

# 5 initiative



## Initiative 5: Improved Specification & Design

**Promote design methodology for free cooling & heat recovery into heating & cooling system design.**

**Ensure that all elements of the specification process are targeted towards sustainable specification.**

**Utilise the supply chain to implement policy.**

System design is the key point at which CO<sub>2</sub> reduction measures and sustainable best practice can be implemented. Improved specification and design is key to ensuring that 'lowest possible' carbon programmes are implemented – ensuring that both the design engineer, the equipment manufacturer, the installer and the end-user client are all aligned on ensuring that the most energy efficient equipment is installed.

### **Promote design methodology for free cooling & heat recovery into heating & cooling system design.**

Integrating free cooling and heat recovery is the first stage. The effect of lowering the heating and cooling requirements produced via mechanical means needs to be integrated into the design specification at the beginning of the process. Using ambient temperatures and fresh air (for cooling) reduces the need to add or remove temperature mechanically.

Mitsubishi Electric LES promotes best practice by ensuring that decisions based on the following components:

Lossnay	Fresh air ventilation must be considered every time before moving on to select air conditioning equipment
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Green List	Equipment from the Mitsubishi Electric LES Green List must be used
Use of Heat Pumps for heating	Heat Pumps for heating applications should be applied wherever possible
Controls	It is important that sufficient controls are fitted to enable correct running of all systems
Installation	All installations must be made in accordance with Mitsubishi Electric LES' Partner Programme Standards
Commissioning	The system must be commissioned to the Mitsubishi Electric LES' specifications to avoid unnecessary use of power and running times
Maintenance	A maintenance regime or contract should in place to ensure optimum running of equipment.

The Company has devised and will shortly implement a more condensed specification & design protocol based on the following four stages:

- 1. Building Concept**
- 2. Air Handling**
- 3. Heating and Cooling**
- 4. Building Controls**

Mitsubishi Electric LES will base its specification recommendations around these criteria. Each element will be weighted and scored for energy efficiency and sustainability.

**Building Concept** – The following are concepts which should be considered/used in the design of buildings:

- Natural ventilation combined with heating and cooling
- Ground sourced heating and cooling
- Heat recovery designed into the building from first concept.

**Heating & Cooling** – Delivery systems must be analysed to maximise efficiency:

- a. Heat pumps for heating applications as a replacement to fossil fuel burning boilers
- b. Cooling only heat pumps should be discouraged as they will be used in conjunction with "wet systems " such as radiators
- c. Design-out conflict between heating and cooling systems that often fight each other causing unnecessary wasted energy
- d. Disable cooling systems when heating systems are operational.

**Air Handling** – Buildings are more insulated and the amount of fresh air required is increasing. Heating and cooling this fresh air requires a lot of energy, thus it is vital that it is done in the most efficient way:

- a. No electrical boost heat or pre heat should be used as this will significantly reduce the efficiency of the fresh air processing plant
- b. Extract warm air from the building vents to recover and re-use
- c. Current building regulations recommend 10 litres per person per second of fresh air be supplied to a building. Thus the fresh air supply to the building should vary with occupancy
- d. Air curtains provide an unseen air barrier insulating the building air from the outside air – direct electric heaters are very inefficient therefore heat pump air curtains should be introduced.

**Building Controls** – The following are concepts which should be considered /used in the control systems of buildings:

- a. Night set back and night ventilation allows the building to maintain a reasonable temperature outside of normal occupancy times
- b. Sensors allow the heating or cooling in the room to either turn off or revert to a night set back when the room is unoccupied, they also drop the fresh air supply and treatment to a minimum level or turns off completely
- c. Ambient tracking and monitoring the indoor temperature can allow for heating and cooling to be held off on cooler summer mornings and warmer winter mornings
- d. Ambient tracking is to alter the indoor set point relative to the outside temperature; this equates to a higher room temperature in summer and a lower room temperature in winter.

## **Ensure that all elements of the specification process are targeted towards sustainable specification.**

To deliver a system at the lowest possible capital outlay is the natural step within any commercial installation. Often those that specify are not in the position of providing quotations, those that quote want to win business, those that purchase want the most cost effective solution.

Only as sustainability has become prevalent in people's thinking have decision makers looked towards perhaps paying an increased price for doing the right thing. However, in providing heating and cooling, doing the right thing actually equates to saving money. If equipment is more energy efficient it uses less energy and is therefore cheaper to run. The total-cost-of-ownership equation is key – detailing to the purchaser what the running costs will be over the lifetime of the equipment, not just at the point of purchase.

To this end, Mitsubishi Electric LES will implement the following:

1. The Company will build upon its existing training and educational programmes to ensure that decision makers are able to make informed decisions, in addition to better arming recommenders and specifiers with the materials they need to promote best practice
2. Existing quotation and specification systems will be upgraded to illustrate:
  - a. The system price according the specification
  - b. The alternative specification if products are specified using the 4-stage approach detailed earlier
  - c. The running costs of both options
  - d. The CO<sub>2</sub> emissions and savings of both options.

## **Utilise the supply chain to implement policy**

Mitsubishi Electric LES promotes its technology to large end user clients directly whilst relying upon accredited companies to provide installation, commissioning and maintenance support.

The Company is also very active in dealing with consulting companies that provide services to construction companies and the commissioning end user or developer.

The more traditional route to market for Mitsubishi Electric LES has been via contractors who offer air conditioning, mechanical and electrical services. In particular, over the last two years, the Company has formalised its relationship with these organisations in order to ensure installation standards and best practice are maintained. These companies currently split into two categories:

1. **Business Solutions Partners** – Will have a turnover of Mitsubishi Electric LES product greater than £200k. These companies are normally the larger installation groups with regional offices and install teams.
2. **Accredited Installers** – Will have a turnover of £30k to £200k of Mitsubishi Electric LES product. These companies are normally smaller independents.

The Mitsubishi Electric LES Partner Programme is uniquely based upon an agreed set of documented standards for Installation, Commissioning and Aftercare – meaning that the ultimate customer can expect a professional level of service and support from a Mitsubishi Electric LES Partner.

However, in today's world technical standards are not enough. We also need to look at the standards we adopt in the way we do business. Health & Safety issues and Corporate Social Responsibility (CSR) policies are just as important to End-user decision making and peace-of-mind. This is why in addition to meeting documented Partner Programme Standards, Partners are committed to upholding Health and Safety and abiding by a set of Corporate Social Responsibility principles. Environmental protection is a key component of the CSR policy.

Through both of these groups the Company will promote its specification and design protocols in order to join-up parties and ensure that the principles behind the Green Gateway Initiative are carried through.

Mitsubishi Electric LES will also provide technical support and 'decision support tools' in order to help all of these groups through the specification and design stages.

### **Expected outcomes from this initiative:**

This initiative is implementation of other elements of the Green Gateway Initiative and so does not have its own outcome.