

IfM Materialie

Corporate acceptance of climate protection
regulation

Markus Rieger-Fels, Susanne Schlepphorst, Christian Dienes, Rodi Akalan,
Annette Icks, Hans-Jürgen Wolter

This English version has been machine-translated and the contents have been checked by the authors.

Imprint

Publisher

Institut für Mittelstandsforschung Bonn
Maximilianstr. 20, 53111 Bonn

Phone +49/(0)228 / 72997 - 0
Fax +49/(0)228 / 72997 - 34

www.ifm-bonn.org

Contact

Markus Rieger-Fels
Annette Icks

IfM Materialie No. 305

ISSN 2193-1852 (Internet)
ISSN 2193-1844 (print)

Bonn, May 2024

IfM Bonn is a foundation under private law.

Gefördert durch:



Bundesministerium
für Wirtschaft
und Klimaschutz

aufgrund eines Beschlusses
des Deutschen Bundestages

Ministerium für Wirtschaft,
Industrie, Klimaschutz und Energie
des Landes Nordrhein-Westfalen



Corporate acceptance of climate protection regulation

Markus Rieger-Fels, Susanne Schlepphorst, Christian Dienes, Rodi Akalan, Annette Icks, Hans-Jürgen Wolter

IfM Materialie No. 305

Abstract

Politicians are pursuing a series of regulatory measures with the aim of promoting climate protection. The effectiveness of these measures also depends on the reaction of the regulated companies and thus on their acceptance of the regulation. This study examines the acceptance of various regulatory measures designed to contribute to climate protection. It identifies aspects of regulation that are detrimental to acceptance and discusses ways to counteract this.

Keywords: *Climate protection, regulation, acceptance, bureaucracy, emissions trading*

Contents

Executive summary	III
1 Introduction	1
2 Diversity of measures in climate protection regulation and strategic scope for companies	3
2.1 Environmental policy instruments for climate protection	3
2.2 Strategic scope for companies in dealing with regulation and the importance of acceptance	6
3 Regulatory measures examined	7
3.1 Energy Services Act	7
3.2 CO2 pricing/emissions trading system	8
3.3 Sustainability reporting obligations	10
4 Approach	12
5 Results	14
5.1 Companies' attitudes and motivation toward climate protection	14
5.2 Assessment of specific regulatory measures	15
5.2.1 CO2 pricing	15
5.2.2 Energy Services Act	17
5.2.3 Sustainability reporting obligations	19
5.3 Barriers to the acceptance of regulation	20
6 Conclusion	23
Literature	25
Glossary	28
Appendix	31

Executive summary

The European Union has set itself the goal of making the European economy climate neutral by 2050. Germany wants to achieve climate neutrality five years earlier. The ecological transformation of the economy required to achieve this is being supported and driven forward by a series of regulatory measures.

Companies have a wide range of strategic options for responding to these regulatory requirements: from evasive reactions such as relocating, to reactively complying with minimum requirements, to proactively exceeding regulatory requirements. The effectiveness of regulatory measures – and thus the success of the ecological transformation – therefore also depends on how companies respond to regulation.

High level of identification with climate protection goals

Our findings show that the companies and associations we interviewed identify with the regulatory goal of climate protection and are willing to do their part to ensure its success. They are guided in part by intrinsic motives, such as the personal convictions of their managers, and in part by extrinsic motives, such as customer pressure and regulatory requirements. Mittelstand companies also feel a sense of responsibility due to their regional roots.

Effective regulations require acceptance

Many companies find it difficult to accept the nature of specific regulations. However, acceptance is crucial to how companies ultimately respond to political requirements. Some of the latest regulations have made companies much more critical, as the constant introduction of new regulations disrupts routine processes within companies and requires additional time to familiarize themselves with the new requirements.

Barriers to acceptance of climate regulations

Above all, a lack of recognizable meaningfulness, a high level of detail, frequent changes, overly short implementation deadlines, and excessive certification requirements lead to unnecessary costs and, in particular, additional bureaucratic burdens, which place a particular strain on Mittelstand companies. In addition, individual operational circumstances are not taken into account and existing entrepreneurial innovation potential remains untapped. As a result, Mittelstand

enterprises may develop a negative attitude. There is a risk that companies will resort to evasive strategies.

Effective climate protection requires a reliable regulatory framework

Climate-friendly regulation should be limited to as few reliable instruments as possible with the greatest possible effectiveness. Companies should be given flexibility in achieving the regulatory objective. This can best be achieved through incentive regulations and by avoiding specific requirements as far as possible. This requires greater trust in the integrity of entrepreneurs and the avoidance of mandatory audits.

1 Introduction

In order to limit climate change, the European Union (EU) has set itself ambitious targets for reducing greenhouse gas emissions. With the adoption of the European Climate Law in July 2021, the agreement formulated in the Green Deal to make the European economy and society climate-neutral by 2050 will be enshrined in law (cf. European Union 2021). By 2030, EU member states are to reduce net greenhouse gas emissions by at least 55% compared to 1990 levels. At the same time, the transition to a climate-neutral economy is intended to promote Europe's economic competitiveness.

While the necessity of the green transformation is largely undisputed in society, there is disagreement about the appropriate pace of this transformation. In response to the advancing climate change and the insufficient progress in mitigating it to date, one side is calling for stricter regulations to prevent climate tipping points from being exceeded. The other side points to possible competitive disadvantages resulting from rigid government regulations and fears that Germany or the EU taking a leading role in combating climate change will ultimately only result in CO₂-intensive production moving to less regulated countries.

In addition to the question of how ambitious the transformation goals and timetables should be, there is also the question of how concrete climate targets can be achieved most efficiently. This is linked to the debate about the appropriate role of government regulation in promoting this transformation: on the one hand, companies should be given as much freedom as possible so that they can fully exploit their innovation potential and find the most cost-effective way to protect the climate. On the other hand, there are fears that companies would tend to use this freedom to pursue climate protection as a secondary priority, which would jeopardize the achievement of climate targets. Accordingly, there must be clear incentives for climate protection. However, policymakers also face a dilemma in designing these incentives: generous subsidies for climate-friendly behavior are controversial, if not impossible, in times of limited government budgets. On the other hand, making climate-damaging behavior significantly more expensive through a high CO₂ price leads to competitive disadvantages and possibly to relocations to countries with lower or no CO₂ prices.

In view of these challenges, policymakers are relying on a mix of instruments consisting of regulations, subsidies, pricing, and information. The effectiveness of these measures depends to a large extent on how companies respond to them. Companies have strategic leeway in doing so – from simply ignoring or

evading the measures, to minimal implementation, to exceeding government requirements. How companies use their strategic leeway depends on numerous factors. Of particular importance is the personal conviction and intrinsic motivation of entrepreneurs. On the other hand, the specific design of individual regulatory measures is crucial for their acceptance.

The second aspect is of particular interest to policymakers: better design of climate protection regulations could promote the desired ecological transformation while reducing the psychological costs that many companies incur in implementing regulatory requirements, in addition to financial and personnel costs.

