CE-PRINCE
D1.1.2-Private Sector C/GPP Initial Assessment

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Section 1
Introduction



Introduction

The European Green Deal (2019) and the new Circular Economy Action Plan (2020) aim to deliver a sustainable, low carbon, resource efficient and competitive economy.
Adopting a circular economy de-couples resource consumption from economic growth, by extending product lifecycles through recycling, reusing, refurbishing and remanufacturing. This reduces reliance on imported and virginrawmaterials, mitigates pricevolatility,and creates new business opportunities.

Circular value chains are essential to achieving climate neutrality by 2050: «In a circular economy, carbon dioxide emissions would halve by 2030 and resource consumption by cars, construction materials, real estate land, synthetic fertilizer, pesticides, water use, fuels and non-renewable electricity could drop by 32% by 2030 and 53% by 2050, compared with today» (The circular economy index, 2016).

The Circular Economy Action Plan specifically calls out Green PublicProcurementasakeydriverinthe transitiontowardscirculareconomy:throughtheintegrationof«circulareconomyprinciples»,C/GPPseeks to leverage the purchasing power of the public sector to advance environmental policy objectives and achieve the market's goals of improved environmental, economic, and social sustainability, boosting the motivation for eco-innovation.

Introduction

CE-PRINCE's objective is to advance Circular Economy in Central Europe through Circular/Green Public Procurement to improve companies' circularity while reinforcing the public sector capacity to publish tenders containing more and more elements of circularity.

Since no common standards exist so far and requirements for incorporating circular criteria into public tenders vary from country to country, CE-PRINCE aims to standardise Circular Public Procurement approaches and standards across Central Europe. In order to make its adoption more homogeneous and consistent in the European context and to prevent distortion of the single market, uniform and quantifiable criteria for public tenders will be developed, emphasising circular economy aspects in new or updated sets of EU GPP Criteria.

This document presents the results of the Initial Assessment of the demand (Public Procurers) and supply (Enterprises), outlining the current state of Circular/Green Public Procurement (C/GPP) capacity Central Europe in both the public and private sectors. The initial assessment focuses on four targeted sectors – agri- food, manufacturing, construction, and local maintenance and enhancement from a tourism perspective. Following anapproachthatinvolvedeskresearchandsurveystoEnterprisesandPublicadministration,this analysis seeks to generate a deep understanding of how circular principles and practices are integrated into public procurement processes and the products/services offered by companies, along with the identification of barriers and drivers to circularity.

CE overview by country -Italy



- Entreprises

According to the European Monitoring Framework for Circular Economy, in 2022 Italy's circular material use rate is 20.6%, significantly above the EU average of 11.5%. The overall recycling rate is 53.3%, higher than the EU average(48,8%). Furthermore, Italy excels in optimizing resource value, with a resource productivity of €3.46 per kilogram, well above the EU average of €2.17. Corsini et al., (2024) profiled 1,443 Italian manufacturing firms based on their adoption of circular economy practices, identifying five clusters. About 35% of Italian companies are categorized as "Linear," with no circular economy actions across their product lifecycle. In contrast, 15.6% are "Circular Companies," fully integrating circularity in procurement, design, logistics, and production, often achieving business growth and operating in global markets. The remaining firms ("Transitioning Companies") focus circular efforts on specific lifecycle phases, such as procurement or logistics. These findings underscore the mixed progress in adopting circular economy principles within the Italian manufacturing sector, with significant potential for improvement.
https://ec.europa.eu/eurostat/web/circular-economy/overview

Corsini,etal. (2024).Bridginggaps inthedemandandsupply for circular economy. Cleaner and Responsible Consumption, 15, 100232.

CE overview by country –Austria



- Entreprises

According to the European Monitoring Framework for Circular Economy, in 2022 Austria's circular material use rate is 12.4%, slightly above the EU average. The overall recycling rate is 62.6%, reflecting strong waste management practices. Additionally, Austria's resource productivity is €2.47 per kilogram, higher than the EU average of €2.17, indicating efficient resource utilization. Holly et al., (2023) reveals that 87% of Austrian manufacturing companies view the circular economy as strategically relevant for long-term success, yet implementation remains slow. Over 27.5% of firms have taken no steps toward circularity, and 16.6% are in the planning stage but lack implementation. Around 13% of the company attribute little to no strategic relevance to the circular economy. Companies cite customer demand, environmental concerns, and regulatory pressure as key drivers, while inadequate political support and supply chain challenges are significant barriers.

https://ec.europa.eu/eurostat/web/circular-economy/overview
Holly F, Kolar G, Berger M, Fink S, Ogonowski P and Schlund S (2023) Challenges on the way to a circular economy from the perspective of the Austrian manufacturing industry. Front. Sustain. 4:1243374

CE overview by country -Germany



- Entreprises

According to the European Monitoring Framework for Circular Economy, in 2022 Germany's circular material use rate is 12.5%, above the EU average of 11.5%. The overall recycling rate stands at 69.2%, significantly higher than the EU average by over 20 percentage points. Additionally, Germany optimizes resource value more effectively, with a resource productivity of €2.86 per kilogram compared to the EU average of €2.17. A recent (2023) study reveals varying levels of circular economy adoption among German manufacturing firms, mapping strategies for closing the loop. A significant 36.3% of companies have not implemented any circular strategies, indicating substantial untapped potential. Among those adopting strategies, 23.4% focus on just one, with "creating/enabling circular cycles" being the most common (12.2%). Only 15.6% employ two strategies, most often combining "closing cycles" and "extending cycles" (10.5%). Remarkably, 24.7% holistically integrate all strategies, reflecting a minority of firms embracing comprehensive circular business models.

https://ec.europa.eu/eurostat/web/circular-economy/overview
Lichtenthäler, S., & Neligan, A. (2023). How circular are businesses in Germany?. Intereconomics, 58(2), 79-86.

