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Institutional determinants of circular economy

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Abstract

Motivation: In the context of circular transition, a novel and significant area of research is the role of institutional determinants. This study is of paramount importance as it aims to fill the gap in understanding how institutions influence the implementation of circular economy (CE) in companies. By adopting an institutional approach, we can comprehensively consider the role of diverse factors, merging the realms of regulation (formal institutions) and actors' attitudes (informal institutions).

Aim: The study aims to assess the role of institutional factors in the circular transition and provide valuable insights that can significantly guide future strategies and policies for the circular economy. This research has the potential to inspire significant changes and guide us towards a more sustainable development.

Results: The study confirms that vital institutional determinants can be identified, encompassing formal and informal institutions. The analysis underscores the urgent necessity for adjustments in both areas to support the transition. While functioning formal institutions are a crucial transition driver, their form and quality are often poorly assessed. Notably, significant changes are imperative in informal institutions, particularly a shift in consumer attitudes. Moreover, the results indicate that being motivated by regulations influences the company's perception of other CE drivers and barriers. Particularly interesting are the more favourable attitudes of enterprises towards transition. Similarly, companies strongly moti-

vated by concern for the environment tend to perceive some drivers more positively, while barriers become less severe.

Keywords: formal institutions; informal institutions; circular economy; circularity drivers and barriers;
JEL: D02; P36; P48; Q54

1. Introduction

With the rapid climate change and its consequential resource depletion, the need for new economic models has never been more urgent. The circular economy concept, which has gained significant traction recently, presents a promising solution. The alarming data on climate change and resource use underscore the pressing need for change and the importance of closing resource cycles.

The circular transition can support achieving postulated climate neutrality by 2050, decoupling economic growth from resource use or reducing the consumption footprint. This concept fits well with the need to combat climate change – it enables more efficient use of resources, waste reduction, and use of renewable energy. Circularity reduces irreversible damage caused by resource depletion, preserves biodiversity and reduces air, soil and water pollution (COM(2015)614). Economic benefits are also often highlighted, such as providing more efficient ways of production and consumption, creating new jobs, ensuring social cohesion, developing innovation and increasing Europe's competitiveness in the global market. From a company's perspective, the CE is expected to protect from resource scarcity, reduce material costs, increase profitability, and provide new business opportunities (COM(2020)98). Meanwhile, the Polish economy is only 10.2% circular (Circle Economy, 2022, p. 8). The circular transition is, therefore, a significant challenge for the whole economy, and it is essential to study its determinants, including those of an institutional nature.

Institutional economists recognise adaptation to climate change as a novel and important topic that needs to be addressed and put on the research agenda (Roggero et al., 2018a, p. 411). The diversity of opportunities and barriers encountered during climate adaptation enforces a precise diagnosis of institutional determinants (Oberlack, 2017, p. 828). Despite the growing debate on climate adaptation and the underlying role of institutions, little is known about their effects on the process (Carlos et al., 2022). Therefore, to support CE transition, identifying institutional determinants, investigating how they operate, and indicating possible areas for improvement remain essential challenges.

The paper poses the following research questions:
- What formal and informal institutions can influence circular transition?
- How do enterprises evaluate these institutions?

The paper thus aims to identify and assess the formal and informal institutions that determine the circular transition. In the literature, most research on institutions has focused on the broader theme of adaptation to climate change without focusing on the specifics of actions that fit into the CE concept (e.g. Adger, 2003; Oberlack, 2017; Roggero & Thiel, 2018). Still, they remain scarce, and Roggero et al. (2018b, p. 443) note that "analyses of climate adaptation seldom rely on the conceptual toolbox of institutional economics". Based on the research, institutional determinants will be examined from the perspective of companies operating in Poland and implementing circular solutions.

The paper is structured as follows. Section 2 describes the role institutions play in the circular transition. Section 3 briefly explains the methodology. Section 4 presents the results of the empirical analysis and explains how enterprises evaluate formal and informal institutions and how they are connected. Section 5 presents the conclusions.

