

Cement industry's contribution to the Polish economy

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Executive Summary

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Characteristics of the cement industry in Poland

The cement industry, which was associated under the Polish Cement Association 30 years ago, is among the brightest jewels of the Polish economy. Comprising of 13 modern plants and employing directly approximately 3,500 people, this sector continuously supplies its products to the domestic construction sector and supports the Polish economy with its growth. It has thus steadily contributed during the last three decades of economic miracle, which is how historians have been referring to the recent period in Polish history, where the country has been rapidly closing the gap which for centuries separated Poland from the most developed countries.

The years of economic transformation have been also marked as a time of rapid change of the domestic cement industry, which, although inherited valuable human capital from the communist era, was on the other hand affected by completely outdated production facilities and know-how.

The steps and billions in investments undertaken as a result of a broad privatisation process have led to equipping cement plants with state-of-the-art technologies, making them among the most modern in Europe today. The investment expenditure of the cement industry in Poland in 1995-2017 reached almost PLN 9.7 billion and included:

- ▶ replacing process lines;
- ▶ constructing or upgrading warehouses;
- ▶ investing in environmental protection;
- ▶ improving processes;
- ▶ introducing new systems for managing company value.

As a result of eliminating obsolete wet process production lines, 50% of the production capacity of the domestic industry was replaced and 40% was modernised.

Cement production grew steadily in Poland to almost 18.9 million tons in 2018, 31% more than in 2013. The year 2018 also saw the greatest year on year growth of cement production: 10%. In 2019, the cement production was almost the same as a year earlier, at 18.7 million tons. The growing cement production in Poland gave the country an approx. 10% share of EU production and made it the third largest producer in the EU in 2017.

The cement industry in Poland mainly focuses on domestic deliveries which represent approx. 99% of total sales.

Export sales are generally made to EU countries, as geographically close to Poland non-EU countries such as Belarus and Russia introduced numerous administrative restrictions which effectively eliminate Polish cement plants from these markets (e.g. introduction of obligatory certification of imported cement resulted in cut of cement exports from Poland to Russia to zero in 2017). This makes it all the more concerning that in 2013-2019, third countries' share of cement imports into Poland increased from 8% in 2013 to 29% in 2019, the highest level in that period. It is worth noting that, unlike in the EU, no stringent climate regulations apply in the geographically close Belarus (the source of 24% of all imports into Poland in 2017), giving Belarussian producers significant competitive advantage over Polish cement plants.

Economic effects of cement industry activity

Based on the EY Spectrum¹ model, which is an extended version of the input-output model, the cement industry can be said to impact the Polish economy not only through:

- ▶ directly generated value added (~GDP), employment and government revenues, but also:
 - ▶ demand generated in the supply chain (**indirect effects**), and
 - ▶ consumer demand generated by employees of the cement industry and its suppliers (**induced effects**)².

In 2017, through direct, indirect and induced demand-side effects, the cement industry generated the following in the Polish economy:

- ▶ approx. PLN 3.8bn of value added
- ▶ approx. 21.8 thousand jobs
- ▶ approx. PLN 1.9bn of government revenues.

Sectors which gained the most (in terms of value added) from the demand generated by the cement industry include:

- ▶ transport, postal services and telecommunication sector (PLN 362m)
- ▶ electricity, gas, water and recycling sector (PLN 299m) and
- ▶ mining and extraction (PLN 215m).

¹ The EY Spectrum model is a unique method of analysis developed by EY Poland. It is a combination of the input-output model and modern spatial econometric techniques, accounting for flows of goods and services both between different sectors (industries) and individual regions (districts) of the country.

² A description of the approach to the economic analysis of the effects of the industry activity is presented in Chapter 2.

The greatest effects for employment were generated by the cement industry:

- ▶ in the transport, postal services and telecommunication sector - 3,540 jobs
- ▶ in the mining and extraction sector - 2,185 jobs
- ▶ in the retail sector - 1,772 jobs

Of the PLN 1,876 million of government revenues generated by the cement industry, the central government received PLN 1,272m, the social security subsector PLN 403m, the local government PLN 195m, and environmental protection and water management funds PLN 7m.

In addition, the government revenues generated by the cement industry can be used to finance additional public spending, generating as much as PLN 3.0bn of further value added in the Polish economy.

The greatest effects in terms of value added, employment and local government revenues were generated in districts in which individual cement plants included in this analysis are located.

The districts (poviats) in which cement industry operations generated the highest value added are as follows: Krapkowice (PLN 349m of added value), Opatowiec (PLN 311m), Warsaw (PLN 252m), Chełm (PLN 180m), Pajęczno (PLN 178m) and Żnin (PLN 162m). The districts with the greatest effects in terms of number of jobs supported were: Capital City of Warsaw (2,460 supported jobs), Krapkowice (725), Pajęczno (674), Opatowiec (595) and the City of Kraków (555). Public levies paid due to cement industry activity to the greatest extent supported the local budgets in the Krapkowice district (PLN 21.7m of the revenues of the district and municipal budgets in the district), Opatowiec (PLN 14.6m), Chełm (PLN 14.1m) and Pajęczno (PLN 10.6m).

Apart from the demand-side effects generated by its operations, the cement industry also influences economy through its investments and supply-side effects. Examples of sectors in which these types of influence is relatively strong are construction and concrete production.

The scale of construction sector activity in Poland (PLN 245.9bn of total value added generated in 2018 and approx. 2,131 thousand of jobs supported) means that any potential problems resulting from a limited of domestic cement availability, leading to disturbances in the construction sector, could have potentially strong, negative consequences for the entire economy. It can be hypothesised that supply-side effects generated by the cement industry in the construction sector will be of particular importance in the coming years, when intensified infrastructure investments will form an important channel for reviving the economy after the recession caused by the COVID-19 pandemic.