CE overview by country –Slovenia



- Entreprises

According to the European Monitoring Framework for Circular Economy, in 2022 Slovenia's circular material use rate is 8.3%, below the EU average of 11.5%. The overall recycling rate stands at 62.6%, exceeding the EU average. However, Slovenia's resource productivity is €1.56 per kilogram, which is lower than the EU average of €2.17, indicating room for improvement in resource efficiency. Sebo et al. (2021) reveals that approximately 39% of Slovenian manufacturing firms implement water recycling technologies, 34% adopt energy recovery solutions, and 37% engage in remanufacturing practices. Larger firms, R&D- active companies, and those with medium or large batch production are more likely to implement circular economy technologies. External demands, such as supplier requirements from Western European markets drive the Slovenian manufacturing companies' progress. These insights highlight Slovenia's gradual but meaningful steps toward integrating circular economy technologies.

https://ec.europa.eu/eurostat/web/circular-economy/overview
Šebo, J., Šebová, M., & Palčič, I. (2021). Implementation of circular economy technologies: an empirical study of Slovak and slovenian manufacturing companies. Sustainability, 13(22), 12518.

CE overview by country -Hungary



- Entreprises

According to the European Monitoring Framework for Circular Economy, in 2022 Hungary's circular material use rate is 4.9%, well below the EU average of 11.5%. The overall recycling rate is 32.8%, below the EU average of 48,8%. Hungary's resource productivity stands at €1.09 per kilogram, which is also below the EU average of €2.17, demonstrating significant opportunities for development. A study from Fekete et al. (2022) clustered Hungarian enterprises revealing three distinct groups based on circular economy practices. The "Environmentally Goal-Oriented" cluster, representing 39% of firms, actively implements all circular economy objectives, including reducing emissions and increasing product durability. The "Resource-Oriented" cluster, encompassing 31% of firms, prioritizes resource efficiency but underemphasizes other circular goals. Lastly, the "Non-Environmentally Goal-Oriented" cluster (30%) shows minimal engagement with circular practices. These findings highlight a fragmented landscape and significant opportunities for broader circular economy adoption in Hungary.

https://ec.europa.eu/eurostat/web/circular-economy/overview
Fekete-Berzsenyi, H., Koczor-Keul M., Molnár T. (2022). The implementation of the circular economy requirements among Hungarian enterprises – capital versus countryside. Deturope. T4(2), 108-126.

CE overview by country -Croatia



- Enterprises

According to the European Monitoring Framework for Circular Economy, in 2022 Croatia's circular material use rate is 6.8%, below the EU average of 11.5%. The overall recycling rate is 34.2%, which is significantly lower than the EU average (48,8%). Additionally, Croatia's resource productivity is €1.24 per kilogram, also below the EU average of €2.17, reflecting the need for enhanced resource efficiency. Several studies emphasize that Croatian companies face significant challenges in adopting circular economy practices, including administrative barriers, limited financial incentives, and low levels of innovation. (Andabaka et al., 2018) Manufacturing firms in particular report difficulty accessing financing and navigating complex legal frameworks (Svark et al., 2022). Despite progress in municipal waste recycling, circularity remains constrained, with a circular material use rate of only 4.9%, among the lowest in Europe.

https://ec.europa.eu/eurostat/web/circular-economy/overview
Švarc, J., Dabić, M., & Lažnjak, J. (2022). Assessment of the European monitoring frameworks for circular economy: the case of Croatia. Management of Environmental Quality: An International Journal, 33(2), 371-389.
Andabaka, A., Beg, M., & Gelo, T. (2018). Challenges of circular economy in Croatia. International journal of multidisciplinarity in business and science, 4(5), 115-126.

CE overview by country -Poland



Entreprises

According to the European Monitoring Framework for Circular Economy, in 2022 Poland's circular material use rate is 6.7%, below the EU average of 11.5%. The overall recycling rate stands at 40.9%, also below the EU average. Furthermore, Poland's resource productivity is €0.85 per kilogram, significantly lower than the EU averageof€2.17,highlightingconsiderablepotentialforadvancingcirculareconomy. Polishmanufacturing companies face challenges in implementing circular economy practices, primarily due to insufficient industrial symbiosis and limited support for recovery technologies (Kledynski et al., 2020). Key barriers include fragmented legal frameworks, a lack of cross-sector collaboration, and underdeveloped recycling infrastructures (Smol et al., 2021). Despite these challenges, growing ecological awareness and innovative rawmaterial recovery technologies are emerging drivers for CE adoption in Poland, though progress remains uneven and slower than in Western Europe.

https://ec.europa.eu/eurostat/web/circular-economy/overview

Smol, M., Marcinek, P., & Koda, E. (2021). Drivers and barriers for a circular economy (CE) implementation in Poland—A case study of raw materials recovery sector. *Energies*, *14*(8), 2219.

Kledyński, Z., Bogdan, A., Jackiewicz-Rek, W., Lelicińska-Serafin, K., Machowska, A., Manczarski, P., ... & Zubrowska-Sudol, M. (2020). Condition of circular economy in Poland. *Archives of Civil Engineering*, *66*(3).

Questionnaire Overview

The Initial Assessment has been conducted through an in-depth survey examining the dynamics of both the demand and supply sides.
The questionnaire surveys were developed based on a thorough review of relevant scientific and grey literature, focusing on measuring GPP implementation, circular economy performance, barriers and drivers, and organizational learning and adaptation. The questionnaires were designed in a complementary manner, ensuring that circular criteria in public tenders align with enterprises' circularity practices.

By analyzing the balance between circular demand and supply in both public and private sectors, this assessment outlines the current state of C/GPP implementation across Central Europe and evaluates circularity readiness. The tools developed as part of this project—targeted at public administrations (to strengthen C/GPP) and businesses (to improve circularity practices)—aim to support the transformation and advancement of the circular economy in the region.

After design, the questionnaire was reviewed by all CE-Prince project partners, who provided valuable feedback to improve the survey by modifying or rewording items to reduce potential bias and misleading question wording.