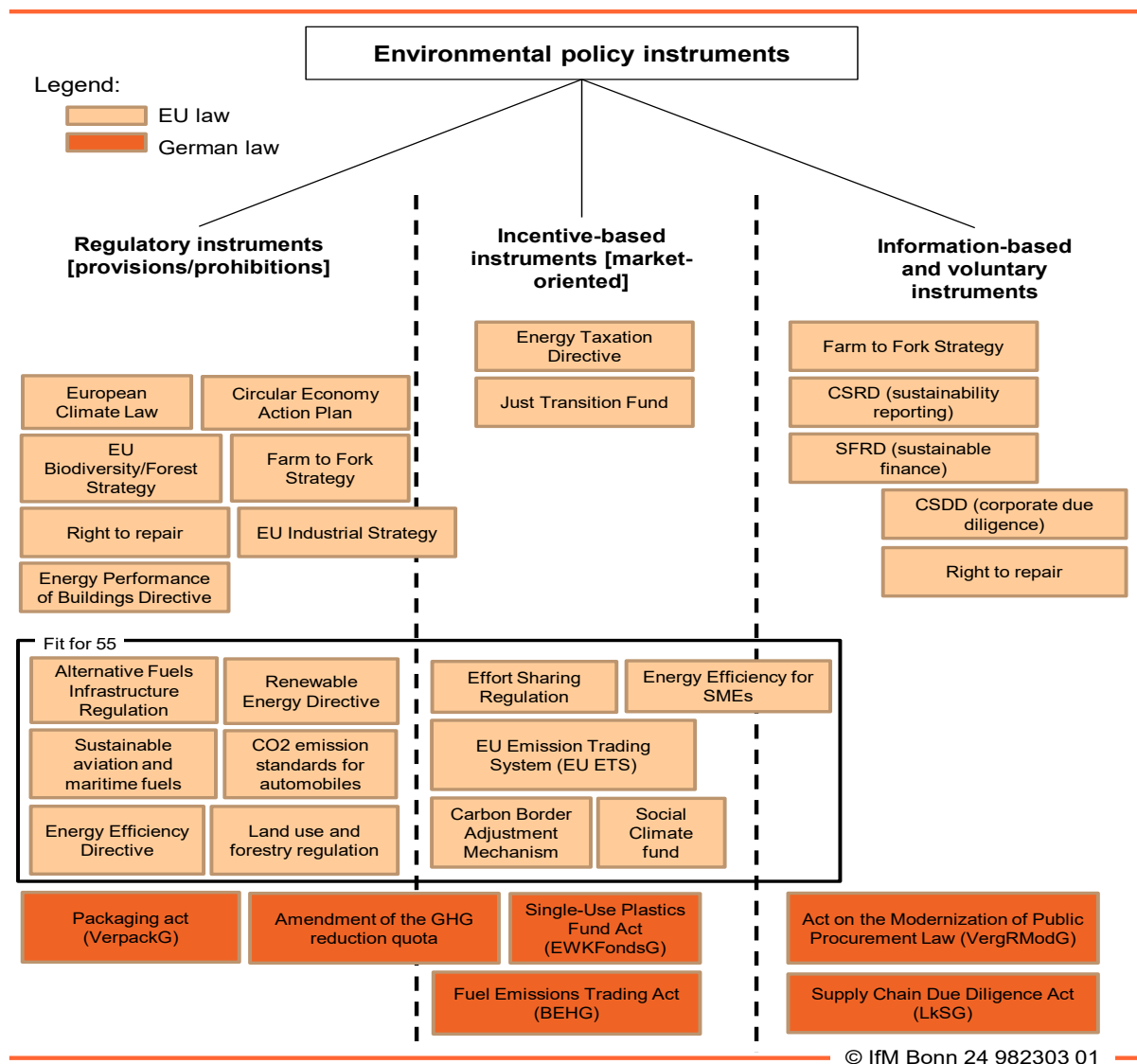
This study examines how companies evaluate specific regulatory measures aimed at climate protection and how these measures can be designed to achieve the highest possible level of acceptance among companies.

2 Diversity of measures in climate protection regulation and strategic scope for companies

2.1 Environmental policy instruments for climate protection

To achieve their climate targets, the German government and the EU use a combination of various environmental policy instruments. These can be divided into regulatory, incentive-based, informational, and voluntary instruments (see Figure 1).¹

Figure 1: Environmental policy instruments



Source: Own representation based on Hasenhüttl (2003).

¹ Most of the EU directives/regulations mentioned here are still in the approval process and have not yet entered into force.

Regulatory instruments such as provisions and prohibitions are behavioral regulations that give those being regulated little or no leeway (e.g., by specifying concrete actions) or only limited leeway (e.g., by defining boundaries/limits). This regulatory approach, also known as the "command-and-control" approach, is often considered particularly effective because it directly enforces desired behavior or prohibits undesirable behavior. This is primarily true in the short term. In the long term, however, these direct behavioral regulations provide little incentive to research environmentally friendly innovations. In addition, these instruments incur high monitoring costs, and the efficiency of target achievement is not considered. For example, undifferentiated emission reduction targets neglect the fact that reduction costs vary across different industries and companies. A reduction target could therefore be achieved at lower overall societal costs if greater reductions were made in those industries and companies where the reduction costs are lower (cf. Hasenhüttl 2003; Lo et al. 2020).

Incentive-based instruments do not impose direct behavioral regulations and allow companies more freedom of action. They aim to change behavior through financial incentives for environmentally friendly behavior or penalties for environmentally harmful behavior, e.g., through taxes, levies, or subsidies (cf. Hasenhüttl 2003; Lo et al. 2020). Provided that the same price applies to all market participants, this approach is economically efficient (assuming perfect information). Indirect control is achieved either through quantity or price control. Under quantity control ("cap-and-trade"), the state limits the maximum permissible environmental impact within a certain period by issuing a limited amount of pollution rights in the form of certificates. Companies must either present certificates for their emissions during this period or pay a penalty. The certificates are tradable, and their price is determined by the market. This allows companies to decide whether it is cheaper for them to pay for pollution or to reduce their emissions. Under price control, the price for using the environment or consuming resources is set politically by the state imposing pollution charges in the form of (Pigou) taxes, levies, or fees. Both approaches have advantages and disadvantages: With quantity control, the achievement of emission reduction targets is certain, but the future CO₂ price path remains uncertain, which makes long-term planning difficult for companies when making investment decisions. In the case of price control, an ideal scenario involves establishing a long-term, specific CO₂ price (or price path). This improves the predictability of investments, as future costs can be calculated reliably (cf. Adolf 2008). On the other hand, however, it remains unclear whether the announced price path will be sufficient to achieve the climate targets that have been set.

Informational instruments are often described as a low-intervention form of regulation, as they also rely on market forces to achieve environmental policy goals by reducing information asymmetries between market participants (cf. Delmas et al. 2010; Hasenhüttl 2003; Shimshack 2020). One disadvantage of these instruments is that they assume that individual preferences for environmentally friendly products will translate into a corresponding willingness to pay.² This form of regulation fails to address the problem that, when it comes to climate protection, individual and societal incentives diverge due to external effects. Such regulatory approaches are therefore often understood as accompanying measures.

Voluntary instruments give economic actors the greatest scope for action. They are based on agreements between companies or their interest groups and policymakers ("voluntary commitments") on environmental protection goals and do not involve government regulation (cf. Hasenhüttl 2003; Lo et al. 2020). However, there is a risk that the targets set may not be achieved.

All regulatory measures have in common that they change the competitive situation of those regulated compared to companies that are not subject to regulation. This can manifest itself in increased bureaucratic burdens or higher production costs due to CO₂ pricing or the ban on cost-effective but emission-intensive production processes. Especially regarding CO₂ pricing and regulatory measures, discussions often focus on potential competitive disadvantages and the risk of triggering the relocation of production sites (cf. Paha 2022). According to the "pollution haven" hypothesis (cf. Copeland/Taylor 1994), the strictness of environmental regulations can have a noticeable impact on locational competition and, consequently, on the global distribution of foreign direct investment. In contrast, the Porter hypothesis states that stricter environmental policy can have a positive effect on the international competitiveness of regulated companies if it encourages them to innovate. In their literature review, Dechezleprêtre/Sato (2017) arrive at a nuanced assessment of the empirical results. While negative effects of regulation do exist, they are smaller than is commonly feared. Innovation advantages are also present; however, for regulated companies, these rarely offset the competitive disadvantages.

² Information asymmetries mean that consumers are uncertain whether products labeled as environmentally friendly are truly environmentally friendly. This uncertainty reduces their willingness to pay, leading to a discrepancy between their individual preference and their individual willingness to pay for environmentally friendly products.

