

PERSPECTIVES ON FLAT GLASS MARKET – MARKETING AND MANAGEMENT CHALLENGES FOR SUSTAINABLE DEVELOPMENT

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ABSTRACT

The fascinating world of glass seems to be dominated by engineers and architects and not so much by economists, even though in the end the decisions concerning the choosing of the appropriate flat glass for a building or a vehicle are decisions with a deep economical impact, whether it is financial, operational or marketing-related. The techniques and methods employed for the obtaining of glass are becoming more and more efficient and are ensuring varied and useful properties for a wide range of activity domains. This article wishes to explore the sector of flat glass from the perspective of management and marketing challenges both at a global level as well as in Romania by means of case studying the multinational company Saint-Gobain, the flat glass division. The new assortments of glass and its transforming into products with an added value are management and marketing decisions in view of achieving sustainable development in the Romanian flat glass industry.

KEYWORDS: *flat glass, challenges, Saint-Gobain, sustainable development*

JEL CLASSIFICATION: *M30; M31; M39*

1. INTRODUCTION

Glass is a fabulous material which is underused compared to its infinite possibilities. Deciding what investments are required in order to understand and develop glass as a basis material for industrial value chain needs a strategic management and marketing approach. The business environment is complex, challenging and filled with competitive opportunities and threats (Duane, R., I., Hitt, M. A., 2005). Choosing the appropriate organizational goals and courses of action to best achieve of those goals it is a great challenge. It is only up to human nature to creatively use its aptitudes and the appropriate technology so as to capitalise glass's explosive potential. Given the fact that the resources required for the production of glass are readily available, the only other imperiously necessary things are the capital – human and financial – and the required technology and energy for the obtaining of glass with new attributes and characteristics and able to respond to the challenges posed by sustainable development. The forming of the human capital specific to the light industry of obtaining glass imposes the need for a specific education as well, one that requires an adequate human basis, as well as

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appropriate financial and time resources. Both a technician and a specialist in the glass industry are formed within years. The future will show us that humankind's main problem is not energy, but rather the techniques for capturing it with costs as low as possible. The number of applications using simple glass or glass combined with other materials is ever-growing. The technologies used in the glass industry have greatly evolved during the last twenty years and we estimate that the use of glass at the beginning of the 2050s will play a significant role in the explosion of new applications and uses.

2. Flat glass – a ubiquitous material

Combining utility with aesthetics issues gave a strong impetus to study and industrial scale production of many types of flat glass. Finally, the composition and the way to obtain flat glass establish the flat glass properties. It is considered by glass specialists that process of producing flat glass is divided into an upstream and downstream process (Center for European Policy Studies, 2014). The upstream activities cover producing basic float glass, while the downstream processes describe all activities like cutting, forming, annealing, coating, insulating, laminating.

Taking into account technical issues there are the following main types of glass: annealed glass, toughened glass, laminated glass, mirrored glass, patterned glass, extra clear glass. Nowadays flat glass is fulfilling a wide range of requests according to the report drafted by Pilkington: Thermal Insulation, Solar Control, Noise Control, Safety/Security, Self-cleaning, Fire Protection, Decoration, Glass Systems, Special Applications (www.nsg.com, annual report 2013). Flat glass is a key element in a number of industries, such as constructions, automobiles, communications and solar energy. That is why the Glass Alliance Europe, the professional association in the glass field, (<http://www.glassallianceeurope.eu>) considers that the following research and development areas are important for the future of flat glass:

- Special coatings for buildings: smart mirrors and highly insulating glass windows for photosensitive, switchable or electro-chromic glazing;
- Anti-reflection properties and technologies for clean energy generation;
- Strength: if glass of any type were available at 50 times its current strength, new products and opportunities could emerge in the market place, like ultra thin and light container glass and lighter flat glass and fibreglass for composites; some applications already render glass stronger by 2 to 6 times;
- Functional integration in glass that can then become an ideal substrate for OLED lighting, touch screens, audiovisual displays, etc.;
- But also bendable glass, scratch resistance, audio glass, thinner glass and much more.

One of the most innovative players in the glass industry, Corning's Advanced Glass, considers that glass represents a unique combination of qualities which will continue to offer an incomparable visual and sensorial experience which in its turn will sustain the innovation and development of products that render differentiation possible (<http://www.corning.com>).

