
DECARBONIZED ENERGY ROADMAP – Moving Away From Fossil Fuels

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Abstract

As the global demand for fossil fuel continues to rise and environmental regulation targets are becoming increasingly stringent, glass manufacturers are faced with the challenge of reducing costs for melting glass under a variety of operating constraints without compromising glass quality and productivity. This enabled a stronger demand among glass manufacturers to invest in innovative energy and emission reduction technologies.

The core glass industry, which has a production process with high energy consumption, produces approximately 95 million tons (Mt) of CO₂ per year. Of these emissions, 40-60% are emitted directly from combustion of fossil fuel, 10-20 % come from primary generation of electricity used on site and 25-35% are released from the decomposition of carbonate raw materials. Whilst the sector has made progress by halving emissions in the last 50 years, there is a need to urgently accelerate efforts to increase energy efficiency and reduce CO₂ emissions to meet the 2050 carbon commitments.

As many furnaces due to be installed in the coming years will be expected to run for up to 12-15 years, new low carbon fuel technologies need to be proven technically and economically within the next 10 years if the glass sector is to fully decarbonise by 2050. Therefore, to effectively decarbonise the entire sector as fast as possible, it is recommended that the following scenarios need to be investigated and developed by the Glass Sector in order to maximise the chances of successfully decarbonising manufacturing process by 2050:

- Hydrogen
- 100% electric melting
- Biofuels
- Hybrid-fuel scenarios
- Carbon capture

In this speech, alternative solution scenarios and the pathways that can be created will be presented and discussed.

Keywords: decarbonisation, sustainable glass manufacturing, energy roadmap, hydrogen in glass melting, electrification in glass furnaces, carbon capture

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