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Quality over quantity? Using corporations' climate change related disclosure for risk assessment[1]

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[1] This contribution was prepared for the workshop. The views expressed are those of the authors and do not necessarily reflect the views of the European Committee of Central Balance Sheet Data Offices (ECCBSO), the Bank of Spain, the BIS, the IFC or the other central banks and institutions represented at the event.

Quality over Quantity? Using corporation's climate change related disclosure for risk assessment

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Abstract

Non-financial corporations provide sustainability reports, mainly based on recommendations and market standards to address the increasing demand by financial market participants for climate change risk (CCR) related information. This paper analyses how and to which extent companies disclose CCR information from a credit risk assessment perspective. To study the CCR information in a structured manner, a template was developed and the sustainability reports of 91 Austrian non-financial corporations were analysed. Summing up, the defined analyses aspects risk awareness, actions and target setting are broadly disclosed. However, partial shortcomings in the disclosure quality are identified, also revealing differences between physical risk and transition risk. Notably, companies with higher disclosure quality are more likely to show a downwards trend in their carbon emissions evolution. In sector comparison, the energy sector is a forerunner in CCR disclosure.

Keywords: Climate Change Risk, Transition Risk, Physical Risk

JEL classification: Q54, Q56, Q42

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Background and Motivation – The need of climate change risks integration into credit risk assessment

The European Commission (EC) published its Action Plan on "Financing Sustainable Growth" in March 2018, following the Paris Agreement on limiting global warming to well below 2°C, preferably below 1.5°C, in the long-term. (European Commission, 2018)

The European Central Bank (ECB) as integral part of the European Union (EU) is contributing to the standardization of regulations as well as to increased clarity concerning the (legal) framework conditions, acknowledging possible effects and dangers for monetary policy resulting from a changing climate. (ECB, 2021) The action plan of the ECB (see (ECB, 2022)) comprises the need to introduce CCR in the in-house credit risk assessment systems (ICAS) of national central banks[2] and banks[3].

The basis for such an assessment is CCR-relevant firm-level information, currently only mandatorily disclosed by companies falling under the Non-financial Reporting Directive (NFRD)[4], which lacks standardisation. However, given the increasing demand for sustainability reporting by financial market participants and supervisors, ever more companies strive to voluntarily provide respective information, mainly based on recommendations and market standards.

Succeeding the NFRD, the Corporate Sustainability Reporting Directive (CSRD) demands a more comprehensive and standardized reporting and specifies sustainability as of financial relevance. (European Parliament; EU Council, 2022) The CSRD is accompanied by a package of European Sustainability Reporting Standards (ESRS) developed by the European Financial Reporting Advisory Group (EFRAG). Thereby, European Sustainability Standards for Climate Change (ESRS E1) are of special interest focusing on reporting aspects for CCR. (EFRAG, 2022)

This paper analyses how and to which extent companies disclose CCR information based on current and prospective disclosure standards to be used for the assessment of CCR in the context of ICASs.

2 Into the so-called Eurosystem Credit Assessment Framework (ECAF) which functions as a quality assurance of mobilised collateral in the Eurosystem credit operations. (Auria, et al., 2021)

3 See Guide on climate-related and environmental risks (europa.eu)

4 The NFRD entered into force in April 2014 and stipulates how financial and listed non-financial corporations with more than 500 employees shall disclose environmental, social and governance topics.

Categorizing a company's sustainability disclosure for climate change risk assessment – methodology and data sample

Description of the template and the analysed criteria

To study the quality of CCR information in a structured manner, a template based on different regulatory and markets standards as well as common reporting practice was developed and the sustainability reports of 91 Austrian non-financial corporations were analysed. Based on this template, the status quo of the companies' CCR reporting is analysed in terms of risk awareness, actions, target setting and emissions. Further it is analysed if there is an interrelation between disclosure quality and emissions' evolution.

Based on the established reporting practice, the template separates between physical and transition risks. According to the adopted single materiality approach for CCR in the context of ICAS only information was collected which potentially has a financial relevance for the company (outside-in perspective). The data collection includes open text questions and categorisations into nominal variables. The assessment of the emissions evolution is based on the historic emissions data reported by the companies and on a calculated emission intensity ratio (scope 1+2 emissions / turnover). Each category is complemented by an evaluation question to verify the quality of the reported information in a harmonized manner. To normalize the evaluation of each category, the outcome is linked to a score value, which is summed up to a final score indicating the quality level of the companies' disclosure. The quality levels are displayed in a range of "very good" to "poor".

Challenges in the filling of the template were mostly related to the open text fields as the required information had to be collected from different parts of the reports, strictly selected regarding the focus of the question, and briefly summarized. The categorizations followed the labelling of the companies, if available, and otherwise was done by the author.

The analysed criteria as well as the evaluation questions for physical and transitions risks are displayed and described in Annex 1: Template description.

Data sample

The sample consists of 91 non-financial companies domiciled in Austria. 39 are listed companies, which mandatorily report under the NFRD, and 52 are groups, which prepare their consolidated statements according to IFRS and voluntarily disclose sustainability information. The analysed reports were published with a financial statement date in a period from 30th June 2022 to 30th September 2023. For the analyses, these firms are classified into the four sectors construction, energy, industry and services, a classification according to the NACE Rev2 4-digit level also used by the ERICA WG[5], belonging to the European Committee of Central Balance Sheet Data Offices (ECCBSO).[6] Distinguishing the different sizes, again based on the classification of the ERICA WG, 17 companies are of small size, 32 are medium and 42 are large.[7]

	Size			
ERICA Sector	Small	Medium	Large	Total
Construction	1	0	3	4
Energy	0	1	8	9
Industry	11	14	20	45
Services	5	17	11	33
Total	17	32	42	91

Table 1: Distribution of companies in the data sample.

5 European Records of IFRS Consolidated Accounts Working Group (ERICA WG)

6 The ECCBSO functions as a consultative body of several national central banks (NCBs) with the goal of supporting central banks' functions by advancing non-financial corporations' analysis. (European Committee of Central Balance Sheet Data Offices (ECCBSO), 2024)

7 The ERICA Working Group defined group sizes based on revenue as follows: small groups < 250 million euros, medium-sized groups 250 million - 1.5 billion euros, and large groups > 1.5 billion euros.

Empirical results

Risk awareness of companies

The level of the risk awareness is measured by the evaluation, whether the companies disclose a comprehensive risk analysis ("Yes"), take a more superficial approach ("Neutral") or do not report on actual or potential climate change risks at all ("No"). In total, out of the 91 assessed companies, a share of around 75% disclose physical and/or transition risks. However, a full risk awareness, meaning a comprehensive and detailed risk description, is only attributed to a smaller fraction of around 43%.

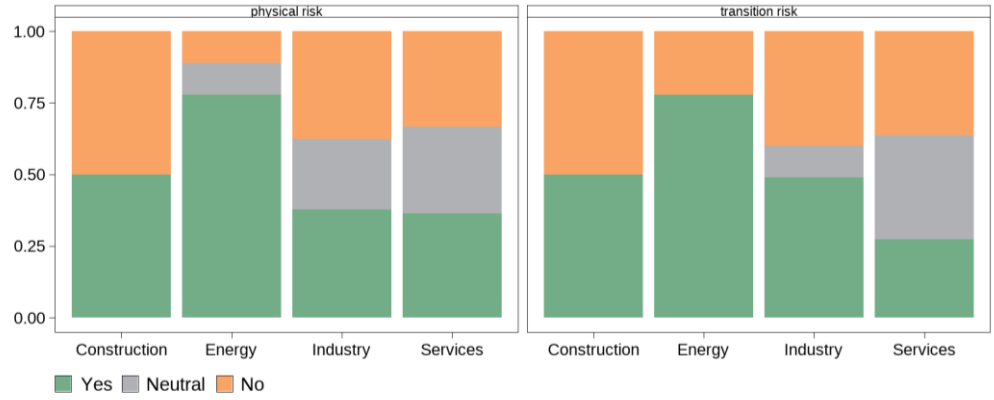

Figure 1 shows the evaluation results separated for physical and transition risks per sectors, revealing that the energy sector takes a leading role, as a comprehensive risk awareness is broadly given in both categories. A less pronounced risk awareness, but at least a certain degree of risk acknowledgment ("Neutral"), is revealed for companies of the industry and services sector. The highest stake of no risk awareness is seen in the construction sector, however, given the small number of companies, these results must be handled with care.

