

# ZERO EMISSION HYBRID RAILCAR

## LEAD ORGANISATION

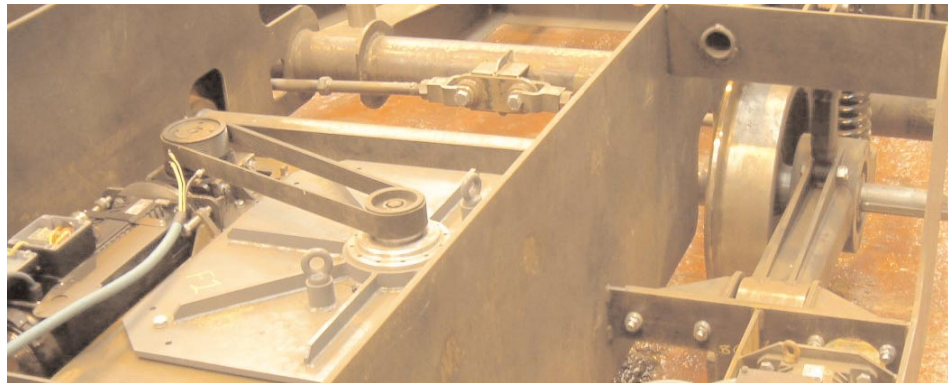
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site under construction)

## COST AND DURATION

The Carbon Trust  
contribution towards this  
project is £48,800. The  
project started in November  
2003 and is due for  
completion in February  
2005.

## PROJECT REFERENCE NUMBER

2002-12-85



Testbed under construction at Clayton's works, showing flywheel assembly

## OBJECTIVES

The main technical objectives are:

- To investigate the power requirements of hybrid passenger transit vehicles through modelling and field testing.
- To investigate cost-effective zero emission and carbon-neutral power sources, including solar PV arrays and the hydrogen fuel cell, able to supply this power.
- To investigate the relative merits of batteries, flywheels and ultracapacitors in meeting the vehicle's energy storage requirements, and, to compare the cost-effectiveness of the hybrid and conventional forms of vehicle propulsion.

## SUMMARY

There is an increasing worldwide demand for energy efficient, low emission, user friendly passenger transit vehicles to meet urban mobility needs at minimal environmental cost. This project aims to research emerging technologies to identify those most appropriate to meeting this requirement by:

- encouraging a switch from private car use to public transport
- increasing the energy efficiency of public transport vehicles
- minimising the vehicle emissions.

Public transport vehicles are selected because of their existing higher fuel efficiency per passenger relative to cars and because of the amenability of vehicle fleets to using alternative fuels and fuel cells in the short term.

It is proposed to investigate how these separate technologies can be integrated and optimised to form a vehicle propulsion system to meet the above objectives. In comparing the benefits of use of various energy sources, "well to wheel" energy consumption will be considered. Relative life cycle energy costs will also be assessed and compared.

The project will be undertaken by Bristol Electric Railbus Ltd, public transport operator and promoter of low emission technologies, using the test facilities of Clayton Equipment Ltd. The vehicle manufacturer, Clayton, intends to incorporate low emission propulsion into its vehicle designs to meet environmental objectives.

The project consists of a series of dynamic tests and measurements on a prepared drivable testbed able to emulate vehicle performance and determine power and energy storage requirements. In parallel, feasibility studies will be carried out to determine the most appropriate and cost-effective propulsion technologies to achieve the carbon emission reduction targets.