Enterprises questionnaire overview

Section	Purpose
Performance	To evaluate the extent to which circular economy practices have been implemented considering the main lifecycle stages of products or services: design, procurement of material, production process optimization, logistics, product's information, end-of-life.
Company's Commitment to GPP	To assess the level of company engagement in public procurement, including frequency and success of tender applications, and participation at local, regional, and central scales.
Barriers & Drivers	Barriers: To identify the relevance of economic, administrative, regulatory, market-related, and technological barriers that hinder companies' ability to participate in green public procurement. Drivers: To identify the relevance of economic, market, and regulatory drivers that encourage companies to engage in green public procurement and meet green or circular criteria.
GPP Orientations	To assess the orientation of companies towards public procurement, including internal commitment for public buyers and external pressures from competitors, as well as the coordination within companies for successful tender applications.
Public Buyer Attractiveness	To evaluate the attractiveness of the public sector as a partner for private companies, focusing on innovation, and collaborative approaches towards greener and more circular products.
Organizational Learning	To examine the processes through which companies acquire insights and knowledge about circular economy innovations, adapt to new methods, and reorganize resources to meet circularity criteria effectively.

Questionnaire Overview

Questionnaires' specularity between public and private sectos is aimed to assess the circularity potential as well as the gaps that hinder the matching between demand and supply, focusing on the following aspects:

- C/GPPintegrationandenterprises'circularityperformanceareinvestigated,toassessthecurrentlevelof implementation across Central Europe. The questionnaires' sections regarding circularity aspects are built specular to assess current strengths and weaknesses related to the matching between public demand and supply of circular economy.

- Publicbuyers'attractivenessfromthecompanies'perspectiveisinvestigated,withafocusonperceived innovativeness, mirroring suppliers' knowledge «awareness» from the public procurers' perspective.

• Enterprises'Organizationallearningsection,whichismeanttoexaminetheprocessesthroughwhich companies acquire new insights and knowledge about circular economy innovations and adapt to new methods, is specular to PA's Organizational aspects, where internal learning procedures are investigated.

- Barriers and Drivers to circularity implementation are investigated in both questionnaires; assessing the initial barriers is crucial to develop the Transnational Strategy and to provide solutions and guidelines to support the process towards circularity.

Survey Dissemination in public and private sectors

The survey was launched in mid-September 2024 and disseminated through the networks of project partners. Each partner

• Italy: For the private sector, Liguria Region and the Genoa Chamber of Commerce worked in synergy. Companies were selected focusing on sub sectors relevant to public procurement, specifically those offering services or goods already covered by existing environmental criteria. This selection was facilitated by matching NACE codes with environmental criteria, allowing to exclude enterprises producing items not currently aligned with GPP requirements. Geographically, the outreach was limited to the Liguria region, to accurately reflect the regional context and avoid distortions that could arise from engaging companies at the national level. Considering the region's economic structure, most of the enterprises targeted were micro or small-sized, with a few exceptions in the construction sector. The Chamber of Commerce facilitated communication by sending the survey through Certified Electronic Mail (PEC), while some enterprises with an established relationship with the Chamber were contacted directly via telephone or email to encourage their involvement. Regione Liguria sent out the survey through several mailing lists of enterprises that already participated in specific networks, projects and calls for grants related to sustainability. For the public sector, the focus was similarly concentrated on regional entities, including municipalities, the metropolitan city, and provincial administrations. Communication was primarily conducted through the GPP infoNet mailing list and a dedicated newsletter. Formal invitations, co-signed by the regional departments involved in the project, were also sent via PEC to reinforce the official nature of the outreach. Furthermore, public entities that already collaborate with the Environment Department were directly approached via telephone or email to ensure higher engagement and response rates.

Survey Dissemination in public and private sectors

- Croatia: The DURA agency conducted data collection across the entire NUTS2 region of Adriatic Croatia in the Republic of Croatia. Target companies were identified based on their geographic location and industry sector, focusing on tourism-related businesses such as accommodation services, food and beverage services, travel agencies, and tour operators. The selection included both companies with an active collaboration history and those without any prior partnerships. The survey link was distributed via direct emails, telephone calls, and newsletters. Targeted public authorities were located within the City of Dubrovnik and Dubrovnik-Neretva County, and all were actively involved in current collaborations. The survey link was shared through direct emails sent by the Director of DURA, followed by telephone calls as part of the follow-up process.

- Poland: ARMSA engaged a research company to reach their target audience. The Marshall Office facilitated contact with public institutions by distributing the survey link to the relevant entities.

- Hungary: ERI utilized its networks to reach targeted respondents, while STRIA collaborated with a professional research company. The selected companies were chosen based on their prior involvement in public procurement.

Survey Dissemination in public and private sectors

- Austria: For the private sector (enterprises), data collection focused on companies located in the Styria region. The primary approach involved leveraging contacts from internal databases, as well as utilizing partners and business connections. The survey link was distributed mainly via email, but newsletters and social media platforms (e.g., Facebook and LinkedIn) were also employed. The involvement of the Styrian Business Promotion Agency, which supports and funds local companies, greatly facilitated engaging participants. For the public sector (public administrations), efforts were also concentrated in the Styria region, using internal databases and business partners. The survey link was shared predominantly through email and newsletters, with telephone surveys considered if necessary. Additionally, the survey wording was simplified to encourage greater participation from public administrations, ensuring clarity and accessibility.

- Slovenia: CCIS conducted a nationwide dissemination of the questionnaire, targeting listed companies and both local and national public administrations. Distribution methods included emails, newsletters, website announcements, and social media posts. To improve response rates, telephone-based data collection was also utilized.

Survey Dissemination in public and private sectors

- Germany: ABW contacted public administrations and enterprises in their network from former projects and cooperations in the region. Due to low response rate, they the scope and sent the questionnaire directly to procurement departments in municipalities and municipal companies across sectors (f.e. utilities, transport, education, healthcare, culture). ABW selected public authorities by checking on-going tenders via the national procurement platform and their websites and selected enterprises by their capacity to attend tenders (i.e. size/scope, procurement department, public contracts). Despite extensive efforts, they encountered challenges due to low commitment from associated policy entities and lack of responses from the enterprises contacted.

Survey Dissemination in public and private sectors

The data collection phase successfully concluded in mid-November 2024, exceeding the response targets for both Enterprises (target: 300) and Public Administrations (target: 200). Specifically, 398 responses were collected from Enterprises and 232 from Public Administrations.