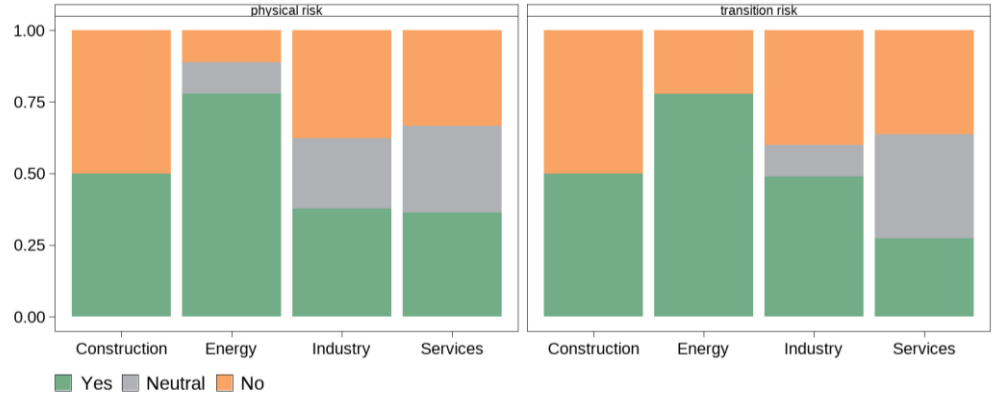

Figure 1: Does the company show a comprehensive risk awareness? Evaluation for physical (plot left) and transition risk (plot right). Note: Share of companies per sector.

The most frequent risk categories in physical risk are water stress (floodings, droughts) and temperature rise (see Figure 2). Companies of the energy sector show the highest frequency in water and temperature, which are related risk categories in

this sector, such as the most common reference is to water scarcity leading to a lower energy production and water scarcity itself is linked to increasing temperatures.

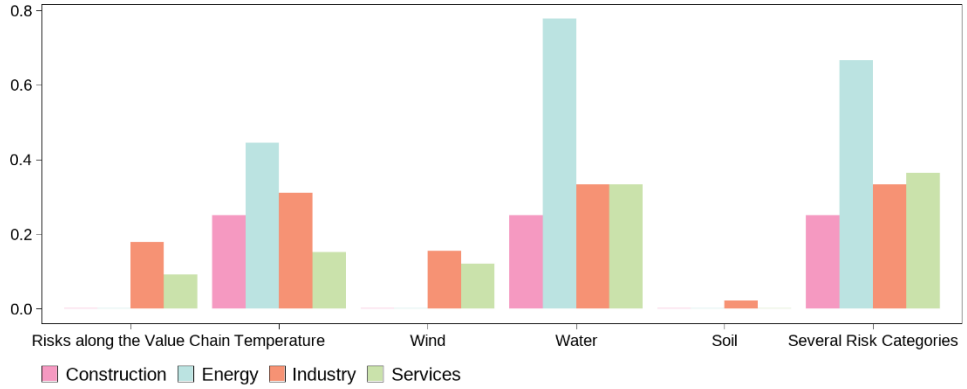

Figure 2: Risk categories of physical risk. Note: Share of companies dealing with physical risk per sector.

Within transition risks, the transmission channel "Legal/Politics" is most frequent, particularly addressed by companies of the construction and energy sector (around 75%, see Figure 3). The risk descriptions mainly refer to regulatory changes connected with the political goals towards CO2 neutrality (energy efficiency / emissions standards) and/or to rise in carbon prices. Changes resulting from the market is particularly relevant for the industry sector. Often the risks are related to rising prices for energy and other input factors of production. Changing customer behaviour leading to a lower demand and to a weaker market position is not only addressed by the industry sector but also by the services sector. Risks accrued from technological developments are particularly pronounced in the energy sector and connected with the risk of stricter energy related regulations, pushing companies to transition from fossil to a renewable energy production. Reputational risks are listed least often across all sectors, in some cases a whole industry is seen confronted with a loss of prestige, e.g. the chemical or textile industry.

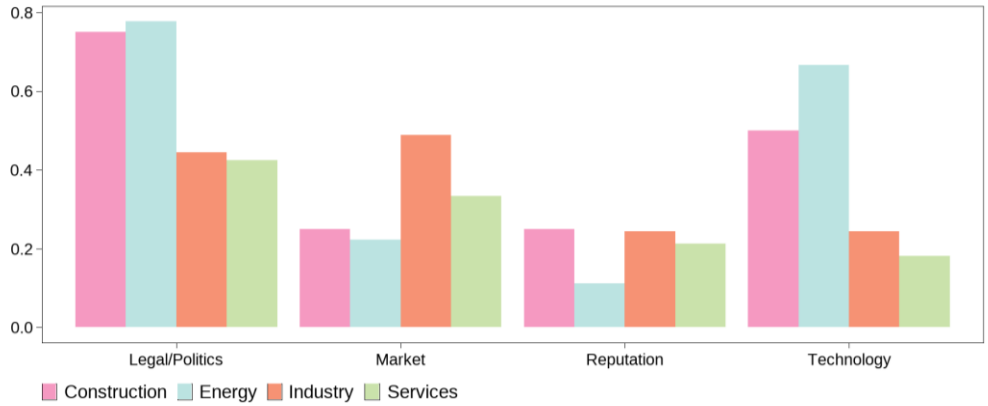

Figure 3: Transmission channels of transition risk. Note: Share of companies dealing with transition risk per sector.

Actions and target setting

The disclosure of actions to address these risks as well as the disclosure of targets along a decarbonisation path are further indicators of the companies' progress in tackling and reporting of CCR.

The assessment of actions separated for physical and transitions risks reveals that the discussion on actions related to physical risks is not as far progressed as for transition risks (see Figure 4).

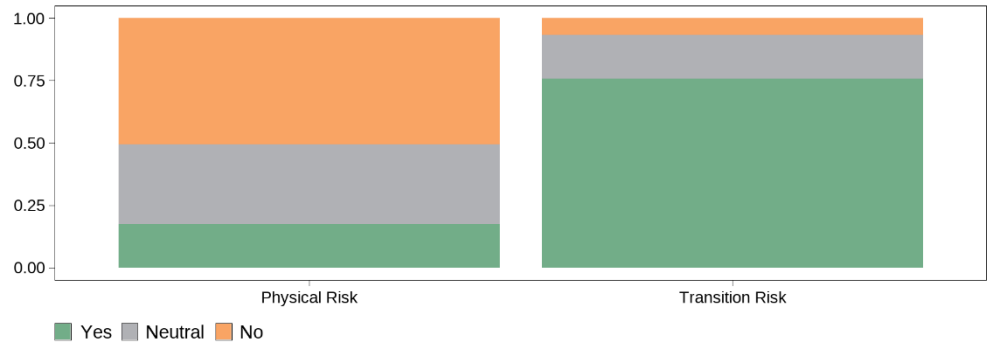

Figure 4: Are the actions in line with the named risks? Note: Share of companies for physical and transition risk.

Only half of the assessed companies reflect on physical risk measures, whereby in the energy sector the share is substantially higher at around two thirds. A fraction of around 30% of the companies show a medium quality regarding their disclosed measures ("Neutral"), and only a minority of 18% is confirmed to disclose comprehensive actions that are in line with the named risks ("Yes"). Physical risk actions are categorized into constructions measures, location measures, process changes and others (see Figure 9 in Annex). Whereas no company plans or takes the action to relocate to an area less endangered by physical risks, construction measures are broadly addressed by all sectors. Process changes are named by a further 20% of the companies.

In contrast, the disclosure of actions to handle transitions risk appears as a common practice, such as more than 75% of all companies publish actions that are in line with the named risks, rising to 100% for companies of the energy sector. However, only a fifth of the actions are precisely defined (i.e. measurable and scheduled). The fraction of measures which are further disclosed together with an implementation plan stands even lower at around 10% of the companies publishing this kind of information.

Published transition actions often comprise a switch to or a higher share of sustainable energy (e.g. purchase of renewable energy resources, purchase/construction of photovoltaic systems) or the increase of energy efficiency. Process changes are particularly in the focus of companies of the energy and construction sector. Actions in "Electrification" or "Fuel switching", mainly referring to the purchase of electric motor vehicles or to use alternative fuels, show a substantial share of mentions across all sectors. Less frequent are measures related to "Material efficiency/consumption reduction" and "Product changes" (see Figure 10 in Annex).

Next to actions, target setting is a crucial disclosure element to tackle the transition to a low-carbon economy (EFRAG, 2022). To assess how far the companies progressed in this reporting field, the disclosure of targets is analysed regarding the timeframe (1-3 years, > 3 years), regarding alignment with the Paris agreement goals and whether the goals are science based (i.e. certified by the Science Based Targets initiative (SBTi)[8]).

