

Analysis on R&D Trends of Limestone in South Korea

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Extended Abstract

Limestone stands as the largest mineral resource in possession of South Korea. The reserves of limestone, which include dolomite and marble, amount to approximately 13.8 billion tons as of 2020, constituting about 85% of Korea's total production of mineral products([2],[3]). Notably, around 80% of the total limestone production is utilized in cement manufacturing[1]. Additionally, limestone plays a pivotal role in various industries such as steelmaking, desulfurization, papermaking, fertilizers, chemicals, glass production, and the food and medicine sectors.

Despite limestone being a crucial raw material for the Korean industry, the current status and future outlook of the limestone industry are not very optimistic. Globally, limestone of relatively high quality is found in Mesozoic strata; however, in Korea, it is primarily distributed in Paleozoic strata. Despite abundant reserves, there is a shortage of high-grade limestone with a CaO content of 52% or more, emphasizing the urgent need for the secure and efficient development of high-quality limestone[4]. Moreover, in line with the trend towards carbon neutrality, Korea has implemented a greenhouse gas emissions trading system. In the limestone processing industry, it currently benefits from a free allocation up to the third period. However, with the potential introduction of the fourth period, there is a high likelihood that this allocation will transition to a paid system[7]. To address this situation, it is essential to undertake limestone research and development (R&D) efforts aimed at elevating technological capabilities.

Hence, by conducting an analysis of national research and development tasks associated with limestone, we aim to assess whether the outcomes of limestone R&D align appropriately with the Korean government's investment of research funds into this sector.

As a result of the analysis conducted using the National Science & Technology Information Service(NTIS) on national research and development projects related to limestone from 2002 to 2023, a total of 113 projects were identified, with the total government investment research funds amounting to KRW 39,469 million. The average government investment research cost per project is KRW 349.3 million. The number of projects and research funds reached their peak at 13 projects and KRW 65.55 million, respectively, in 2004. Subsequently, there was a downward trend, but this trend reversed after 2019, with 7 projects and KRW 27.87 million in research funds recorded in 2023([5]). During the same period, the number of research papers and patents related to limestone R&D totalled 126 and 1,437, respectively. However, the number of research papers has decreased from 12 in 2011 to 4 in 2023, and the number of patents has also seen a decline from 101 in 2013 to 52 in 2023([6],[8]).

Moreover, in the classification of limestone R&D-related tasks, the majority were focused on mine development, while the number of tasks related to carbon dioxide reduction was relatively limited. Based on the analysis, it is clear that, in addition to efforts aimed at developing high-quality limestone and limestone-related products, there is a critical need for support in R&D tasks addressing carbon dioxide reduction challenges within the limestone-related industry.

References

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