

TAKE THE BUS ROUTE

Alternative powertrains for urban buses boast a number of advantages

Compared to traditional buses, hydrogen fuel cells have extensive driving range, flexible route options and use filling stations (primarily in depots)

Fuel Cells and Hydrogen Joint

FOR THE EU to achieve its 2020 targets of reducing greenhouse gas (GHG) levels and increasing energy efficiency by 20 per cent, relative to 1990 levels, a focus on alternative and sustainable fuel sources is crucial. With the depletion of traditional fuel sources, alternative energy supplies are becoming increasingly popular. In addition, Europe's dependence on other regions to provide non-renewable fuels such as gasoline and diesel has taken an undesirable turn due to spiralling costs. Transport is one sector that depends heavily on fossil fuel sources, and a large portion of the decarbonisation process will need to be addressed here – particularly in road transport – if the EU is to keep its energy commitments.

The day-to-day use of public and private transport in Europe produces a large quantity of CO₂, carbon monoxide, sulphur and other pollutants that are recognisable causes of global warming. Aside from playing a destructive role in the deterioration of our environment, these GHGs also have a negative effect on public health and quality of life. Such concerns have increased the demand for tighter regulations on local emissions.

WHY THE SWITCH?

Reducing GHG emissions, securing our energy supply and fortifying Europe's economy are all aspects that make hydrogen a credible energy source for the future. It is an environmentally-friendly means of consuming energy and is non-hazardous when used efficiently. Predominantly, hydrogen is produced from the chemical processing industry (petrochemical and chlor-alkali); however, it can be highly efficient when produced via electrolysis from renewable energy. Hydrogen is transferable to a number of different industries (healthcare, welding, glass making,

to name but three), and is a safe form of industrial energy. When used to produce electric power, hydrogen acts as a cleaner carrier of energy and can contribute to efforts to address the energy challenges faced by Europe and the world today.

Fuel cells convert hydrogen (or hydrogen-containing fuels) directly into electrical energy capable of being continuously fed with a fuel so that the electrical current flows perpetually. They are considered to be a primary application technology for hydrogen given their efficiency, cleanliness, and their ability to be applied to several energy-consuming sectors.


A NEW REPORT

The advancement of alternative powertrains – the system of components that initially produce energy and then deliver it to the road surface, water or air – has meant that urban buses can play a better role in the decarbonisation process, contributing to the reduction of air and noise pollution. A number of European countries have become engaged with cleaner transport systems, with players in the bus industry hoping to renew their vehicles or switch to low-emission powertrains.

Commissioned by the Fuel Cells and Hydrogen Joint Undertaking, a group of companies and government organisations therefore participated in a study on the various powertrain technologies available for urban buses in Europe from 2012-30. The aim: to provide a fact-based and objective evaluation of their sustainability, performance and economics (on a well-to-wheel basis), based on proprietary industry data. The report is set to be launched in Brussels on 6 December.



Trolley buses are successful in operation and can move easily within the network of overhead lines

Reducing time-to-market and initiating commercial lift-off of hydrogen and fuel cell technologies is critical if Europe is to reach its target emission levels. FCH JU is providing the requisite research infrastructure 

Undertaking

Opportunity e-buses are electrically generated and can recharge at various en-route stops to minimise the weight of the battery. Projected costs appear to be fairly low

Overnight buses are electric buses that carry the battery weight required to perform drives without recharging

ON THE GROUND

Three of FCH JU's most significant transport projects

- Clean Hydrogen in European Cities (CHIC) aims to implement clean energy in five EU countries, prepare for the commercialisation of hydrogen fuel cell hybrid bus technology and address related infrastructure issues



- High V.LO-City looks to speed up deployment of the last generation of hydrogen FC buses by tackling environmental and operational issues regarding the transport sector

- HyTEC addresses the European network of demonstration sites in Denmark and the UK – two locations considered very promising for early market hydrogen and fuel cells

Although diesel hybrids have relied on fossil fuels for long-distance drives, hybrid buses can reduce fuel and GHGs, and serial hybrids can perform stretches of particular routes in fully electric drive

OPEN CALLS FOR PROPOSALS

In a bid to identify a practical approach to meeting the needs of successful development and integration of hydrogen and fuel cells technologies in Europe, FCH JU has set out the Multi-Annual Implementation Plan

The budget is operated to launch annual competitive and open call for proposals which have been taking place since 2008.

The activities are guided by a long-term strategy document, the Multi-Annual Implementation Plan (MAIP), which outlines the scope and details the planning for research and demonstration in the long term.

The (MAIP) is divided into five main application areas:

- Transport and refuelling infrastructure
- Hydrogen production and distribution
- Stationary power generation and combined heat and power
- Early markets
- Cross-cutting activities such as regulations, codes and standards, prenormative research, socioeconomic research, technology and life-cycle assessments, market support, public awareness, and education

The strategy and objectives set out in the MAIP are translated into annual programmes of activities in the Annual Implementation Plans (AIP), which set out the topics for the Call for Proposals for which project proposals are required by each application area.

Consortia are invited to submit proposals to an open competitive process which assesses each proposal on a range of criteria, with the highest scoring examples being selected for FCH JU support.

To date, five calls for proposals have been published: 2008, 2009, 2010, 2011 and 2012. 100 projects from the 2008 to 2011 calls for proposals are currently run in parallel by the programme office.

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