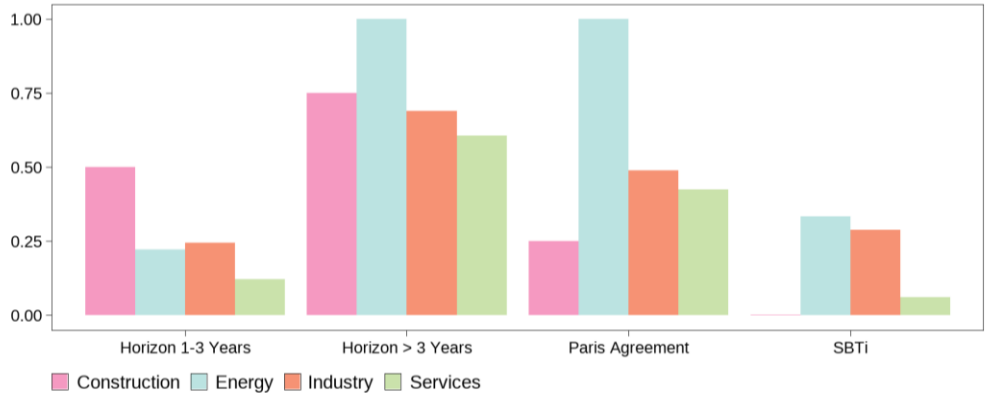

Figure 5: Evaluation of targets. Note: Share of companies per sector.

90% of the analyzed companies disclose at least one target that meets the required criteria, i.e. the target must be measurable and timed, best with reference to a basis year. As shown in Figure 5, goals with a longer horizon than 3 years are clearly more common across all sectors, ranging from 60% in the services sector to 100% in the energy sector. Remarkably, all companies of the energy sector define their goals also in line with the Paris Agreement. Science based targets are disclosed by a third of the energy and industry companies. A full disclosure of target setting, comprising all four defined aspects, is only found in 3 cases. Though incorporated in ESRS E1[9], only 57% of the targets are defined with a clear reference to the emission's scope. Most reported are scope I & 2 references, whereas only a minority of companies also disclose targets for scope 3 emissions.

Summary of the disclosure quality

Figure 6 pictures the disclosure quality (the darker, the better), separating in physical and transition risks, actions as well as transition targets. Generally, the disclosure quality of transition risk and physical risk awareness is balanced. Regarding actions, however, a higher disclosure quality is apparent for transition risk. Acknowledging sector differences, the quality of transition targets broadly meets the disclosure

8 SBTi is a partnership between organizations like CDP, the United Nations Global Compact (UNGC), theWorld Resources Institute (WRI), and the World Wide Fund for Nature (WWF). Its main goal is to help companies to set greenhouse gas (GHG) emission reduction targets to meet the goals of the Paris Agreement. (SBTi, 2024)

9 Once applicable from the financial year 2024 onwards, ESRS E1-4, 35 b specifies that "GHG emission reduction targets shall be disclosed for Scope 1, 2, and 3 GHG emissions, either separately or combined. The undertaking shall specify, in case of combined GHG emission reduction targets, which GHG emission Scopes (1, 2 and/or 3) are covered by the target, the share related to each respective GHG emission Scope and which GHGs are covered.").

quality of actions. It is clearly illustrated, that the energy companies show the highest disclosure quality in all assessed areas. The graph as well visualizes punctual weaker positions, such as the rather low reference to physical actions in the industry sector or to transition targets in the services sector.

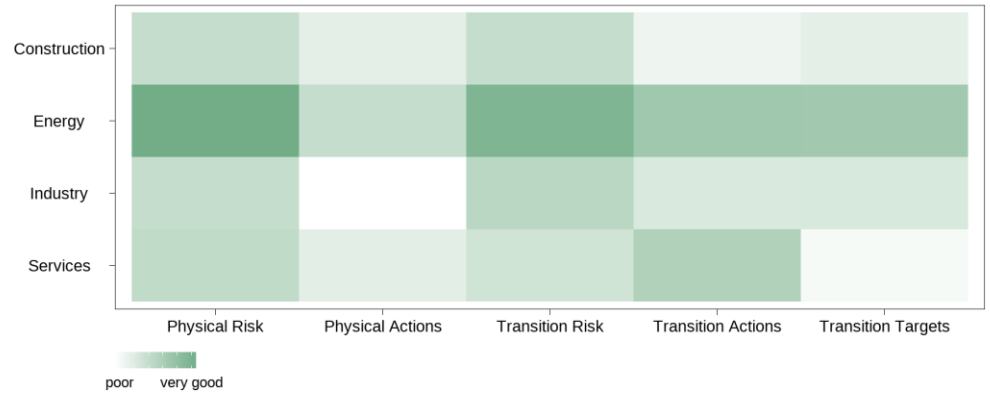

Figure 6: Disclosure quality of physical and transition risk aspects per sector.

Assessment of emissions and relation to disclosure quality

The assessment of the companies' emissions evolution (absolute numbers and emissions intensity[10]) relates to the evaluation question "Does the historic CO2 evolution show a reduction?". In total, a majority of 45% of the companies (45%) show a stable emissions evolution ("neutral"), 38% display an increase and only 17% present an emission reduction. Figure 7 illustrates the results per sector, revealing that companies of the industry and services sector record more often an increase in emissions, whereby the industry sector at the same time also shows the highest share of companies with a downwards trend in emissions. However, it must be noted that a company's business background and the calculation method applied for emissions may influence the observed development of emissions.

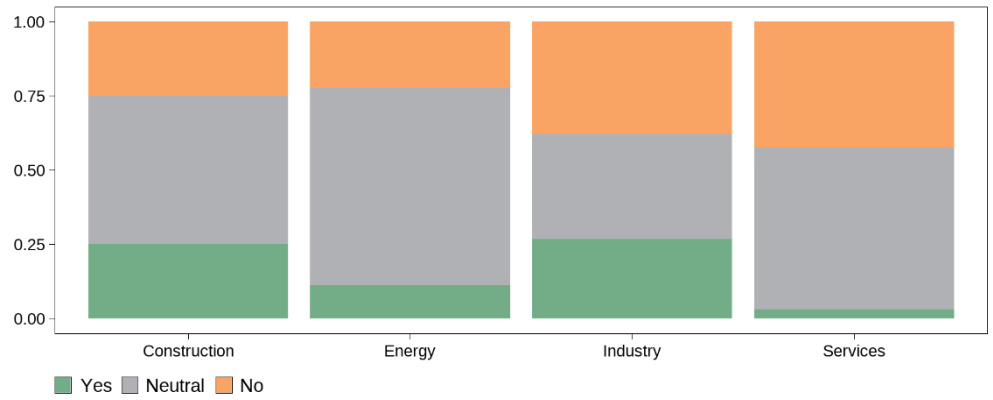

Figure 7: "Does the historic CO2 evolution show a reduction?". Note: Share of companies per sector

10 Emission intensity is measured by scope 1+2 emissions in relation to turnover.

Finally, it is analyzed if companies with a higher disclosure quality are more successful in reducing emissions than other companies. The disclosure quality is determined on the basis of the evaluation questions (see Annex 1: Template description), leading to a final score for each company that is further translated into a quality description graduating from "very good" to "poor".

The relationship between the disclosure quality and the evolution of CO2 emissions is reflected in Figure 8. It is apparent that a high-quality level is often related to a reduction in CO2 emissions, whereas companies with a poor disclosure quality tend to record an increase in emissions. Further, it can be observed that companies with a medium disclosure quality show a "neutral" development of their CO2 emissions. Comparing sectors, the graph depicts the energy sector once more as outperformer.

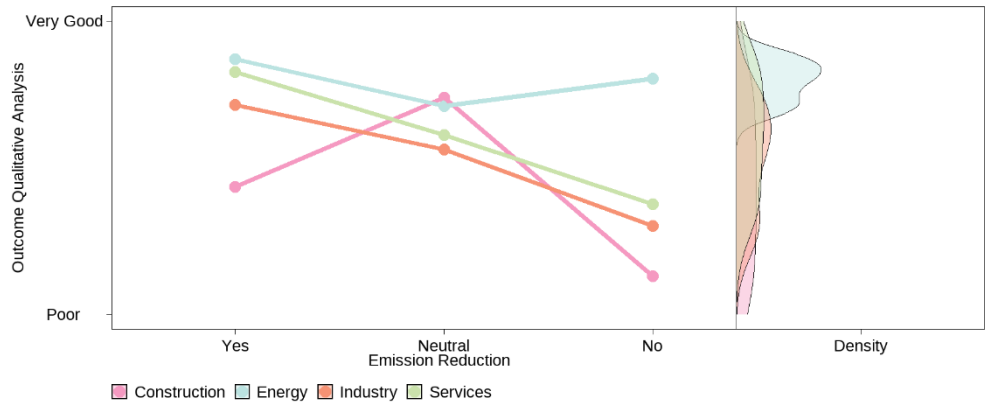

Figure 8: Disclosure quality in relation to emission reduction.

