

# chalcroft

construction specialists for the food industry

## **Turning food green: How sustainable building could save the UK food industry £120m every year**

**A white paper prepared by Chalcroft Construction**

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## 1. Introduction

The UK food and drink industry generates approximately 20% UK GHG (greenhouse gas emissions) according to Defra and spends approximately £800m on energy every year<sup>1</sup>. As the question of sustainability gains momentum, it is an industry faced with increasingly important and complex challenges to reduce its impact on the environment and natural resources.

With the Government target in place to reduce GHG by 80% in the built environment by 2050, sustainability is an issue that faces every company and which impacts on all areas of business, from operational efficiencies and energy savings to consumer loyalty and corporate social responsibility (CSR). It is also a fundamental consideration during the construction and refurbishment process of new and existing food manufacturing facilities.

**There is a clear opportunity for the UK's £76bn food industry to take a leading role in sustainability, while the energy savings it could make have the potential to greatly reduce the total UK GHG emissions and contribute directly to the security of future energy supplies.** Yet despite rising awareness, all too often, sustainability is considered too late in the day to maximise either the reduction in emissions, energy use or financial savings.

## 2. A guiding concept

For many years, sustainability has been established as a guiding concept for the construction industry. As the UK Government commits to low carbon construction and consumers make greater demands for sustainable produce, the sustainability agenda is being driven from the top down and from the bottom up.

On a stage traditionally dominated by the multinationals, businesses throughout the food industry are paying closer attention to their green credentials and acceptance that sustainable practice equals good business practice is growing.

The term 'sustainable development' was coined in 1987 in *The Brundtland Report* as: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs"<sup>2</sup> and today, sustainability is a term which has come to encompass a complex array of issues.

Such complexity however can hinder progress towards achieving real sustainability. **A collaborative approach between food manufacturers, construction companies and the supply chain ensures the best and most sustainable outcomes bringing long term affordability, quality and efficiency as well as a reduction in use of primary natural resources.**

This best practice also makes sound long term economic sense but Chalcroft's research has shown that the necessary collaboration does not always occur and when it does, it is often too late. The end result is that sustainability is left until last when it comes to building new food storage and manufacturing facilities. Without early engagement from industry, sustainability measures can never amount to much more than a retrospective 'green-washing' exercise, which by its nature, offers limited financial savings and does little to reduce overall GHG emissions or contribute to the security of energy supplies.

The challenging economic conditions of recent years and the consequent caution in investment mean that while sustainability may have been accepted as a guiding policy for construction, it is a policy whose implementation in the food industry has been inconsistent.

### 3. Cost effectiveness and long term affordability

One of the greatest barriers to sustainable construction for the food industry is cost.

**Paradoxically, savings against the bottom line are one of the more obvious benefits that green building can deliver for the industry.**

According to the McGraw-Hill Construction Study<sup>4</sup>, for new sustainable building projects, firms report median total operating cost savings of 8% over one year and 15% over five years. In addition, increased building values of 7% are reported by design and construction firms, while higher asset valuation of 5% is reported by building owners.

Yet while Chalcroft has seen continued interest in sustainability in recent years, that interest is often relegated when faced with the perceived high cost of green building. Despite the food industry's continued growth through the recession, investors throughout the supply chain remain faced with immediate financial challenges that do not appear to favour long term investment measures.

Close scrutiny of capital expenditure, combined with an approach that typically seeks to provide return on investment within two to three years – too soon for some sustainable design options to generate the requisite return – is currently causing investors to discount measures such as combined heat and power (CHP).

**Short term planning, justified by lower construction costs, has been favoured over more strategic investment in sustainability, which could provide far greater financial savings along with an increase in brand value and other marketable CSR achievements in the long term.**

## 4. Achieving sustainability

The evidence gathered by RIBA Enterprises in its first industry-wide Sustainability Survey (2012)<sup>5</sup>, suggests that more than three-quarters of respondents feel they achieve sustainability on their projects at least half of the time.

