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**The future of Hydrogen for Clean Transport**  
*Public Transport in the Future Europe - European  
Commission Policies and Practices*

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State Secretary Muecke, Ladies and Gentlemen,

It is a pleasure for me to attend events such as this. There are too few opportunities for me to get away from my desk and to see - at first hand – what has been achieved in Commission funded projects.

I see that you have put our funding to very good use! The achievements of HyFLEET:CUTE are remarkable – 44 hydrogen buses, 2.5 Million kilometres in public service – under a wide range of conditions, and more than 8.5 million passengers carried. Now I understand clearly why you have chosen the theme – "***Hydrogen Transports***" – for your conference. Hydrogen vehicles are no longer an engineer's dream, but a working reality.

The Commission has long noted the potential of hydrogen to contribute to reducing greenhouse gases, pollution and improving energy security. We have supported fuel cell research for 20 years and research on hydrogen as an energy carrier for over 12 years.

This led to the formation of the High Level Group, its vision report in 2003, and the formation of the Hydrogen and Fuel Cell Technology Platform. In its strategy plan for 2006, the platform recognised the importance of buses as a vehicle for proving the technology and promoting public acceptance.

The hydrogen bus projects CUTE, ECTOS, STEP, and now HyFLEET:CUTE have been a very important step along that road - providing in-depth knowledge of the technologies, the vehicle and refuelling operations, safety and maintenance and also human and social factors.

But as we all know, it is not only a question of proving that a technology is safe and fit for purpose – it is also a question of how to bring these new technologies to the market place.

This will be one of the important next steps for the Fuel Cells and Hydrogen Joint Undertaking – putting into place key elements for rapid deployment.

But, for the European Union, the challenge has to be seen not only in terms of hydrogen vehicles and infrastructure.

Our challenge is to set achievable targets for Greenhouse Gas Emissions reduction and energy security having regard to **all** end-use sectors and **all** technologies, whilst – and this is crucial - maintaining industrial competitiveness.

As we approach Copenhagen it is increasingly clear that radical solutions, stringent measures and large investments will be needed if we are to avoid more than a 2 degree rise in average global temperature this century. To improve energy security we must increasingly diversify sources of primary energy. In terms of final energy consumption, Europe is still nearly 80% dependent on fossil fuels. Transport accounts for 25% of CO<sub>2</sub> emissions and is more than 98% dependent on oil. Our oil import dependency will rise to uncomfortable levels over the next decade.

Substantial de-carbonising of transport will be complex and difficult. But we must do it.

*The European Union has adopted a threefold approach:*

- *agreeing comprehensive, far reaching **EU-wide targets** for de-carbonising our energy systems*
- *supporting **development of innovative technologies** and leveraging finance for innovation*
- *developing **policies** for progressive market introduction of new technologies - including both legislative and non-legislative measures*

### Target Setting

On *target setting*, the EU has been pro-active in bringing forward an ambitious, integrated energy and climate policy in 2007 – the 20-20-20 by 2020 initiative. We have targets and action plans for energy efficiency, renewable energy and greenhouse gas reduction.

The **Renewable Energy Directive** requires a share of 10% of renewable energy sources in transport fuels by 2020. This is expected to be made up of biofuels, hydrogen and electricity from renewable sources.

Last year the Commission adopted an Action Plan for Intelligent Transport Systems. We have also just adopted an Action Plan on Urban Mobility. These initiatives foresee a range of actions that will explore ways to implement new, clean technologies, enhance traffic fluidity and re-balance public and private transport systems.

The Commission is now looking at its energy strategy beyond 2020. What we want to aim for is a zero-emissions electricity sector by 2050. President Barroso has also anticipated (in his submission to the European Parliament) moving towards **decarbonising** all transport modes and stepping up the development of clean road vehicles.

### Innovative technologies

To substantially decarbonise transport by 2050, *innovative technologies* such as hydrogen, fuel cells and electric vehicles will be essential.

The Commission's Strategic Energy Technology Plan sets out priorities for Europe to work in a more focused and result-oriented manner on several **industrial initiatives**: Wind, Solar, Bioenergy, (Smart) Electricity Grid, CCS and

(Sustainable) Nuclear Fission. All of these industrial initiatives have clear links to hydrogen.

On 7 October the Commission adopted a Communication on Investing in the Development of Low Carbon Technologies. To achieve our goals, we estimate that we will need €8 billion per year – more than double what industry and governments invest today. The communication also estimates that an additional €5 billion will be needed for the deployment of Fuel Cell and Hydrogen Technologies from 2013-2020.

### Policy

*Policy will play a critical role in stimulating early, Europe wide market introduction* of new technologies.

Our aim is to support the progressive emergence of ever cleaner, more energy-efficient vehicles and transport systems. A **consistent policy framework** will be needed. It needs to be sufficiently demanding to **spur immediate and significant action**. It also needs to be both flexible and progressive. Flexible, because we cannot anticipate what technologies will finally deliver. Progressive, because **we absolutely have to arrive** at our long term target to decarbonise transport by 2050.

