



World Nuclear Association Annual Symposium
8-10 September 2004 - London

Hydrogen – Fuel for Future Propulsion Technologies

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In recent years, the concept of “sustainability” with reference to human activities has taken on ever greater importance. Among other things, this concept requires a reduction in the dependency on fossil resources and a reduction in CO₂ emissions. For the transport sector, the limited extent of fossil resources and the aim of reducing CO₂ necessitates a search for an alternative future fuel which can be manufactured from primary energy sources other than oil, natural gas and coal. In order to reduce anthropogenic CO₂ emissions, the production of the alternative fuel and its use in vehicles must be linked to the lowest possible CO₂ emissions. An alternative fuel with a good long-term prognosis is hydrogen, which has considerable potential for regenerative production.

It's a dream that has been with us for a long time: running a vehicle on a fuel obtained from water. Hydrogen burns CO₂-free, is non-toxic, has no negative effects on the environment and can be produced long term from regenerative energies like solar, wind, water and biomass energy.

The BMW Group has set itself the target of promoting the hydrogen-based economy as rapidly as possible, and has therefore given preference to the well-proven internal combustion engine as a power unit. By the time the sixth generation of hydrogen vehicles is ready, which will be during the lifecycle of the current 7-series, we will offer the cars directly to our customers for the first time. For BMW, this step onto the market is the logical consequence of 25 years of pragmatic development work. The cars can run on either petrol or hydrogen and thus makes it possible for the vehicle to be operated even before an adequate hydrogen supply infrastructure has been built up. The BMW Group was the first automobile manufacturer in the world to start series-production development work on a hydrogen-fuelled car.

From the investigation of the dynamic overall system (production of hydrogen including renewable energies, distribution and gas station infrastructure), it clearly follows that, according to the criteria considered (e.g. maximum reduction of CO₂, minimum costs, cost-related and emission-related optimum), partially differing results stand out as the optimum that should be realized. On the one hand, this derives from the fact that the aim of long-term high-level reduction of CO₂ cannot be realized at low cost. On the other hand, it also depends on the observed institution that pursues this primary goal. Since the criteria are sometimes

contradictory, the build-up of a hydrogen infrastructure can only take place as an optimized middle course, taking all of the objectives into consideration.

The industry and politics must work together to ensure that the hydrogen car does not fail, like the natural gas vehicle, due to a lack of infrastructure. If we want to maintain our present level of mobility, the long-term transition to hydrogen as a source of energy is an absolute necessity. This transition requires time – and that only makes it more important to start now. Our progress in the development of hydrogen engines makes us confident that the road to the market is a short one. The BMW Group will certainly make every effort to help hydrogen make a breakthrough as a source of energy and the hydrogen engine as the propulsion concept of the future. We are convinced: The way into the hydrogen future is irreversible!