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Business description	Kira Supplies have developed a highly innovative, practical and marketable range of ICT products using high quality hardware components and software. Their innovative use of SoftXpand turns 1 windows-based computer into 6 independent computer workstations using standard monitors and keyboards. As only 1 computer is required to run 6 independent workstations not only are initial cost savings realised but ongoing energy savings of 83% are achieved. In addition heat output is reduced by 83%. The reduction in heat generation enables further savings in the operation of heating/cooling systems in buildings. It can also have important benefits and advantages for the design of new buildings. The product is being marketed primarily on the energy reduction and reduced emissions benefits.
Significant business impacts	A meeting with the company took place on the 7th April to discuss in more detail the business impacts following earlier extended telephone discussions. It was decided that the discussions should focus on the opportunities rather than the risks. The key business impacts were identified as: 1. The SoftXpand system can offer major heat savings (in addition to emissions reductions) and could be a cost effective method for reducing heat in buildings at risk from overheating. 2. Marketing the product against the heat reduction benefits would allow the product to meet both challenges climate change challenges: reducing emissions (mitigation) and building resilience (adaptation). There are few products that can meet both challenges with real savings at relatively low cost.
Impact analysis	**Increasing temperatures will make it more difficult to maintain comfortable conditions in the working environment** Internal temperatures in the workplace will increase in response to the effect on increasing ambient air temperatures and the urban heat island effect in our major cities. The challenge for both new and existing buildings and in particular those using large numbers of computer workstations is to maintain temperatures at an acceptable level with increasing ambient air temperatures. ICT equipment can make a major contribution to the

internal heating and cooling requirements of a building. Reducing the heat output from such equipment may provide a potentially relatively cheaper practical solution to managing internal heat compared with remedial structural work and/or the introduction of air conditioning.

The observed trends in increasing summer temperatures and warmer spring and autumns have been documented by the Met Office[T]. Observed increases in daily maximum temperatures in summer over the period from 1961 to 1990 between 1.8°C to 2.7°C have been recorded across the East Midlands. The Met Office also notes that in the period 1961 to 2006 there has been an increase in annual cooling degree days of between 15 to 30 days across the East Midlands.

All climate change impact studies and particularly those relative to the property sector identify increasing internal temperatures and the need for cooling of buildings as one of the key impacts of climate change. The scale of the changes that we face is significant. The 2003 heatwave is considered to have had a return period of 1 in 500 years, by the 2040s similar heatwaves will have a return period of 1 in 2 years and will be considered the norm. We will experience far more extreme heatwaves by the middle of the century. By the 2060s summers like 2003 will be considered relatively cool.

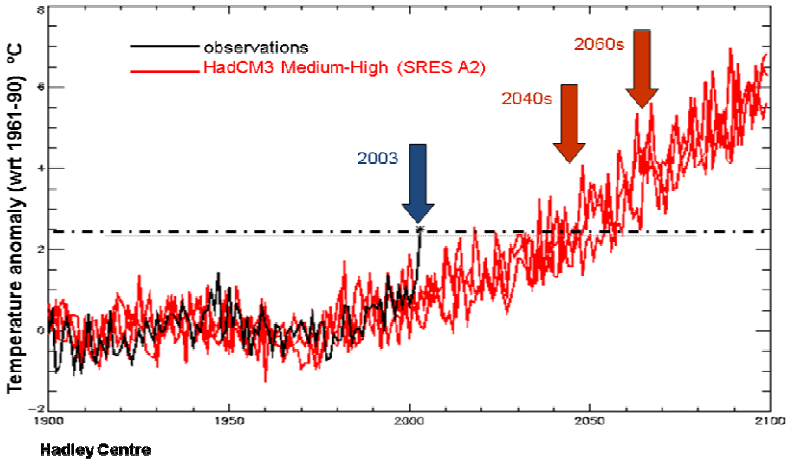


Figure 1 Changes in temperature compared with 1961-90

Box 1 shows how even in a modern naturally ventilated office, internal temperatures will increase above design levels requiring the introduction of remedial cooling measures. Similar assessments have been undertaken for new schools. Of course the problem of increasing internal temperatures becomes even greater for older buildings.

Box 1: Advanced naturally ventilated office

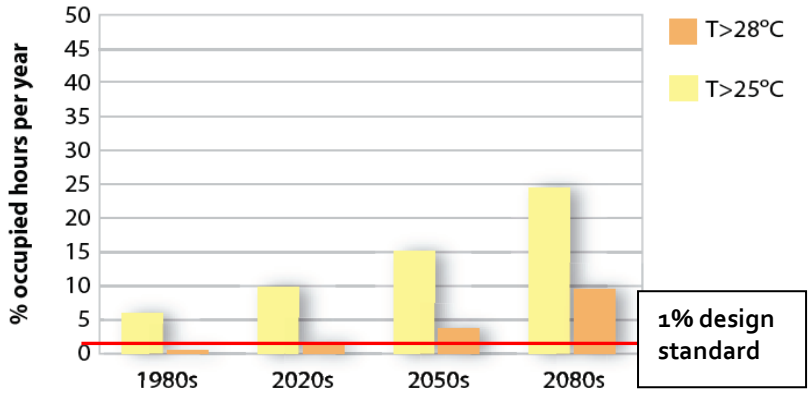
This is a medium sized 3-storey office building with passive features (fixed external shading, advanced natural ventilation via ventilation stacks and thermal mass in heavyweight ventilated floors).