2. Literature review – the role of institutions in the circular transition

The circular economy concept emerged as early as the 1960s. However, its practical implementation only started in the 21st century (Kulczycka, 2019, p. 5). Our understanding of the circular economy has gradually evolved to encompass elements from different concepts united by closed loops (Geissdoerfer et al., 2017). Therefore, it is challenging to create a precise definition, and various approaches are used in practice (Moraga et al., 2019, p. 453; Prieto-Sandoval et al., 2018). Sometimes, it is stressed that it is not worth pursuing a universal definition, as it is a dynamic concept constantly evolving (Korhonen et al., 2018, p. 548).

The EU interprets circular economy as "a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible" (European Parliament, 2023). Generally, the interpretations stress the importance of closing loops and slowing resource flow (Bocken et al., 2016, p. 309). Closing the loops occurs when the loop between use and production is closed, leading to a circular flow of resources – the end of a product's life is the beginning of the life of a new product or service. Slowing resource flow is achieved by designing long-life goods and extending product life cycles, e.g. through repair or repurposing. The CE concept emphasises that transition requires

actions at all stages of the product's life cycle, starting with its design, raw material sourcing, processing, production, sustainable consumption, waste collection and management. As a system restorative and regenerative by intention (Ellen MacArthur Foundation, 2012, p. 7), it will move the economy away from linear models that are ineffective and devastating to the climate.

Institutions strongly determine the circular transition. Using an institutional approach allows for the consideration of diverse factors. It will enable two areas of analysis to be combined – the area of regulation, i.e. formal institutions, and of actors' attitudes, i.e. informal institutions.

Institutions are generally the 'rules of the game' and, more specifically, a set of fundamental political, social and legal rules that form the structure of production, distribution and exchange. They consist of formal institutions, informal institutions and enforcement mechanisms (North, 1994a, pp. 3–9).

Formal institutions are legal regulations, administrative and technical rules, etc., introduced by law-making bodies. They remain closely linked to the state and are subject to deliberate shaping. They are most often in written form, and they should be strictly adhered to. Institutions are usually perceived as constraints; however, they also allow behaviour as 'they enable choices and actions that otherwise would not exist' (Hodgson, 2003, p. 163). The enabling role of institutions is crucial for circular transition. They can form backgrounds for individual operations and enforce the development of new habits that support circularity.

Based on the literature describing the CE transition, the following formal institutions can be identified:

- legal regulations at the national and EU levels encouraging transition
- formal solutions related to providing financial support for the transition,
- education activities raising awareness in the area of existing CE solutions and benefits,
- formal solutions supporting the creation of critical infrastructure, setting up cooperation frameworks for entities implementing CE, etc.

Significant progress can be noted as far as formal institutions are concerned—a review of EU strategies confirms that the transition framework has been marked (COM(2014)398; COM(2019)640; COM (2020)98).

However, it is essential to be aware that while the circular transition implies the need for radical change in most countries, EU strategies are only beginning to impact change (del Mar Alonso-Almeida et al., 2021). Knowing that formal institutions are only part of the institutional system is also crucial. Their practical operation depends on informal institutions. Formal and informal institutions interact, which is often the subject of research (e.g. Gruszewska, 2017; Helmke&Levitsky, 2004; Williamson& Kerekes, 2011). They can reinforce or undermine each other's effects. Hodgson (2006) emphasises that formal rules cannot be seen as purely formal because their

operation depends on informal institutions. Developing new norms that support the novel formal rules is a long-term process. However, it is a necessary condition for transition. Moreover, while it is stressed that institutions pressure climate adaptation, one should consider the interactions as each type of institutional pressure is conditioned by the other institutional determinants (Arranz et al., 2022, p. 2).

Informal institutions are a society's customs, behavioural norms, traditions, culture, religion, or morals. They result from acquired experiences and value systems. As principles rooted in people's consciousness, they tend to last a long time and are not very sensitive to deliberate change. They are created, transmitted, and enforced outside official channels (Helmke & Levitsky, 2004, p. 727). Informal institutions are reflected in people's actions but are difficult to capture and operationalise (e.g. Voigt, 2018).

