

Economic Analysis of Domestic Combined Heat and Power System in the UK

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Abstract : A combined heat and power (CHP) system is an efficient and clean way to generate power (electricity). Heat produced by the CHP system can be used for water and space heating. The CHP system which uses hydrogen as fuel produces zero carbon emission. Its' efficiency can reach more than 80% whereas that of a traditional power station can only reach up to 50% because much of the thermal energy is wasted. The other advantages of CHP systems include that they can decentralize energy generation, improve energy security and sustainability, and significantly reduce the energy cost to the users. This paper presents the economic benefits of using a CHP system in the domestic environment. For this analysis, natural gas is considered as potential fuel as the hydrogen fuel cell based CHP systems are rarely used. UK government incentives for CHP systems are also considered as the added benefit. Results show that CHP requires a significant initial investment in return it can reduce the annual energy bill significantly. Results show that an investment may be paid back in 7 years. After the back period, CHP can run for about 3 years as most of the CHP manufacturers provide 10-year warranty.

Keywords : combined heat and power, clean energy, hydrogen fuel cell, economic analysis of CHP, zero emission

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