Information regulations that require regulated companies to provide information can have competitive effects beyond the costs of providing the information itself, because the published information is available not only to customers but also to a company's competitors (cf. Christensen et al. 2021; Leuz/Wysocki 2016).

2.2 Strategic scope for companies in dealing with regulation and the importance of acceptance

Companies often have leeway when implementing regulatory requirements (cf. Mallett et al. 2019). The extent of this leeway depends on the specific regulation. But even regulatory approaches that appear to set clear requirements at first glance – such as traditional command-and-control measures – allow for a range of possible courses of action for companies. These can include ignoring the requirements and accepting potential penalties, adapting business activities to avoid falling under the regulation (e.g., by relocating or withdrawing from regulated markets), implementing the minimum requirements, or even exceeding regulatory requirements ("going beyond compliance," cf. Gunningham et al. 2005; Thornton et al. 2003).

How companies use their strategic leeway and, consequently, how effective climate protection regulation ultimately is, therefore depends on the entrepreneurs' acceptance of the regulatory framework. Acceptance of specific regulations, in turn, is determined by various factors. One important factor is the extent to which entrepreneurs identify with the regulatory objective. If the purpose of the regulation is perceived legitimate, acceptance is promoted, and regulations are less likely to be circumvented (cf. Tyler 1990).³ In this regard, it is noteworthy that interest in climate protection is particularly strong among Mittelstand companies, partly due to their intergenerational thinking (cf. Pahnke et al. 2019).

Finally, the design of the regulation itself is also crucial. In addition to the effectiveness of a regulation, its efficiency – that is, the relationship between the regulation's impact and the associated bureaucratic burdens, financial costs, and personnel costs – also plays an important role. The efficiency aspect is particularly important for small, typically family-run companies, as the compliance costs associated with regulation are often regressive in nature (cf. Kitching/Smallbone 2010).

³ Graafland/Bovenberg (2020) point out that environmentally friendly regulations can also suppress intrinsic motivation for climate protection.

3 Regulatory measures examined

The acceptance of regulatory measures aimed at climate protection is to be investigated in the context of specific policy measures. In order to cover a broad spectrum of regulatory approaches, three measures were examined in detail: the German Energy Services Act (Energiedienstleistungsgesetz, EDL-G) based on the EU Energy Efficiency Directive, the emissions trading systems at the national and the EU level, and the sustainability reporting obligations at EU level. Emissions trading systems can be classified as forms of incentive regulation, and sustainability reporting requirements as a form of information regulation. We consider the obligations defined in the EDL-G regarding energy audits and the introduction of energy or environmental management systems as a regulatory instrument (cf. Gunningham/Sinclair 1999). Hasenhüttl (2003) tends to classify environmental audits as information regulation. However, this classification seems to be limited to situations in which companies are given the option, but not the obligation, to conduct such audits. We therefore follow Gunningham/Sinclair (1999), who further divide regulatory instruments into design/specification standards (the specification of a specific technology), performance standards (the specification of a specific reduction target), and process standards (the specification of specific processes), and classify the obligation to implement environmental management systems, for example, as the latter. Another reason for classifying this as a regulatory instrument is the obligation imposed on energy-intensive companies in Germany in 2022 to implement those energy-saving measures identified during the audits that are economically feasible.

3.1 Energy Services Act

In order to achieve its climate targets, the European Union is focusing on greater energy efficiency in industry, buildings, and transport (cf. European Council and Council of the European Union 2023). To this end, the European Energy Efficiency Directive (EED) was first adopted in 2012 (cf. Bundesstelle für Energieeffizienz (BfEE) 2024). The directive's initial goal was to reduce the primary energy consumption in the EU by 20% by 2020, compared to a reference value. The EED was implemented in German law through the Energiedienstleistungsgesetz (EDL-G), among other things. The EDL-G requires large companies⁴ to conduct energy audits in accordance with EN 16247-1 every four

⁴ As part of a 2015 revision, large companies with a total annual energy consumption of 0.5 GWh were exempted.

years or, alternatively, to implement an energy or environmental management system in accordance with ISO 50001 or EMAS III (cf. Bundesamt für Wirtschaft und Ausfuhrkontrolle 2019). This requirement was first applied in 2015. At the end of 2023, the EDL-G was supplemented by the “Energy Efficiency Act” (Energieeffizienzgesetz, EnEFG). Unlike the EDL-G, it is not the size of the company that determines whether it is affected, but its total annual energy consumption. Companies with an annual total energy consumption of more than 2.5 GWh are required to draw up and publish implementation plans for economically viable efficiency measures. In addition, companies with an annual total energy consumption of more than 7.5 GWh must introduce an environmental or energy management system by July 18, 2025.⁵

The provisions of the EDL-G became particularly important as a result of the “Medium-Term Energy Supply Security Measures Ordinance” (Mittelfristenergieversorgungsicherungsmaßnahmenverordnung, EnSimiMaV) issued in October 2022. It requires companies with an annual total energy consumption exceeding 10 GWh to implement the savings measures identified through energy audits or management systems within 18 months, provided that the measures are classified as economical according to the Valeri standard (Valuation of Energy Related Investment, DIN 17463). The EnSimiMaV is limited to a two-year period and is therefore set to expire in September 2024.

3.2 CO2 pricing/emissions trading system

EU emissions trading

The European Emissions Trading System (EU ETS), in force since 2005, applies to around 10,000 installations in the energy and industrial sectors (cf. Umweltbundesamt 2023a). The participating installations include large energy facilities, such as combined heat and power plants, and energy-intensive industrial plants, such as blast furnaces in the steel industry. In addition, the EU ETS has applied to European aviation since 2012. In total, the emissions trading system covers around 40% of European greenhouse gas emissions.

The basic mechanics of the EU ETS are based on a “cap and trade” system. Under this system, a maximum limit (“cap”) is first set for the greenhouse gas emissions that participants in the EU ETS are allowed to emit. This limit is then gradually reduced over time to achieve the EU’s reduction targets. Within this

⁵ The interviews took place before the Energy Efficiency Act was passed and referred to the regulatory status in mid-2023.

limit, emission allowances (in the form of certificates) can be traded. Participants must purchase at least as many emission allowances as they emit. Emission allowances can also be resold, creating a market mechanism that determines their price. To prevent international competitive disadvantages and production shifts ("carbon leakage") caused by the EU ETS, selected products receive free emission allowances for emission-efficient production.

As part of a reform, the free allocation of emission allowances is to be replaced in the future by a carbon border adjustment mechanism (CBAM) (cf. Umweltbundesamt 2023b). In addition, emissions trading is to be extended to the building and road transport sectors.

National emissions trading

In addition to the EU ETS, Germany has operated a national emissions trading system (nEHS) since 2021, regulated by the "Fuel Emissions Trading Act" (Brennstoffemissionshandelsgesetz, BEHG) (cf. Deutsche Emissionshandelsstelle (DEHSt) 2023a). Unlike the European system, the nEHS focuses on the areas of heat generation and transport. However, unlike the EU ETS, it does not target the polluters themselves, but rather the distributors of fossil fuels, such as oil companies, gas suppliers, and the coal industry. From 2024, waste used as a fuel will also be included in the nEHS. Fuel distributors, known as BEHG-responsible parties, participate in the nEHS and pass the financial burden on to end users (consumers and industry), thereby creating incentives to reduce greenhouse gas emissions. The nEHS will be in its introductory phase until 2025, during which time the specific price for emission allowances will be determined. Subsequently, a cap-and-trade mechanism will be implemented, similar to the European system, allowing the market to determine the price.

To avoid double taxation under the EU ETS and the nEHS, two options are provided (see Deutsche Emissionshandelsstelle (DEHSt) 2024): either BEHG-responsible parties can reduce their tax obligations when selling fuels to companies covered by the EU ETS. Alternatively, companies subject to both systems can apply for compensation from the German Emissions Trading Authority at the Federal Environment Agency.

