

1 Introduction

The European plastics processing industry faces intense competition from lower wage economies and alarming rise in energy prices. To remain competitive a business must have an effective energy management process, good market knowledge and an awareness of technology and support mechanisms. This industry comprises more than 27,000 companies more than 80% small to medium enterprises (SME), employing more than one million people, and with total sales of over 100 billion.

If it were possible to reduce energy consumption across the industry by 10%, this would result in an annual reduction in carbon dioxide emissions of more than 3 million tonnes.

Western industry is highly focused on the cost of labour and sees the growth in volume of imported products as being due purely to the lower labour costs of overseas suppliers. The reality is that labour costs are, and always have been, a minor component of the overall cost of most plastics products. Direct labour has shrunk from an average of 25% of manufacturing costs in 1960 to 10% today. The cost of materials and overheads are far more important in the total product cost, but Western industry still focuses overwhelmingly on labour cost even as the overhead and energy costs rise. The main energy usage and cost is in processing machinery and services (92%), lighting, heating, and offices are minor energy costs (8%).

For the majority of plastics processing plants, the cost of energy is in the region of 4% to 8% of sales and for some firms is approximately equal to the profit level. In low margin sectors of plastics processing, such as packaging and automotive parts, the cost of energy can be greater than the profit margin.

The possible savings from good energy management are in the range of 30% of current energy expenditures for most plastics processors. In rare, extreme cases, energy savings of up to 50% have been identified with little difficulty.

These savings are virtually irrespective of the industry sector or process used. One particular plastic process does not waste more energy than another. It is not the process but the management that makes the difference.

The potential for 30% average savings in energy cost is achievable in equal shares through management, maintenance, and investment. Simple recognition that the rules have changed and that managing energy usage with about the same degree of effort that management devotes to managing direct labour can produce savings of up to 10% of energy usage.

Another 10% energy savings is available with simple quick fix actions such as controlling the use of utilities and services (such as compressed air) in both the process and the plant at large. This includes small investments in emerging technologies such as variable-speed drive control of water pumps and air-handling fans. Maintenance investments are defined as those whose expected payback is less than one year, regardless of the amount invested.

The final 10% saving is possible through investment in energy-efficient processing technologies and, just as important, through effective management of these technologies.

The majority of all these savings can be delivered through a balanced combination of no-cost, low-cost, and investment (maintenance or capital) actions. The average payback for all investments in energy management is, generally in the region of six to nine months.

However, in Asia their low labour costs mean that in many cases energy costs are already higher than labour costs [1]. Some of the most energy efficient sites in the world are already in the East. In addition to a labour cost advantage, they are also gaining an energy cost advantage.

Energy costs now represent the third largest variable cost (after materials and direct labour) for most plastics plants, and in some cases energy is the second largest variable cost. This is particularly true for plants that have low direct labour costs.

Energy efficiency is one of the 'hot' topics of the 21st century and plastics processors around the world are trying to come to terms with it. Ten years ago, a column on this subject would have attracted scant management interest. Today, energy management is not just a 'green' issue, or a 'carbon footprint' issue, it is a very real business issue and, in many cases, a matter of survival.

Price increases in energy and the desire to reduce greenhouse gas emissions have raised the profile of energy management in the plastics processing sector. This has pushed many businesses into action, but all too often their efforts have been poorly directed or ineffective. Sadly, this has led some firms to abandon their efforts to improve energy management, even though the basic techniques are essentially very simple and easily applied. Where managers have been well informed and have diligently