Conclusion

This study analyses the CRR related disclosure practices from a credit risk assessment point of view. Using a sample 91 Austrian non-financial corporations the results are summarized as follows:

- Risk awareness: Generally, a share of 75% of the assessed companies disclose information on physical and/or transition risks. However, a full risk awareness, meaning a comprehensive and detailed risk description, is only attributed to a smaller fraction of around 43%.
- The assessment of actions separated for physical and transitions risks reveals that the discussion on actions related to physical risks is not as far progressed as for transition risks. Whereas only 18% of the assessed companies reflect comprehensively on physical risk measures, the share rises to 75% for transition risk.
- Target setting towards decarbonisation is already well integrated in the companies reporting such as 90% of the analysed companies disclose at least one CO2 reduction target. Long-term targets are much more frequent than short term targets, however science-based targets represent a minority. Notably, only

57% of the targets are defined with a clear reference to the emissions' scope (most common scope 1&2).

- An analyses of the companies' historic emissions evolution illustrates that a majority of 45% companies show a stable emissions evolution, 38% display an increase and only 17% present an emission reduction.
- The assessment showed that there is a positive relationship between the disclosure quality and the evolution of CO2 emissions. A high-quality level is often related to a reduction in CO2 emissions, whereas companies with a poor disclosure quality tend to record an increase in emissions.
- In sector comparison, energy companies are forerunners in CCR disclosure.

Limitations of the study are the small sample size especially in the sector construction and the discretion applied by the authors in categorizing the heterogenous disclosure standards applied by the companies. With the enforcement of the CSRD, which stipulates not only a more comprehensive sustainability reporting but also an assurance by external auditors, it is likely that the disclosure quality on CCR will improve on an accelerating speed.

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Annex

Annex 1: Template description

Physical Risk			
Criteria	**Assessment**	**Category**	**Evaluation**
Risk	Which relevant physical risks are reported by the company? (Open text field)	• Temperature • Wind • Water • Soil • Risks along the value chain • Several risk categories	Does the company show a comprehensive risk awareness? • Yes • Neutral • No
Actions	Which actions are taken to face / reduce the physical risks? (Open text field)	• Construction measures • Location measures • Process-related measures • Other	Are the actions in line with the named risks? • Yes • Neutral • No

Disclosed physical risks and actions are collected in open text and further categorized. The categorization of risks follows the EU regulation 2021/2139, based on the laid-out classification of climate-related hazards into temperature, wind, water, and soil being directly taken from it (European Commission, 2021). It is supplemented by risks along the value chain as a common reporting practice as well as by several risk categories in case of general or overarching risks. The categorization for the key actions a company takes to reduce the physical risks (i.e. construction measures, location measures, process-related measures, other) is defined on basis of commonly reported actions. The evaluation questions point at the risk awareness of the company and how targeted the named measures are. "Yes" stands for a company specific identification of potential or actual physical risk factors respectively for actions that are capable to minimize the named risks, "Neutral" for a partly or more general fulfilment and "No" if there is no information given.

Transition Risk			
Criteria	**Assessment**	**Classification**	**Evaluation**
Risk	Which relevant transition risks are reported by the company? (Open text field)	• Legal/policy • Market • Technology • Reputation	Does the company show a comprehensive risk awareness? Y/N/neutral
Targets	Which CO2 reduction targets does the company define? (Open text field)	N.A.	• Definition of comprehensible short term targets? Y/N • Definition of comprehensible medium / long-term targets? Y/N • Are the targets in line with the Paris Agreement? Y/N • Are the targets sciences based and validated (SBTi)? Y/N
Actions	Which actions are taken to enable the defined targets? (Open text field)	• Energy efficiency • Material efficiency • Fuel switching • Electrification • Renewable energy • Modification product • Modification process	• Are the actions in line with the main CO2 causing activities, risks and targets? Y/N/neutral • Are the actions measurable and

			scheduled? Y/N/neutral • Is a comprehensible implementation plan disclosed? Y/N/neutral
Emissions / Evolution	Historic CO2 emission values (scope 1+2+3)	N.A.	Does the historic CO2 evolution show a reduction? Y/N/neutral

Data collection for transitions risk is broader than for physical risk and comprises next to risks and actions also the aspects targets and emissions evolution. The description of disclosed transition risks is collected in open text, first. The further classification of transition risks into policy/legal, technology, market, and reputation, follows market standards, also adopted by the EFRAG in the defined ESRS E1 climate change (EFRAG, 2022). The related evaluation question regarding risk awareness is answered with "Yes", if the company describes its actual or potential transition risk comprehensively from different perspectives, "Neutral" if risk examination is of superficial nature, and "No" if there is no risk disclosure at all. The targets respectively the CO2 reduction path is collected in an open text field, according to the companies' individual target setting. To normalize this individual information, four target related evaluation questions were defined. The questions focus on the timeline of the disclosed targets (short term, medium to long-term), if they are in line with the Paris Agreement and at best, if the targets are science based. The questions are answered with "Yes" or "No".

The categories for the key measures a company takes to achieve its defined CO2 reduction targets are aligned with the categorization in ESRS E1 climate change (EFRAG, 2022), complemented by the category "Other". The evaluation focuses on the target-orientation of the actions, on the precise definition regarding timeline, and on the availability of a comprehensible implementation plan. The questions are answered with "Yes", "Neutral" or "No".

The assessment of the emissions evolution is based on the historic emissions data reported by the company and supplemented by a calculated emission intensity ratio (scope 1+2 emissions / turnover). The evaluation question "Does the historic CO2 evolution show a reduction?" is answered with "Yes" if there is a clear downwards trend in the emissions' volume, "Neutral" if the reported emissions values are widely unchanged or volatile and "No" if the emissions reveal an increasing tendency. For the correct evaluation of this question also other factors must be considered, such as e.g. a change in the business scope / business units, price related effects on the turnover etc., that might distort the observable trend line.

Annex 2: Detailed analyses results

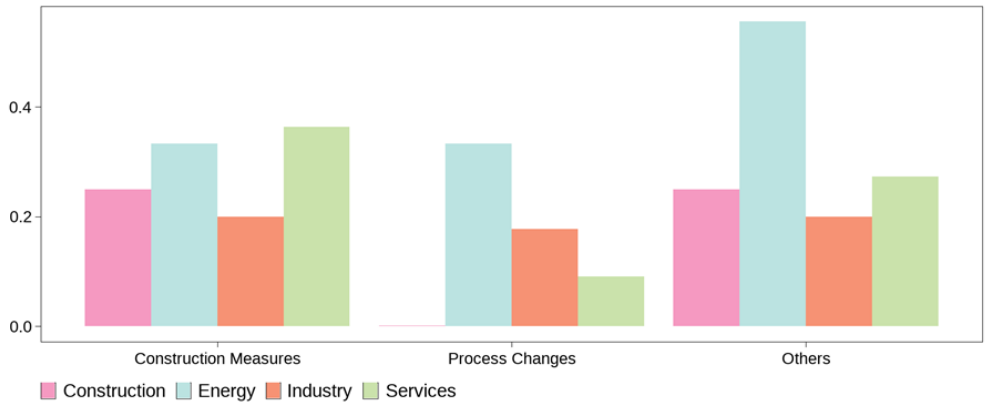

Figure 9: Classification of actions to mitigate physical risk. Note: Share of companies per sector.

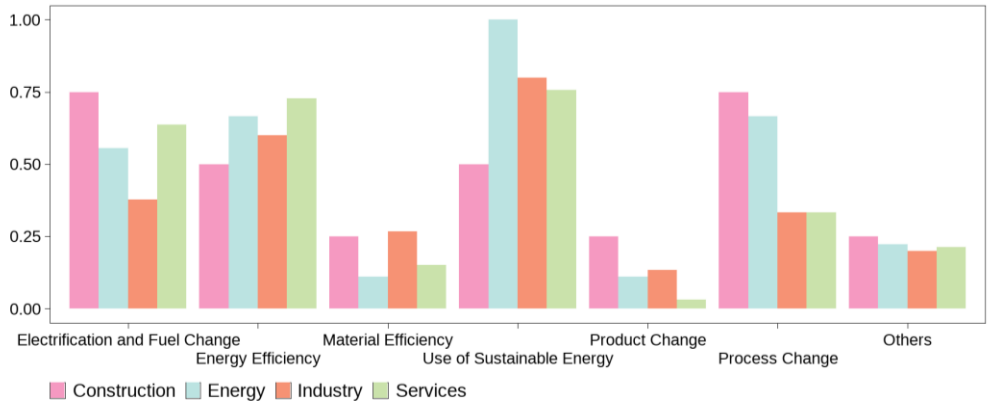

Figure 10: Classification of actions to mitigate transition risk. Note: Share of companies per sector.

Figure 11: Assessment of actions for transition risk. Note: Share of companies per sector.