To prevent international competitive disadvantages, a BEHG Carbon Leakage Ordinance (BEHG-Carbon-Leakage-Verordnung, BECV) has also come into force (cf. Deutsche Emissionshandelsstelle (DEHSt) 2023b). This enables companies in selected sectors and product groups to apply for reimbursement of the

costs of the nEHS in form of a subsidy. To receive the subsidy, companies must meet two conditions: first, the company must be able to present an energy management system certificate in accordance with ISO 50001 or an environmental management system certificate in accordance with EMAS. Second, at least 50% of the subsidy must be invested in climate protection measures, provided this is economically feasible. From 2025 onwards, at least 80% of the subsidy must be used for climate-friendly investments.

3.3 Sustainability reporting obligations

Currently, according to the NFRD⁶, "public-interest entities," – i.e., listed companies with more than 500 employees, banks, and insurance companies – are required to provide non-financial reporting. In November 2022, the EU adopted the Corporate Sustainability Reporting Directive (CSRD), which replaces and expands the NFRD (cf. European Commission 2024; Rieger-Fels/Löher 2024). Consequently, all companies covered by the NFRD will be required to report in accordance with the CSRD from 2025 onwards. From 2026, regardless of their capital market orientation, all companies that meet two of three criteria will be required to report: 250 or more employees, total assets exceeding €25 million, and turnover greater than €50 million. From 2027, with the exception of micro-enterprises, listed SMEs will also be required to report, although they will be granted a two-year deferral.

Sustainability reports must be published in the management report and audited externally. The content and format of reports will be more strictly regulated. They are to be prepared in accordance with the European Sustainability Reporting Standards (ESRS), which are being developed by the European Financial Reporting Advisory Group (EFRAG). In the future, this standardized corporate information will be published in a publicly accessible register, the European Single Access Point.

In July 2023, the EU Commission adopted the so-called Set 1 of the ESRS.⁷ This includes industry-independent reporting standards on twelve topics with a total of over 80 disclosure requirements: two general standards, five standards on environmental issues, four standards on social issues, and one standard on good governance. The sustainability topics a company must report on depend

⁶ Non-Financial Reporting Directive. Implementation in Germany was carried out by the Corporate Social Responsibility Directive Implementation Act (CSR-RUG).

⁷ A set 2 with SME standards and industry-specific reporting standards is currently being developed.

on the results of an internal materiality assessment. The principle of "double materiality" applies here: a sustainability topic is considered material if the company has an impact on people or the environment (impact materiality) or if a topic-specific issue is expected to have a financial impact on the company (financial materiality).

The areas of "general information" and "climate change" are particularly relevant for this study. In the area of "general information", the company should explain, among other things, the material effects, risks, and opportunities for and resulting from the company's activities in relation to climate change. In the area of "climate change", the company's policy, goals, and actions to combat climate change and adapt to it should be presented. This includes outlining plans for the transition to climate neutrality, as well as describing related goals, measures, and resources used. Companies should report on energy consumption, energy mix, and energy intensity (in relation to revenue) as well as gross greenhouse gas (GHG) emissions broken down by Scope 1 to Scope 3.⁸ In addition, information on GHG removal or offsetting through carbon credits and internal carbon pricing must be provided. The company should also report on the potential financial impacts of climate change risks and opportunities.

⁸ Scope 1 emissions are those generated directly within the company, e.g., through process emissions or the operation of a vehicle fleet. Scope 2 emissions are those generated indirectly by the company, e.g., through the purchase of electricity or heat. Scope 3 emissions include emissions along the company's value chain.

4 Approach

To thoroughly examine the effects and acceptance of various climate protection regulations, interviews were conducted with experts from companies affected by the regulations as well as from professional and industry associations. Between August 2023 and October 2023, a total of eleven interviews were conducted with representatives of companies and nine interviews with representatives of business-related institutions such as chambers of commerce, trade associations, and initiatives.⁹ Selected companies had to be directly affected by at least one of the regulatory measures, e.g., by being subject to mandatory auditing or participating in emissions trading. In the case of the CSRD reporting requirements, which will only apply to companies in the future, companies were chosen that are either already subject to non-financial reporting requirements, engage in voluntary reporting, or will be affected by the reporting requirement in a few years. Since being directly affected by the regulations was a selection criterion, interviews were primarily conducted with large Mittelstand companies, as the selected regulatory measures provide exemptions for SMEs. In addition, the snowball sampling method (cf. Patton 1990) was used to identify further interviewees from companies through associations and initiatives. Interviews with representatives of associations, chambers, and initiatives aimed to obtain a broad understanding of the perspectives of groups of companies and industries particularly affected by the regulations.

The assumption that companies with a stronger identification with the societal goal of climate protection are more willing to engage in a discussion on the topic suggests that our corporate interviewees represent a selective sample. Specifically, it can be assumed that the companies we interviewed have a comparatively positive attitude toward climate protection.

The interviews were guided by semi-structured interview protocol to organize the conversations and direct the interviewees toward the topics that were central to addressing the research questions. In designing the interview protocol, the phase diagram of Mallet et al. (2020) was also used. This model is based on the results of qualitative research on how SMEs deal with regulation and describes the regulatory process from initial identification to implementation. At the same time, semi-structured interviews allow for flexible conversation flow, enabling emerging topics to be addressed and explored in greater depth. Moreover, this

⁹ An overview of the companies and associations interviewed can be found in the appendix.

format gives respondents the space to provide comprehensive answers (cf. Bryman/Bell 2011).

5 Results

Our results can be divided into three sections. First, in section 5.1, we discuss the results on companies' general attitudes toward the regulatory goal of climate protection, as well as the factors that motivate them to protect the climate. Section 5.2 presents the results of how companies evaluate specific regulatory measures aimed at climate protection. Based on these evaluations, we derive four aspects of regulation in section 5.3 that emerge as general barriers to the acceptance of climate protection regulation.

5.1 Companies' attitudes and motivation toward climate protection

Companies can contribute to climate protection for a variety of reasons. These include intrinsic motives, such as a strong conviction on the part of management and owners, as well as extrinsic motives, such as customer pressure and regulatory requirements.

The companies we interviewed generally perceive themselves as responsible for contributing to climate protection. Particularly Mittelstand companies often refer to their responsibility toward future generations of their families who will eventually take over the business. They are aware that this can only succeed if the transition to a climate-neutral economy is successfully mastered.

"As a family business, [...], we have certain values. Our owner family decided already several years ago that [...] should also contribute to societal and sustainable development. So, it is a fundamental decision based on the values of the family and the company." (U3)

Representatives of associations further point to the regional roots of Mittelstand companies and their sense of responsibility towards the region. For many Mittelstand companies, this means that relocating operations is not considered an acceptable option.

"The companies feel a sense of responsibility. Simply because of the business model of the craft sector. Craft companies are regionally rooted. Craftsmen cannot simply move away, as the entire basis of their business is local. This is especially true for multi-generational companies." (V)

When asked whether and to what extent companies are willing and able to accept competitive disadvantages for the sake of climate protection, companies respond differently. Some companies point out that customer demand for a low carbon footprint in production provides a strong incentive to implement climate-friendly measures in their companies.

"That is, if the demand comes from the customer, our company is also willing to do more. So, I think it's always best when the pressure comes from [that] side." (U1)

Others, however, emphasize that they are weighing up whether they can and want to forego profit margins in favor of climate protection, as customers are not necessarily willing to pay higher prices for more environmentally friendly products.

"But I also see it in the entrepreneurial decisions we are currently dealing with, namely, the investments that we now consider necessary to achieve climate neutrality by 2045... hardly any company can do this out of conviction. So, we are talking about a complete absence of viable business models for the technologies that actually need to be invested now." (V)

Associations therefore observe a wide range of behavior. There are, on the one hand, pioneering companies that stand out for their exceptional efforts, in some cases going far beyond what is required by regulation.

