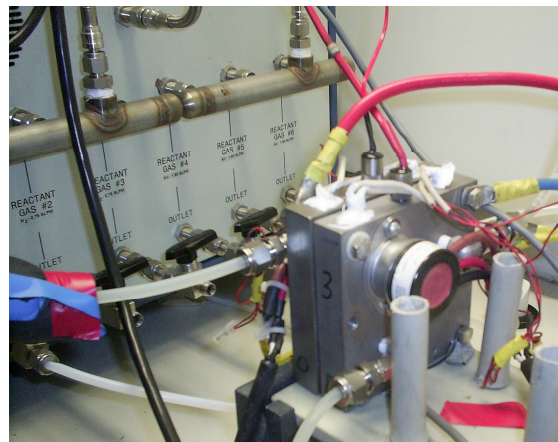


Project Title: 'PEM fuel cell test stand for low carbon technologies.'
Principle Investigator: Dr E Roberts (University of Manchester)
Project duration: 01/01/07 – 31/06/08
Grant Value: £41362.51

One of the solutions put forward for the demand for a clean, efficient form of energy production is the use of hydrogen, in particular hydrogen fuel cells, and the development of the 'hydrogen economy'. The 'hydrogen economy' is a term for a hypothetical future economy where hydrogen is the dominant form of stored energy, the manner in which the UK and other countries might adopt such an economy is currently the subject of much discussion. A key technology for the hydrogen economy is the hydrogen powered fuel cell, and it is widely believed that the Polymer Electrolyte Membrane (PEM) fuel cell will be used for automotive applications. The aim of this project was to establish a PEM fuel cell test system which will be used for a wide range of related research projects. Fuel cell tests are an essential step not only in the development of materials and components for fuel cells, but also in the evaluation of technologies that are intended to interact with the fuel cell, such as hydrogen carrier systems. Prior to this project a number of new fuel cell materials were being developed in Manchester but there were no facilities for evaluation of these new materials in a hydrogen PEM fuel cell.

In this project, a hydrogen fuel cell test stand has been established which allows researchers to evaluate new materials and hydrogen storage systems currently being developed. The test stand allows accurate control of operating conditions to give reproducible performance data and can be used for lifetime testing of components. It is available for industry in the North West and elsewhere in the UK with an interest in fuel cells to evaluate new technologies in collaboration with the fuel cells group in Manchester and several commercial partners have already used the facility. The system also provides an invaluable demonstration tool to showcase the capabilities of the University of Manchester in this fast moving and vital field of research



A preliminary study of a new form of hydrogen storage has been carried out and this has suggested it could be integrated with a PEM fuel cell system for automotive applications. This system provides better performance than current state of the art compressed hydrogen technology. In addition because the fuel is stored as a liquid, the existing fuel infrastructure could be used with this system. As well as this the fuel cell test stand will be used to evaluate new materials for PEM fuel cells which will enhance performance and reduce costs. This research is of great interest to industry and the UK Government alike.