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Quality over quantity? Using corporation‘s climate change related disclosure for risk assessment

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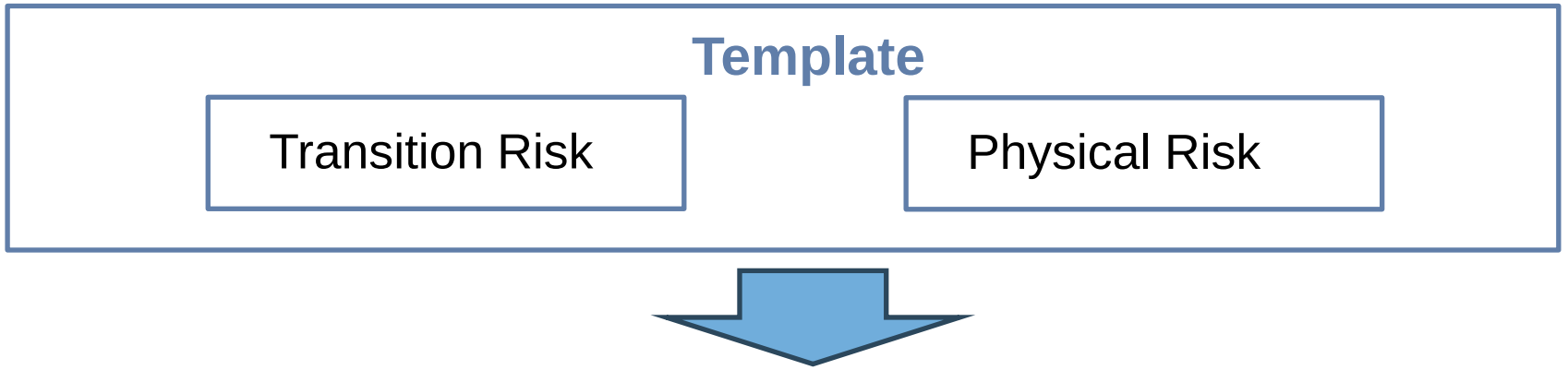
The need of climate change risks integration into credit risk assessment

- Action Plan of European Commission on „Financing Sustainable Growth“
- ECB: Introduction of climate change risk (CCR) in the in-house credit risk assessment systems (ICAS)

  ⇨ Basis: Relevant firm-level information (NFRD / CSRD, voluntarily provided information)

Our paper: Analysis how and to which extent companies disclose CCR information based on current and prospective disclosure standards to be used for the assessment of CCR in the context of ICASs

Methodology - Template and analysed criteria



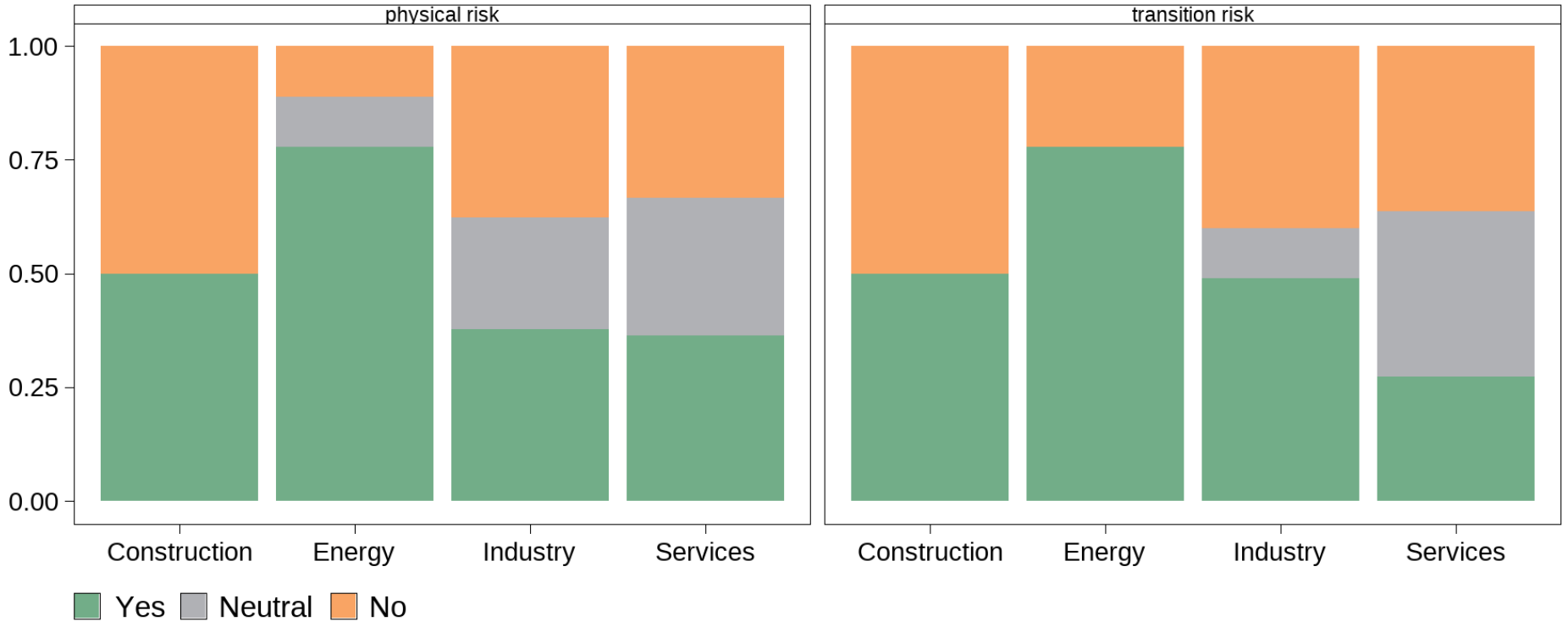
- Sustainability reports of **91 Austrian non-financial corporations**
- **Criteria:** risk awareness, actions, target setting, and emissions,
- **Outside-in** perspective
- **Tools:** Open text questions, categorisation into nominal variables, evaluation questions
- **Emissions:** Historic data reported by companies and calculated emission intensity ratio

The data sample consists of 91 Austrian non-financial companies

ERICA Sector	Size			Total
	Small	Medium	Large	
Construction	1	0	3	4
Energy	0	1	8	9
Industry	11	14	20	45
Services	5	17	11	33
Total	17	32	42	91

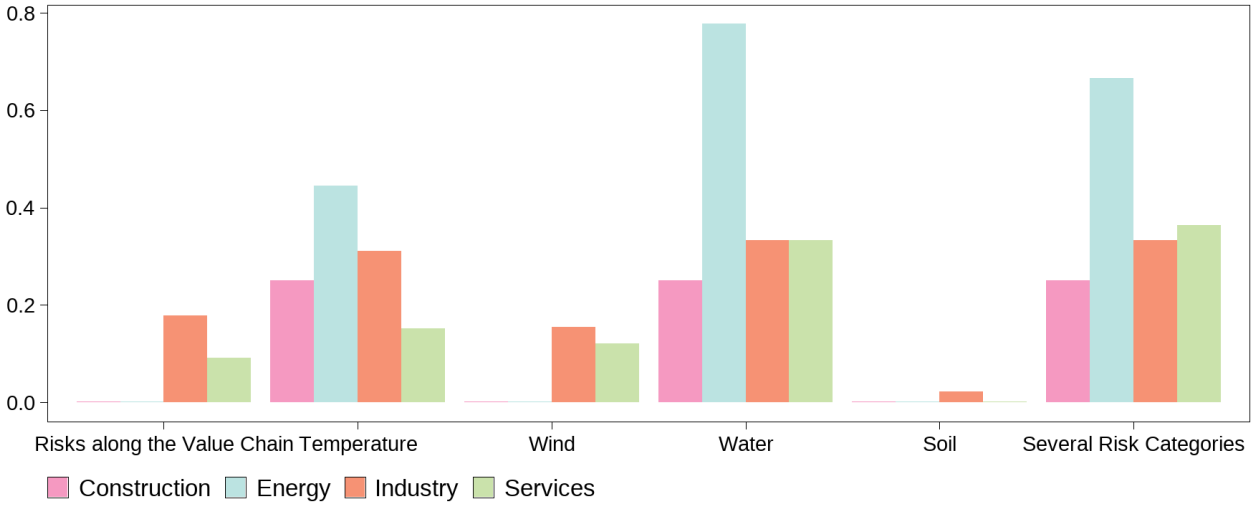
- **39** firms are **listed** companies (NFRD),
- **52** corporations **voluntarily** disclose sustainability information

