

6c Hydrogen Buses Update

- Purpose of Report

The purpose of this report is to provide an update on the Aberdeen hydrogen bus project as requested by the Board at the last meeting on 29 February 2016.

- Background

The Aberdeen Hydrogen Bus Project is a key project helping to deliver some of the Aberdeen Hydrogen Strategy objectives. The project is formed from a number of key industry and public sector organisations who have joined forces to demonstrate the world's largest integrated hydrogen project.

The purpose of the hydrogen bus project is to demonstrate how hydrogen fuel cell buses can be incorporated into operational bus fleets and how they compare to diesel equivalents.

The project consists of Europe's largest fleet of hydrogen buses, with 10 operating in Aberdeen currently and the UK's first fully integrated hydrogen production and bus refuelling station. First currently operate four hydrogen buses on the X40 Park & Ride route between Bridge of Don and Kingswells, while Stagecoach operates the other six on the X17 Aberdeen to Westhill and Elrick route.

- Project Progress

The operational phase of the project began in March 2015, with the official launch of the refuelling station. The buses and station have now been running for a year and reached some important milestones.

In November 2015, the refuelling station marked its 1,000th refuel, and to date has produced over 40 tonnes of hydrogen, with 99.9% availability.



The refuelling station is consistently refuelling the buses in an average of 5 minutes, and has now completed over 1,600 refuellings.

The hydrogen buses are also performing better than expected. In total all ten buses have travelled over 250,000miles, the equivalent distance of each one travelling around the world. They have also carried over 400,000 passengers, and are performing at above 75% availability. One of the key areas of the project for the bus operators is that the bus can perform similar to a diesel bus. An average diesel bus will be available for service 95% of the time. The current trend for availability of the hydrogen buses is an improving one. The operators' availability is calculated using the daily peaks. There are two peaks a day (one in the morning, one in the afternoon) a bus must be running during these peaks to be classed as available that day. If the bus misses a peak it is classed as unavailable.

As this is a demonstration project the issues we are encountering are new to us and also to the bus manufacturer. We have two permanent hydrogen technicians based in Aberdeen who are on hand 24/7 to help resolve the issues. Ballard, who manufactures the fuel cell, is also working with us to improve the availability of the buses.

Feedback from the operators and passengers has been very positive. Not only do the drivers enjoy driving them but the passengers are noticing a difference in the noise levels, and are keen to know more information about them.

Although we are currently still in the early stages of the operational phase of the project, so far progress is good. There have been some teething problems at the start of the operations but these have now been mainly sorted.

- Next Steps

The ten hydrogen buses in Aberdeen will continue to operate until December 2018, which will mark the end of the bus project. After this full analysis of the operational phase will be carried out and compared with other hydrogen fuel cell buses across Europe.

As Aberdeen City Council is the owner of the 10 hydrogen buses, at the end of the project the lease to the operators will end and the buses returned to the council. However, it is hoped that at the end of the project First and Stagecoach will want to keep the buses and either extend the lease or purchase the bus from the council. As we are still in the early stages of operations it has not been decided what will happen with the buses at the end of the project.

The refuelling station at Kittybrewster, which was designed and built solely for the buses, will be upgraded this year to allow it to service the hydrogen vans and cars currently in Aberdeen. The Kittybrewster station will remain the key station for the buses to refuel, but as new vehicles start to arrive in Aberdeen there becomes a need to future proof. The upgrades to the station are due to be complete by the end of 2016.

Currently Aberdeen's second hydrogen production and refueling station is under construction at Cove. The ACHES (Aberdeen City Hydrogen Energy Storage) is due for completion in summer 2016. This station will be a publicly accessible station which will have 350bar and 700bar refueling available along with electric charging points. The station is designed to refuel cars and vans, the buses will continue to refuel at Kittybrewster station.

We are currently in the process of deciding on a new name for the station which will reflect better on the hydrogen work Aberdeen are carrying out.

- Recommendation

It is recommended that the Board note the contents of this report.

Emily Anderson/4 March 2016