3. The flat glass market at a global level and in Europe

The production of flat glass is an activity which requires important capital resources, long term investments and a good command of the glass technology. The ovens for flat glass work continuously for approximately 15 years, after which they are rebuilt, the structure being partially or totally replaced. The construction of a unit producing 500 tonnes per day costs approximately 100 million euro, while the reconstruction process costs between 30 and 50 million euro. Under these circumstances the

predictability of the investment is very important and that is why any uncertainty regarding legislation, taxes, demand can discourage investments in this sector.

At a global level, taking into account the Pilkington report from 2010 and the industry rate it is estimate for 2013 an annual production of approximately 50 million tonnes of flat glass, out of which 8 million tonnes are being produced in the EU-28. Demand for flat glass is dominated by China (51%), Europe (17%) and North America (7%) (Center for European Policy Studies, 2014). According to Pilkington’s estimates (Pilkington report, 2010), around 29 million tonnes was demand for high quality float glass, 3 million tonnes for sheet glass and 2 million tonnes for rolled glass. The remaining reflects demand for lower quality float, produced mainly in China. 40% of the produced flat glass is used for new buildings and the same percentage is used for existing buildings. Approximately 10% is used in the automobile industry (83% for new vehicles and 17% for existing ones). The rest of the production of flat glass is destined for various applications within the communications industry and solar energy. The production in the EU dropped by 20% from 2007 to 2013 (Glass Alliance Europe, 2014), as it is revealed by the chart no. 1 below. Out of approximately 60 production lines in Europe for 2008, today there are only 46 production units. In Europe and, of course, at a global level as well, the most important players are Saint-Gobain, AGC, NSG Group (Pilkington) and Guardian. These four players operate 90% of the production units in Europe (Glass for Europe, 2013).

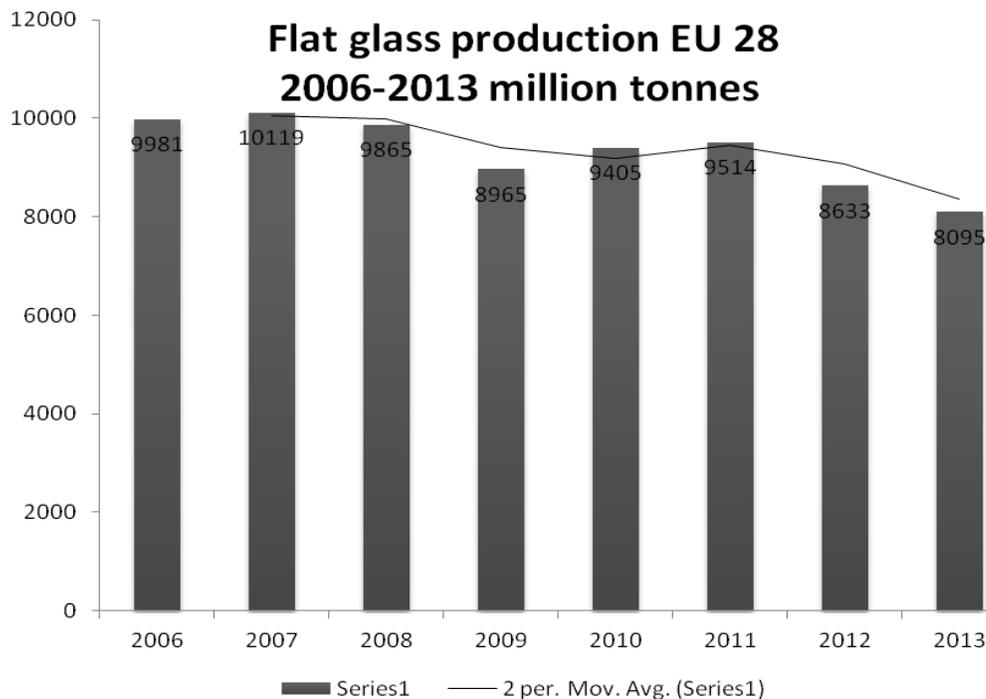


Figure 1. Flat glass production EU 28, 2006-2013 million tonnes

Source: Data from Glass Alliance Europe (2014)

A study realised by Pilkington in 2010, shows that, as far as costs are concerned, the raw materials and the energy are the two largest elements, followed by the costs with the workforce and general expenses (figure 2). Calcined soda is one of the most expensive utilised raw materials and it represents

approximately 60% of the costs destined for raw materials. Since natural gas is the dominant fuel within the production process, its price is the most important cost factor for the flat glass industry.