Empirical results: Risk awareness

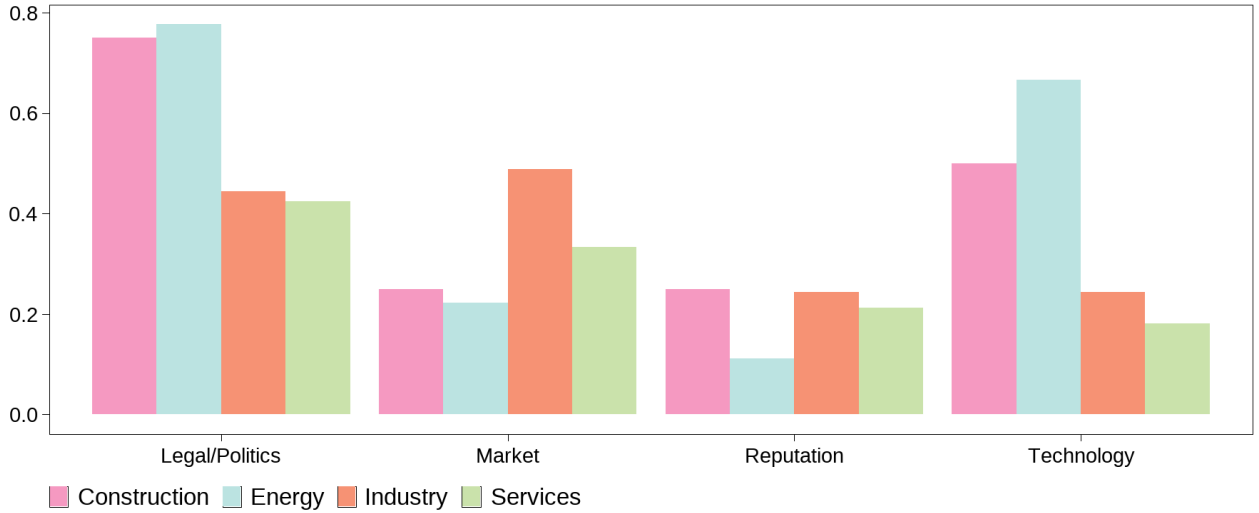


- **75%** of the assessed companies disclose information on physical and/or transition risk
- **Full risk awareness** is only given for **43%**
- Energy sector takes a **leading role**

Empirical results: Most frequent risk categories



- **Water stress** (e.g. flooding, droughts) is the most frequent risk
- **Temperature** is another crucial physical risk category



- Tranmission channel **„legal/politics** is most frequent
- **Reputational risks** are listed **least** often

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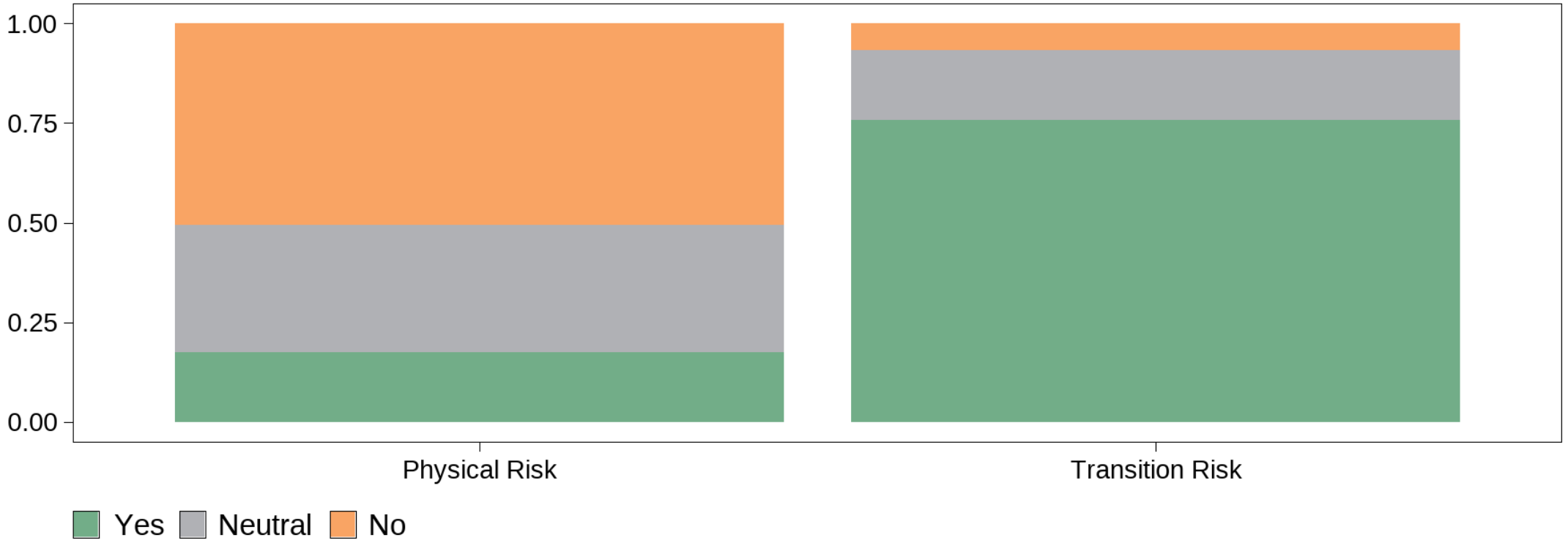
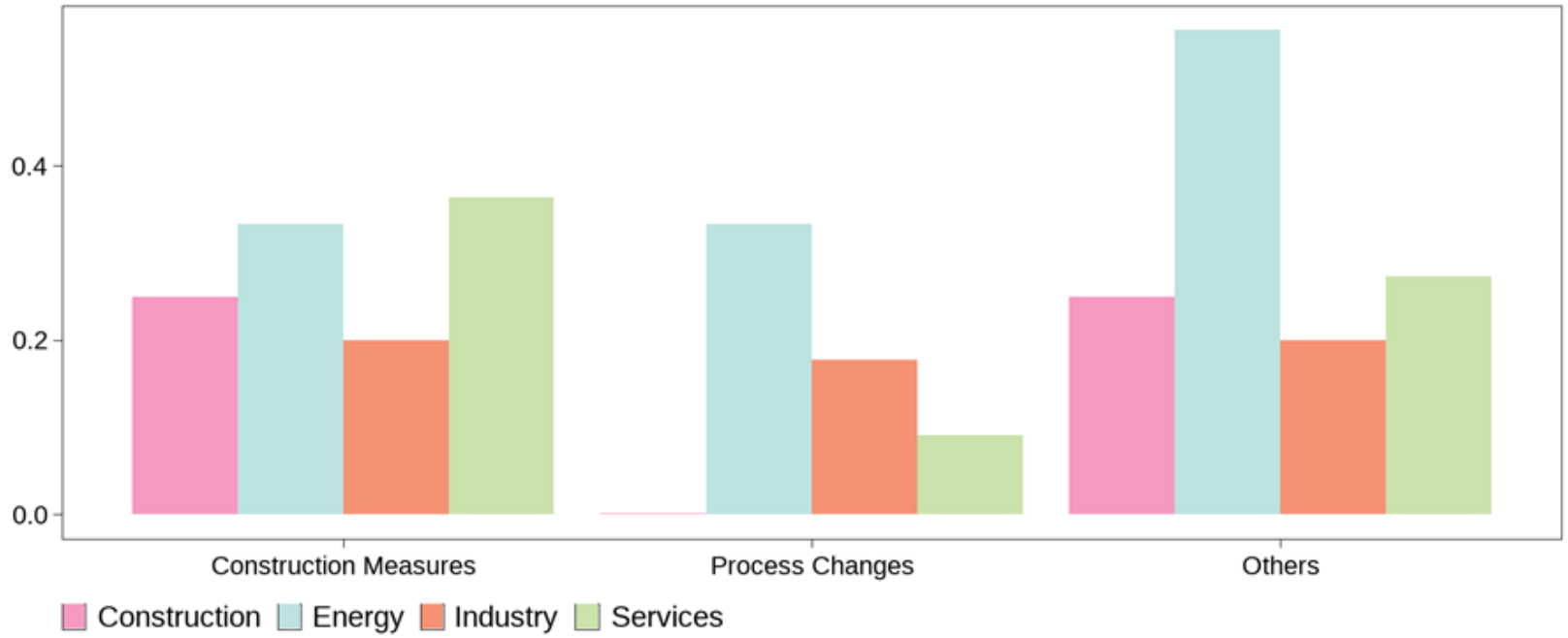
Empirical results: Disclosure of actions