The top floor is of timber construction and is thermally lightweight. The building has good insulation and air tightness and meets the 2002 Building Regulations.

Gas-fired central heating. Cooling provided by a combination of daytime ventilation control, thermal mass absorption and night cooling by ventilation.

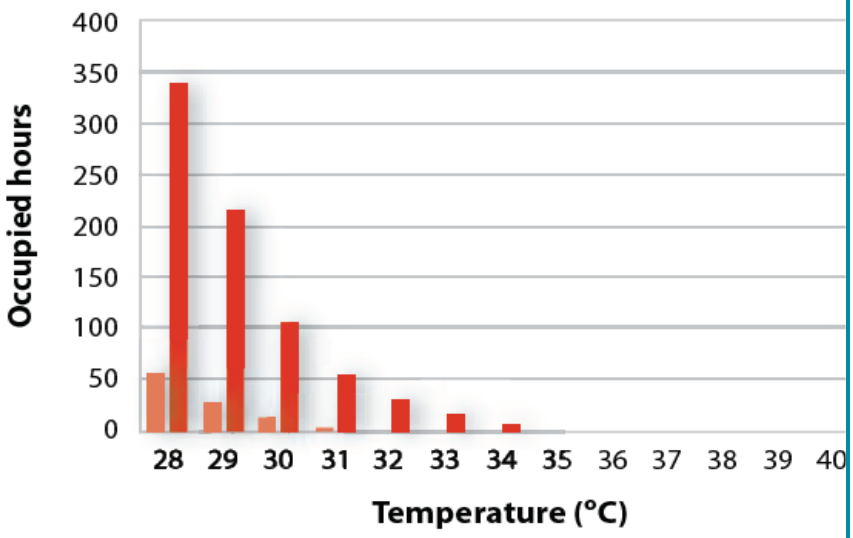
The design target is not more than 1% of occupied hours over 28° C.

Figure 10a: Discomfort temp: Building average



By the 2050s the discomfort temperatures are exceeded. The 25° C level is exceeded 10% of the occupied hours in the 2020s

Figure 10c: Extreme temp: Top floor



Peak temperatures on the top floor in the 2050s reach 34° C. The top floor of the building performs relatively badly because it has a lightweight low thermal mass roof. This problem could be addressed by replacing the existing roof with a thermally heavyweight structure, which would be very expensive (this would be a beneficial design change for a new building).

The adaptation option for retrofit might be to add mechanical cooling using water-cooled chilled beams, which come into operation when indoor temperatures exceed 28° C.

Source: *Beating the Heat: keeping UK buildings cool in a warming climate* Hacker, Belcher and Connell UKCIP 2005

Kira Supplies can provide case study examples of schools were the introduction of SoftXpand workstations has had a dramatic effect on the internal temperatures in ICT rooms. In one case the effect was so dramatic that the school no longer uses its air conditioning system.

Kira Supplies is finding it difficult to convince purchasers that the financial, energy and heat benefits are real. In particular persuading those involved in the procurement and design of new buildings (e.g. new schools under the Building Schools for Partnership) meets a number of barriers.

Specifying SoftXpand systems for ICT suites and offices would enable architects and building services engineers to design buildings and heating, cooling and ventilation systems taking into account the reduced heat generation output figures. It is likely that this may have significant cost benefits. The major consortia bidding for Building Schools for Partnership schemes are using standardised designs and are predisposed, because of the PFI financial structure, to systems with long term residual maintenance costs.

Recommendations	1. Provide support on research and development to maintain market leadership by continuous development of the software and hardware. Additional R&D research would be beneficial to assist schools with the use of schools management software.

2. Commission marketing research to:
    a. Quantify the capital and operational cost savings arising from the introduction of the SoftXpand system into various property types (schools, universities, hospitals, offices, internet cafes, libraries etc.) compared with standard systems. The analysis to look at the capital and operational costs savings taking into account the impact of increasing ambient air temperatures driven by climate change, the urban heat island effect, mechanical cooling systems and adaptive measures to building structures.
    b. Identify the key barriers to sales.

3. Support marketing activities to raise visibility and awareness. Grant funding attendance at major 'green procurement' trade fairs and events

4. Provide facilitation and networking support. Kira Supplies would benefit by being introduced to Building for Schools Partnership consortia, and local authority procurement managers.