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Memorandum submitted by Mitsubishi Electric UK Ltd (FP 23)

1.0 The Company

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1.1 Mitsubishi Electric was founded in 1921, giving it over 80 years experience of manufacturing and supplying cost-effective energy systems designed to provide the consumer with constant, comfortable living and working environments.

1.2 Mitsubishi Electric is now in the vanguard of promoting air source heat pumps (ASHPs) for significant use in the residential sector as an energy efficient, low cost and low carbon alternative for heating and hot water.

1.3 Mitsubishi Electric's Living Environmental Systems (LES) Division (UK) has an operational base in Hatfield and an assembly plant in Livingston.

2.0 Executive Summary

q Greater importance needs to be given to the dynamic performance of a property's heating system when attempting to alleviate fuel poverty.

q Greater importance should be placed upon fuel poverty impact, achievable by replacing existing heating systems.

q Gas is becoming an expensive and unsustainable way to heat our homes, and gas boilers have reached their potential in terms of efficiency.

q Air source heat pumps are at least three times more efficient than gas boilers and five times more efficient than oil boilers making them cheaper to run, so cutting the cost of heating and hot water and providing assistance for the fuel poor.

q When replacing an average current gas boiler, a household will save between 39% to 57% on their heating costs, a possible maximum £715 annual cost saving.

q As ASHPs provide a whole house heating approach they significantly reduce the cost of energy supply.

q ASHPs can be fitted to all new build properties and about 7 million existing homes.

q Many homes are off the gas grid and rely on oil based heating which is expensive and polluting. Only requiring an electricity supply makes ASHPs ideal for those homes that are not connected to the mains gas supply.

q With the increased efficiency of ASHPs, comes commensurate savings in CO₂ emissions. The most significant single source of CO₂ reduction in residential properties can be delivered by the use of air source heat pumps (ASHPs).

q ASHPs should be adopted as a wide scale form of domestic heating as they are highly efficient and are scalable so they can achieve wide and rapid penetration. The infrastructure for installing, supporting and maintaining the technology already exists.

q The Government should extend the inclusion of ASHPs in grant schemes to boost their take up amongst those most likely to suffer from fuel poverty.

3.0 Background

3.1 Mitsubishi Electric draws a simple conclusion on the current debate surrounding energy efficiency and fuel poverty; we have to fundamentally change the way in which we heat our homes.

3.2 We believe that any discussion focusing on issues concerning fuel poverty can only be meaningful if it fully recognises and addresses the question as to which low carbon heating systems are most efficient and will therefore deliver the highest cost savings to the householder.

3.3 Approximately 75% of the total energy consumed by an individual property is in the production of space and water heating. Therefore in order to have the greatest influence on reducing overall household energy consumption and fuel bills, this area needs significant attention.

3.4 Managing the internal temperatures of the environments in which we live has to keep pace with the new technologies that are available and the incremental cost and carbon savings that are eminently achievable.

3.5 Modern gas boilers are more efficient than their predecessors, but the technology has reached the summit of its possible energy efficiency and has been overtaken technologically by air source heat pumps.

3.6 The use of ASHPs safeguards householders against the inevitable and continual rise in cost of fossil fuels

3.7 This should be recognised by Government which should focus on introducing policies for a long term, stable mechanism to support the widespread use of ASHPs in new residential buildings and for retrofit to existing homes.

4.0 Air Source Heat Pumps

4.1 Air source heat pumps use the ambient temperature in the air to supply heat. Therefore, the amount of primary energy is reduced, significantly lowering running costs and carbon emissions.

4.2 With the most modern conventional boiler (93% efficiency), one kilowatt of energy 'in' gives less than one kilowatt of heat to the building. With a typical electrically driven ASHP, one kilowatt of energy 'in' gives a heat output of 3.32 kilowatts (measured as a Coefficient of Performance (COP) of 3.32) and this efficiency will increase as the technology develops.