To ensure high-quality standards for data analysis, a data cleaning process was applied to the collected responses. This process considered the completion rate of the questionnaires and the number of "Not Applicable" (NA) entries. Specifically:

- Partially completed responses with insufficient data to evaluate the state of Circular Economy implementation/GPP implementation, as well as barriers and drivers, were excluded.
- Responseswithatleasttwosectionsentirelymarkedas"NA"werealsodiscarded.

This rigorous approach ensures that the analysis is both robust and meaningful, providing reliable insights into the dynamics of Circular Economy implementation and Green Public Procurement.

Following this process, the final sample includes 283 responses from Enterprises and 212 from Public Administrations, building a solid foundation for following analyses.

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Section 2
Circular Economy Supply

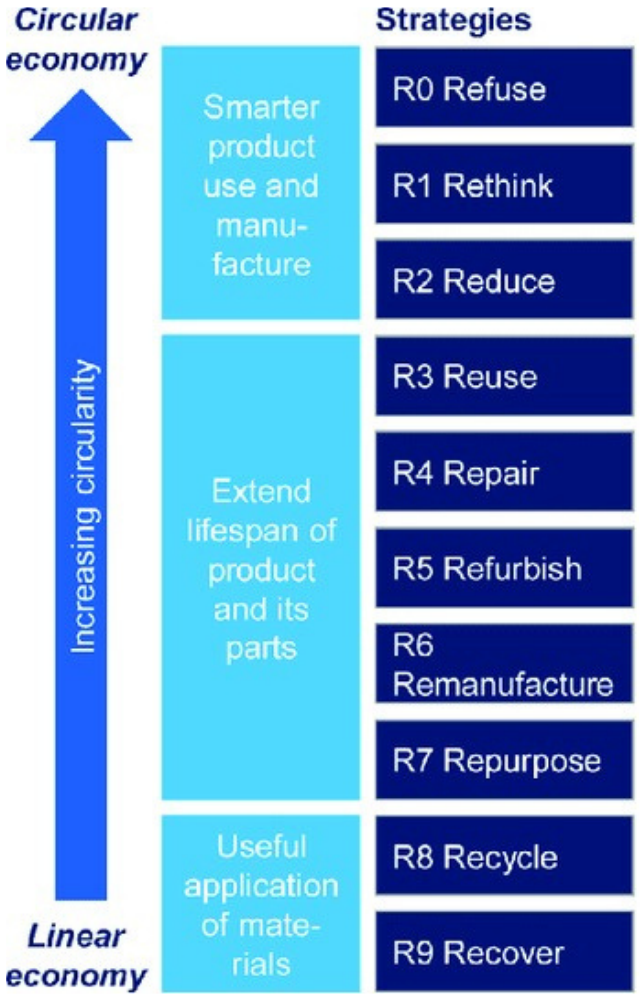


The Circular Economy Model

The circular economy represents an economic model designed to minimize waste and make the most of resources by extending the lifecycle of products and materials. Unlike the traditional linear economy, which follows a "take, make, dispose" approach, the circular economy focuses on keeping products, components, and materials in circulation for as long as possible. This is achieved through numerous practices such as recycling, reusing, refurbishing, and remanufacturing.

For companies, adopting circular economy principles offers several important benefits. Firstly, by reusing materials and integrating recycled components, companies can reduce the cost of raw materials and waste management. Additionally, circular business models open up new market opportunities. As more consumers and industries demand sustainable products, companies that innovate with circular models can open to new customers.

Beyond the financial benefits, companies that embrace circularity can also gain a competitive advantage. As regulations on environmental sustainability increase globally, businesses that are proactive in adopting sustainable practices will be better positioned to comply with new standards. Finally, by adopting circular economy practices, companies contribute to reducing their overall environmental impact, helping to meet global sustainability goal.



Circular Economy and Business Model Innovation

While some companies have already fully adopted circular business models, offering products and services that are designed with sustainability and circularity in mind, many others are still transitioning from traditional linear business models.
Those that have made the transition demonstrate that circularity can become a core part of a company's

strategy, driving not only environmental benefits but also long-term economic value. These innovative companies implement circularity across various stages of their operations—through sustainable design, resource-efficient production, product take-back programs, and circular procurement. They often focus on creating value beyond product sales, for example by offering services that allow products to be leased, maintained, and upgraded instead of being discarded. However, these companies remain a minority, with the majority of businesses still relying on linear models.

For most companies, the transition to a fully circular model is a gradual process. They often begin by integrating circular economy principles in specific aspects of their operations, such as improving material sourcing by using recycled inputs or enhancing product design to ensure durability and recyclability. As companies become more comfortable with circular practices, they can expand these principles to other parts of their business model, ultimately creating a more sustainable and resilient organization.

For many companies, this transformation involves progressively integrating circular economy principles into one or more stages of the product or service lifecycle.

Circular Economy and Business Model Innovation

In a comprehensive study by Corsini et al. (2024), over 1,400 companies were analyzed to determine the extent to which they have adopted circular economy practices.
Linear Companies were found to be the biggest group (35%).

These companies continue to operate under a traditional linear model, with no significant circular economy practices, still following the "make, use, dispose" approach. Transitioning companies represent those companies that are in the process of adopting circular economy practices, but not yet fully integrated across all operations. The 18% of them focuses on circular practices in procurement and product design but has yet to extend these to logistics or production. The 15% emphasizes logistics, implementing solutions like reverse logistics to promote reuse. Lastly, the 17% concentrates on improving internal process efficiency by optimizing energy and resource use but has not fully embraced circularity in procurement or logistics. Together, these companies highlight the gradual, step-by-step nature of the transition toward a fully circular model.



Conversely, the fully Circular Companies, that have implemented circular economy practices across all phases represent only the 16% of the total sample.

The role of public procurement in the Circular Transition

Public procurement plays a critical role in supporting companies on their transition toward circular business models. Public buyers can leverage their purchasing power to stimulate innovation and promote sustainable practices. By including sustainability requirements in tenders, demanding circular products and services, and encouraging the adoption of innovative solutions, public procurement is considered a powerful tool in driving the circular economy.