**Yet internal research conducted by Chalcroft has highlighted that while many companies aspire to best practice in the construction and refurbishment of food storage and manufacturing facilities, a significant proportion of sustainability specifications are dropped during the planning process as budgets are scrutinised.** These measures include the use of alternative construction materials such as timber instead of steel or concrete, which may be better suited to specific projects or are simply more sustainable, being less energy intensive to produce.

Other measures include more effective insulation and air purification options as well as energy efficient fittings and micro-generation options including wind turbines.

For some, the return on the investment required to reduce energy consumption and associated costs simply appears to be too little, too late. But energy costs continue to rise. A little over a decade ago, the greatest cost for the majority of businesses would have been wages, today it is energy. It is a situation that is unlikely to change in the foreseeable future and one which presents a good example of the benefits of long term investment over short term savings.

**Rather than seeking to reduce costs simply by cutting energy consumption, businesses willing to invest over the longer term, in some cases accepting a pay-back period of the lifespan of the building, could make significantly greater savings overall by investing in technology to generate, as well as save, energy.** This investment would not only reduce long term operating costs, but would contribute to the security of energy supplies and help to achieve a real-world, sustainable result.

## 5. Energy use in the UK food and drink industry

In its 2012 Electricity Capacity Assessment Report to Government<sup>6</sup>, Ofgem's assessment was that the risks to electricity security of supply will increase in the next four years and the situation in the UK is no different from the global predicament: energy is a fundamental prerequisite for economic growth.

**The UK food industry is a major energy user. The bill already totals approximately £800m per year and this is expected to rise. Meanwhile some 27% of the UK food industry's energy consumption occurs within the manufacturing process<sup>7</sup>. The cold food supply chain alone generates 2m tonnes CO<sub>2</sub> emissions (based on potato products comprising 10% of frozen product and ready meal market by volume)<sup>8</sup>.**

Yet as the global demand for energy increases, the world's natural resources are placed under ever greater pressure. In addition, the energy that is produced from fossil fuels generates GHG emissions and if mitigating action is not taken, it is a process which threatens the stability of the world's climate. In the short term, increasing levels of competition for finite resources continue to contribute to escalating costs. Globally, industry must work cohesively to mitigate the effects of climate change – long term economic growth is dependent upon it.

While such an approach is the only sustainable option that remains realistic, even if action is taken to reduce energy consumption and thereby reduce emissions resulting from burning fossil fuels, the demand for energy remains set to increase. Finite natural resources and the need to reduce emissions mean that alternative supplies must be found.

### 5.1 Micro-generation

There are numerous options open to companies seeking to ensure food manufacturing and processing facilities operate as sustainably as possible. **According to Defra, combined heat and power (CHP), a form of micro-generation, offers the single most significant opportunity to reduce operating costs and improve environmental performance.**

Sometimes referred to as co-generation, CHP is the generation of both heat and power, typically electricity, in a single process. Usually based on site, these systems can be

extremely efficient, reducing the energy loss that normally occurs through transmission and distribution associated with centralised power generation. It also meets heating requirements that would otherwise require alternative energy sources, incurring additional costs and increasing GHG emissions.

**The pay-back period for CHP is typically in excess of five years however, on average, CHP will save users as much as 30% on energy costs and reduce GHG emissions by 20%.**

**Installation of CHP also brings other benefits, including Climate Change Levy exemption and exemption from the business rating of CHP plant and machinery.**

## **5.2 Advances in technology**

**Lighting is another area in which the food industry can make significant energy and cost savings, taking advantage of the rapid advances in technology. Increasingly efficient options such as LED lights can save businesses between 75% and 80% on energy consumption and lighting costs.**

The benefits are farther reaching still however. In a cold store environment, the heat produced by less efficient lights may impact on the energy required and cost of keeping refrigeration units at the correct temperature. In such a setting, lights which produce low levels or no heat as a by-product will generate further energy savings and create additional GHG reductions. In addition, the return on investment for energy efficient lighting is typically seen after 12 to 18 months.