The following attitudes are relevant for CE:

- authorities – crucial in developing formal solutions and supporting their implementation,
- entrepreneurs – reflected in the orientation towards long-term goals, readiness to adopt new solutions, offer CE products and services,
- consumers – marked by choice of products and services, readiness to repair products, reduce consumption.

Ostrom (2014) points out that addressing global issues such as climate change requires a polycentric approach and cooperation between public, private and individual actors at different levels. Adger (2003) noted that societies have inherent capacities to adapt to climate change. Individuals perceive new problems and solutions through their preexisting values, preferences, and beliefs (Moser & Ekstrom, 2010). Society's values limit the adaptation to climate change (Adger et al., 2009). For a successful transition, it is not enough to create the right policies; one should inspire people (Kovaric et al., 2020, p. 45). Meanwhile, D.H. Meadows (2020, p. 91) noted that systemic problems surprise people because they think about single causes leading to single effects. K. Webster (2017, p. 169) points out the need for a systemic perception of problems and an awareness that the effects of our actions will not be immediate. In practice, changing actors' attitudes is challenging. As informal institutions, attitudes evolve slowly (Williamson, 2000), making it difficult to steer their changes. Moreover, institutional stickiness causes institutions imposed and perceived as exogenous without social memory grounded to be unsuccessful (Boettke et al., 2008).

One should refer to institutional change while explaining the role of institutions in circular transition. Change has hardly been addressed in the context of the changing climate (Roggero et al., 2018a, p. 410). Institutional change is a ubiquitous, ongoing, gradual process that results from the daily choices made by individual actors and organisations (North, 1994b, p. 361). Certain habits and routines hold, and successive imitators begin to use them

while others fall out of use (Hodgson, 1998, p. 175). Aoki, perceiving the shaping of institutions as a specific game, states that institutional change is triggered when the situation is no longer taken for granted—the game conditions change (Aoki, 2007, p. 30).

In line with the evolutionary trend, North (1991, p. 97) assumes that institutional change is incremental. Moreover, changes in informal institutions are slower than changes in formal ones. This difference in the pace of change weakens the effectiveness of the process. The coherence of the changing formal and informal norms is the condition for effective institutional change (North, 1994b, p. 366). As noted, formal institutions in CE have emerged in recent years. They need to be adapted to work correctly and support expected results. These new institutions confront people's deep-rooted attitudes stemming from informal institutions. It is crucial to study whether they are coherent. If not, the need for change or the ineffectiveness of existing institutions does not automatically imply adjustments. The state can introduce ineffective formal solutions. Moreover, society may be reluctant to reform when it strikes its economic interest, contradicts its values or principles, or doubts that the reforms will achieve the effect promised by the authorities (Eggertsson, 2006, p.15). Similarly, Aoki's analysis of the institutions' interrelationships indicates various sub-optimal solutions (Aoki, 2001, p. 3). Therefore, it is vital to identify institutional determinants of new phenomena and verify how they operate.

3. Methods

To assess the institutional determinants of circular transition, a survey was conducted in 2022 in 200 randomly selected manufacturing companies in Poland. During the canvass, 512 attempts were made to establish a telephone call, of which 200 resulted in an effective interview, and 59 were ineligible for the survey. Companies qualified for the CATI survey had to declare the implementation of products' reuse or recycling activities to eliminate waste. The interviewer briefly explained the concept of CE, ensuring respondents understood the topic properly. Among other things, the respondents – company executives – were asked to assess the drivers and barriers encountered in the CE transition on a five-stage scale (Figures 1 and 2). The results are analysed in terms of the frequency of indications showing the motivation or burden of a particular factor. Later on, correlation is analysed for the selected factors, indicating how the shaping of certain factors influences the perception of others.

4. Results

Among both groups, selecting factors to assess institutions in the CE implementation is possible. Several factors do not relate to institutions (e.g. opportunity to reduce costs); however, they seem potentially crucial for companies and have been included to show the role of institutional factors against their background.