4.3 An ASHP looks like, and is the size of, an air conditioning unit. It sits outside the house against a wall or adjacent to the property. It is easy to install, with most plumbers having the required skills and is used in conjunction with conventional radiators. Only requiring an electricity supply makes ASHPs ideal for homes that are not connected to the mains gas supply.

4.4 Air source heat pump technology is already well used for domestic properties in other countries such as France, Switzerland and Sweden.

5.0 Air Source Heat Pumps Cost Savings

5.1 The purchasing of an air source heat pump (5kW model) for an average new house will cost around £2,000 compared with about £900 for a modern gas boiler with installation costs being the same.

5.2 ASHPs can be fitted in new houses and can also be retro-fitted where buildings have been effectively insulated (about some 7 million homes currently).

5.3 On an average annual gas bill of £677, with a 93% efficient gas boiler, there will be a £132 or 19% saving using an ASHP. The savings in cost accord to the efficiency of the boiler being replaced. As the chart below shows, for an 70% efficient boiler the running cost saving is 39% and for an older, 50% efficient boiler this will increase to 57%, a saving of £715.

5.4 The average efficiency of a domestic boiler in the UK is 60%, so large annual savings can be achieved when replacing boilers with an ASHP.

5.5 The table below shows the average annual running cost savings. With ASHPs cutting the cost of heating and hot water, they are able to provide assistance for the fuel poor.

Cost comparison for heating an average home (Jan 2010 prices)

	ASHP	Gas Boiler	Oil Boiler					
Efficiency (%)	330	93	70	60	50	97	70	50
Energy Required (kWh)	18000	18000	18000	18000	18000	18000	18000	18000
Annual Running cost	£545	£677	£900	£1,050	£1,260	£724	£1,003	£1,404

5.6 Savings are significantly more where the current heating system is oil based.

5.7 Savings will rise as the cost of an ASHP comes down with numbers sold growing and with their increasing efficiency as the technology develops.

6.0 Air Source Heat Pumps for Hard to Treat Homes

6.1 Using electricity to drive a heat pump makes air sourced heat pumps an ideal alternative for those homes which are not connected to the mains gas supply.

6.2 20.9% of those off the gas network are fuel poor and make up 23% of the national fuel poor statistics. Off-gas-network households pay higher heating costs because oil or liquefied petroleum gas are more expensive and are subject to volatile price fluctuations.

6.3 The use of ASHPs removes the need to negotiate the enormous expense and disruption of extending the National Gas Grid and offers those in fuel poverty access to cheaper energy.

7.0 Incentivising Air Source Heat Pumps for the Fuel Poor

7.1 As outlined above, given the significantly lower costs of running an air source heat pump compared to a conventional gas boiler or an oil boiler, there is significant potential to help cut the cost of heating and hot water for the fuel poor.

7.2 The Government should introduce measures to support low carbon heating solutions, including simple to access funding support mechanisms to reduce the financial barrier of the installation and capital costs of acquiring an ASHP for a domestic home. This will assist the market to grow and prices to come down.

7.3 The Government should ensure that ASHPs are included in all grant schemes to boost their take-up amongst those most likely to suffer from fuel poverty.

7.4 ASHPs need to be actively promoted through fiscal and financial incentives. An effective Renewable Heat Incentive would help mitigate the cost for households. The French Government recognises the efficiency of heat pumps and therefore promotes their use with a 40% tax incentive.

7.5 The current property improvement streams i.e. CERT, CESP, LCBP, and Warm Front should still be utilised but we would suggest greater importance is placed upon fuel poverty impact achievable by replacing existing heating systems.

7.6 We welcome the boiler scrappage scheme, which allows householders to replace inefficient boilers with renewable heating units, including ASHPs.

7.7 The Government should publish the Household Energy Management Strategy, previously called the Heat and Energy Saving Strategy as soon as possible so a comprehensive framework is put in place to drastically improve the energy efficiency standard across our housing, including the social housing sector.

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