"The fundamental mindset [with regard to] climate compatibility varies greatly. Some companies have an inherent sense of leadership in this area." (V)

On the other hand, other companies are more extrinsically motivated and tend to implement climate protection measures when they are either required by regulation or requested – and compensated – by customers. For these companies, regulation itself drives behavior change.

"It's regulation, of course. Especially when it has monetary implications, companies naturally pay attention. And [...] the higher the CO₂ price, the more important the issue becomes for companies." (V)

This does not mean that pioneering companies ignore economic considerations. However, they are more willing to invest in climate protection even if there is no clear business case for these investments or if they only pay off in the long term.

"I believe this is because family businesses do not have to operate solely on a cost-oriented basis. [...] Ideally, they want to pass the company on to the next generation. They want their children to be able to identify with it. And they are often intrinsically motivated and have no problem with things going badly for two years if they have just made an expensive investment." (U1)

5.2 Assessment of specific regulatory measures

5.2.1 CO₂ pricing

The CO₂ pricing system was the most widely accepted of the regulatory measures we examined in detail. Many of the entrepreneurs we interviewed, as well as representatives of associations, understand the purpose of a CO₂ pricing system for climate protection and view the basic approach of incentive regulation positively.

"[...] an auditing requirement here, a reporting requirement there [...] that can't be sufficient. In my view, a pricing instrument [such as the] CO₂ price [...] will always have more effect than all these other instruments." (V)

Associations and companies alike also appreciate that emissions trading allows reductions to be achieved where they can be implemented most cost-effectively.

"The CO₂ price, which reflects the external costs generated by a certain behavior, would allow market participants to approach the avoidance of these costs in the most innovative way possible and also to find the solution that is as efficient as possible and involves the lowest costs [...]. And this might result in different solutions than if you say, 'Do this and that!' through support measures." (V)

The EU ETS is also appraised for being an established system, meaning that companies have developed appropriate routines. Implementation costs are therefore low. Consequently, the EU's plans to modify the established system, e.g., by transitioning from certificate allocations to a border adjustment mechanism, are viewed with some skepticism.

"The [EU ETS] was a great idea. As it was intended. You introduce a cap, then a price is formed, and then reductions occur where it is cheapest. That's a great idea. But the problem is, they should have left it at that." (U2)

In theory, incentive regulation such as CO₂ pricing requires very little detail in the regulation, which may be another reason for the comparatively high acceptance of this regulatory approach. The approach is designed to leave it to market participants to decide how, where, and by whom CO₂ reductions are made. Deviations from this theoretical ideal arise from two circumstances. On the one hand, trade with countries that are not subject to the EU trading system must be regulated. Here, some companies view the transition from the system of free allocation of allowances to a carbon border adjustment mechanism (CBAM) critically. The latter obliges all importers of emission-intensive goods to document these imports and purchase allowances.

"We need to see whether CBAM works in practice, which is a reasonable idea in principle. But after the first information events, I fear that a huge bureaucratic monster is rolling towards us." (U9)

At the same time, Germany has set up a parallel system with the nEHS, so that companies subject to both systems can either apply for an exemption from the nEHS or a retrospective compensation payment. Companies must find out which regulation applies to them, which entails a corresponding bureaucratic effort.

"According to the law, national emissions trading should not affect us at all. The only problem is that a burden of proof has been introduced that lies with [EU ETS] companies. So we have to constantly prove that we are not subject to it. It would have been better if they had said from the outset that [EU ETS] companies are not included and are exempt [from the nEHS]. But somehow the policymakers couldn't bring themselves to do that." (U2)

When it comes to CO₂ pricing, the uncertainty of the regulation is surprisingly often mentioned as a point of criticism. In fact, a fixed price path, as envisaged in the early years of the nEHS, should be less uncertain than a market-determined CO₂ price, as in the EU ETS, which depends on future supply and demand conditions. In practice, however, the companies we interviewed associate significantly greater uncertainty with the politically determined price, as it can be changed depending on the political situation. The short-term price increase from 2024 onwards as part of budget consolidation in December 2023 shows that this concern is not unfounded.

"I wouldn't bet on what the CO₂ price will be next year." (V3)

"If prices are now set according to the budget situation [...], that would really be the last straw." (U8)

The associations also express concern that uncertainty regarding future electricity prices could deter companies from making investment decisions in Germany.

"What electricity price am I supposed to assume for an investment in Germany for summer 2024? What will my electricity costs be? If I cannot answer this existential question at the moment – and I simply cannot – then I'd like to see the board of directors that proposes to its supervisory board [...]: 'We'll do it in Germany. We don't know what it will cost, but we'll do it in Germany.'" (V)

The assessment of CO₂ pricing also depends on the extent to which companies are exposed to competition from outside Europe. Some fear that a very high price compared to non-European third countries could lead to production being relocated to countries with less stringent regulations, which would undermine the climate protection effect of CO₂ pricing.

"So if we don't have the same CO₂ pricing globally, [...] then it won't work." (U9)

5.2.2 Energy Services Act

The interviewees' assessments of the EDL-G vary. With regard to the implementation of climate protection regulation, the companies agree that this is now proceeding smoothly. Energy-intensive companies, in particular, had already established energy and/or environmental management systems at an early stage out of their own interests. However, the other companies have also developed a certain routine with regard to audits. In principle, the companies consider the EDG-G to be useful for identifying energy-saving measures, but at the same time they criticize the fact that the scope for efficiency improvements is limited.

"We had an energy audit at our company last week, recertification, and everything went well. And we took a brief look back. [...] From 2011, the last year without energy management, to 2022, we were able to reduce this key figure [total energy consumption] by 24%. [...] And even the auditor said, 'That's it,

there's nothing more to be done.' [...] At some point, it comes to an end. Our customers always ask, 'You're doing 50001, so you must be making savings every year.' Yes, we are. But they're getting smaller and smaller." (U9)

Companies and associations also emphasize that management systems are particularly useful in the context of rising energy prices in Germany and in connection with CO₂ pricing.

"And if you are competing with countries where energy is much cheaper, then the energy or everything you use [must] be optimized. And we simply noticed, when we did 50001 for the first time, that something is actually happening there." (U10)

"So, if policymakers say you [...] have to set up a management system, then one indirect effect of this will certainly be that the CO₂ prices of the future will also have a more significant impact on the measures implemented by companies. In this respect, too, a commitment to energy management is a relatively clever tool, in contrast to direct regulation." (V)

Another positive aspect is that the EDL-G requirements are not very detailed, as they open up various implementation options (audits, management systems) and the energy-saving measures identified in the course of the audits show companies possibilities without committing them to anything.

"From this perspective, it is quite clever of policymakers to say, 'Okay, set up a management system [...]'. And in the end, you come up with measures and have a continuous improvement process, so to speak. [...] In the end, if [...] a profitable measure is proposed [...] there is no reason for a company not to do it [...]." (V)

The EnSimiMaV was received negatively because it deviated from this principle and made certain measures identified in the audits mandatory for energy-intensive companies. The fact that the EnSimiMaV specified a period of only 18 months for the implementation of identified measures was viewed particularly critically. Depending on the measure identified, this could be very short.

"One standard says we have to list all energy efficiency measures, and the other says we then have to evaluate all energy efficiency measures immediately and implement everything that is [economically viable] within 18 months. As a Mittelstand company, we simply cannot manage that. How are we supposed to do it? We only have limited capacity." (U8)

The fact that certification requirements are constantly increasing was also viewed critically.