As for CE regulations, respondents ranked them among the most critical drivers. 62% is a high percentage, especially as the most crucial factor – the opportunity to reduce operating costs – gathered slightly more – 68% of indications. At the same time, analysis of the barriers shows that the quality of regulation rated low – the variability and unpredictability of regulations are indicated by 46% of respondents, making it the most critical barrier. High on the list of barriers is the difficulty of interpreting CE regulations and their inadequacy to the company's specifics. Thus, on the one hand, regulations induce enterprises to change – they have to adapt to new rules; on the other hand, the quality of regulations is assessed negatively. The PARP report (2020, p. 8) also points out legal issues as one of the most effective CE stimulants. Berrone et al. (2013) recognise regulatory pressure in pursuing environmental innovations as non-compliance with regulations brings business risk.

Formal institutions related to financial support are secondary drivers. Access to existing subsidies is vital to less than half of companies. A similar percentage appreciate the role of tax policy, including the tax credits and exemptions system. However, it can be seen that companies point to the cost of compliance with CE regulations as one of the main barriers. This highlights the need for well-designed subsidies or reliefs linked to the transition, which could help address the financial issues. In other studies, financial support has proved to be a vital driver in developing green products and processes in companies (Arranz et al., 2022, p. 3).

It is worth noting the support of local government while considering the role of formal solutions. Local administration plays a key role by supporting collective actions (Roggero & Thiel, 2018). Still, this factor is less important compared to others. At the same time, the list of barriers shows that the lack of infrastructure necessary to implement CE is in the middle of the list. Finding partners to implement CE is also a minor barrier. However, the low number of indications may be because enterprises in Poland are at the initial stage of CE implementation and usually act without cooperation. Further transition may require the development of an infrastructure and improved solutions in this area.

Among the informal institutions, authorities' attitudes were singled out. They may be reflected in the lack of a pro-innovation policy; however, the survey does not confirm the existence of such a barrier. Also, the local gov-

ernment's impediments to circularity seem to be of little importance. This may indicate a good assessment of the authorities' attitudes.

As far as companies' attitudes are concerned, their assessment in the survey is positive. The company's concern for the environment is the second most crucial transition driver (65%). High on the list are the requirements of business partners, which confirms that other companies are interested in circularity. Standing out from the competition (55%) and creating a 'green' corporate image (52%) are also crucial. The willingness to distinguish through circularity can be assessed positively. It is also worth noting that entrepreneurs do not complain about a lack of knowledge of CE benefits or the overambitious CE goals. Of course, one should be aware that assessing entrepreneurs' attitudes presents declarations, and their practical actions may be less favourable. It is often said that there is a gap between declarations and actions on green issues (e.g. Mintel Consulting, 2022, p. 31).

Unfortunately, while entrepreneurs see themselves as willing to make changes, they view consumers' attitudes negatively. On the one hand, 65% of respondents see establishing long-term relationships with consumers as a driver, and 55% perceived as such meeting buyers' expectations. On the other hand, low awareness in society is the third most crucial barrier (31%). High on the list is limited demand for green products. Such results negatively portray the prospects for CE transition – public awareness, readiness for systemic change, and even exerting social pressure are crucial attitudes here. Many analyses emphasise that consumer participation in circularity is among the most critical missing links. Kirchherr et al. (2018) indicate that cultural barriers, mainly a lack of consumer awareness, are more important than often underlined technological barriers. The PARP report (2020, p. 17) shows market participants' low awareness as the most significant CE barrier. Insufficient educational efforts compound this. Enterprises also believe consumer education is critical to accelerating the transition (Fundacja Circular Poland, 2021, p. 17). A survey by ARC Market and Opinion (2019, pp. 43–47) displays that only 1/3 of consumers believe their actions can contribute to curbing negative environmental impacts.

With the primary results on drivers and barriers, it is worth considering what conclusions can be drawn about the interaction between formal and informal institutions. One key motivator each (according to the survey results) was selected for analysis related to formal and informal institutions. These are CE regulations (formal) and the company's concern for the environment (informal). The remarkable question is how these drivers' perceptions co-occur with those of other motivators and barriers. The Spearman correlation was calculated for the said relations[1].

