THE ENERGY NEEDS OF THE EU CEMENT INDUSTRY

TNO study for CEMBUREAU - Key Findings

Introduction

In the coming years, the energy needs of the EU cement industry will evolve significantly, both due to the higher efficiency of cement kilns and to the deployment of decarbonisation technologies, which will require an increased use of electricity.

TNO's recent study for CEMBUREAU explores the energy requirements in the European cement industry by 2050. The study follows CEMBUREAU 2050 Carbon Neutrality Roadmap with an emphasis on CCUS methods, particularly Carbon Capture and Storage (CCS) and Carbon Capture and Utilisation (CCU) via methanol route, with corresponding energy requirements. It assesses three scenarios to achieve the sector's carbon neutrality ambitions through CCUS: high CCS, half CCS/CCU, and high CCU.

Key findings

- The results across all three scenarios indicate a **significant increase in energy consumption due to the introduction of CCS and CCU technologies**. This increase is despite the expected decrease in energy intensity of cement production by 2050.
- Based on the CEMBUREAU Roadmap, the study indeed finds a **potential reduction in the overall thermal energy demand by 29% and electricity demand by 27% by 2050**, largely driven by reductions in the clinker to cement ratio and full renewable energy sourcing.
- However, **the deployment of carbon capture technologies will imply a significantly increased energy use, ranging between 68% and 119% by 2050**.
- **The energy demand will largely depend on the type of carbon capture technology which is used**. In the 50% CCS/CCU case, by 2050, the total specific energy demand was 119% higher than the baseline for 2020, with methanol production via CCU accounting for 93% of the additional energy. Similar trends were seen in the 70% CCS / 30% CCU and 30% CCS / 70% CCU cases, with total specific energy demand increasing by 68% and 170% respectively compared to the 2020 baseline.

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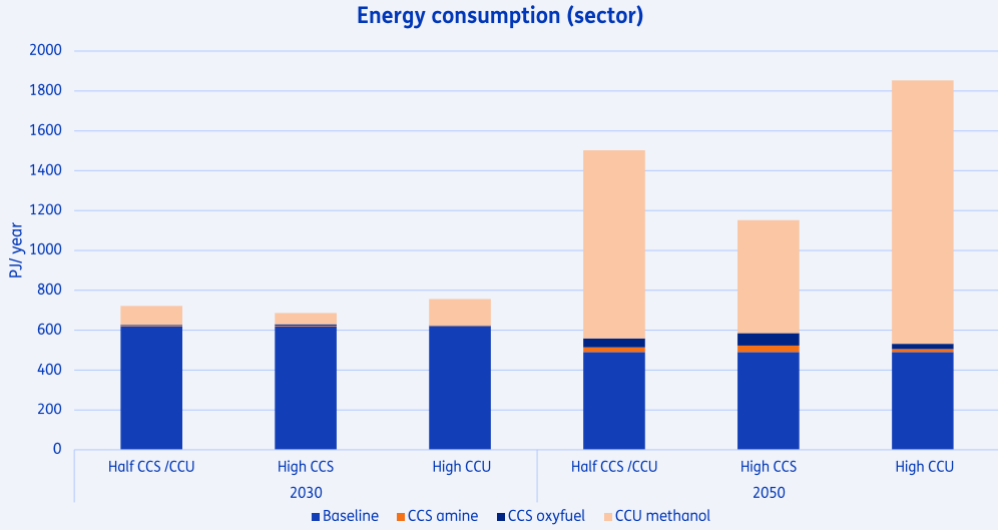
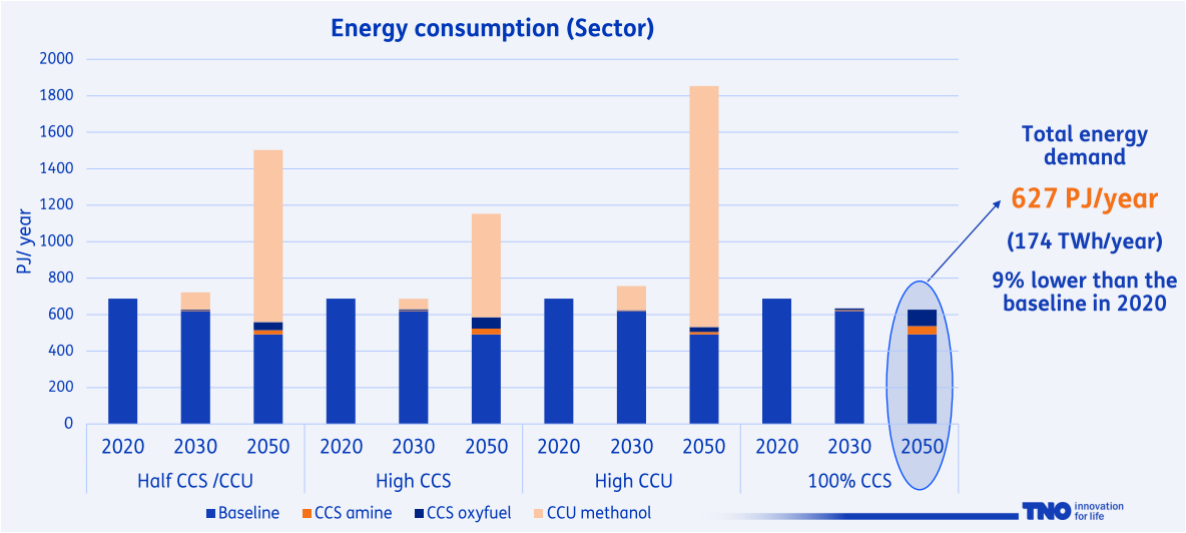


Energy consumption in the EU cement industry in 2030 and 2050 depending on different CCS/CCU scenarios (Source: TNO)



Energy consumption in the EU cement industry in 2020, 2030 and 2050 depending on different CCS/CCU scenarios (Source: TNO)

The Role of the EU Policy

- The implementation of decarbonisation breakthrough technologies will necessitate significant amounts of clean energy. It is essential that policymakers accelerate the deployment of low carbon sources of energy at a reasonable cost for consumers.
- High energy prices as experienced in recent months disproportionately impact the cement sector due to its cost structure. Measures to mitigate the impact of high energy prices at a national and EU level are critical.
- Permitting measures for the deployment of renewable energy on industrial sites should be fastened (please see CEMBUREAU position paper on permitting procedures).
- Innovation funding for breakthrough technologies should support both CAPEX and OPEX, taking into account the increased electricity use as a result of such technologies.