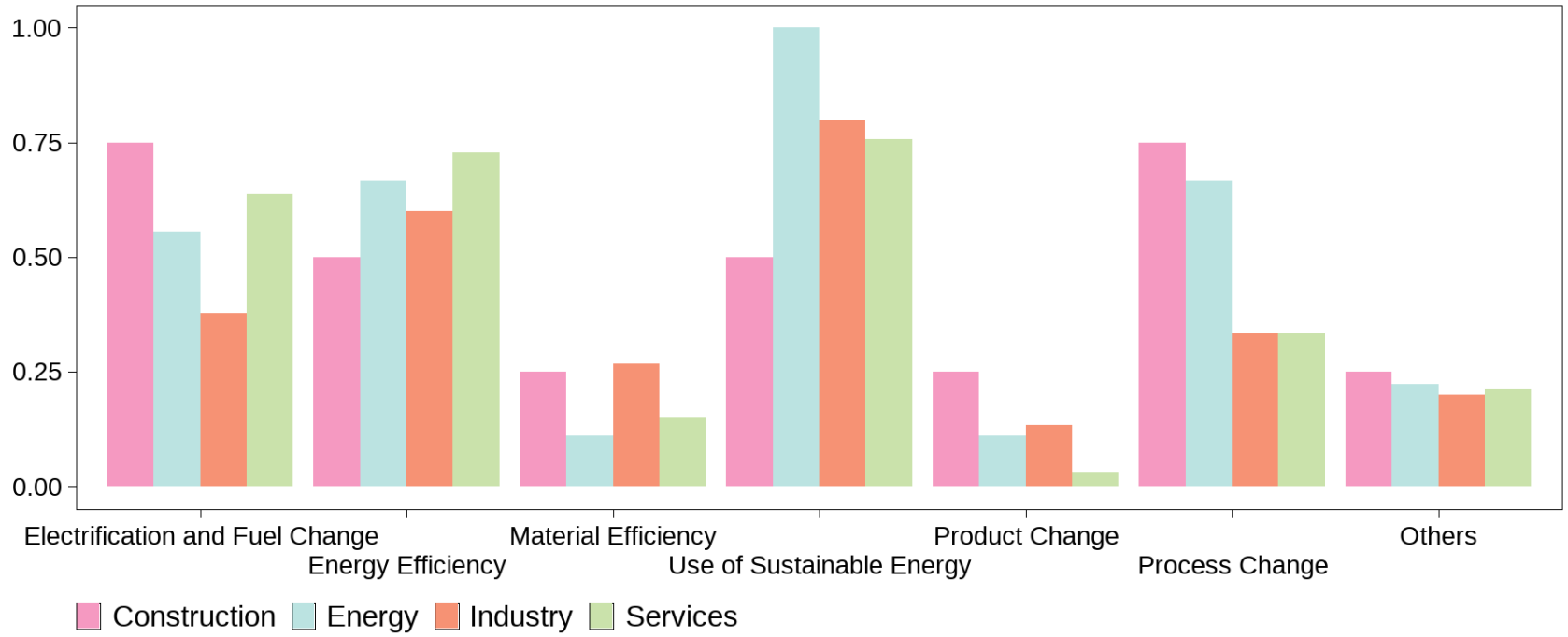
- Actions to mitigate transition risks are common practice
- Actions to mitigate physical risks are not far progressed

Empirical results: Classification of actions to mitigate physical risk



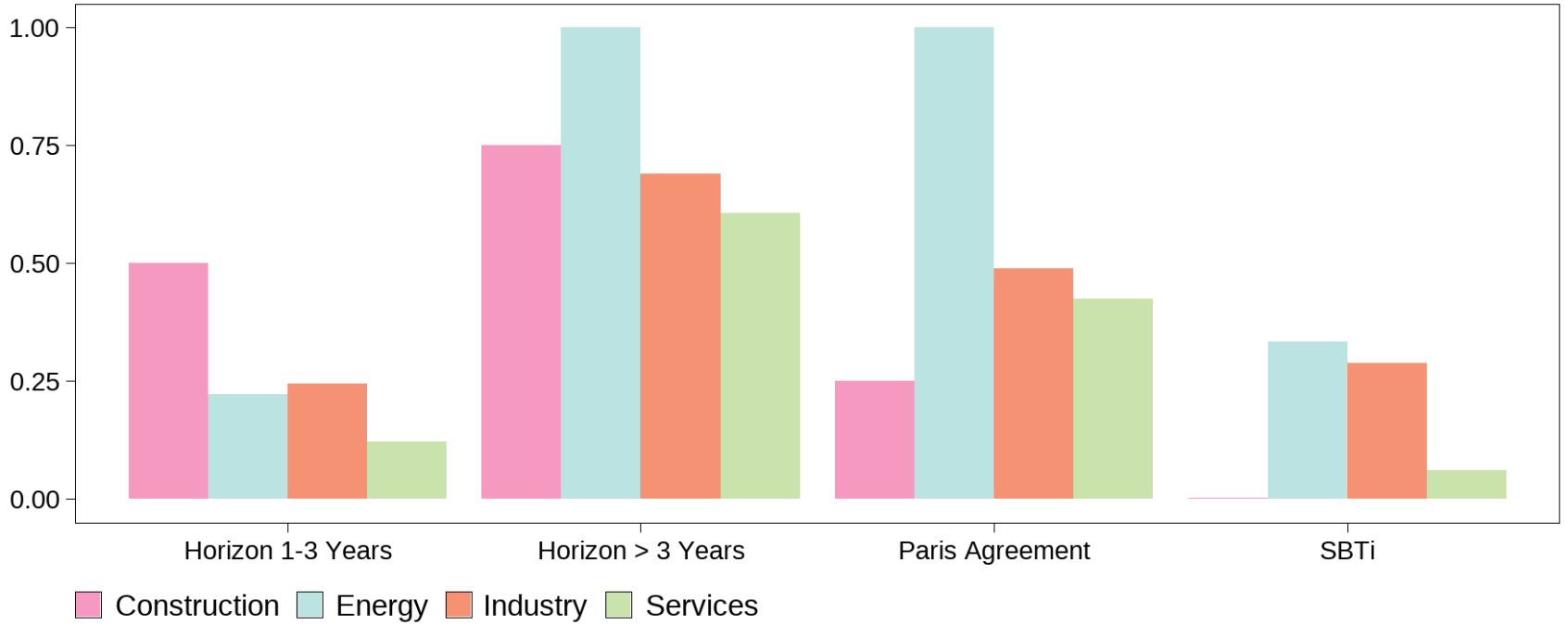
- **The descriptions of construction measures vary in its level of detail.**
- **Companies of the energy sector often focus on contingency plans.**

Empirical results: Classification of actions to mitigate transition risk



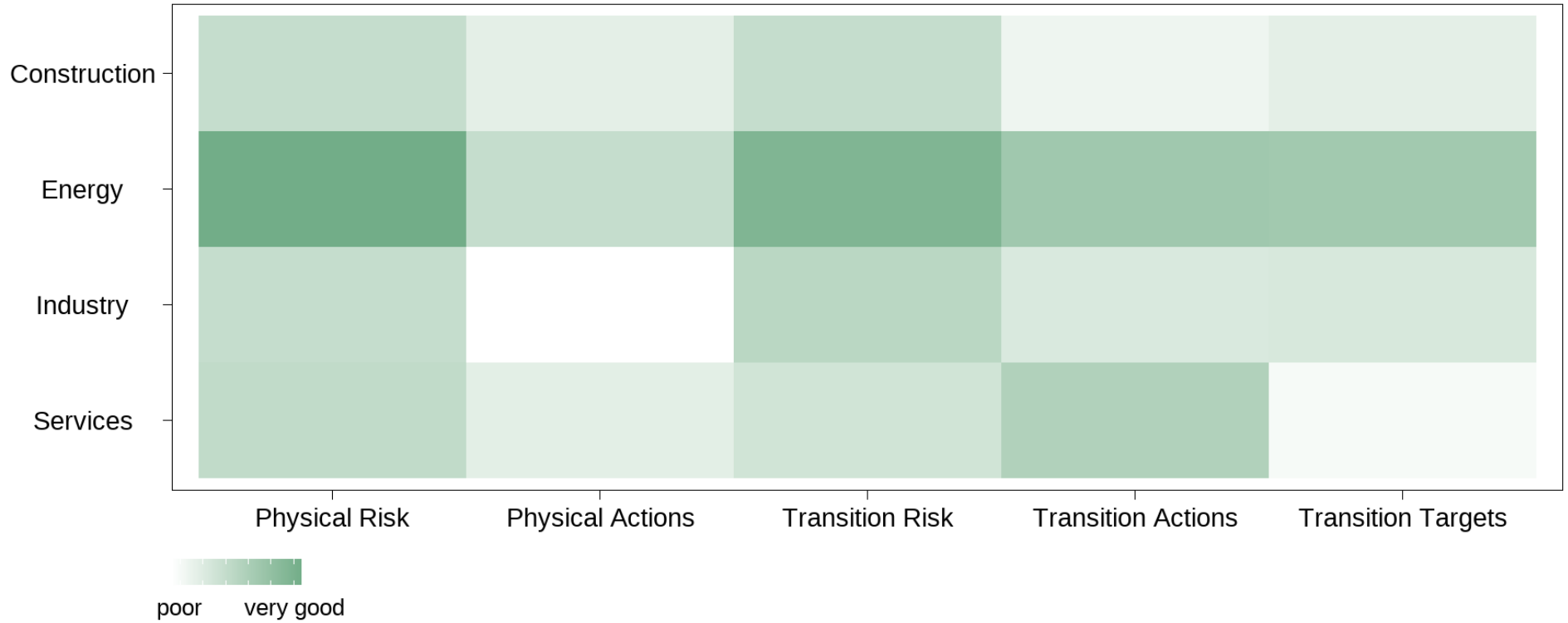
- **Externally driven actions** such as electrification and use of sustainable energy are **preferred**
- **Internal adaptations** such as material efficiency, product or process change are **less common**