[1] The correlations' results were examined using the Holm correction to adjust for multiple comparisons based on alpha 0.05.

The analysis indicates that if the company recognises the regulation as crucial, it co-occurs with more favourable company attitudes towards the transition and willingness to use it as its strength (Table 1). There is a strong positive correlation between the regulations and creating a 'green' corporate image and the company's concern for the environment and moderate for standing out from the competition[2].

Moreover, companies strongly motivated by regulations tend to perceive the barriers as less severe. This applies to all types of barriers – whether they concern other formal institutions, informal institutions or even transition costs. The negative correlations can be described as moderate here. It is particularly worth highlighting the links with barriers deriving from informal institutions. When regulations motivate the transition, companies suffer less from low societal awareness and limited demand for green products. This is a remarkable notion – as noted, formal institutions can be shaped intentionally and can quickly change entities' behaviour. The analysis confirms the role of formal rules in perceiving other drivers and barriers. Moreover, there are distinct relationships between formal and informal institutions – well-designed CE regulations can be expected to influence entities' attitudes in the transition.

The company's strong motivation by its concern for the environment is related to other drivers connected with positive attitudes to circularity, such as establishing long-term relationships with consumers, standing out from the competition and creating a 'green' corporate image (strong to moderate positive correlation) (Table 2). It also co-occurs with a better assessment of formal institutions, not only the mentioned regulations but also access to subsidies supporting CE innovations, tax policy, and local government support (moderate positive correlation). Moreover, drivers from other fields are perceived as more intense. Expectations of the enterprise's key stakeholders and requirements of business partners reflecting others' attitudes are positively correlated with concern for the environment. Cost factors and the perception of new opportunities in the market are also rated as more important.

There are also relations concerning barriers. Some of them are assessed as less severe. This applies to obstacles from the field of formal institutions, such as inadequacy of CE regulations to the company's specifics and lack of pro-innovation state policy, but also to informal institutions – company's attitudes relating to lack of knowledge of CE benefits and perceiving CE targets as over-ambitious. Similarly, the operational barriers – difficulty in finding partners for implementing CE and the high complexity of waste recovery – tend to be evaluated as less crucial.

[2] The correlation index (0–0.3) is considered as none or weak, (0.3–0.5) moderate, (0.5–0.7) strong, and above 0.7 very strong.

Such results indicate that entrepreneurs' positive attitudes towards the environment co-occur with a more vital perception of the role of other essential drivers and a weaker perception of critical barriers.

5. Conclusion

Adopting an institutional perspective in the study of circular transition allows us to see these issues in a new light. The paper identifies two groups of institutional factors that determine change in enterprises. The research findings indicate that changes are needed in formal and informal institutions to support transition effectively.

As shown, companies consider regulations as an essential driver for change, but their shape and quality are not well perceived. Entrepreneurs rate the volatility of regulations, the difficulty of interpreting them and the failure to adapt them to the specifics of the business as vital factors limiting transition. Therefore, there is potential for progress – if regulations are to motivate transition effectively, their quality should improve, providing entrepreneurs with greater stability and predictability. This is all the more important given that the in-depth analysis of the relationship between perceptions of different factors indicates that appreciating regulations' role is related to more favourable enterprises' attitudes towards transition and a lower tendency to perceive different barriers.

Other factors from formal institutions also have the potential to support the transition more strongly. It is worth paying particular attention to developing effective solutions supporting the creation of infrastructure for companies to cooperate. Recent CE analyses indicate that the demand for cooperation will increase (GOZ 2030, 2024, p. 19). Moreover, although the study does not suggest that the role of information activities among enterprises is crucial, and they do not perceive a lack of knowledge about CE, it seems that, in practice, the understanding of the concept is still weak (PARP, 2020, p. 4). Adger et al. (2009) point out that the lack of precise knowledge is one of the crucial limits to climate adaptation. Providing better solutions related to education, financing and strengthening the infrastructure for cooperation could accelerate the transition.

