Carbon Reduction Challenges for South Korean Fastening Tools Suppliers

南韓緊固工具廠商的減碳挑戰

Introduction

South Korea, one of the world's most fossil-fuel reliant economies, has sought to reach carbon neutrality by 2050. However, **the government of South Korea has recently reduced the 2030 industrial carbon reduction target from the previous 14.5 percent set in 2021 to 11.4 percent**, while maintaining the previous administration's nationally determined contribution (NDC) goal. Korea's NDC goal is reducing carbon dioxide emissions by 40 percent, what it called a reasonable adjustment, to 436.6 million tons from the country's peak of 727.6 million tons in 2018. Although the industry appreciated the target adjustment, the private sector believes that the 11.4 percent goal is still ambitious considering Korea's manufacturing-centered industry structure.

The government plans to decrease carbon emissions by speeding up the energy transition from fossil fuels to nuclear energy and renewables. The plan is to use less carbon intensive energy sources to reduce emissions by 45.9% from 2018 levels by 2030, up from the existing target of 44.4%.

Korea has eased industrial reduction targets, which was claimed to be in light of realistic domestic conditions including raw material supply and technology prospects. In the energy sector, the target was boosted to reduce greenhouse gases through a balanced energy mix between nuclear power and renewables, and by expediting the move to clean energy such as solar and hydrogen. To do so, South Korea plans to increase nuclear energy to 32.4% of total power production by 2030, up from 27.4% in 2021, and renewables to at least 21.6% of power output from 7.5%, the commission said.

South Korea supplies more than 40% of its electricity from coal and has promised to reduce the portion by 2030, but environmental groups have said the goals are too low and criticised Korea's plans to build more coal-fired plants.

Manufacturing Sector

The manufacturing sector has been recognized as a key contributor to global carbon emission. The future product demands are coupled with the manufacturing and consumption of goods and services which allow sustainable development and reduction of carbon footprint. While some manufacturing organizations have come to terms with the reality of carbon emission, a large proportion of organizations are still searching for how to reduce carbon emissions.

Undoubtedly, bring down the industry's dependency on fossil fuels, recycling components and embracing more environmental design practices will be critical, as it will be requiring on a better way of working across the value chain.

Korean manufacturers must accept their huge responsibility for emissions of greenhouse gases. Extensive shifts need to be made across every aspect of manufacturing in this country by transforming operations and products. **Overproduction, waste and too many dependencies on fossil fuels have historically been significant contributors to emissions in this industry, but manufacturers now should take major steps to overturn this trend.**

Fastener and Tooling Industry

As stated earlier, Korea heavily relies on fossil fuels for its energy needs, particularly coal and oil. This is one of the key challenges for this country to reduce carbon emissions since these fuels are major sources of greenhouse gas emissions. Additionally, demand for the energy is growing rapidly in Korea due to its fast-paced economic growth and industrialization. This makes it even more challenging to reduce carbon emissions.

While Korea has made significant progress in developing renewable energy sources, they still only account for a small portion of the country's total energy mix. This limits the potential for carbon emission reductions through renewable energy and it is more

challenging when it comes to industries like machinery, fastener, and tooling.

Relatively small land area and compactly populated cities make it challenging, and significantly costly, for fastening tools suppliers to build large-scale renewable energy infrastructure such as wind farms and solar power plants.

Korea's economy is immensely dependent on exports, particularly in the technology and manufacturing sectors. This makes it challenging to apply carbon emission reduction policies that could impact the competitiveness of industries like fastening tools, to compare with other exporters such as Taiwan, China and Japan.

In Korea, the fastening tools industry is characterized by many small and medium-sized enterprises (SMEs) that specialize in the design and production of tools and other fastener related products. These companies have a strong focus on innovation and quality and have gained a reputation for producing high-quality fastening tools that meet international standards. **In order to bring this sector to net zero, there is a need for utilizing clean electricity and production processes.** Additionally, it is required to scale up existing technologies that capture and store carbon so that it doesn't enter the atmosphere.

Wider adoption of new technologies, processes driven by artificial intelligence (AI) and techniques such as additive manufacturing (using 3D printing technology to produce tools and parts to enable quicker production and continuous quality improvements) can also go a long way to reducing the environmental impact of our manufacturing, processes and services.

The world is changing, and **the potential is there for all fastening tools manufacturers to use this digital transformation to do things better**. Fastening tools suppliers can't only look at their own internal process but must look beyond that towards all other parties along the supply chain.

Finally, policy will be critical to achieving decarbonization in fastening tools industry in Korea, since it will require large capital investments, not something that most suppliers will be able to do on their own. **The Korean government has also recognized the importance of the fastening tools industry and has implemented various policies to support its growth. These include funding for research and development, tax incentives for companies that invest in new technologies, and support for overseas marketing and sales activities.**

Governments can assist with the investment cost, provide demand pull for low-carbon products, and use trade policy to protect domestic low-carbon industries from cheaper but higher-carbon products from abroad. These policies use different forces to encourage action, and the industry may need all of them to make such extensive changes.

Sources:
From remanufacturing to recycling, by World Economic Forum.
The challenge of decarbonizing heavy industry, by Brookings

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