"Now there is a requirement that large companies must be ISO certified. Not only the factory in [...], but also the small port office in [...]. And we had a lot of work to do, either to include existing certificates or to obtain certifications. And this was also a collateral damage that doesn't help the environment at all. [...] It's an office with 15 people, it's a rented building, we have no influence on the energy efficiency. [...] It's often absurd what you have to do." (U2)

The growing certification requirements are met with a limited range of certification options. On the one hand, this leads to rising prices and thus certification costs. On the other hand, some companies that need certification but have less

financial clout will come away empty-handed. This is problematic because certain certificates are now a basic requirement for access to subsidies and for bidding on contracts from large public or private customers. Companies without the appropriate certificates are then excluded from effective market participation.

"The audits [...] are extremely extensive and [there] are [...] not enough auditors in the relevant areas. [...] And that naturally leads to extreme frustration when, on the one hand, [I] am required to comply with the law and know from the outset that I won't be able to find an auditor anyway [...]." (V)

The situation is exacerbated by the fact that some companies use a strategy of over-certification in order not to lose access to subsidies or public tenders, which leads to a further shortage of the limited resource "auditing."

"Where certification is linked to major relief regulations, [there are companies] that have decided to go for EMAS and ISO 50001 for risk assessment reasons. This means that [...] if you are certified after three years by an assessor or certifier according to 50001 and they say, 'No, you no longer meet the standard,' then you have a problem. You lose your eligibility to apply [...]. And with another system, you naturally have a second chance [...]." (V8)

5.2.3 Sustainability reporting obligations

Overall, sustainability reporting requirements were viewed rather critically. In particular, companies find it difficult to see the specific contribution that reporting requirements are supposed to make.

"What is it actually needed for? [...] Once we have the large European database, the European Single Access Point, will we be able to find out how it contributes to the Green Deal?" (U7)

However, the company representatives we interviewed are not fundamentally opposed to sustainability reporting.

"We see it as a plus in terms of loans. Certain customers will request the [report]. [...] CO₂ is also actively requested. And we will certainly present at least essential parts of the sustainability report to our employees. So we also see this as a way to [increase] employee satisfaction." (U6)

However, they point out that the very specific requirements regarding what must be published and the obligation to collect and publish the information necessary for the reports tie up resources within the company that are then no longer available for the company's own sustainability transformation.

"And every letter I put on a piece of paper keeps me from [...] dealing more intensively with climate efficiency measures." (V)

In addition to the costs of obtaining the information itself, there are also the costs of auditing.

"It's getting more expensive. Simply more expensive. I think we'll deliver the same content because we've already [reported] according to the GRI standard." (U10)

The complexity of the reporting requirements was perceived as particularly critical. Companies do not have to report on all 1,000 possible contents. However, companies must first conduct a materiality analysis to determine what specific content they need to report on. In doing so, companies have to deal with a wide variety of topics – from CO₂ accounting and climate risk assessment to issues of equality and good governance. Added to this are exceptions and deferrals, which alone make the question of who has to report what and when a challenging one.

"But when I read through these standards, it sometimes takes me five minutes to understand what is actually required. And then I ask myself [...] how are companies that have no experience in this area supposed to cope? Or those that perhaps hire people straight out of college, who are certainly highly intelligent [...]. But operationalizing the whole thing [...] often requires a certain amount of [...] experience. And I have to say, that's really a tough nut to crack with a very short transition period." (U3)

Short training and implementation periods were also criticized. The standards according to which reporting is to be carried out were only finally decided at the end of July 2023. However, the first reports according to these standards are to provide information already on the 2024 financial year. This leaves the companies affected with only a few months to familiarize themselves with the information they need to provide and to establish processes within the company to compile this information.

5.3 Barriers to the acceptance of regulation

Despite a fundamental acceptance of climate protection as a regulatory goal among the interviewees, the specific design of regulatory measures is often viewed critically. Four aspects can be identified from the interviews that reduce corporate acceptance of regulatory measures aimed at climate protection.

Lack of meaningfulness

Entrepreneurs consider a regulatory measure to be meaningful if they perceive a clear causal relationship between the measure and the regulatory objective – in this case, climate protection. Accordingly, frustration arises when a causal relationship is difficult to identify or when a measure is even perceived as detrimental to the objective. In addition to effectiveness in achieving objectives, the efficiency of regulation is also an important criterion for meaningfulness. This means that companies should not have the impression that the regulatory

objective could be achieved more quickly, better, or more cost-effectively with alternative regulation.

Regulatory detail too high

In many companies, an excessive level of detail in regulation leads to declining acceptance. They view regulations that impose detailed requirements critically, as these unnecessarily restrict their freedom of action and, in addition, often do not fit the specific situation of the company or only fit it poorly.

It is not uncommon for legislators to attempt to make regulations more accurate or adapt them to new circumstances by making subsequent changes. However, this usually only increases the level of detail in the regulations. As a result, implementation costs rise, as many companies must first determine whether – and if so, how – they are affected by a regulation.

High and growing number of necessary certifications

Many regulations are accompanied by implementation controls. Since public control capacities are limited, there is an increasing reliance on private controls and audits to certify implementation by companies. This neglects the fact that private control capacities are also limited.

Another reason that can make access to certificates more difficult is the high level of detail in the regulations, as already mentioned. This means that more inspectors remain in individual companies for longer, thus increasing the time and financial costs of individual audits for the company.

In addition to these financial consequences resulting from growing certification requirements, psychological costs must also be taken into account, as they trigger a feeling of "being constantly under suspicion" in some companies.

Frequency of changes and short implementation deadlines

Another hurdle to acceptance is the frequent changes to existing regulations. This is particularly burdensome because the highest implementation costs are incurred at the beginning, when a company's affectedness by a new regulation or amendment must be determined and routines for its implementation must be established. However, if regulations are frequently changed and adapted, companies cannot develop routines. If the frequent changes are accompanied by

very short implementation deadlines, the financial and personnel burden is increased, as is the psychological burden caused by the regulation.

In addition to increased implementation costs, high frequencies of change lead to a high degree of uncertainty among companies about the future regulatory framework. This hinders investment, as regulatory uncertainty makes it difficult or even impossible in some cases to calculate whether, when, and under what circumstances an investment is worthwhile.

6 Conclusion

On the one hand, rapidly advancing climate change requires effective measures to limit emissions, particularly of CO₂, but also of other greenhouse gases. On the other hand, the regulatory requirements necessary to achieve this should be designed in such a way that the economic competitiveness of companies is not jeopardized. Only a strong economy can provide the resources necessary for climate protection. The majority of companies are willing to go down this path. Mittelstand entrepreneurs in particular tend to be highly intrinsically motivated to contribute to protecting the environment and the climate. This is important because companies always have strategic leeway in implementation. The spectrum ranges from relocating to ceasing production and deliberately ignoring requirements to voluntarily exceeding regulations. Against this backdrop, it becomes clear that it is not only the choice of the "right" regulatory instruments and their optimal mix that are important, but also the specific design of the measures chosen. Measures that are widely accepted by entrepreneurs are implemented more willingly and more quickly.

The following four points in particular have a negative impact on the acceptance of climate-friendly regulations by Mittelstand companies: First and foremost is the (lack of) usefulness of a regulation for the intended goal: a regulation that has obvious positive effects will be more readily followed than one that requires considerable effort but delivers little benefit. Another important barrier to acceptance is the high level of regulation or the high degree of detail in a regulation: detailed requirements lead to additional bureaucratic effort and a neglect of companies' innovation potential in achieving a regulatory goal. Closely related to this is the third barrier to acceptance, which depends on the rate of change: experience shows that the more detailed a regulation is, the higher the frequency of adjustments. The latter is problematic, on the one hand, because frequent changes always require adjustments to operational routines. It also leads to a lack of reliability in the regulatory framework, which can be a significant barrier to investment. In addition, the large number of certifications required also proves to be an acceptance problem. From a psychological point of view, companies see this as a sign of lack of trust. It also leads to practical problems, as the capacities of external auditors are limited and it is already very difficult to find an auditor for the required certifications. In addition, these processes tie up considerable resources that are then no longer available for environmental innovations, for example.