A key factor in this process is the perceived innovativeness of public buyers. The way companies view public procurers in terms of their willingness to embrace innovation can significantly influence resource allocation and investment decisions. If public procurers are perceived as open to new ideas, companies are more supported to invest in circular solutions and, therefore, prioritize public tenders. On the contrary, if public buyers are seen as resistant to innovation, this can act as a barrier to adopting circular practices in public procurement.

Moreover, companies face both barriers and drivers when participating in C/GPP. Financial, regulatory, and administrative barriers often increase the effort of participation in C/GPP tenders. At the same time, economic incentives, client demand for sustainable solutions, and opportunities for innovation serve as important drivers. Overcoming these barriers and enhancing the drivers are essential for enabling more companies to engage in circular public procurement and accelerate their transition to sustainable practices.

Strategies for C/GPP success

To successfully participate in CGPP, companies must adopt well-defined strategies that enable them to navigate the complexities of the public procurement.

These strategies often include monitoring competitors' actions in the public sector, strengthening relationships with public clients, and ensuring strong coordination both within the company and with external suppliers and partners. For example. Customer and client orientation involves actively understanding and responding to the needs of public sector clients, ensuring that products and services align with their circular economy goals. Effective internal coordination fosters collaboration across departments, aligning efforts toward circular procurement objectives, while external coordination, especially with supply chain partners, ensures that suppliers and logistics operations are integrated to support sustainability and circularity throughout the entire process.

In addition to these strategies, a company's ability to learn and adapt is crucial for its long-term success in the circular procurement market. Organizational learning enables businesses to acquire new knowledge, leverage insights from past experiences, and continuously improve their approach to circular economy practices. Through effective knowledge sharing, companies can ensure that valuable information flows across departments and is utilized to drive improvements. Equally important is resource reconfiguration, which involves reallocating internal resources to better align with the demands of G/C PP. Companies that are agile in adapting to market changes, integrating new circular innovations, and coordinating their internal processes are more likely to thrive in a rapidly evolving procurement environment.

Together, these strategies and learning mechanisms support companies to compete more effectively in G/CPP.

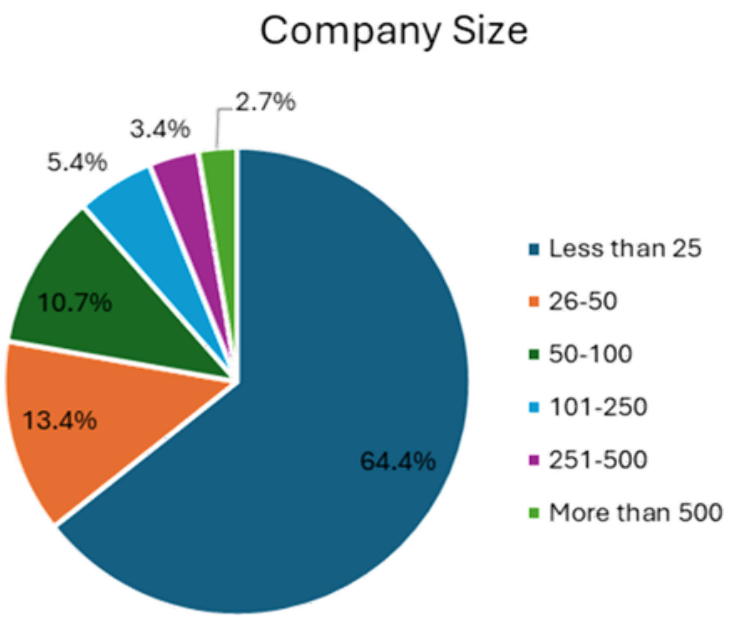
Circular Economy Supply Assessment

The Initial Assessment of supply (Enterprises) seeks to generate a deep understanding of how circular principles and practices are integrated into the products/services offered by companies at public buyers.

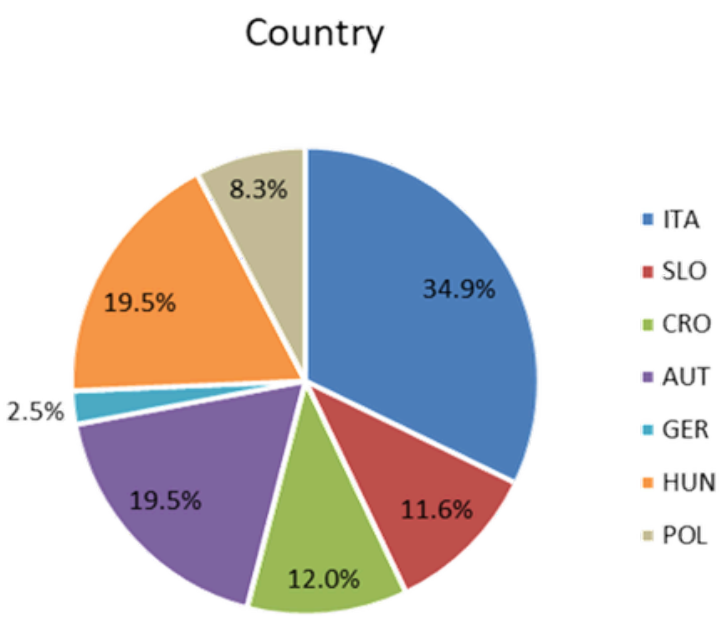
Based on the current frameworks to assess circular economy performances in enterprises, and on possible strategies to boost the transition toward circular transition, a questionnaire survey was designed and disseminated, covering various sections, including:

- Thelevelofcircularityinthedifferentphasesoftheproduct/servicelifecycle
- Barriersanddriverstoimplementingcircularity
- Thecompany'scommitmenttoparticipatinginC/GPPtenders
- TheperceivedinnovativenessofPublicProcurers
- Organizationallearningandadaptationdynamics

