

Impact zone

Knowing the ecological impact of new materials for the packaging sector needs to be at the heart of their development cycle. **Martin Kay**, Pira International, tells Jim Banks how environmental considerations are changing the way the industry thinks.

Packaging manufacturers are facing times of change and their investment in the development of new materials must satisfy many criteria. Profitability should be balanced with the issues that touch on fitness for purpose, including the performance of materials in contact with food, and the efforts to make packaging lighter in weight, more flexible and more printable. The new packaging materials that will define the industry in the future must not only be able to help producers reduce costs, but also support novel design features. Progress towards these goals needs to be made with a full awareness of the environmental impact of the manufacturing process and the final product.

Martin Kay, head of strategic consulting, Pira International, says this means working on the ability to recycle, whether that is for like-for-like use, energy recovery or organic recovery. It also means finding new ways to lightweight packaging. One thing that Kay has noticed is that the industry is embracing the need to make its new materials and methods ecologically sound.

LIGHTER FOOTPRINT

A growing proportion of the projects Pira is asked to undertake are focused on environmental issues, whether they are intended to identify ways in which the industry can reduce its footprint, or whether they establish the green credentials of new materials.

Pira International serves the paper, packaging, print and publishing supply chain through its extensive archive of technical and commercial information generated over 75 years of research programmes and consultancy on behalf of governments and corporations worldwide. Data from Pira Consulting provides deep sector knowledge to numerous projects around the world.

Kay feels that sustainability is vitally important to the development of new materials and should be a core value of all research and development plans.

'The development of life cycle assessment methodology in the 1990s, and latterly the various carbon standards, has now been embraced to provide a robust assessment of environmental impact including the industry's carbon footprint,' he says. 'The introduction of the Dutch Carbon tax last year is evidence of its wider applications.'

Furthermore, he feels that there are good examples of this philosophy in action. Marks & Spencer's Plan A – a five-year programme to combat climate change, reduce waste, safeguard resources and trade ethically – is one initiative he picks out, as is the Wal-Mart Scorecard.

MEASURE UP

Launched in 2006, the Wal-Mart Scorecard is part of a five-year plan to reduce the environmental impact of packaging and significantly reduce the company's carbon footprint. The packaging scorecard is seen as a crucial element in the company's plans to cut 5% from the amount of packaging used across its global supply.

The scorecard is a measurement tool that enables Wal-Mart's suppliers to evaluate themselves against competing suppliers using specific metrics. These metrics are derived from the general principles that Wal-Mart refers to as 'the seven Rs of packaging': remove, reduce, recycle, renew, revenue and read.

Specifically, the metrics break down to the following weightings: CHG/CO₂ per ton of production (15%), material value (15%), product/package ratio (15%), cube utilisation (15%), transportation (10%), recycled content (10%), recovery value (10%), renewable energy (5%) and innovation (5%). Using these criteria, suppliers will be able to clarify how their packaging innovations, environmental standards, energy efficiency and use of materials compare with their peers.

DELIVERING THE PROMISE

It is easy to talk about commitment to the green agenda, but backing up those words with practical action takes time and investment. However, it seems the industry is making measurable

progress. For example, there has been a significant rise in the use of recycled polyethylene terephthalate (rPET) in retail packaging applications, with producers increasingly finding the material acceptable in their products. This, along with the growing use of recycled high-density polyethylene (rHDPE), has been largely driven by industry projects such as WRAP.

In close partnership with the packaging industry, WRAP aims to enable businesses and consumers to use their materials more efficiently and recycle more packaging. Its broader goals are to reduce landfill use and carbon emissions. WRAP's third business plan aims to deliver on key objectives by March 2008. These include removing at least 3 million tonnes of material from the waste stream, increasing public participation in recycling, and reducing the amount of food thrown away by consumers.

'There are a number of innovations that have made a marked difference to the industry, but the wider use of rPET and rHDPE are significant advancements,' says Kay. 'So, too, are advances in barrier coatings that assist with efforts at lightweighting, and renewable polymers are coming into wider use.'

LIFECYCLE ASSESSMENT

The sustainable credentials of many different packaging materials are improving, and Kay feels it is difficult to choose the best. 'I don't have all the answers, but our recent studies on certain plastics using life-cycle assessment (LCA) methodology indicate that recycled content materials carry a lot less environmental burden compared to virgin plastic materials,' he says.

LCA methodology is used to evaluate the mass balance of inputs and outputs of systems and to organise and convert those flows into measures of environmental impact. The result is a life-cycle inventory, which is converted into simpler indicators that form a life-cycle impact assessment. Such analysis goes in hand with assessment of the cost implications of new materials, which must be balanced with environmental concerns and profitability.

'The cost of development will be weighed against the market attractiveness,' says Kay. 'Leading-edge companies with strong R&D capability can exploit many new opportunities.'

EXPERT KNOWLEDGE

The world's major packaging companies will inevitably continue to work on new materials in-house, but research is also thriving among specialist developers of advanced materials

'Use of rPET is brand owner led, but involves a range of technology companies that come from outside the traditional PET industry to develop the product,' Kay says. 'Research can also be facilitated by external funding bodies to steer collaboration. Other innovations come from outside the industry, and universities are a key source. Some technologies are taken up by individual packaging companies and it is important to ensure

that these projects are strongly led internally and bring in the specific skills necessary to carry them forward.'

A key element in bringing new materials to market is collaboration within the industry. So far, projects like WRAP have been able to capitalise on the growing willingness of companies to share their experiences, problems and best practices. 'In my experience, industry collaboration can work on a number of levels,' notes Kay. 'Legislation plays an important part in harmonising the choice of material for food contact, or its ability to be recycled or its contribution to material reduction. The Courtauld Commitment is a good example of retailers

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coming together and bringing brand owners to tackle packaging reduction/waste.'

The Courtauld Commitment is an agreement between WRAP and 25 leading grocery organisations in the UK intended to lead to new packaging solutions and technologies to reduce waste and

minimise the industry's environmental impact. Key signatories include Tesco, Heinz, Northern Foods and Unilever.

HIGHER IMPACT

Kay feels such projects have the right intentions, and that industry-led programmes may be more effective than company-led initiatives. 'The Wal-Mart Scorecard may bring the desired results, but it could come across as a retailer instructing suppliers to reduce packaging,' he warns.

Perhaps there is more benefit to be derived from industry-led collaboration, and WRAP suggests that this can work well, though Kay notes that funding for the project will be reduced.

Collaborative schemes such as WRAP have assisted in driving through the use of 'R' content. Other schemes, such as those backed by the EU and the UK's Department of Trade and Industry have been less specifically focused on packaging. Kay believes that levels of collaboration within the packaging industry are good and have the potential deliver far more value in the future.

'Supply chains are becoming more integrated; materials recovered through waste and materials collection form the raw feedstock, especially paper,' he says. 'Shared initiatives involving synergistic or non-competing companies seem to work best.'

Provided the industry can pull together, it has an opportunity to push materials science forward in the next few years and change the way many people perceive the packaging sector. **pci**



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