What is THERM?

Getting Started

THrough-life **E**nergy and **R**esource **M**odeling

Integrating manufacturing processes and buildings sustainably

THERM aims to help move the manufacturing industry towards a more resource-efficient, low-carbon future; by highlighting the sustainability and economic benefits of an integrated modelling process, providing insights and numbers on energy flows to achieve potentially large energy and carbon reductions. THERM will create an integrated tool for sustainable manufacturing, which will take into account the building design and the manufacturing processes and allow manufacturers to understand and reduce their energy / resource use (material, water, chemicals).

The demand for manufacturing to become low-carbon and resource-efficient is coming partly from governments through various UK, EU and even US strategies, with the UK Low Carbon Economy Summit in March 2009 announcing the Low Carbon Industrial Strategy (currently in consultation).

The signal for manufacturing to act is loud. The ability of manufacturing to act is much lower – there are a few leading companies, but in general manufacturers have limited experience of the concrete actions needed and have a limited tool set to call upon. THERM addresses this issue through the examination of sustainable manufacturing practices and the ability to model and understand what is possible. Currently, no 'tools' are in regular use by manufacturers to assess environmental performance, identify improvement areas and help suggest concrete actions. THERM seeks to integrate 'Sustainable Building Design' tools and 'Sustainable Manufacturing Process' tools to achieve an 'Sustainable Manufacturing' tool. It is concerned with the creation of a new, innovative commercial modelling tool specifically for the manufacturing industry.

Any sustainable manufacturing modelling tool must be capable of modelling the interaction between the production system and its physical environment – firstly the building itself and then the locality (for example, sustainable manufacturing tactics include the potential to use local waste to power production processes, or the provision of waste heat from production to other local businesses). This project will develop a tool that through such integrated modelling can help identify improvements via its database of tactics. These sustainable manufacturing tactics have to account for location and time, as well as production process, in a manner that is not currently supported by either manufacturing process simulation tools, or building energy tools.

The THERM project is made up of an independent consortium of academic and business partners working together as part of a Technology Strategy Board Competition winning group. The team includes Airbus UK (aerospace) and Toyota Motor Manufacturing UK (automotive) who are highly representative of UK manufacturing and have provided test sites. Cranfield University and De Montfort University are experienced modellers and researchers in manufacturing processes, and buildings and services. IES Ltd has the simulation tool development expertise, and market presence and clear motivation to exploit the tool for the benefit of the whole UK manufacturing industry.