

1 Background

The Bus Emissions Abatement Retrofit (BEAR) Programme Phase 1 was developed to support the delivery of the Programme for Government 2017 commitment to introduce Low Emission Zones (LEZs) and help inform early thoughts on an Engine Retrofitting Centre(s) policy in Scotland.

The programme was launched in January 2018 as an open and competitive grant funded process to deliver the following.

- Support bus operators to reduce nitrogen dioxide (NOx) and particulate matter (PM) emissions of existing (Euro 4 and Euro 5) fleet vehicles operating on routes in Scotland's Air Quality Management Areas (AQMAs), through the installation of Clean Vehicle Retrofit Accreditation Scheme (CVRAS) accredited retrofit technology, in tandem with on-bus air quality monitoring equipment.
- Demonstrate and evidence the effectiveness of retrofit technology to Scottish bus operators.
- Support the early investigations into the establishment of the Scottish Engine Retrofitting Centre(s).

As part of continuous stakeholder engagement during the open period of the scheme a free workshop was held on 15 February 2018 at the Lighthouse, 11 Mitchell Lane, Glasgow, G1 3NU, from 13:00 to 16:30. The event was well publicised and over 60 delegates, from the public and private sector attended the workshop, with a broad spread of affiliation across the bus sector, retrofit and air quality professionals, and government officials.

The key objectives of the event were as follows.

- To provide stakeholders with an understanding of the Bus Emissions Abatement Retrofit (BEAR) Phase 1 programme.
- To provide a background and overview of the reasons for the approach.

- To allow stakeholder to raise queries or concerns.

The Workshop Agenda was as follows.

Time	Topic	Topic Lead
13.00-14.15	Arrival and networking lunch	All
14.15-14.30	Welcome and introductions	Stephen Thomson, Transport Scotland
14.30-14.50	BEAR phase 1 programme overview	Matthew Eastwood, Energy Saving Trust
14.50-15.10	An introduction to the CVRAS	Colin Smith, Energy Saving Trust
15.10-15.20	BEAR phase 1 monitoring	Drew Hill, Transport Scotland
15.20-15.40	Question and Answer session	All
15.40-16.30	Close, tea and coffee	All

2 Welcome and Introductions

Stephen Thomson of Transport Scotland led the workshop and provide the following background.

- The BEAR programme has been developed to support operators in reducing emissions from vehicles in the existing fleet within locations identified as an AQMA or requiring an LEZ.
- By monitoring and evaluating those vehicles fitted with retrofit technology, we can assess any associated impact on fuel consumption and efficiency.

3 Introduction to the Clean Vehicle Retrofit Accreditation Scheme (CVRAS)

Colin Smith of Energy Saving Trust noted CVRAS is a robust certification scheme for manufacturers of retrofit emissions reduction technology that will enable Clean Air Zone (CAZ) compliance of legacy fleet vehicles. This certification scheme supports the operation of Clean Air Zones and addresses the air pollution emissions from buses, coaches, heavy goods vehicles, mini-buses, taxis and vans. He noted the following key points on this.

Compliance options for an LEZ.

- Of the five options available for fleet operators, the retrofit option is the only route that supports the immediate reduction of emissions.
- Other options include; avoiding the zone, accept and pay the charge, re-arranging the fleet, the purchase of new compliant vehicles.

Why conduct certification and approval.

- The development of an approved method of retrofitting leads to consistent quality, comparability, informed decision making and increased trust in outcomes.

Rules and requirements for certification.

- Any company wishing to be included in the CVRAS list of accredited retrofit providers must demonstrate they are a legal entity with financial stability who can provide quality management, insurance cover, warranty provision and licensing agreements.
- The products they intend to provide must demonstrate emission reductions and limits, a data logging system for in-service performance, emission control strategies and system identification.
- There is a five step process prior to certification.

CVRAS approved list.

- There are currently three approved companies able to provide retrofit exhaust after-treatment system (SCRT);

Eminox Ltd, HJS UK Ltd and Baumot UK Ltd.

- Excalibre Technologies Ltd and GreenUrban Technologies Ltd have had applications accepted and are awaiting approval.

4 BEAR Phase 1 Programme Overview

Matthew Eastwood of Energy Saving Trust provided the following background on the BEAR Phase 1 Programme and noted BEAR scheme eligibility is dependent on meeting the following four key tests.

1 Vehicles must travel on routes through an Air Quality Management Area (AQMA) or through a city considering an LEZ (Glasgow, Edinburgh, Aberdeen and Dundee).

2 Vehicle operation and use must comply with the following conditions.

- Operate under Public Service Vehicle licence or be used for voluntary, community or other non-profit making purposes.
- Be less than 10 years in age with a remaining service life of at least 5 years.
- Be Euro IV or V standards and have an ad-blue system fitted.
- Provide the last 12 months fuel consumption data.
- Operator statement of intent to use the vehicle within an LEZ or AQMA.

3 A CVRAS accredited provider of SCRT retrofit technology must be used.

4 Operators must be able to accept State Aid De Minimus or GBER grant, or loan funding.

- Applicants to provide evidence of primary and ancillary costs.
- Grant or loan maximum of £25k per vehicle and £350k per applicant.

5 BEAR Phase 1 Monitoring

Drew Hill of Transport Scotland provided background to the before and after CVRAS and air quality monitoring proposed as part of the BEAR scheme and noted the following.

- Emission monitoring is essential in order to support the development of the Scottish Retrofitting Centre and to assess the efficiency of BEAR Phase 1 retrofit performance.
- A monitoring scheme is being developed however emissions could be monitored at three locations.
 - Engine - fuel consumption, distance driven, hours of operation and the daily average NOx emission reduction would be monitored.
 - Tailpipe - these could be compared to benchmark emissions across the fleet.
 - Roadside - an approach is in development which could see corridor mapping.

- Is it known the percentage of the Scottish bus fleet can currently be retrofitted.
- Why are there no approved companies for coach retrofit.
- Concern whether retrofit technology will perform as expected in real life.
- How will the BEAR project team navigate EU funding issues for future phases of BEAR.

These questions, together with the input from other stakeholders have been reviewed and included in scheme revisions, questions and response to applicants, and will provide input to the BEAR Phase 2 programme.

6 Discussion

A wide ranging and open discussion took place. Some key questions from this were as follows.

- What is the Scottish Retrofitting Centre and what purpose will it serve.
- Do the companies offering retrofit services across the UK have sufficient capacity to handle demand.
- Could Euro III buses be considered for retrofit.
- A desire for the age requirements to be reviewed – the suggestion was for the requirements to increase from 10 to 13 years.
- How does monitoring equipment identify emissions coming from buses.
- Concern over the balance of monitoring; both that there was too much and that there was not enough.