](https://www.globalhighways.com/news/lower-thames-crossing-contracts-awarded-national-highways?utm_source=openai))
6. <https://www.skanska.co.uk/about-skanska/news-and-events/press-releases/272082/ULEMCo-and-Skanska-pioneer-the-first-real-world-use-of-hydrogen-dualfuel-piling-rig> - ULEMCo and Cementation Skanska have brought hydrogen dual-fuel to install piles on the HS2 site in London, cutting the use of traditional fuel by 36%. This is the first deployment of a dual-fuel hydrogen rig – installing four piles to a depth of 30 metres. The rig, modified to operate from on-board hydrogen tanks, achieved 36% (average) displacement of diesel by hydrogen, corresponding to the equivalent reduction in fuel consumption and CO2 emissions. ([skanska.co.uk](https://www.skanska.co.uk/about-skanska/news-and-events/press-releases/272082/ULEMCo-and-Skanska-pioneer-the-first-real-world-use-of-hydrogen-dualfuel-piling-rig?utm_source=openai))
7. <https://nationalhighways.co.uk/our-roads/lower-thames-crossing/news-and-media/hydrogen-powered-construction-a-step-closer/> - The Lower Thames Crossing project's plan to replace diesel with hydrogen in its heavy construction machinery has progressed following the successful conclusion of its first hydrogen trial in partnership with Gallagher Group, JCB, and hydrogen supplier Ryze Power. The trial was hosted at Gallagher’s Hermitage Quarry in Kent, using a JCB 540-180H Loadall powered by a hydrogen combustion engine fuelled with low carbon hydrogen. The machine replaced the use of an existing diesel-powered JCB Loadall for masonry work and successfully demonstrated the safe operation of hydrogen combustion powered equipment and mobile refuelling infrastructure. The Lower Thames Crossing is a pathfinder project exploring low-carbon construction. ([nationalhighways.co.uk](https://nationalhighways.co.uk/our-roads/lower-thames-crossing/news-and-media/hydrogen-powered-construction-a-step-closer/?utm_source=openai))