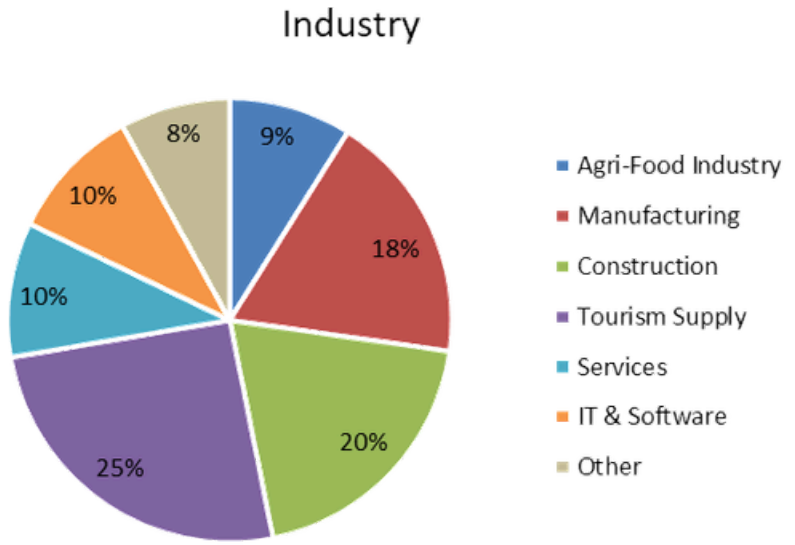
Sample Description



Over three quarters (77,8%) of respondents consists of small enterprises with less than 50 employees, highlighting the prevalence of smaller-scale businesses in the dataset. The skew towards smaller companies in the sample is highly aligned with the reference population in targeted countries.



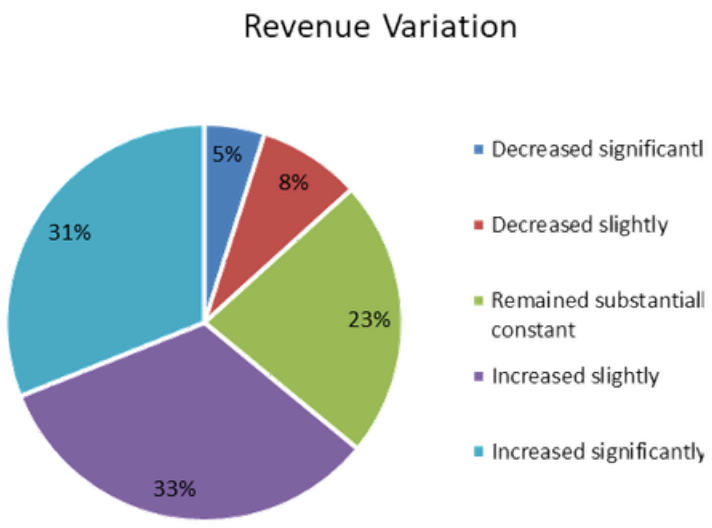
While most of responses originated from Italy (34.9%), Hungary (19,5%) and Poland (19.5%), other countries are well-represented relative to their target populations. However, responses from Germany were limited, accounting for just 2,5% of the sample.



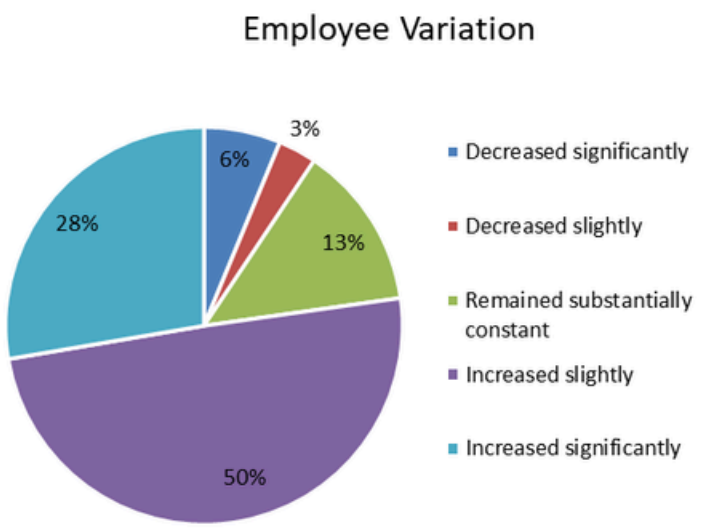
There is high representation from Tourism supply (25%), Construction (20%), Manufacturing (18%) and Agri-food (9%) sectors, known for their significant environmental impacts and potential for circular economy innovations. Other sectors like IT software and Services were also reached by the survey dissemination and are well represented in the sample.
The diversity in size, industry and country helps in

understanding challenges and opportunities for implementing circular economy.

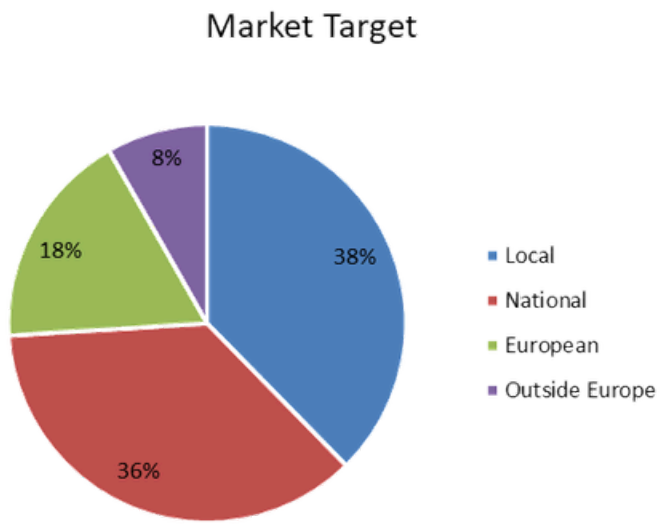
Sample Description



In terms of revenue variation, the results suggests a largely stable or positive trend, with 33% of enterprises reporting a slight increase and 31% experiencing significant revenue growth. Only a small fraction, 13% of companies, faced a decrease in revenue, reflecting an overall economic growth among the companies.