What conclusions can be drawn from this for economic policy? Firstly, climate-friendly regulation should be limited to as few instruments as possible with the greatest possible effectiveness. Ideally, companies should be given flexibility in achieving the regulatory goal. This is the only way to achieve climate protection cost-effectively. In addition, flexible solutions make it possible to harness the undoubted potential for innovation within companies for more far-reaching climate protection in the long term. This requires limiting the level of detail in regulations, as concrete specifications and flexibility are mutually exclusive. As a side effect, this would also reduce the frequency of changes. Detailed requirements often lead to problems that could not be anticipated *ex ante*, but which in principle result in (avoidable) changes (or exemptions) with the aforementioned negative consequences, especially for Mittelstand companies.

One should therefore have the courage to set a regulatory framework in the form of incentive regulation and to refrain from detailed requirements as far as possible. This also applies to the "flood of certification." Here, more trust should be placed in the honesty of Mittelstand entrepreneurs, and mandatory certifications should be limited to a few key indicators. If there are indications of shortcomings, more detailed checks can still be carried out. Audits, on the other hand, can be useful as a voluntary instrument for reducing information asymmetries (e.g., to signal appropriate behavior to potential customers).

Literature

Adolf, J. (2008): Marktwirtschaftliche Instrumente – Königsweg der Klimapolitik?, *Wirtschaftsdienst*, 88 (5), S. 326-333.

Bryman, A.; Bell, E. (2011): *Business research methods*, 3. Auflage, Oxford University Press, Oxford.

Bundesamt für Wirtschaft und Ausfuhrkontrolle (2019): Merkblatt für Energieaudits nach den gesetzlichen Bestimmungen der §§ 8 ff. EDL-G.

Bundesstelle für Energieeffizienz (BfEE) (2024): Europäische Energieeffizienzpolitik. Zuletzt abgerufen am 11.03.2024, unter https://www.bfee-online.de/BfEE/DE/Effizienzpolitik/EuropaeischeEnergieeffizienzpolitik/europaeischeenergieeffizienzpolitik_node.html

Christensen, H. B.; Hail, L.; Leuz, C. (2021): Mandatory CSR and sustainability reporting: economic analysis and literature review, *Review of Accounting Studies*, 26 (3), S. 1176-1248.

Copeland, B. R.; Taylor, M. S. (1994): North-South Trade and the Environment, *The Quarterly Journal of Economics*, 109 (3), S. 755-787.

Dechezleprêtre, A.; Sato, M. (2017): The Impacts of Environmental Regulations on Competitiveness, *Review of Environmental Economics and Policy*, 11 (2), S. 183-206.

Delmas, M.; Montes-Sancho, M. J.; Shimshack, J. P. (2010): Information Disclosure Policies: Evidence from the Electricity Industry, *Economic Inquiry*, 48 (2), S. 483-498.

Deutsche Emissionshandelsstelle (DEHSt) (2023a): Nationalen Emissionshandel verstehen. Zuletzt abgerufen am 12.03.2024 unter https://www.dehst.de/DE/Nationaler-Emissionshandel/nEHS-verstehen/nehs-verstehen_node.html

Deutsche Emissionshandelsstelle (DEHSt) (2023b): Carbon Leakage. Zuletzt abgerufen am 12.03.2024 unter https://www.dehst.de/DE/Nationaler-Emissionshandel/Carbon-Leakage/carbon-leakage_node.html

Deutsche Emissionshandelsstelle (DEHSt). (2024). EU-ETS-1-Kompensation. Zuletzt abgerufen am 12.03.2024 unter https://www.dehst.de/DE/Nationaler-Emissionshandel/EU-ETS-1-Kompensation/euets-1-kompensation_node.html

Europäische Kommission. (2024). Corporate sustainability reporting. Zuletzt abgerufen am 12.03.2024 unter <https://finance.ec.europa.eu/capital-markets->

union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en?prefLang=de

Europäische Union (2021): Verordnung (EU) 2021/1119 des europäischen Parlaments und des Rates vom 30. Juni 2021 zur Schaffung des Rahmens für die Verwirklichung der Klimaneutralität und zur Änderung der Verordnungen (EG) Nr. 401/2009 und (EU) 2018/1999 („Europäisches Klimagesetz“), 2021/1119 C.F.R. (2021).

Europäischer Rat und der Rat der Europäischen Union (2023): Ein europäischer Grüner Deal. Zuletzt abgerufen am 11.03.2024 unter <https://www.consilium.europa.eu/de/policies/green-deal/>

Graafland, J.; Bovenberg, L. (2020): Government regulation, business leaders' motivations and environmental performance of SMEs, *Journal of Environmental Planning and Management*, 63 (8), S. 1335-1355.

Gunningham, N. A.; Sinclair, D. (1999): Regulatory Pluralism: Designing Policy Mixes for Environmental Protection, *Law & Policy*, 21 (1), S. 49-76.

Gunningham, N. A.; Thornton, D.; Kagan, R. A. (2005): Motivating Management: Corporate Compliance in Environmental Protection, *Law & Policy*, 27 (2), S. 289-316.

Hasenhüttl, S. (2003): Umweltpolitische Steuerungsinstrumente und ihre Effekte, in: *Umweltschutz, F. Ö. W. f. (Hrsg.): Wissenschaft & Umwelt* 6, Wien, S. 3-12.

Kitching, J.; Smallbone, D. (2010): Literature Review for the SME Capability to Manage Regulation Project, A Research Report for the National Research Unit within Inland Revenue, New Zealand, <https://eprints.kingston.ac.uk/id/eprint/12064/1/Kitching-J-12064.pdf>

Leuz, C.; Wysocki, P. D. (2016): The Economics of Disclosure and Financial Reporting Regulation: Evidence and Suggestions for Future Research, *Journal of Accounting Research*, 54 (2), S. 525-622.

Lo, C. W.-H.; Liu, N.; Pang, X.; Li, P. H. Y. (2020): Unpacking the complexity of environmental regulatory governance in a globalizing world: a critical review for research agenda setting, *Journal of Environmental Policy & Planning*, 22 (5), S. 594-607.

Mallett, O.; Wapshott, R.; Vorley, T. (2019): How Do Regulations Affect SMEs? A Review of the Qualitative Evidence and a Research Agenda, *International Journal of Management Reviews*, 21 (3), S. 294-316.

Paha, J. (2022): CO2-Bepreisung beeinflusst den Wettbewerb – und profitiert von ihm, *Wirtschaftsdienst*, 102 (5), S. 385-391.

Pahnke, A.; Holz, M.; Welter, F. (2019): Unternehmerische Zielsysteme: Unterscheiden sich mittelständische Unternehmen tatsächlich von anderen?, IfM Bonn: IfM-Materialien Nr. 276.

Patton, M. Q. (1990): Qualitative evaluation and research methods, 2. Auflage, Sage Publications, Inc., Beverly Hills, California.

Rieger-Fels, M.; Löher, J. (2024): Nachhaltigkeit im Mittelstand: Die CSRD als Chance oder Herausforderung?, Bertelsmann-Stiftung Focus Paper 18, Gütersloh.

Shimshack, J. P. (2020): Information Provision, in: Konisky, D. M. (Hrsg.): Handbook of U.S. Environmental Policy, Edward Elgar Publishing, S. 231-242.

Thornton, D.; Kagan, R. A.; Gunningham, N. (2003): Shades of Green: Business, Regulation, and Environment, Stanford University Press, Stanford.

Tyler, T. R. (1990): Why People Obey the Law, Yale University Press, New Haven.

