



## **Four steps to a new reliable, cleaner and decentralized Energy Supply based on Hydrogen and Fuel Cells: “Revolution in the Garage”**

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With a new reliable, cleaner and decentralized Energy Supply based on Hydrogen and Fuel Cells, incidents like the August 2003 electrical grid blackout in U.S. and Canada would not have happened. Also the needed reduction of CO<sub>2</sub> can be achieved, when the hydrogen is produced directly from renewable energies, without using electricity. The “components” to achieve this goal are all available; some need additional R&D work, but the target can be achieved.

The cars are the key. If all 800 Mil. cars worldwide were equipped with a Fuel Cell system, they can easily take over the function of all existing stationary electrical power plants. Looking at Germany with 82 Mil. inhabitants, there are 44 Mil. cars registered with an average power of 70 kW in their conventional IC engines, running either on gasoline or diesel fuel. Together, the engines installed in these cars generate ~3,000 GW max. At this time, this capacity is “only” used for transportation. For comparison: the capacity of all stationary power plants currently in service in Germany totals ~115 GW max. The primary energy sources of these power plants today: 61% fossil fuels, 34% nuclear energy, 5% renewable energies. Other countries, like the U.S., share similar figures for the number of registered cars in relationship to the installed capacity of the operating power plants.

Consider that the average car only runs less than one hour out of 24 and imagine that each car will be equipped with a 75 kW Fuel Cell powered by Hydrogen. Based on the above figures, while stationary, these 44 Mil. cars together will produce enough power to create a “Virtual Powerplant” to supply all industrial and private consumers not only with electricity, but also with heat.

The incentive for car owners driving and using vehicles equipped with Hydrogen and Fuel Cells systems is twofold. They can either save or earn money while their cars are parked and connected to buildings via a smart docking station. For example, your car parked at home in your garage will supply electricity to your home and additionally, replace the function of your existing boiler. You can even sell the electricity generated, but not used at home at that time, to the utilities and feed it into the existing electricity grid.

In the first stage, the Hydrogen needed to power this system will come from natural gas, which is worldwide available, but not renewable. In a next stage, the Hydrogen will be produced directly through renewable energies like wind power or solar energy without electricity (or even possibly from organic and artificial waste in the long-term). The individually produced Hydrogen will be stored in a personal tank inside the garage or the cellar. The Fuel Cell in the cars produces DC, which will be directly in the household - with nearly all advanced appliances like computers. The heat generated by the fuel cell will warm homes in winter, and in summer, the heat will be converted by means of heat exchangers to eventually replace all air-conditioning units.

Other examples: When cars are parked for shopping, they can easily earn a rebate for each minute the car is “plugged” into the “system”, supplying electricity and heat to the supermarket. This rebate would show up on the final bill: “Earning money while you shop”. The same idea applies at the office: Once the car is connected to one of the docking stations at the office buildings, it will supply electricity and heat, to earn money for the time connected, which will regular show up as additional income on the pay slip of the participants of this system.

Quoting a famous German carmaker Board Member, who heard the idea for the first time: “This can only be realistic in 20 years.” To his comment I replied: “If you don’t start this year, it will be only reality in 21 years....”

Others like Amory B. Lovins, Co-Founder of the Rocky Mountain Institute, had this vision before. Prof. Bernd Hoehlein, Forschungszentrum Jülich GmbH proved this theory with his calculations and it is further supported by journalists like Bernd Genath. For my part, I strongly believe that the time has now come to make this vision happen. These new PersonalPowerCars will not only drastically reduce CO<sub>2</sub> pollution, they can also prevent further blackouts of the existing electricity grid with their decentralized energy supply as described.

However, it still requires a lot of engagement and dedication from people all over the world to implement this idea into reality. The realities of today’s Hydrogen and Fuel Cells industry are demonstrated at the Group Exhibit - Hydrogen + Fuel Cells since 1995 at the annual HANNOVER FAIR in Germany, each year in April.

<http://www.fair-pr.com>

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