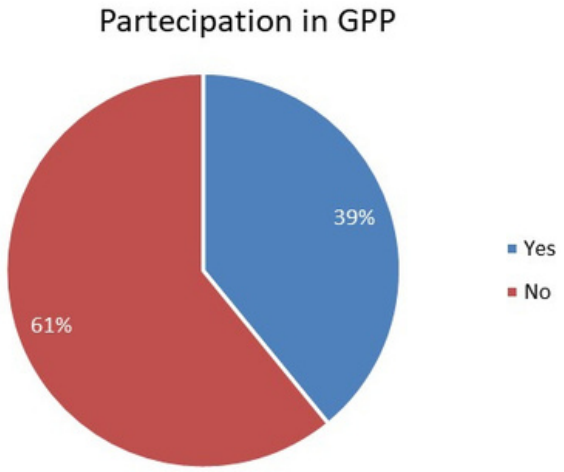


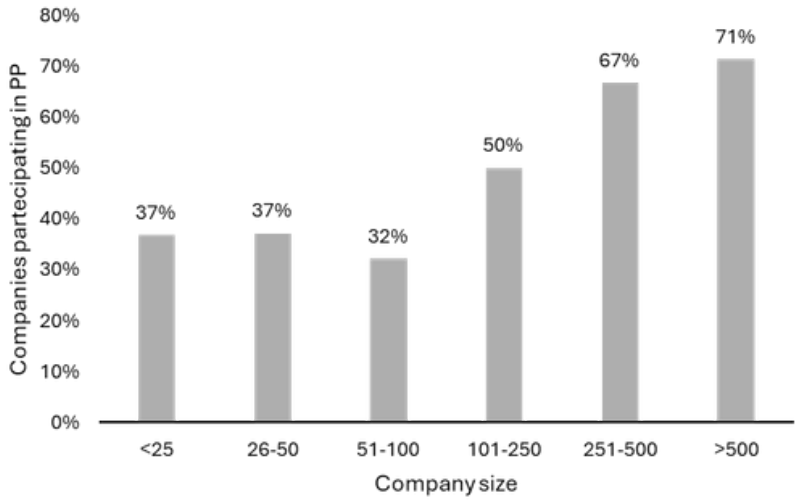
Employee variation confirms this stability, as half of the enterprises (50%) reported a slight increase in number of employees, while 28% saw a significant increase. This indicates that, despite current challenges, many enterprises have managed to maintain or slightly grow their workforce, which may point to adaptation to uncertain market conditions.

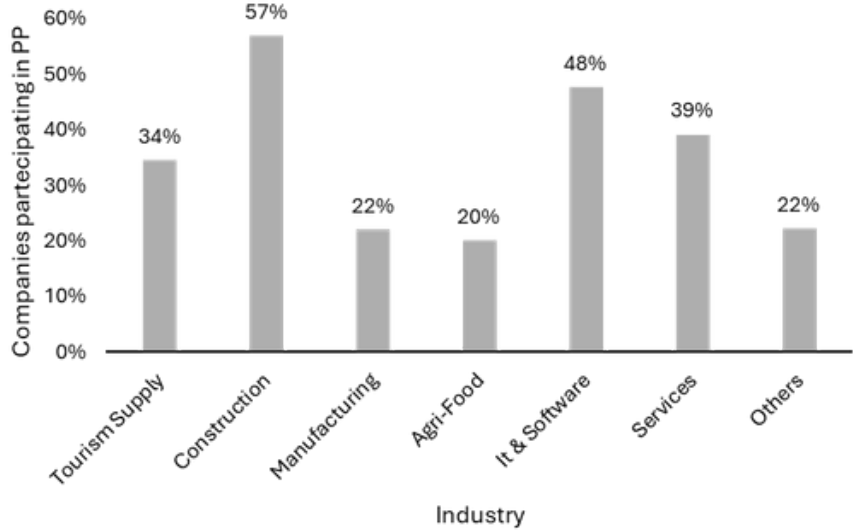


The largest proportion of enterprises (38%) focuses on local markets, while 36% target national markets. Interestingly, 18% are oriented towards European markets, and 8% engage in markets outside Europe. This distribution underscores the different market goals of the sample, with a significant share looking beyond local or national markets, which could influence their engagement with circular practices given different market demands.

Enterprises' Commitment to C/GPP





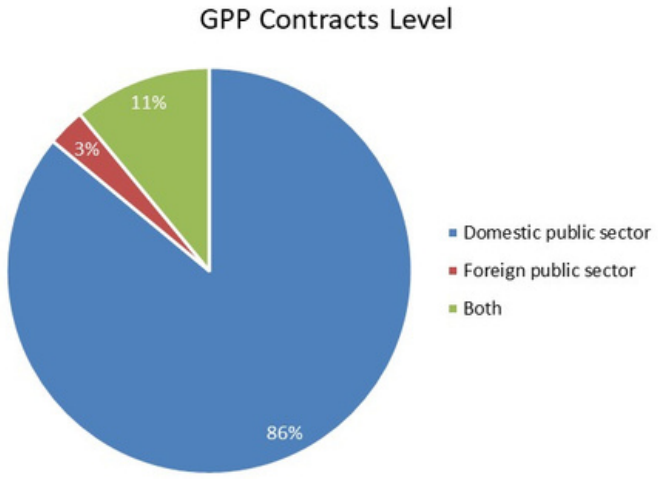


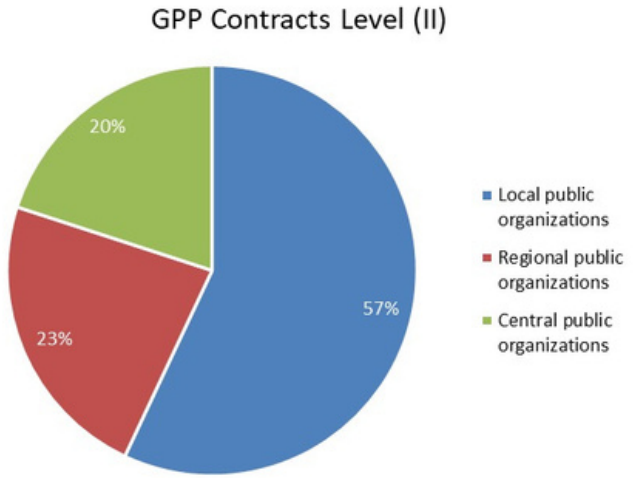
Only 39% of the respondent enterprises have participated in public procurement in the past three years. Most respondents remains not committed to public procurement opportunities, potentially reflecting barriers such as limited resources or lack or regulatory challenges.