## **6. Conservation of water and other natural resources**

With the world's population now standing at more than seven billion and the global competition for water to supply industry increasing rapidly, widespread water stress, affecting two thirds of the world's population by 2025, is predicted by the Food and Agriculture Organisation of the United Nations (FAO)<sup>9</sup>. **In fact, water scarcity is already an issue in the UK and the majority of the south and east of England is already subject to severe water stress, with less water available per person than in the majority of EU countries.**

Industry as a whole accounts for approximately 30% of total water use in the UK – the food industry is one of the most significant players in this arena using around 430m litres every day and extracting 260m litres of ground water per day – equivalent to 10% of all the water abstracted by businesses in the UK<sup>10</sup>.

In the face of this challenge, the Food Industry Sustainability Strategy (FISS) Champion's Group on Water made a recommendation in 2007 that the food industry should adopt an overall reduction target of 20% by 2020, against a 2007 baseline.

**Of the food industry's £76bn turnover, approximately £300m is water expenditure – a reduction of 20% in water use could therefore save the industry some £60m per year.**

It is a challenge to which the industry has since risen, with a number of initiatives announced such as the Food and Drink Federation's (FDF) Five Fold Environmental Ambition – part of a wider commitment to help its members reduce their water consumption significantly by 2020.

The Federation House Commitment (FHC) was formed following collaboration between the FDF and the Waste & Resources Action Programme (WRAP). Its purpose is to help drive water efficiency across the food and beverage sector and is free for all businesses within the sector to join.

However, the most direct way in which businesses can reduce their water consumption and subsequent expenditure is by investing in the appropriate sustainable technology when new facilities are constructed or refurbished.

The options include measures such as rain water harvesting, while incorporating the appropriate equipment to recover and reuse process water and installing low-volume high-pressure cleaning systems are two further examples of how food manufacturing plants can reduce water consumption.

Other equipment, such as boilers and cooling towers, does not need food grade water to operate and often has dedicated water treatment systems. This can present a good opportunity to recirculate lower quality water that is not suitable for direct contact with food.

**There is not a one size fits all solution and the food industry should seek the advice of construction experts to help them achieve the greatest efficiencies and cost savings.**

## 7. A fresh approach – sustainable best practice

For the food industry, sustainability and best practice in construction means investment in buildings to ensure they are: durable, cost effective and affordable to operate as well as energy efficient. It also means that once food manufacturing buildings are operational, they can play an active role in climate change mitigation as well as conserving natural resources.

A sustainable building will deliver further savings through improved occupant comfort and increased levels of productivity. A building constructed with these principles in mind will also add value to the brand, as public concern about sustainability grows, by providing a demonstrable commitment to CSR.

**By not incorporating more sustainable options in new manufacturing and processing plants, the UK food industry could be throwing away as much as £120m every year in operating costs, while even greater savings are possible given a long term approach to green building investment.** The reduction in energy use and the adoption of other sustainable energy solutions, such as micro-generation, will also bring wider long term benefits such as the security of UK energy supplies.

As a major player in UK industry, the food and drink sector cannot afford to wait until legislation or spiralling energy prices force sustainable measures to be adopted. To maximise cost savings, help secure future energy supplies and conserve natural resources, a fresh approach is required.

**It is vital that the food industry engages at the earliest opportunity with construction companies like Chalcroft whose experience and expert knowledge can complement that of the architects and designers, to achieve best practice.** In addition, all parties must be prepared to work collaboratively, accepting alternative recommendations to provide a more sustainable solution where appropriate.

Only by working cohesively, in partnership with the construction sector, will the food industry be able to achieve the multi-million pound savings and improved environmental performance that underpins all economic growth today.

**Ends**

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