



Benefits

- Zero carbon – hydrogen is a sustainable, zero emission fuel
- Green hydrogen – onsite electrolysis powered by renewable energy
- Fast refuelling – 10 minutes for a bus, 5 minutes for a car
- Excellent range – up to 350km for a bus
- Safe – the technology is proven and safe
- Low noise – no engine noise from vehicles

Kittybrewster, Aberdeen: Europe's largest hydrogen vehicle refuelling station

The government's 'Road to Zero Strategy' is driving the transition to zero emissions across all vehicle types. With the end of the diesel vehicle in sight, forward-looking councils and fleet operators are taking action to provide clean public transport alternatives. Aberdeen City Council partnered with BOC to deliver a commercially viable hydrogen refuelling station using proven technology to power one of Europe's largest fleets of hydrogen buses.

The issue

Like many UK councils, Aberdeen City Council is seeking solutions to develop a cleaner public transport network. In addition to reducing greenhouse gas emissions, the council is helping to improve air quality, reduce noise levels in the city centre and work towards Scotland's green energy targets. Aberdeen also recognises the role hydrogen can play in storing and benefiting from the country's abundance of renewable energy.

Councillor Philip Bell,
Hydrogen spokesperson,
Aberdeen City Council

"We have until 2050 according to the IPPC to be net carbon zero – that's quite a tall order as transport is the single largest source of Britain's greenhouse gas emissions. In Aberdeen, with BOC's help, we're committed to a low carbon strategy."



The solution

BOC worked with Aberdeen City Council to develop and install a tailored, state-of-the-art hydrogen refuelling station at the Kittybrewster bus depot. The facility produces green hydrogen from electrolysis on site – a process that extracts hydrogen from water using electricity generated from renewables. Hydrogen is stored as a compressed gas until it is needed and then pumped into vehicles, much like refuelling a petrol or diesel vehicle.

With safety paramount, BOC worked closely with the council to implement key safety measures from the outset. A thorough risk assessment was undertaken and shared with the public, along with BOC's exemplary safety record and details of the safety measures installed such as continuous leak monitoring.

The station opened in 2015 and was originally designed to refuel single-deck buses. In 2018 it was scaled up to offer public refuelling of cars and vans, and in 2019 it was upgraded again to accommodate double decker buses.



The site has the capacity to produce 360kg of hydrogen daily. That is enough for the current fleet of 10 x 42-seat buses to travel up to 350km each day emitting nothing more than clean water produced from the tail pipes.

The results

Kittybrewster is Europe's highest performing hydrogen refuelling station. It is accessible to all hydrogen-fuelled vehicles and has attracted over £20m of investment into Aberdeen.

The fleet of hydrogen buses operate an equivalent service to their diesel counterparts but with the added benefit of zero emissions. Over a four-year period, a small fleet of just 10 buses saved over 1,000 tonnes of carbon dioxide compared to running the latest Euro 6 diesel engines, helping to improve air quality in the city.

With an expanding fleet of hydrogen buses and other vehicles, Aberdeen City is starting to reap the rewards of hydrogen as a transport fuel. And, with the potential to provide energy storage and grid balancing services in the future, there are opportunities to develop the role of hydrogen even further.

Mark Griffin,
Hydrogen Market Development
Manager, Clean Fuels – BOC

"The refuelling station is designed to be reliable. If anything fails, there's a secondary unit to keep the station operational and the hydrogen buses running. Since 2015, every refuelling has been successful and we're operating at over 99% reliability. Hydrogen is a proven zero emissions fuel for public transport projects. Working with other councils we can help deliver low carbon transport targets across the UK."

Councillor Philip Bell,
Hydrogen spokesperson,
Aberdeen City Council

"BOC's experience with clean fuels goes back a long way. They're a safe pair of hands."

To find out more about BOC's hydrogen solutions for transport visit boconline.co.uk/hydrogen or email h2refuelling@boc.com