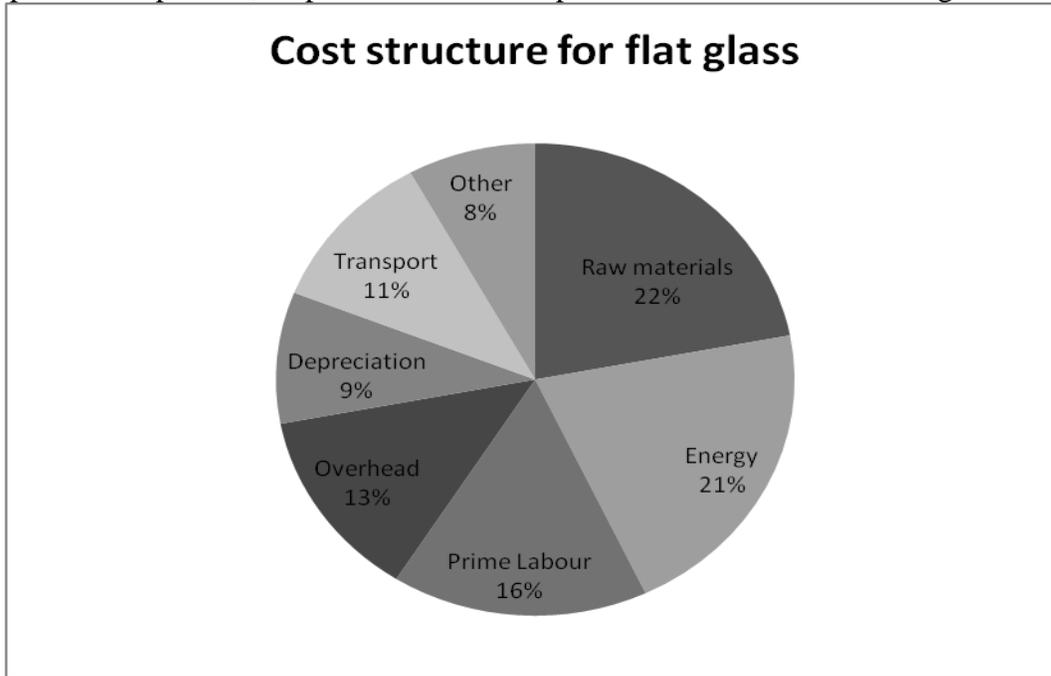


Figure 2. Cost structure for flat glass production

Source: Pilkington, 2010

So far there has not been discovered any available technology for the operation of flat glass ovens solely on electrical energy. The best and most effective installations are being fuelled with a mix of fossil fuels and electrical energy. The latter can stimulate and increase the ovens' melting capacity (if it is necessary) by providing between 2% and 20% of the total amount of energy.

Since 2000, employment in the glass sector has been on a downward trend, due to the combination of several factors: productivity requirements, increased automation, industry consolidation and competition with low-cost products. EU glass sector faces many challenges in terms of competitiveness, many of them driven by globalization, increased environmental regulation and rising energy costs. The gradual increase in the number of comparable products at low price, imported from developing countries is a sign that reduces the competitive advantage of the EU glass industry, especially in terms of low-value product markets.

4. Saint-Gobain Glass in Romania and sustainable development

Romania's economy is subordinated to the global economy and must accept that opportunity derived from the degree of integration in the global economy flows (Pop, N. Al., Draghescu, F., Rosca, V., 2013). Saint-Gobain Glass is a company with a tradition of over 340 years within the French group Saint-Gobain and it is specialised in the production of construction materials. It is the main glass producer in Europe and Romania and second worldwide, with sales of over 1.1 billion euro in 2013 (Saint Gobain Glass Romania, 2014).

Saint Gobain has 37 float lines worldwide, including ten operated with partners. Over a third of the glass produced by Saint Gobain flat glass plants is further processed before being sold, notably for building and automotive industries. Flat glass is manufactured in large industrial facilities where Saint-Gobain produces everything from basic clear and colored grades to more sophisticated types with

metallic oxides or other special coatings for use in a wide range of applications, such as insulation and solar control glass (Saint Gobain, annual report 2013).

As far as the production of Saint-Gobain Glass Romania is concerned, at its factory in Călărași it has a production unit with a capacity of 600 tonnes per day, producing each year 21 million square metres of float glass (<http://actualitateacalarasi.ro>, 2 June 2014). Of this amount approximately 10 million square metres undergoes a process of metallic coverage within the magnetronic sputtering line, while other 2 million square metres of glass (both float as well as sputtered) enters the new lamination line. In addition, another advantage of using new glass assortments produced by Saint-Gobain Glass Romania is represented by the possibility of their being used in a multitude of decorative applications which are being more and more sought on the local market. As concerns the destination of the new type of glass, it is mainly destined for the residential market (80%), while the rest (20%) is destined for non-residential projects, both commercial as well as office (Press release, <http://ro.saint-gobain-glass.com/node/53>).

