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Decarbonisation of medium-sized firms in the manufacturing sector

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Summary

A reduction of CO_2-emissions and a decarbonisation of the manufacturing sector is important to achieve the climate targets of the Paris Agreement. This empirical study examines the decarbonisation of medium-sized firms in the manufacturing sector. The results show that the majority of medium-sized firms take climate protection seriously and have already taken concrete measures to reduce their carbon footprint. However, medium-sized firms also differ greatly from one another in terms of the paths they have taken towards decarbonisation. Five different decarbonisation types can be identified.

In order to limit global warming and achieve the goals of the Paris Climate Agreement, decarbonisation of the manufacturing industry is necessary. Emerging sustainability regulations, such as the Corporate Sustainability Reporting Directive (CSRD) and the EU taxonomy, raise the pressure on medium-sized companies to develop strategies to reduce their CO_2-emissions and to decarbonise. Although these regulations currently affect mainly large and listed companies, medium-sized firms are also increasingly affected in their role as suppliers to large companies (the so-called "trickle-down effect"). To maintain their position in the supply chain, many medium-sized companies are thus faced with the need to comply with sustainability standards.

Based on survey data gathered from a representative study of 444 German, medium-sized manufacturing firms (NACE 20-30), our study examines the decarbonisation paths taken by these firms. Medium-sized firms are defined as firms between 50 and 2.999 employees. Multivariate statistical methods (i.e., latent profile analyses) are used to identify different decarbonisation types within the group of medium-sized firms. Afterwards, analyses of mean differences help to characterize these types.

Many medium-sized firms take the issue of climate protection seriously

The analysis shows that the majority of companies take the issue of climate protection and decarbonisation seriously. 77 % of the companies stated that reducing their own CO_2-emissions has a high priority. 33 % have defined a precise target year by which they intend to reach CO_2-neutrality and 4 % are already CO_2-neutral. However, there is also a group of companies that are not particularly advanced in terms of climate protection and do not have any ambitious targets.

Different paths towards decarbonisation

Companies can adopt various paths to reduce CO_2-emissions. Some companies focus on their manufacturing and logistics processes, for instance, by avoiding fossil fuels, saving energy, or using solar or wind energy. Other companies focus on reductions across the entire supply chain from the supplier to the end consumer. Another option is purchasing voluntary CO_2-certificates. Here, companies purchase emission certificates on a voluntary basis to offset their own emissions. However, such voluntary CO_2-certificates are often criticised as they are deemed non-transparent and having a rather symbolic character. Nevertheless, companies make use of this option as the reduction of their own emissions cannot be realised quickly and is associated with far-reaching changes in the company's products and processes.

Five decarbonisation types in medium-sized manufacturing firms

Based on the answers to the selected decarbonisation paths, we were able to identify five decarbonisation types in medium-sized manufacturing firms using a latent profile analysis. The first group accounts for around 25 % of the surveyed companies. We refer to them as *Internal Supply Chain Decarbonizers*. The companies in this group concentrate on reducing their own CO_2-emissions (e.g., by converting their production processes or avoiding air travel or business trips). In contrast, they have a critical view on offsetting their own emissions by purchasing voluntary CO_2-certificates. Approximately 19 % of companies consider the entire value chain in addition to their own emissions. We refer to this group as *Total Supply Chain Decarbonizers*. Companies in this group also pay attention to proven decarbonisation efforts among their suppliers. 23 % of companies can be described as *All-Rounders*. The companies in this group have a broad and comprehensive climate protection strategy that includes all of the decarbonisation paths described above, including voluntary CO2-certificates for offsetting. We describe the fourth group as *Decarbonization Undecideds* (approx. 28 %). The companies in this group are not against decarbonisation and the associated measures as such but can be described as rather passive and as preferring a wait-and-see approach. The final group of around 6% of companies are sceptical about all decarbonisation paths and question the goal of decarbonisation fundamentally. We could not identify any firm size differences between the firms in the five respective groups.

Comparison of the five decarbonisation types

How do the companies in the five groups differ in terms of structural characteristics, capabilities, competitive strategies and corporate success?

All-rounders are mostly older companies with high profitability and strong growth ambitions. Companies in this group have a strong focus on sustainability and have defined clear CO2-reduction goals. They also perceive high pressure from stakeholders in this regard and pay attention to a positive green image. *Internal Supply Chain Decarbonizers* tend to be young companies with low growth ambitions. Compared to other companies, they feel little pressure from stakeholders. *Total Supply Chain Decarbonizers*, on the other hand, have a strong focus on green innovations. They pursue a strategy of quality leadership, already have a lot of experience in the area of sustainability and attach importance to a positive green image. They are older than average and have low growth ambitions and below-average profitability compared to other companies. The group of *Decarbonization Undecided*s has not yet fully developed a clear sustainability strategy. Although companies in this group prioritise the reduction of CO2-emissions, they have so far failed to take concrete measures to achieve these goals. The group of *Decarbonization Sceptics* pursues a strategy of cost leadership, thereby having little ambition for growth and being below average in terms of profitability. They also feel no pressure from stakeholders to reduce their emissions and place no value on a green image.

Drivers of medium-sized firms' decarbonisation strategies

What is driving medium-sized firms towards decarbonisation? Broadly speaking, a distinction can be made between internal and external drivers. Internal drivers include the management itself and its values and attitudes. External drivers are large companies as corporate customers and the state with its regulatory framework conditions (e.g., the EU taxonomy). Banks and other financial institutions as well as the company's own employees, works councils and trade unions currently play a subordinate role. However, too much external pressure can also lead to a company opting for more symbolic measures (e.g., the purchase of voluntary CO2-certificates). In order to bring about real change in companies with regard to climate protection, politicians should therefore encourage companies to reduce their CO2-emissions in a long-term sustainable way out of their own interest.

In addition to the internal and external drivers, path dependencies can also be recognised. Medium-sized companies that have been working intensively on the topic of sustainability for years have built up corresponding sustainability expertise and are (unsurprisingly) also pioneers in climate protection.

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