

2 Understanding Energy

2.1 Introduction

According to the *European 2008 Environment Policy Review – Annex 1* - ‘energy use (including transport) accounts for 80% of all greenhouse gas emissions in the European 15.

Following agreement at the European Council in 2007, the European Union (EU) is committed to:

- Achieving at least a 20% reduction in its greenhouse gas emissions by 2020 compared to 1990, or 30% if other developed nations agree to take similar action
- An increase in the use of renewable energy, to 20% of all energy consumed. This is a binding target. However, the plan allows flexibility in how each country contributes to the overall EU target
- A 20% increase in energy efficiency
- An increase in the use of bio-fuels, to 10% of all fuel used in transport

The European Energy Market is, at best, complicated and with many disparate issues. Whilst we may be subject to a multitude of European Directives, Requirements and Laws, the European market, it can be argued, is dominated by ‘National Interest’ and legal requirements which often differs from country to country, even within the ‘European 27 (EU-27)’. With the increasing challenges faced by climate change, an increased dependency on energy imports (and associated issues of transport and most importantly, international relations) and higher energy prices, the EU-27 faces a common challenge – or opportunity – to develop energy efficient technology.

Energy efficiency and energy management have never been more important themes than now. With the advent of the Climate Change Levy within the UK, companies have found an increasing burden (or incentive!) on them to reduce energy consumption and improve manufacturing processes, without significantly adding to financial burden. In reality of course, there are three major drivers for increased concern with energy – security of supply, legislation and cost.

Although there is an increasing pressure on businesses in all sectors to improve their environmental performance, many small-to-medium enterprises (SME) still have a low awareness of obligations with regards to reducing their 'carbon footprint'. A European wide survey carried out by the ENER-PLAST project in 2009 revealed that of the 262 companies questioned:

- 40% were unaware of existing legislation regarding energy
- 61% of companies do not have an energy manager
- 94% believe that their home country should harmonise legislation with the EU
- 63% report that profit is their main driver for energy reduction

Energy prices have seen an exponential increase in recent years, with security of supply one of the main issues. There are many reasons for the uncertainty of supply (and of prices), from natural to man made issues, including conflicts around the world. Developing nations such as Brazil, China and India, and to some extent, Russia, have seen gross domestic product growth rates between 8% and 10%, together with the associated increase in demand for raw materials and meeting the needs of an increasing population. Even allowing for the global recession of 2008-2010, energy prices have continued to remain volatile, as security of supply is by no means assured.

Energy accounts for 80% of all greenhouse gas emissions within the EU. Determined to fight against climate change, the EU is committed to reducing its own emissions by at least 20% by 2020, as detailed in the *Action Plan for Energy Efficiency (2007 – 2012)*. 'The Commission considers the biggest energy savings are to be made in the following sectors: residential and commercial buildings (tertiary), with savings potentials estimated at 27% and 30%, respectively, the manufacturing industry, with the potential for a 25% reduction, and transport, with the potential for a 26% reduction in energy consumption.' [1]

There are a number of commitments which many European Government's have signed up to, one of which is the Kyoto Agreement (countries that agree to the Kyoto Protocol will reduce greenhouse gas emissions that contribute to global warming by 5.2% below 1990 levels. The target date for the initial agreement is 2012). As the European Environment Agency reports, 'the European Union's greenhouse gas inventory report, shows that emissions have not only continued their downward trend in 2008, but have also picked up apace. The EU-27's emissions stood 11.3% below their 1990 levels, while EU-15 achieved a reduction of 6.9% compared to Kyoto base-year levels'. The report continues 'the EU-27's emissions have been declining steadily since 2003 to reach 4,940 billion tonnes of CO₂ equivalents in 2008. Compared to the 2007 emissions, this represents a reduction of 99 million tonnes or 2%. With the