The company entered the Romanian market in 2005, but its glass production started in 2007, once the construction of the factory in Călărași was finalised. The Romanian factory, with approximately 540 employees is one of the group's main production centres in Europe.

The value of the production is of 70 million euro, out of which 60% is being exported. The local market is estimated at a value of approximately 55-60 million euros; according to a discussion with the company's representatives, Saint-Gobain owns a market share of 50% (Draghescu, personal communication). The rest of the Romanian market share is divided between the players from AGC, Guardian and SiseCam. Flat glass is a key element in various industries such as constructions, automobiles, communications and solar energy. The distribution of the production from Călărași occurs on a territory defined by the markets in Romania, Moldova, Ukraine, Hungary, Macedonia, Serbia, Turkey and Bulgaria, as a direct consequence of Saint-Gobain's strategy of covering various markets. Once produced the glass is overtaken by distributors or processors, the final destination being buildings for offices or for production and the residential segment. Saint-Gobain Glass Romania works with a network of approximately 80 partners which own both a significant storage capacity, as well as adequate logistics.

The flat glass produced at Călărași is destined for the constructions sector, given the fact that the factory has a specific organisation model that can only produce this type of glass. Flat glass destined for the ever-developing automobile sector must be imported. The factory at Călărași does not hold a monopolistic position since it is part of the Eastern European cluster for flat glass together with production units in Bulgaria, Hungary and Poland. The production unit in Călărași also competes with the non-EU Turkey, the latter having imposed a 16% tax for flat glass imported from the EU (Draghescu, personal communication). The cost of the transport renders the distribution of this product economically inefficient if the distance is greater than 1,000 km.

Glass sector faces environmental regulation on energy use, CO₂ emissions, pollution prevention and waste, and regulations relating to environmental protection. Manufacturers outside the EU, particularly those in developing countries, have a much less strict legislation benefiting thereby fewer constraints in production and lower production costs.

We identified the following management and marketing challenges for sustainable development of the glass industry both at a global level as well as in Romania, according to sources from the European Commission, reports from industry players, other articles in the field:

- The excess of total production capacity in the sector – some of the producers were closed in the last years, so competitive operations management and careful investment financing become a must to survive. The plants closed in the EU in the last years (Center for European Policy Studies, 2014) are mainly smaller plants with less than 400 tonnes/day and old technologies, meaning that higher

capacity creates competitive advantage in terms of cost and quality. Most of the players in flat glass sector have suffered losses starting with 2009, which caused the closure of a large number of production capacities. On the other hand innovation creates a competitive advantage for 6-12 months and investments are huge (Draghescu, personal communication).

- Legislation on working conditions and EU environmental regulations is more demanding in EU than other developing countries from outside; implementation of these measures means considerable financial efforts for companies. Emissions of greenhouse gases is around 20 millions per year in Europe in glass field according European Commission and up to date reduction targets have been set mainly on political grounds, without looking at real potentials in the different sectors (http://ec.europa.eu/clima/index_en.htm). Glass Alliance Europe recommends a target-setting exercise based on consultation with sectors, to identify real reduction potentials. Human resources involved directly in glass production from European Union are protected by legislation on working conditions, additional payment for night and weekend hours, supplements in food (especially milk), medical controls.
- Technological innovation and sustainable innovation in products - advanced technologies and processes used affect energy consumption and carbon intensity issue; on the other hand, innovation in products give new solutions for durable development. Flat glass production is a continuous production process, meaning that a float line operates 24 hours a day, 7 days a week for uninterrupted periods of 16 to 18 years. During this period, only very limited upgrades can be carried on producing installations so as to keep the furnace hot and therefore avoid wasting energy and CO₂. Major energy efficiency improvements can only be undertaken when production is completely stopped and the installation entirely rebuilt, which requires waiting for the end of the 16 to 18 year production cycle. There is a natural incentive to apply best technologies in order to limit production costs for the next decades. For instance, a 90% reduction in CO₂ emissions in the glass industries is simply not achievable due to the decomposition of raw materials in the furnace which represent about 20% of the CO₂ emissions of a glass furnace (Glass for Europe, 2013). Another challenge of industry is the collecting and reuse of cutlet – glass fragments; the more cutlet, the energy consumptions is smaller and lower CO₂ emissions.
- Clients requests to reduce costs - Cost pressure arising from increased global competition facing the European industries such as car manufacturing, building construction, consumer electronics, aviation and retail trade have a negative effect on the glass sector. The crisis reduced demand for flat glass products, in fact set profits to zero and many companies decreased prices below their costs.
- Pressure to increase energy prices and inputs, in general - increasing energy prices directly affect the price of raw materials. The total liberalization of the Romanian natural gas market, according to the guidelines of Directive 2003/55/EC and Directive 2009/73/EC, require establishing a transitory period to adapt the infrastructure and the regulatory framework. As Deloitte report to CONPIROM in March 2014 outline, an aggressive natural gas price liberalization in Romania for industrial consumers with a 143% increase in two years is hardly affordable in any industry. Taking into account that the natural gas is the dominant fuel within the glass production process, the glass producers must keep an open eye on governmental decisions on this issue and are interested to be part of.

