Hollow Glass Industry: Innovations in a Difficult Environment

The hollow glass industry is faced with intensive international competition. To secure their future, manufacturing companies are developing new, innovative products and are building highly efficient, energy-saving production facilities.

Hollow glass for the storage of oils and ointments has been in use for a long time, with evidence dating back three and a half thousand years. The unique properties of this material were valued greatly at the time and are still among its major quality characteristics today. Glass is made of natural raw materials, can be moulded into an infinite number of shapes and is inert, i.e. the material does not react with its content. This means that there is virtually no interaction between the container and the product, and it is therefore an excellent packaging material – not just for food and drinks, but also for cosmetics, pharmaceuticals and numerous chemical products. Bottles, jars and flacons are produced by the container glass industry, which forms the “hollow glass” market segment together with the domestic glass sector (drinking glasses, tableware glass, gift items, etc).

Two success factors: reduced weight and quality design

One of the most important innovations in hollow glass over the past few years has been the development of lightweight glass. Without sacrificing strength, the industry has gradually succeeded in reducing the weights of different glass packages by up to 60 per cent. This has produced benefits in the handling and transportation of products while also leading to substantial savings in raw materials and energy. Apart from the weight, another increasingly important element is the product design. Anyone wanting to stand out among the crowd of competitors must produce high-quality

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products that appeal to the consumer. It is therefore very much worthwhile investing in the development of innovative packaging and suitable production facilities. According to the Glass Packaging Action Forum, an initiative of the German container glass industry, there has been a 39 per cent European-wide increase in the consumption of products packaged in glass. This upward trend is partly due to a reduction in weight and partly to the positioning of glass as an environment-friendly and trendy form of packaging.

Ecologically sound and sustainable

One factor that is providing the hollow glass industry with a positive outlook is the increasingly important aspect of sustainability. Glass is essentially made from raw materials that are available in abundance and which occur naturally, i.e. quartz sand, soda, lime and dolomite. It is 100 per cent recyclable and can be turned into new products. This makes glass products resource-efficient, eco-friendly and sustainable. Recycled glass has in fact come to be the most important input material for glass packaging. Its share in newly made packaging is 60 per cent on average. Another important benefit is its reusability. Within a reusable glass system a glass bottle, for instance, can be used up to 50 times before being recycled.

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Energy as a cost driver

Despite the unique benefits of its products, the container glass industry is very much in competition with alternative packaging materials, such as metal and, above all, plastic. But even within the glass industry the market is highly competitive. Companies face fierce international competition and steadily increasing pressure from imported goods, e.g. from East Asia, so that the situation on national markets is often quite difficult. Within the EU, in particular, glass manufacturers are subject to strict legal

requirements concerning environmental protection, safety at work, compliance with legal regulations and above all rising energy costs – competitive factors which are clearly more difficult than in countries with lower standards.

This applies especially to German container glass manufacturers, because they must also bear the burden of Germany's renewable energy levy (under the German Renewable Energies Act), a measure which was introduced to help usher in the energy turnaround, as envisaged by the country's political decision-makers. According to Dr. Hans-Joachim Konz, President of the German Association of the Glass Industry (BV Glas), only 13 per cent[1] of all companies in the German glass industry (about 400 in all) were exempted from this charge – an exemption that was granted to safeguard the economic future of an area and which was intended for energy-intensive enterprises, so that they could pay a much lower price per kilowatt hour of electricity. After the EU Commission had classified this practice as an illegitimate subsidy, the German Government now wants to either reduce the number of energy-intensive companies exempted from the levy or restructure the system of discount ratios. When the agreement with the EU Commission was announced on 8 April 2014, it was still difficult to see how this might impact glass manufacturers.

More stringent carbon emission certificates

Another burden for the glass container industry is the cost of carbon emission certificates. The decision whether Europe's glass industry is to be put back on the so-called Carbon Leakage List will not be available until the end of 2014. Carbon leakage means that greenhouse emissions are outsourced to non-EU countries in cases where manufacturers are no longer able to operate competitively in their own region and where they would otherwise have to cease production. Sectors that are included on the list are given the relevant certificates for free. Dr. Johann Overath, CEO of

BV Glas, emphasises in this context, however, that “for free” does not mean that it “incurs no costs”: “Thanks to extremely high benchmark figures and the cross correction factor, it is estimated that 65 per cent of certificates will be given to German glass manufacturers for free.” However, as there will be an upper limit to allocation, all glass manufacturers – including those of container glass – will still need to purchase emission rights.[1]

Moreover, Brussels will be adding further complications, as the EU Parliament has now agreed to the practice of backloading whereby carbon certificates are removed from emissions trading in order to create an artificial scarcity on the market and to increase prices. The increase in cost pressure is intended to promote environmental protection. BV Glas, however, believes that this is setting a wrong signal. The association maintains that backloading misses the mark, as it is precisely the energy-intensive glass industry that has invested more and more technology in greater efficiency over the last few years, so that its potential has now largely reached its limits.[1] Not only has the industry achieved substantial reductions in carbon emissions, but it has also made considerable progress in minimising NO_X (nitrogen oxide) emissions, particularly through measures that interfere directly with the combustion process in a melting furnace (primary measures).

