Personal power stations

The elimination of CO2 emissions from transport, industry and home

Transport accounts for about 25% of our pollution and is growing out of control. There are suggestions for electric vehicles, for hybrid vehicles and for increased mpg., but all of them still emit some CO2. This proposes a solution for the total elimination of CO2 emissions from transport. The political hot potato of "what to do with vehicles" and the elimination of CO2 emissions from all sectors of industry, home and transport is presented as a possibility.

With the advent of fuel cells in cars, there is work proceeding with Ballard, General Motors, Ford, Mercedes Benz including buses. Assuming this technology comes to commercialisation by 2005 then here is the possible scenario.

Each vehicle contains a 60 to 80 kilowatt fuel cell and is the equivalent of a personal power station (PPS). On arrival at work the car is plugged into the Town Gas supply (partly hydrogen) and plugged into the electricity grid and water grid. Presently, cars are 95% idle and 5% operative; this solution would propose the car be 100% operative. On plugging in, the car will start producing electricity and be paid for the electricity produced. The utility company could own and lease the fuel cell within the car. During the stay at work, the occupant would start his PC, operate the elevators, operate his lathe and all the power for his personal use and more would be provided by the car and would go into the general grid system. Employees who arrive by train or bus would thus be able to use the overflow of power. There are some 20 million cars in the UK with 60 million inhabitants, so if all of them had fuel cells in there would be more than enough power without having thermal power stations of a central nature.

Upon arrival at home, the same would apply. Plug into the grid for gas, water and electricity and as the car produced electricity, it would also produce water for the home. The balance would go to neighbours houses that didn't have a vehicle.

This would raise the productivity of the capital investment of the car. The fuel cell could be driver owned or leased by utilities. It would eliminate at one stroke the pollution caused by the car, as its only output is electricity, water and heat.

The infrastructure for hydrogen is already in position with the UK Transco grid of pipe-work conveying North Sea Gas. North Sea Gas could be used in the first instance and the use of fuel cells would eliminate the vast majority of CO2 emissions.

At a later stage when electrolysis of water could take place from hydro electric systems, from wind powered systems, from photovoltaic systems and also from gasification of biomass, then eventually there would be a zero CO2 from all sectors – commerce, transport and home.

This idea is simple, it requires work doing on it for the economics, the ergonomics and embedded generation differentiation from central power station distribution. There are people and universities capable of doing this work at the present time. But it needs a political decision and funding, which is being sought.

Addendum

A fuel cell – is for example a stack of plastic sheets and catalysts which absorb hydrogen, combines it with oxygen, produces electricity which drives the car, with pure hot water produced as a by-product.

When the car is parked, the same fuel cell is used to produce electricity for industry and homes. The amount of electricity so produced would far exceed all the power stations in Europe just by the cars in England if they were all so converted.

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