Dutch glass industry continues to innovate

The Dutch glass industry has always been a frontrunner in developing and implementing new technologies to ensure glass remains a competitive and sustainable product, being applied in various applications ranging from packaging solutions to high-tech applications. Based on the acknowledged Dutch road ‘Routekaart 2030’, the glass producing companies pursue their ambition to increase glass furnace energy efficiency by co-operating with customers, hard suppliers and technology providers, forming a strong eco-system. Structured improvement programmes have been in place since the 1980s, which puts the industry among the top global performers. Marco van Valburg reports.

The Dutch glass industry comprises the production of different glass types including packaging (Ardagh, Owens-Illinois), tableware (Libbey), glass wool (Saint-Gobain Isover), glass fibre (EGF NL, formerly PPG fibre) and specialty glass (QSil, formerly Philips).

These glass producing companies are represented by the VNG (Association of Dutch glassworks), which is close to celebrating its 100th anniversary. The ongoing ambition to minimise energy consumption and limit emission levels while safeguarding glass quality and furnace lifetime is transferred into R&D projects and the implementation of state-of-the-art technology in close collaboration with various stakeholders, including the technical committee of the Dutch glass industry (National Committee Netherlands Glass industry or NCNG), technology provider CelSian, branch organisations like Flat glass Recycling Netherlands (VRN), the Sustainable Packaging Glass Foundation (SDV), international glass organisations like the German and UK glass associations HVG and British Glass, the international R&D platform GlassTrend and the agency of the Ministry of Economic affairs (RvO).

Currently, some 2600 personnel are directly employed by the Dutch glass industry. Despite the fact that float glass production by AGC stopped in the country during 2014, the total production capacity of 1.26 million tons reduced by only 0.5% in 2015 compared to 2012. Over the period, primary energy consumption has decreased by 4.4%, which is achieved in down processes. Along with this reduction, a 4.8% CO₂ reduction is reported, of which 80% is via more efficient combustion.

Glass melting sidewall combustion.

Glass packaging production.

Glass melting sidewall combustion.

Glass packaging production.
ENERGY REDUCTION SUCCESS

The continuous drive by the industry to save energy is reflected by over 25% energy reduction figures over the past three decades. The emission of CO₂ went down in a similar trend, whereas in the same period NOx and SO₂ have been reduced with higher percentages, 80% and 67% respectively. The implementation of various energy efficient measures has led to a situation that the thermal limitations of glass melting is approached. This is reflected in well-known energy benchmark graphs. Further reductions in energy consumption have required investments in advanced flue gas heat recovery techniques, dedicated furnace maintenance methods and techniques for downstream processes.

Examples of being at the forefront of using the latest technologies include O-I’s installation of Europe’s first oxy fuel furnace in 1994 and the first batch and cullet preheater at Ardagh in 1997. Currently, the NCNG team is working with CalSian on a project to develop process sensors in combination with advanced process control, enabling combustion stabilisation and optimisation at near-stoichiometric combustion to lower glass furnace energy demand and NOx emissions. In addition, together with the company RGS, the use of thermoelectric elements to reclaim heat from feeders and flue gas channels is under evaluation with the Dutch glass industry’s participation. Finally, Libbey is designing a furnace dedicated to the improvement of energy efficiency by thermochemical regeneration of flue gas heat into a high-calorific syngas using melting waste heat. This OPTIMELT technique from Praxair will be demonstrated in 2017.

In addition to improvements to the glass melting process, the Dutch glass industry supports chain-efficiency projects and increases the education level of employees at glass producing companies by means of special glass-focused training material and courses at different levels.

Because of stricter emission legislation, NOx and SO₂ primary emission reduction methodologies and in the case of unavoidable, secondary abatement technologies have been implemented, resulting in a strong reduction of emission levels.

CO₂ REDUCTION FOCUS

Although the industry has achieved huge improvements with respect to energy consumption and emission reductions, the push to move even further is increasing, especially on CO₂. The unpredictable outcome of ETS system development for the period after 2020 as well as the recent defined goal in Paris to have a carbon-free environment by 2050 will have a huge impact on the industry. It requires a pro-active approach and collaboration with authorities to optimise the roadmap and tools to get it done. This is especially relevant to the Dutch glass industry’s parent companies that run global businesses and need to manage capital expenditure over several continents, with different markets and business results.

Many business decisions are made globally and not locally, which takes focused and timely communication to get everybody on the same page of necessary investments in time and money. Again, the Dutch glass industry is open to embrace the latest technologies for a sustainable future. ■

ABOUT THE AUTHOR:
Marco van Valburg is Secretary General at VNG

FURTHER INFORMATION:
VNG (Dutch Glass Association), Leerdam, The Netherlands
tel: +31 345 671625 or +31 6 14498672
email: mvalbu@libbey.com
web: www.nederlandseglasfabrikanten.nl

Subscribe online at www.glassworldwide.co.uk