The framework should – at the same time - drive incremental efficiency improvements in conventional technologies, whilst providing appropriate incentives for promising near and medium term alternative technologies – such as biofuels, hybrids, plug-in hybrids, and pure electric cars and, of course, hydrogen and fuel cells.

Of course we shall not focus only on vehicle technologies. We have to look at the whole picture – citizens' mobility needs and the transport system.

In the frame of the Action Plan on Urban Mobility we shall explore ways of incentivising clean technologies and more sustainable urban transport systems which integrate car use with Public Transport - and other human friendly modes such as walking and cycling. Application of Intelligent Transport Systems for traffic management, passenger information and smart ticketing will support the development of efficient co-modal and inter-modal chains.

What does all this mean practically? Let me cite some examples.

At the legislative level, the EU has adopted new directives on renewable energy, greenhouse gas emissions trading and more

rigorous energy efficiency standards. These measures will strengthen the EU's energy security and give a massive boost to the low-carbon technologies of the future. These initiatives provide a policy framework, which rewards technologies according to avoided externalities.

In transport, we have also taken steps towards policy internalising external costs – the Directive on Public Procurement of Clean Vehicles obliges public authorities and public transport operators to compare costs of vehicles for public fleets based on lifetime operational costs, including energy, carbon and emissions costs. The Greening Transport package adopted last year also includes proposals for Directives in the areas of heavy goods vehicles and railways which include provision for internalising external costs.

In the Communication "**A sustainable future for transport**" published in June 2009, the Commission identifies challenges, instruments and priorities for transport with a time horizon of 2050. Following public consultation, the Commission will publish at the end of 2010 a White Paper which will present policy measures to be adopted in the area of transport for the next decade until 2020.

In future, we will need integrated mobility solutions which will, on the one hand, improve the efficiency and attractiveness of public transport, and on other hand, offer private transport whenever it is needed. The car will have to be fully integrated into our overall mobility system. Public transport, including buses, will have a crucial role to play. Human centred mobility, such as walking and cycling should also be actively supported wherever possible and safe.

The difficulty of gaining public acceptance for a radical new idea or technology is often underestimated. Bus demonstrations especially will play a very important role in promoting public confidence in the safety and viability of alternatives to fossil fuels.

Also for technologies such as hydrogen which deliver societal benefits, Public Authorities have a crucial role to play. We need to explore options to stimulate Public Private Partnerships and mechanisms for public procurement.

### Investing in the future during an economic crisis

Three years ago Lord Stern, in his review of the economics of climate change, noted that if we invest one percent of GDP now, we will save up to 20% of GDP in the longer term.

Investing now for future returns is a sound business argument for investing in clean, sustainable and secure energy systems. But this is far from easy in these times of economic crisis.

Important decisions are being made now to stimulate return to economic growth. By tackling the economic, energy and environmental challenges in an integrated way, we can create the conditions for new investments, new enterprise and new jobs.

The Commission responded strongly to the financial crisis with its Economic Recovery plan - communicated at the end of 2008. We are building Public Private Partnerships, including the Green Car Initiative. The economic recovery plan combines funding from research with EIB finance facilities. For example around €5 billion has been allocated to the Green Car Initiative – of which €4 billion is an EIB debt financing facility. As part of this initiative, we currently have opened a call for proposals for demonstrating electric vehicles. This closes on 14 January. The Economic Recovery Plan will also dedicate almost €4 billion to new energy networks, offshore wind and CCS projects.

EIB is planning to introduce a new instrument, called ELENA, by the end of 2009. ELENA is intended to assist cities and regions in developing their sustainable energy investments projects and mobilising investments. Through this facility, the Commission will provide funding to local authorities for financing development of municipal investment projects or programmes. This will be of interest to cities which may be planning renewal of their bus fleets and are considering alternatives such as hydrogen – but may need support in planning such a fleet.

### Concluding Remarks

**In concluding, it is my belief that decarbonising transport ranks as one of the great challenges facing the European Union over the next decades.**

New technologies such as hydrogen will play a crucial role.

HyFLEET:CUTE has made a considerable contribution to the development and operation of hydrogen vehicles - of all types. It has addressed technical, safety and social issues - and it has made major efforts to communicate the many experiences gained.

I am convinced that buses will form an ever more important component of urban transport systems of the future – and they will have to be very clean. Initiatives such as the Hydrogen Bus Alliance and the HyRAMP Regions partnership can help mobilise interest. There are a number of international bus demonstrations and we should engage more with these in future – to exchange knowledge and experience.

Finally I would like to pay tribute to our Hamburg hosts – Hamburg has shown great vision and commitment in bringing forward hydrogen technologies not only for road transport – but also for maritime.

I would also like to pay tribute to all of those who took part in the HyFLEET:CUTE project and to congratulate you for the remarkable progress. I wish you every success in moving forward and developing the latest generation of hydrogen buses into products that we will come to use on a daily basis.

Thank you for your attention!