The results indicate the weaknesses of informal institutions. Of particular note are consumers' attitudes. While entrepreneurs do not perceive problems related to authorities' attitudes, they highlight consumer attitudes as slowing the transition. They present themselves as being aware of the need for change, considering the pro-environmental expectations of stakeholders and looking for benefits in circularity. However, they are not meeting the proper demand and do not feel 'rewarded' in the market. The results confirm that society lacks a coherent vision for change and a willingness to participate in

systemic transition. Nonetheless, the results also indicate that entrepreneurs declaring higher motivation with concern for the environment are motivated stronger by other factors and tend to be less discouraged by some barriers. This is a remarkable notion that proves the role of actors' attitudes.

Undoubtedly, changing the attitudes is difficult, but to some extent, it can be stimulated by well-chosen and effective formal institutions. The results suggest their role is discernible in the case of enterprises. Still, it is recommended that the attitudes of all actors, especially consumers, should be influenced. Educational activities are crucial for increasing public awareness and practical support for the transition. Their role is continually highlighted (e.g. Kulczycka, 2019; Mobile Institute, 2021), and the results presented here confirm that emphasis on them is necessary. At the same time, it is crucial to be aware that even educational measures will not lead to sudden changes in attitudes, and it takes time for their effects to become noticeable. Informal institutions resist deliberate change. Nevertheless, with appropriate awareness-raising, people's attitudes can gradually evolve and support a circular transition.

The study presents a first approach to analysing institutional determinants in CE transition. Further steps are needed to deepen the analysis and examine individual institutions more thoroughly. In particular, a more detailed examination of informal institutions is an essential direction for further research. In doing so, it is worth pointing out that the circularity-embedded activities result from the shape of formal and informal institutions. It would be valuable to explore these intersecting institutions' combined roles further. Moreover, conducting a comparative analysis and expanding it on other countries would be vital to provide a more comprehensive understanding of institutional determinants. In further studies, it would also be essential to broaden the research methods and incorporate qualitative research to provide more in-depth perspectives on the issues of circularities' institutional determinants.

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Appendix

Table 1. Correlations between CE regulations and selected factors

Variable	CE regulations (* sig. at 0.05)
Company's concern for the environment	.64*
Standing out from the competition	.36*
Creating a 'green' corporate image	.67*
Variability and unpredictability of regulations	-.27*
Low awareness in society	-.29*
Difficulty in interpreting the CE regulations	-.26*
High costs and risks of pro-ecological innovations	-.31*
Inadequacy of CE regulations to the company's specifics	-.39*
Limited demand for green products	-.31*
Lack of infrastructure needed to implement CE solutions	-.36*
Lack of knowledge of CE benefits to the company	-.29*
Difficulty in finding partners for implementing CE	-.29*
Impediments to CE implementation by local governments	-.32*
Lack of pro-innovation state policy	-.32*
Over-ambitious targets for CE solutions	-.34*

Source: Own preparation.

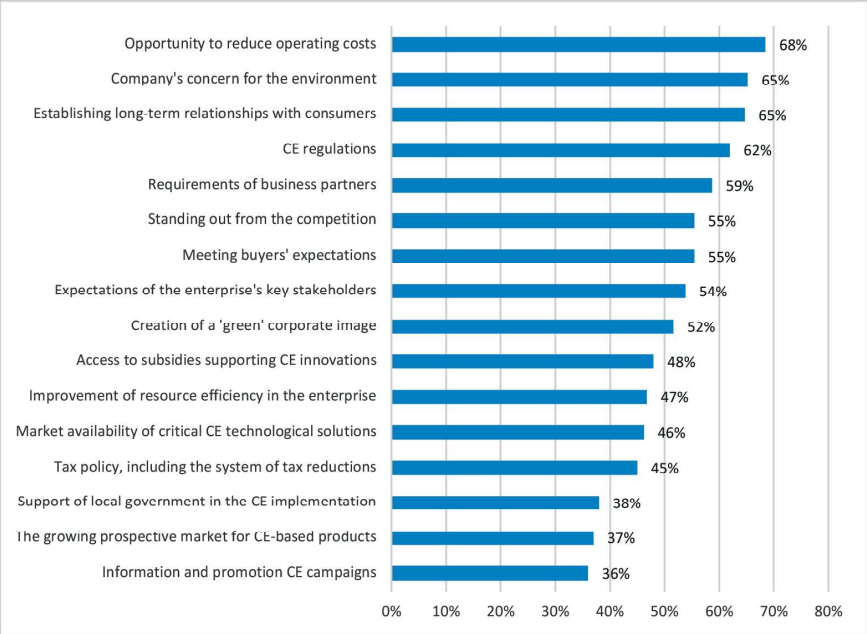
Table 2. Correlations between the company's concern for the environment and selected factors