Cement industry in the environmental perspective

Over the last several decades, the cement industry has completed a number of investment projects to reduce the environmental impact of its plants.

One major success is that emissions into air from the cement industry now represent an insignificant proportion of pollution on the national scale. The scale of emissions is as follows:

- ▶ Since 1970s, the emissions of particulate matter have dropped dramatically - total particulate emissions in 2017 had been reduced by approx. 99.9% compared to 1975.
- ▶ Actual emissions of gaseous pollutants (CO, SO₂, NO_x) by the cement sector are much below the emission standards resulting from the sector BAT conclusions adopted and implemented.
- ▶ CO₂ emissions have been significantly reduced in recent decades - emissions of carbon dioxide in 2019 were about 30% lower than in 1990 (and thus any further reduction of CO₂ emissions in this industry becomes possible only by replacing natural raw materials with secondary raw materials and applying modern CO₂ capture and storage methods).

Generally, water and waste water management in the cement sector does not pose a risk of water pollution. It primarily involves discharging waste water mainly into surface receivers and discharging cooling water. Today, the cement industry in Poland uses only kilns producing cement clinker in the dry process, which use little water and the solution itself is much more environmentally friendly than the wet process widely used in the past.

Operations of the cement sector currently produce little or no solid waste. As a result of using solutions consistent with the BAT (best available techniques), the amount of solid waste from the production of cement and raw materials has been significantly reduced. The solutions applied in the cement sector and allowing low- or zero-waste operations mainly include:

- ▶ reusing the dust captured during cement production, and
- ▶ using dust to produce other commercial products.

In the last 30 years, investments were made to modernise the cement sector, as a result of which:

- ▶ heat consumption was reduced (from 5,700 kJ/kg to 3,600 kJ/kg), and
- ▶ the consumption of heat for firing was reduced by 25% and electricity use was cut as well.

The cement sector also forms a particularly important element in the circular economy. The circular

economy concept has two dimensions in the cement industry. Cement, as an ingredient of concrete used in construction, is in the very heart of the circular economy. Consequently, turning the circular economy concept into reality greatly depends on the degree to which it is embraced by the construction sector.

On the other hand, the production process of the cement sector now features the increasing use of anthropogenic materials instead of primary raw material and thus greatly contributes to the circular economy.

The production process is compatible with the circular economy mainly because of:

- ▶ the use of waste and semi-processed products such as slag from steel manufacturing in the cement industry, which means that primary raw materials are replaced with anthropogenic ones, and in addition, the clinker content of cement is reduced, thus effectively cutting global energy use and CO₂ emissions.
- ▶ the use of refuse-derived alternative fuel – Poland produces some 2.6 million tons of alternative fuel a year, and all cement plants together consume some 1.7 million tons, thus reducing greenhouse gas emissions; they also gave an impulse to develop this new sector of the economy at its very beginning.

The cement industry is affected by the application of the **EU ETS** emissions trading system in two ways:

- ▶ directly - the industry is obliged to buy and surrender emission allowances for the CO₂ emitted in the production process, mainly at the stage of producing cement clinker, which is the main semi-processed product in cement production.
- ▶ indirectly - the cost of purchasing emission allowances by electricity generators, passed on to final consumers in the price of electricity.

The participation in the EU ETS represents a significant expense for the cement sector, mainly due to the limited potential of reducing emissions due to the significant proportion of unavoidable process emissions.

With a view to improving the competitiveness of the cement industry, this industry has lobbied the European Commission to include it on the list of sectors entitled to receive compensation for the cost of purchasing emission allowances pass on in the price of electricity. Although the cement industry has striven for inclusion on this list since 2012, it has not been recognised as entitled to claim compensation for the indirect costs of emissions under the EU ETS yet.

From the perspective of industry, and in particular the cement sector, the mechanism which could help achieve climate goals is the Carbon Border Adjustment Mechanism proposed by the European Commission. This mechanism should, on the one hand, ensure fair competition within the EU, and on the other, would motivate countries where there are no restrictions on emissions, like Belarus, to introduce solutions to help achieve climate protection goals similar to those in the EU.

Responsible, sustainable business in the cement production sector

Cement companies in Poland have been following strategies of sustainable and responsible development for years. As part of their activities, they support employees, but also communities, particularly local ones living around plants. The environmental impact of cement production is steadily reduced. Polish cement plants broadly contribute to the circular economy, also in the social dimension of this activity; they are at the forefront of utilising waste which cannot be absorbed by any other economic sector in an economically justified way.

Cement producers in Poland are also actively expanding their activities in the field of biodiversity and land reclamation, which are treated as an important element of plant management. In addition, both cement producers and the Polish Cement Association run a number of social and educational programs in Poland.

Environmental innovations marketed by the cement industry allow pioneering solutions to be used in practice. These include concrete absorbing car emissions or self-compacting concrete which can precisely fill forms even with dense reinforcement. The cement industry also promotes concrete road surfaces, which it recommends in the design of express roads and motorways where surface durability is important.

Cement and concrete are basic construction materials used, among others, in building infrastructure (e.g. roads, railroads) and housing. In recent years, the construction market has emphasised the role of sustainability, including in particular innovation, the environmental impact of products and structures, social aspects such as comfort of use and functionality as well as life-cycle economic efficiency. In this context, cement and concrete production form an important element of continuous improvement aimed at achieving the goals of a low-carbon economy.

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