Adsorption Heat Pumps: Challenges and Future Perspectives

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In the past two decades, there has been a considerable interest in adsorption heat driven refrigeration and heat pump systems to reduce greenhouse gas (GHG) emissions associated to conventional heating and cooling systems. In fact, in the UK, the annual emission of CO_2 due to heating is about 180Mt CO_2 equivalent corresponding to 38% of all greenhouse GHG emissions. The domestic heating alone (hot water and space heating) counts for about 87Mt CO_2 equivalent (48%). Although substantial progress has been made to overcome scientific and technical challenges of adsorption technology, the commercial adsorption heat pumps and refrigeration machines are still marginal on the market worldwide. The current presentation main objectives are, not only to spell out the key factors that are holding back this technology and to list few commercially available machines, but more importantly to outline future perspectives in both short and long terms. Illustration examples will include a domestic gas fired Adsorption Heat Pump developed by University of Warwick as shown in **Figure 1**.

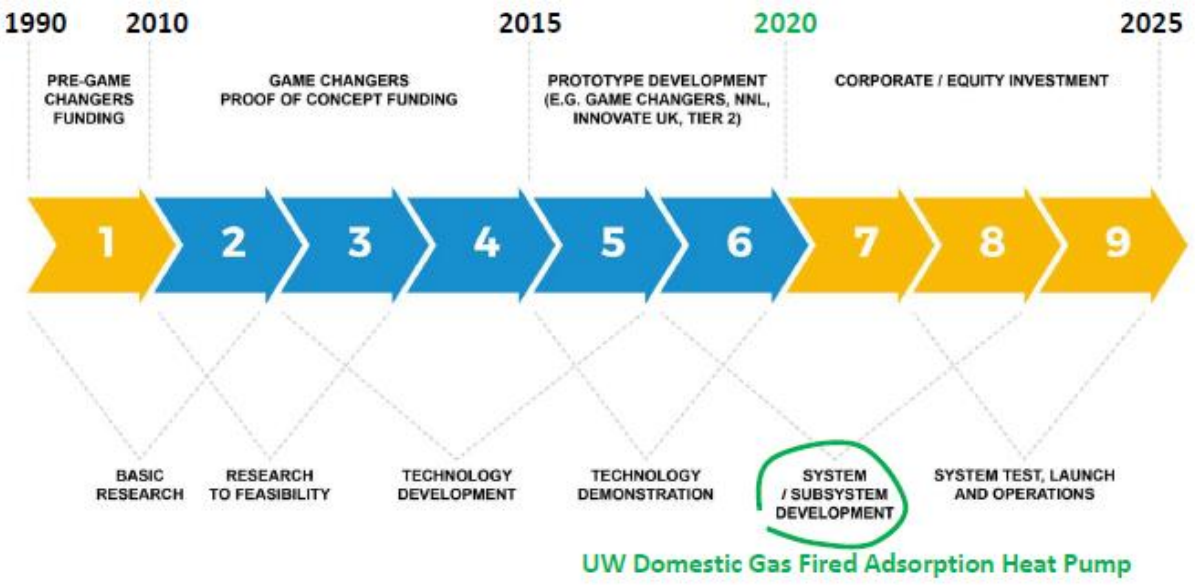

Figure 1: Technology Readiness Level (TRL) roadmap for an Adsorption Heat Pump.