Variable	Company's concern for the environment (* sig. at 0.05)
Opportunity to reduce operating costs	.45*
Establishing long-term relationships with consumers	.69*
CE regulations	.65*
Requirements of business partners	.65*
Standing out from the competition	.48*
Expectations of the enterprise's key stakeholders	.54*
Creating a 'green' corporate image	.60*
Access to subsidies supporting CE innovations	.52*
Tax policy, including the system of tax reductions	.34*
Support of local government in the CE implementation	.42*

Variable	Company's concern for the environment (* sig. at 0.05)
The growing prospective market for CE-based products	.49*
Inadequacy of CE regulations to the company's specifics	-.42*
High complexity of waste recovery	-.34*
Lack of knowledge of CE benefits to the company	-.32*
Difficulty in finding partners for implementing CE	-.31*
Lack of pro-innovation state policy	-.37*
Over-ambitious targets for CE solutions	-.35*

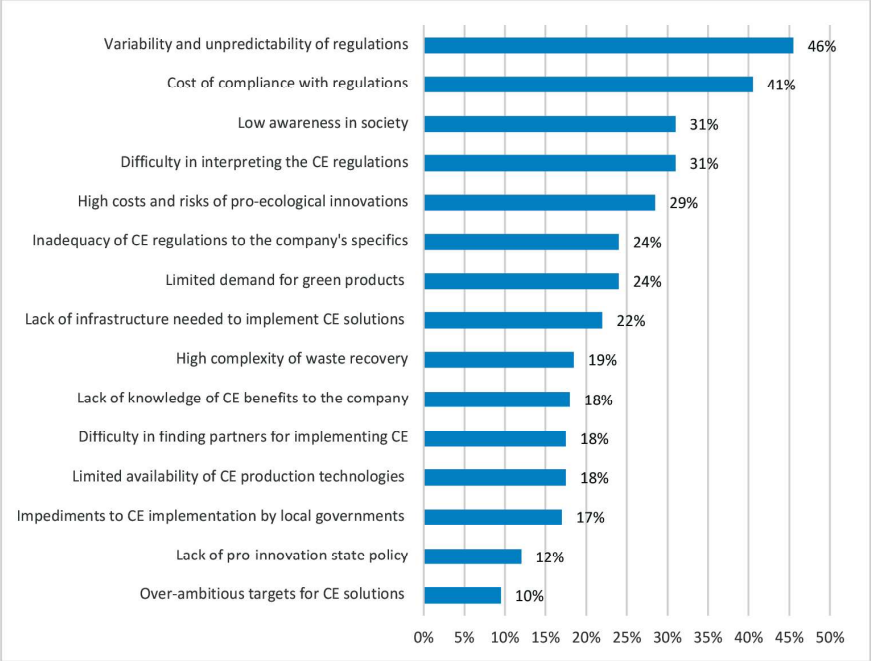
Source: Own preparation.

Figure 1. Drivers of the CE transition*



* % of respondents rating the impact of the factor as important and very important
Source: Own preparation.

Figure 2. Barriers to the CE transition*



* % of respondents rating the impact of the factor as important and very important
Source: Own preparation.