Umweltbundesamt (2023a): Der Europäische Emissionshandel. Retrieved 12.03.2024, from <https://www.umweltbundesamt.de/daten/klima/der-europaeische-emissionshandel#teilnehmer-prinzip-und-umsetzung-des-europaischen-emissionshandels>

Umweltbundesamt. (2023b). Der EU-Emissionshandel wird umfassend reformiert. Zuletzt abgerufen am 12.03.2024 unter <https://www.umweltbundesamt.de/themen/der-eu-emissionshandel-wird-umfassend-reformiert>

Glossary

BEHG	Brennstoffemissionshandelsgesetz (Fuel Emissions Trading Act); basis for the national certificate trading for emissions from fossil fuels (nEHS). The BEHG sets prices for emissions from the combustion of fossil fuels such as gasoline, diesel, heating oil, natural gas, liquefied petroleum gas, biomass, and coal. It requires distributors of motor fuels and heating fuels to purchase CO ₂ emission allowances from January 1, 2021.
BECV	Verordnung über Maßnahmen zur Vermeidung von Carbon-Leakage durch den nationalen Brennstoffemissionshandel (short: BEHG Carbon Leakage Regulation). In order not to jeopardize the international competitiveness of companies with particularly high consumption of fossil fuels, the German government has passed a regulation designed to relieve the manufacturing industry of the burden of national CO ₂ emissions trading. The BECV regulates how companies that are particularly affected by the Fuel Emissions Trading Act (BEHG) and the CO ₂ pricing provided for therein can be relieved under certain conditions. This relief is classified as state aid.
Cap & Trade	European and national emissions trading operate on the principle of "cap and trade." A politically determined upper limit specifies how much greenhouse gases installations subject to emissions trading are allowed to emit in total ("cap"). Member States issue a corresponding amount of emission allowances to the installations, partly free of charge and partly through auctions. The price of these allowances is determined by trading on the market.
Carbon leakage	Relocation of emission-intensive economic activities to countries outside Europe, partly due to CO ₂ pricing.
CSRD	Corporate Sustainability Reporting Directive; Directive on corporate sustainability reporting in the areas of environment, social affairs, and governance; further development of the Non-Financial Reporting Directive (NFRD).
DIN EN 16247-1	Standard for energy audits. Preliminary stage to the energy management system: The energy audit provides the technical basis for introducing an energy management system.
EDL-G	Energiedienstleistungsgesetz (Energy Services Act). The Energy Services Act requires all energy-intensive "non-SME companies" to conduct an energy audit every four years unless an energy or environmental management system has been implemented.
EED	Energy Efficiency Directive of the EU; implemented in Germany by the Energy Services Act (see E-DLG).
EFRAG	European Financial Reporting Advisory Group; independent, non-profit expert group of European stakeholders and national and civil society organizations dedicated to the development and promotion of high-quality, globally recognized accounting standards in Europe. Commissioned by the Commission to develop the ESRS sustainability reporting standards.

EMAS	Eco-Management and Audit Scheme (also known as eco-audit or environmental audit); voluntary commitment by companies to continuously improve environmental protection in their operations. It involves a thorough ecological inventory and assessment of the environmental situation and environmental impact of participating companies. The aim is to reduce the consumption of substances, materials, and resources. The core element is the establishment of an environmental management system that enables companies to set their own environmental protection goals and pursue them with modern management methods. The requirements of the international environmental management standard ISO 14001 are part of an environmental management system according to EMAS.
EnEFG	Since November 2023, the Energieeffizienzgesetz (Energy Efficiency Act) has supplemented the requirements of the Energy Services Act (EDL-G), regardless of a company's SME status. Instead, the total annual energy consumption is decisive. Companies with a total energy consumption of 2.5 GWh/a or more are obliged to draw up implementation plans for cost-effective energy-saving measures. From 7.5 GWh/a, companies are obliged to introduce energy/environmental management systems (deadline 07/2025).
EnSiMiMaV	Mittelfristenergieversorgungsmaßnahmenverordnung (Medium-Term Energy Supply Security Measures Ordinance); obliges energy-intensive companies to implement the savings measures identified in the context of energy audits or management systems within 18 months, provided that the measures are considered economical according to the Valeri standard (Valuation of Energy Related Investment, DIN 17463).
ESRS	European Sustainability Reporting Standards; EU standards for sustainability reporting; they apply to all companies that are subject to reporting under CSRD.
EU ETS	European Emissions Trading System; the starting point is where emissions are generated in installations (e.g., industry, power plants, air traffic; so-called downstream emissions trading); the EU ETS requires installation operators or aircraft operators to report and surrender emission allowances for CO ₂ emissions.
GHG	Greenhouse Gas Protocol; globally recognized standard for accounting and reporting greenhouse gas emissions based on three emission areas (known as scopes).
ISO 14001	This standard defines the requirements for an environmental management system that enables companies to improve their environmental performance, fulfill legal and other obligations, and achieve environmental goals in line with economic, social, and political requirements. Unlike EMAS, ISO 14001 is internationally recognized and is not based on an EC regulation, but is the result of private-sector standardization.
ISO 50001	Voluntary international standard for energy management systems. It defines requirements for the introduction, management, and continuous improvement of energy consumption and energy efficiency in companies.
nEHS	National emissions trading system; unlike the EU ETS, the starting point is not the emitter of CO ₂ , but the distributors of fossil fuels (so-called upstream emissions trading).
NFRD	Non-Financial Reporting Directive; directive on the disclosure of non-financial information.

Scope 1, 2, and 3 emissions	<p>The GHG system divides a company's emissions into three areas (known as scopes):</p> <p>Scope 1: direct emissions that originate directly from the company's own business activities and for which the company is directly responsible (e.g., exhaust gases from the vehicle fleet, plants, machines, boilers)</p> <p>Scope 2: indirect emissions resulting from the purchase and use of energy by the company (electricity, steam, heating, cooling)</p> <p>Scope 3: indirect emissions that arise in the upstream and downstream value chains (e.g., upstream and downstream logistics, employee mobility behavior, business travel, handling of sold goods at the end of their life cycle)</p>
GHG emissions	Greenhouse gas emissions

Appendix

Overview A1: Demographics of the companies interviewed

No.	Industry	Size	Mittelstand enterprises
U1	Manufacturing industry – production of rubber, plastic, glass, ceramic, and similar products	Large (more than 500 employees)	Yes
U2	Manufacturing industry – manufacture of wood products, paper and printed products	Large enterprises (more than 500 employees)	No
U3	Manufacturing – Manufacture of wood products, paper and printed products, etc.	Large companies (more than 500 employees)	Yes
U4	Manufacturing industry – metal production and processing, manufacture of metal products	Large enterprises (more than 500 employees)	Yes
U5	Other services	Medium-sized companies (up to 499 employees)	Yes
U6	Manufacturing, metal production and processing, manufacture of metal products	Large enterprises (more than 500 employees)	Yes
U7	Financial and insurance service providers	Large companies (more than 500 employees)	No
U8	Manufacturing industry – manufacture of wood products, paper and printed products	Medium-sized companies (up to 499 employees)	Yes
U9	Manufacturing – metal production and processing, manufacture of metal products	Large enterprises (more than 500 employees)	Yes
U10	Manufacturing – Manufacture of chemical products, etc.	Large enterprises (more than 500 employees)	No
U11	Manufacturing – Manufacture of chemical products	Large enterprises (more than 500 employees)	No

© IfM Bonn

Source: IfM Bonn: Survey on the effects of climate protection regulations 2023.

Overview A2: Associations interviewed for the study

Bundesverband der Deutschen Industrie e.V.
DIE PAPIERINDUSTRIE e.V.
Deutsche Industrie- und Handelskammer
future e.V.
HANDWERK.NRW
NRW.Energy4Climate
unternehmer nrw
Verband der Wirtschaftsförderungs- und Entwicklungsgesellschaften in NRW e.V.
Zentralverband des Deutschen Handwerks