Empirical results: Target setting towards CO2 reduction



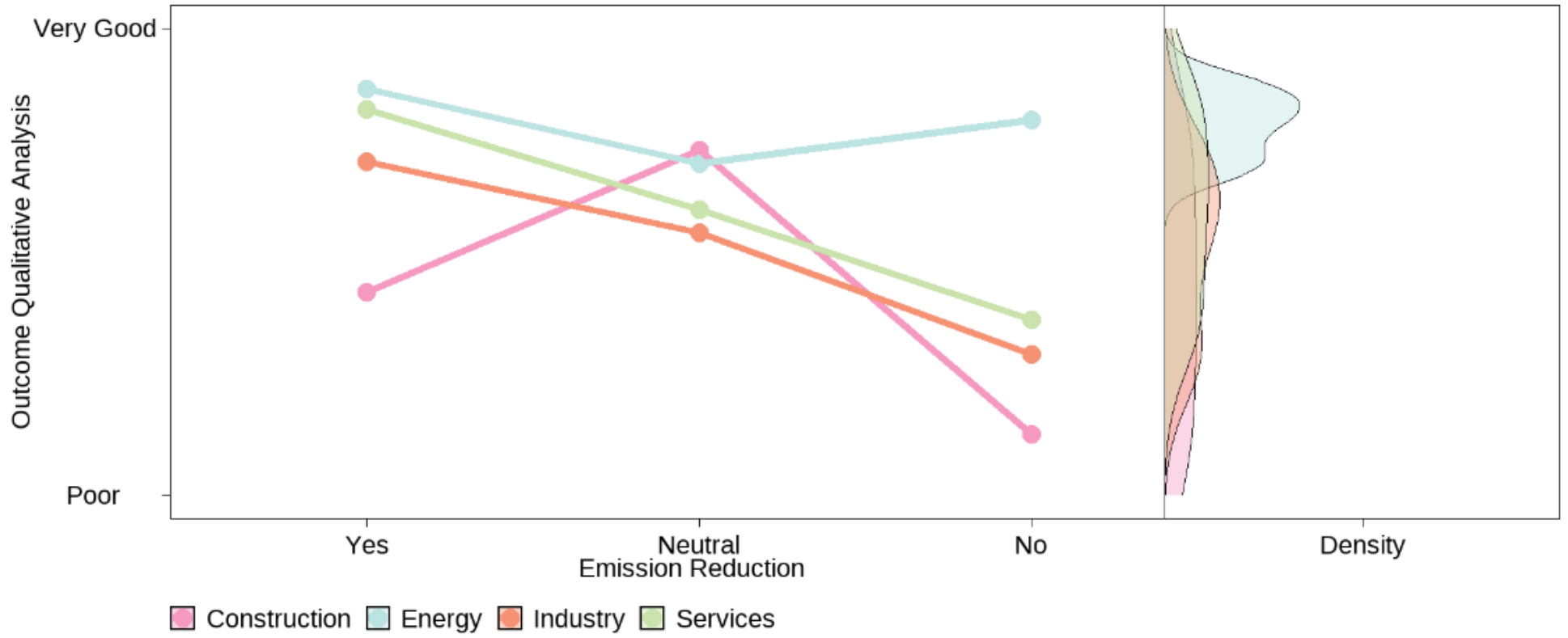
- Goals with a **horizon longer than 3 years** are most common
- All companies of the energy sector disclose goals, which are in line with the Paris agreement
- Science based targets are disclosed by a third of the energy and industry companies

Empirical results: Summary of the disclosure quality



- Risk awareness is balanced for both risk types
- Disclosure quality on actions is higher for transition risk
- Energy sector is forerunner in all categories

Empirical results: Assessment of emissions and relation to disclosure quality



- A **high-quality level of disclosure** is often related to a **reduction in emissions**, whereas
- Companies with a **poor disclosure quality** tend to record an **increase**.

Conclusion

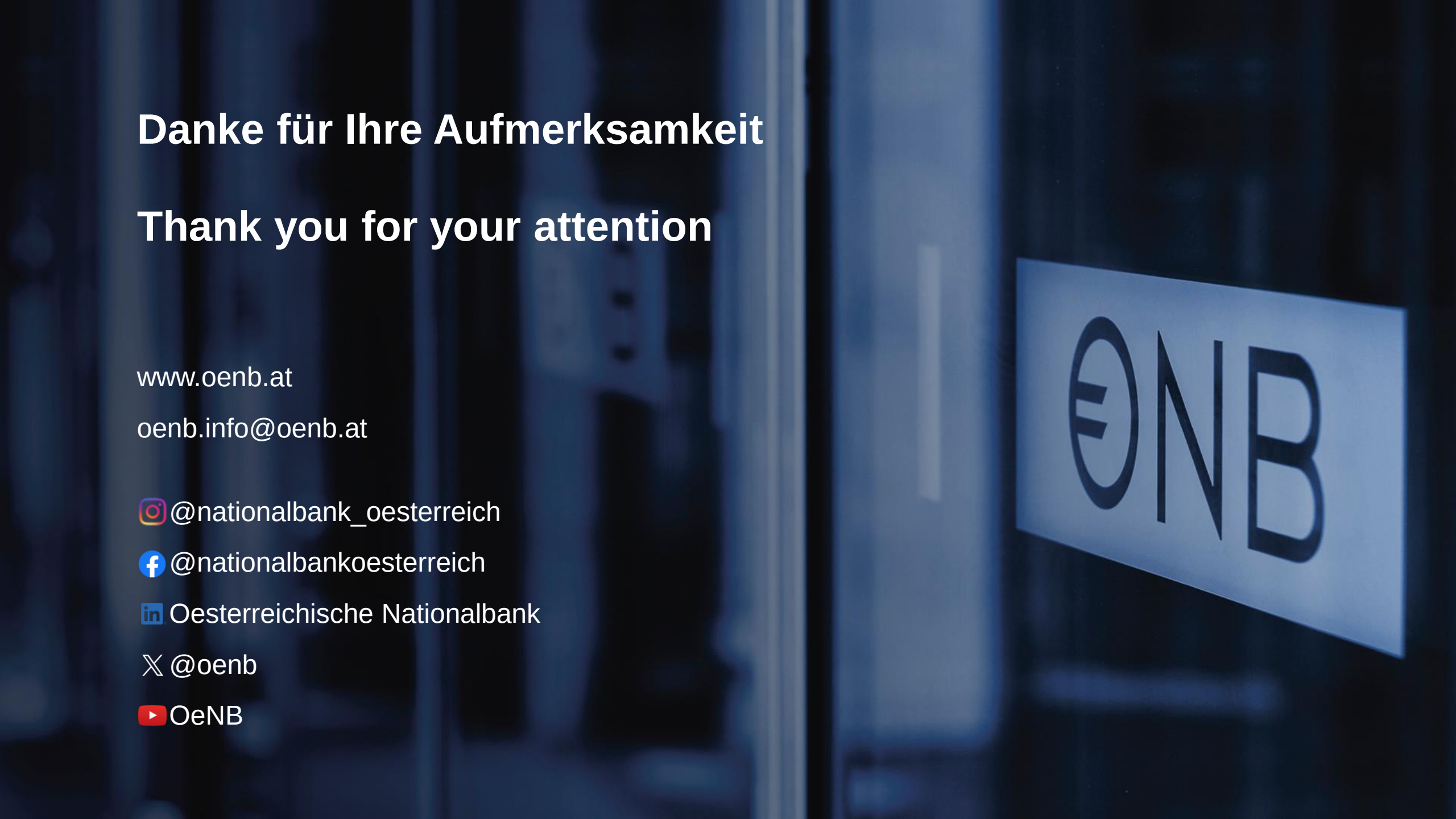
- Companies broadly disclose on risk awareness, actions and targets.
- Differences between physical risk and transition risk are observed.
- Higher disclosure quality is often associated with a downward trend in CO2 emissions.

- Limitations:
  - Small sample size, especially in sector construction
  - Discretion applied by authors in categorizing heterogenous disclosure standards

- Outlook:
  - Standardisation with application of CSRD
  - Assurance by external auditors will be required

Danke für Ihre Aufmerksamkeit

Thank you for your attention



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Backup

Empirical results: Assessment of actions for transition risk