Successful energy-saving measures

According to cost structure statistics published by the German Federal Statistical Office in 2013, the share of energy costs in the gross output value of hollow glass production was 14.9 per cent in 2011, while this value was on average 8.6 per cent for the entire industry, i.e. comprising glass and glass product manufacturers.[2] In view of high energy costs, hollow glass manufacturers can only remain competitive if they use innovative, energy-saving production methods. This is another area where the industry has made great progress recently. According to the Glass Packaging

Action Forum, the use of energy in melting equipment went down 77 per cent between 1970 and 2006. The biggest share of these savings was due to greater efficiency in production facilities (-32%). Other savings were achieved through weight reductions of glass products (-25%) and the addition of recycled glass (-20%). The required melting energy is reduced by 3 per cent for every 10 per cent of broken glass that is used in this process. The European hollow glass industry therefore benefits substantially from its high recycling rate, which – according to latest reports from the Glass Packaging Action Forum – was 83 per cent in Germany in 2012. The European Container Glass Federation FEVE reports an EU-wide value of 70 per cent for the same period.

Two important partners of Germany's container and industrial glass manufacturers in the implementation of the latest technologies are the Research Association of the German Glass Industry (HVG) and the German Glass Engineering Society (DGG). Both organisations have supported developments in the glass industry for many years. HVG and DGG promote research at the interface between academia and industry, maintain laboratories, offer a wide range of advisory services to answer comprehensive questions on glass technology and provide information through publications and training events on the latest developments and findings in research.

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Greater production efficiency

High energy costs and the influx of cheap imported products require the use of highly efficient technology. This is especially true for Germany as a country with high wages. "What it means is that companies in the glass industry must have the best available technology, energy-efficient and largely automated facilities and machinery as well as a suitably efficient and motivating organisation of work routines," says Dr. Jürgen Dispan from the IMU Institute in Stuttgart in his analysis "Glass Industry in

Germany", published in January 2014.[3] It is apparently not a matter of process speeds but also of ensuring a high level of flexibility. One major operational issue, particularly in the container glass industry, has been the question of conversion flexibility due to frequent changes in glass types, and Dispan anticipates another significant increase in retooling over the next few years.[3]

He describes the glass industry as investment-driven. Unless there is sufficient investment, he says, companies are likely to suffer greatly in their future viability. According to Dispan, as well as having to conduct the necessary cold repairs to optimise melting tanks, the glass industry is engaged in a competition for innovation to secure unique selling propositions and technology leadership. The strategy towards this goal, he says, involves not only the development of innovative products but also, among other things, innovative methods and processes to improve the efficiency of operational routines.[3]

Latest technologies at glasstec 2014

The extent to which any existing potential can be realised largely depends on the innovative strength of glass machine and plant manufacturers. They can provide the industry with more breathing space through forward-looking technologies. Dr. Bernd Holger Zippe, Chairman of the Glass Engineering Forum within the German Engineering Federation (VDMA), said in a press release published in November 2013: "There is a good level of demand from the speciality and hollow glass industry. Many German companies have therefore opted for special applications and for the solution of technically demanding challenges. Other business sectors with good prospects are apparently the engineering of customised plants and machinery and the provision of services. In 2014 the industry is mainly expecting new investments in the hollow glass sector."

glasstec 2014 will be showing forward-looking production and handling solutions provided by glass machine and plant manufacturers – solutions that can help towards further improvements to the performance of the hollow glass industry. The leading global trade fair for the glass industry will be held in Düsseldorf from 21 to 24 October. As well as showing the entire spectrum of innovative glass products and applications, the trade fair will focus, in particular, on machinery and plants for the processing and treatment of hollow and sheet glass by both small-scale and industrial-scale enterprises. As on previous occasions, a symposium will be held, accompanying the special exhibition glass technology live. At this symposium information about the latest developments will be provided by Hüttentechnische Vereinigung der Deutschen Glasindustrie (HVG), Deutsche Glastechnische Gesellschaft (DGG) and the Glass Technology Forum within VDMA.

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Bibliography

1. GlasNews, newsletter of the German Association of the Glass Industry (BV Glas), December issue 2013.
2. Statistisches Bundesamt (Federal German Statistical Office), *Produzierendes Gewerbe, Kostenstruktur der Unternehmen des Verarbeitenden Gewerbes sowie des Bergbaus und der Gewinnung von Steinen und Erden*, Wiesbaden 4 June 2013, p. 308.
3. Dispan, Dr. Jürgen, *Glasindustrie in Deutschland – Eine Branchenanalyse, Industriegewerkschaft Bergbau, Chemie, Energie* (ed.), Hanover Jan. 2014.

Captions

Photo 1:
A glass container does not interact with its content. Bottles, jars and other glass packaging therefore warrant the highest standards in product quality for drinks, food, cosmetics, etc. *Photo: Messe Düsseldorf*

Photo 2:
Glass can assume almost any shape and allows a wide range of finishing options. Glass design plays a major role in drinks, food and cosmetics packaging and has a decisive impact on its acceptance by end customers. *Photo: Glass Packaging Action Forum*

Photo 3:
The melting of glass is highly energy-intensive. Using state-of-the-art melting and filter technology, glass manufacturers have substantially reduced their energy consumption and their emission of pollutants over the last few years. *Photo: Schott AG*

Photo 4:
Efficient production engineering is indispensable for container glass manufacturers wanting to maintain their competitive positions on the international market. *Photo: Messe Düsseldorf*

Photo 5:
Glass protects the environment and natural raw material resources. The proportion of recycled glass in the raw material mixture of container glass is currently about 60 per cent. *Photo: Glass Packaging Action Forum*.

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