

NEW PATHS TO THE ENERGY CONSUMER HYDROGEN AND ELECTRICITY PROVIDE THE INFRASTRUCTURE

The German Hydrogen and Fuel Cell Association (DWV) is preparing a publication about the energy infrastructure on the basis of renewable sources. This was announced yesterday by Dr. Joachim Wolf, deputy chairman of the association, on occasion of its annual meeting of members at Isenbuettel (Lower Saxony). The association intends to counteract the apparent uncertainty („Who will pay for it?“) and also to direct the public attention to the necessary changes in thinking and in the energy economy. Completion of the paper is expected for the second half of this year.

It will be based on the „Objectives and demands of DWV“ which were presented during the annual press conference of the association in February (see our [press release 2/09](#) of February 18, in German). DWV acts neutrally and is not influenced by companies or industry groups.

Uncoupling our energy supply from fossil carbon is a key task if we want at to soften the effects of climate change at least a bit. This is true for mobility but also for the producing industry, energy economy and the domestic sector. There are two apparently contradictory consequences from this requirement:

- We must use the whole range of renewable sources which deliver very different kinds of energy.
- We do not want to overburden the end consumer with a lot of expensive processes and installations.

The infrastructure is what connects sources and consumers. Energy must be provided by energy carriers as few as possible, as clean as possible, and as standardised as possible which can be used in all the sectors mentioned above. This is the fundamental requirement for a broad and efficient energy economy which uses all the different sources and leaves a choice between them to the customer.

Current “energy carriers” like gasoline, diesel or natural gas have achieved this unification of quality in the market to a great extent. In the future their role will be taken by electricity and hydrogen. Both can be generated from more or less all renewable sources (sun, wind, water, geothermal), but also from fossil and nuclear energy or biological sources. Unlike natural products like natural gas both have a well defined quality.

The spectrum of hydrogen sources is even wider than in the case of electricity. Its generation from renewable electrical power is associated with losses, but it can be stored much better than electricity. In mobile applications it is superior to battery vehicles as soon as the requirements to range and payload exceed a certain threshold. The efficiency of hydrogen in the Well-to-wheel calculation is the same as for current technologies, but the greenhouse gas emissions are 30 % lower.

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Both will also help to cope with the fluctuations which are a characteristic feature of renewable sources. Just as we have base and peak power stations today a sustainable energy economy will need storage elements. These may be batteries, capacitors, pressurized air, thermal storage – or hydrogen. Existing plants may be optimized by additional investments and used for more profitable market segments (peak power, fuel).

Power providers and other energy companies can use new market opportunities. Electricity providers will sell electric power either directly to battery or hybrid vehicles or indirectly as hydrogen. Companies offering natural gas or technical gases could also sell hydrogen. The fuel companies have already a network of selling points at their filling stations. But hydrogen and electricity offer also the opportunity of complete or partial independence from this network. In France and the UK more than 50 % of the fuel is today sold not by oil companies but by supermarkets.

One of the effects for the final customer is a wider choice of options to adapt his style of life to the challenges of our era. More and more customers demand to know which effect the products offered to them have on climate and environment, but even if they find it out they still have not enough alternatives.

Tax incentives should be able to bring down the higher investments for sustainable and efficient technology to more or less the current level. The operation of electric and fuel cell vehicles will probably be cheaper than today, but certainly not more expensive.

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