In a world where speed of response is one of the key elements in building a competitive advantage, it is important for companies to understand that continued effort is required to support performance through engagement and clarity of expectation. Companies create competitive advantages over rivals through innovation (Pop, N. Al., Draghescu, F., Cerghit, T., 2013.). Henry Chesbrough launches the concept of

open innovation that encourages companies to use internal and external sources to improve their performance as a way to optimise the product's or service's process (Chesbrough, H., 2012). In the end, marketing strategies should depend on the company's market orientation and target market (Daniels, J., Radebaugh, L., Sullivan, D., 2004).

5. CONCLUSIONS

We live in the time of digital economy based on relationships, networks and interaction (Gummerson, 2008). In a knowledge-based society, trade relations gain a new configuration, due to the explosion of human knowledge (Pop, N. Al., & al., 2011). The Romanian economy must evaluate the best practices for various activity branches in order to be able to not only create products and services which are competitive on the internal market in comparison to the external competition, but also to penetrate and maintain extremely competitive external markets (Pop, N. Al., Draghescu, F., 2014).

Glass is a material basis, as are steel, aluminium, cement and paper for which production and processing involves high energy consumption and is indispensable for industrial value chains in a sustainable development. The most global markets are for standard goods and flat glass is one.

Authorities worldwide are concerned with the adoption of measures and policies which would improve the habitat solutions under the circumstances of the acceleration of global warming and the diminishing of natural resources. The glass sector provides numerous opportunities for the various industries in which it is involved. The strategy of NSH Group is to pursue business with focus on value-added, consolidating the reputation for manufacturing excellence (cost, quality) by improving profitability in architectural and automotive fields and growing in technical glass.

Competitiveness of glass industry faces numerous challenges, many of them driven by globalization, increased environmental regulation and rising energy costs. Excellent environmental performance of many glass products should be promoted as energy-saving milestone in the construction industry in the EU. Glass is an energetic and technological product which can bring a great added value through processing, thus involving adjacent activities such as finishing, montage and transport. The lack of strong Romanian processors renders this activity underdeveloped from the point of view of its potential. We must also mention here Poland's success, which manages to export flat glass utilising products, such as windows, doors and shower stalls with a value of over 1 billion euro each year. Poland doors and windows are sold in more than 90 countries around the world – but mainly in the European Union which is 95% of the export. Export destination depends on the material from which joinery is made. Wooden doors and windows are mainly addressed to United Kingdom, Denmark and Scandinavian countries. The PVC doors and windows are mostly sold in Germany, Czech Republic, Slovakia (<http://poid.eu/en>). Furthermore, the greatest European companies producing joinery located their production sites in Poland including Danish Group VKR, the Swedish Group Invado, the Swiss AFG Group, a German manufacturer Roto. Poland managed to use the absorption of European funds to acquire the newest technologies and to establish strong partnerships with suppliers and clients, using its highly qualified workforce and competitive wages. In order to benefit from this opportunity, Romanian processors must hurry because we believe that in the next 10 to 15 years said opportunity will disappear. Government and EU incentives in the construction industry to obtain an optimal energy performance of buildings seem to be the best tool for supporting the glass industry and climate change policy.

Special attention must be paid to the education specific to the sector and to the sustaining and promoting of investments in the silicates and oxide compounds technology. We believe in the development of a public-private partnership system, in which the state encourages economic agents to become specialised in professions specific to the glass sector, from workers to researchers who can

discover new solutions to the present and future challenges in industries such as constructions, automobiles, communications and solar energy.

Sustainable development means the understanding of the present and future of the glass industry by means of continual research, supporting investments and forming specialists in the domain. Success in the future will come from (Bateman, Snell, 2002): shaping the future and adapting to the world, being clear about what you want to change and being responsive to others' perspectives, pursuing your vision and understanding current realities, leading and learning.

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