Larger companies are significantly more likely to engage in public procurement, with a strong positive trend as company size increases. This trend reflects the ability of larger firms to meet the complex requirements of public tenders, including green or circular criteria, which smaller companies may find more challenging.

Sectors such as construction and IT & software have higher levels of public procurement participation, possibly due to their alignment with typical government projects and the emerging digital needs. In contrast, manufacturing and agri-food industry exhibit much lower participation rates.

Enterprises' Commitment to C/GPP





The majority (86%) of GPP contracts are awarded to enterprises by the domestic public sector, indicating that enterprises predominantly engage in green procurement within their national boundaries. Only 3% of enterprises report involvement in contracts with foreign public sector organizations, while 11% engage with both domestic and foreign sectors, suggesting limited cross-border engagement in green procurement.

Local public organizations emerge as the most significant PA-level to which companies apply, accounting for 57%. Regional public organizations represent 23%, while central public organizations, such as states or federal governments, contribute to 20%. This distribution underscores the critical role of local administrations as key drivers of procurement opportunities for enterprises, while also pointing to the need for greater engagement of companies with regional and central government bodies.

Circular Economy Performance

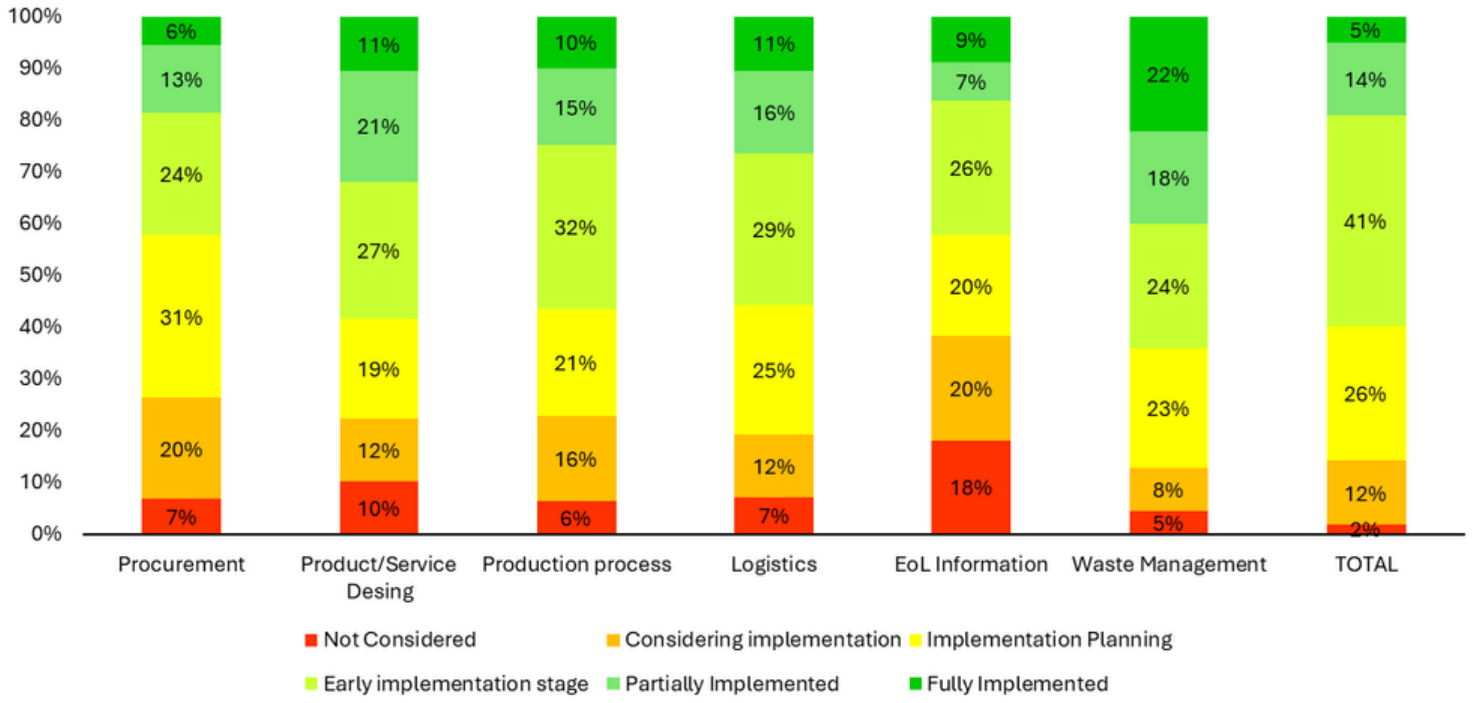
The circular economy performance was measured by assessing the actions companies take across different phases of the product or service lifecycle, from the procurement of raw materials to the end-of-life management. Each phase presents opportunities to implement circular practices.

Procurement	Assesses the sourcing of recycled materials, by-products, and the preference for local, sustainable suppliers. It also evaluates supplier accreditation processes based on circularity principles.
Design	Evaluates how products are designed for durability, repairability, and recyclability. It also examines the use of recycled materials in packaging and collaboration to enhance product circularity.
Production	Focuses on the use of technologies that optimize resource efficiency and reduce environmental impact, including circular management of waste and water within production processes.
Logistics	Assesses practices like reverse logistics, optimizing delivery routes, and the use of sustainable transport solutions (e.g., electric vehicles, intermodal options).
Product Use	Measures how companies inform and support customers in sustainable use, repair, and reuse of products, including buy-back programs and training on circular practices.
Waste management	Evaluates the management of product and packaging waste, including recycling programs and take-back initiatives, with a focus on material and energy recovery.

Circular Economy Performance

This bar chart provides an overview of the level of circular economy implementation across different phases of the life cycle.

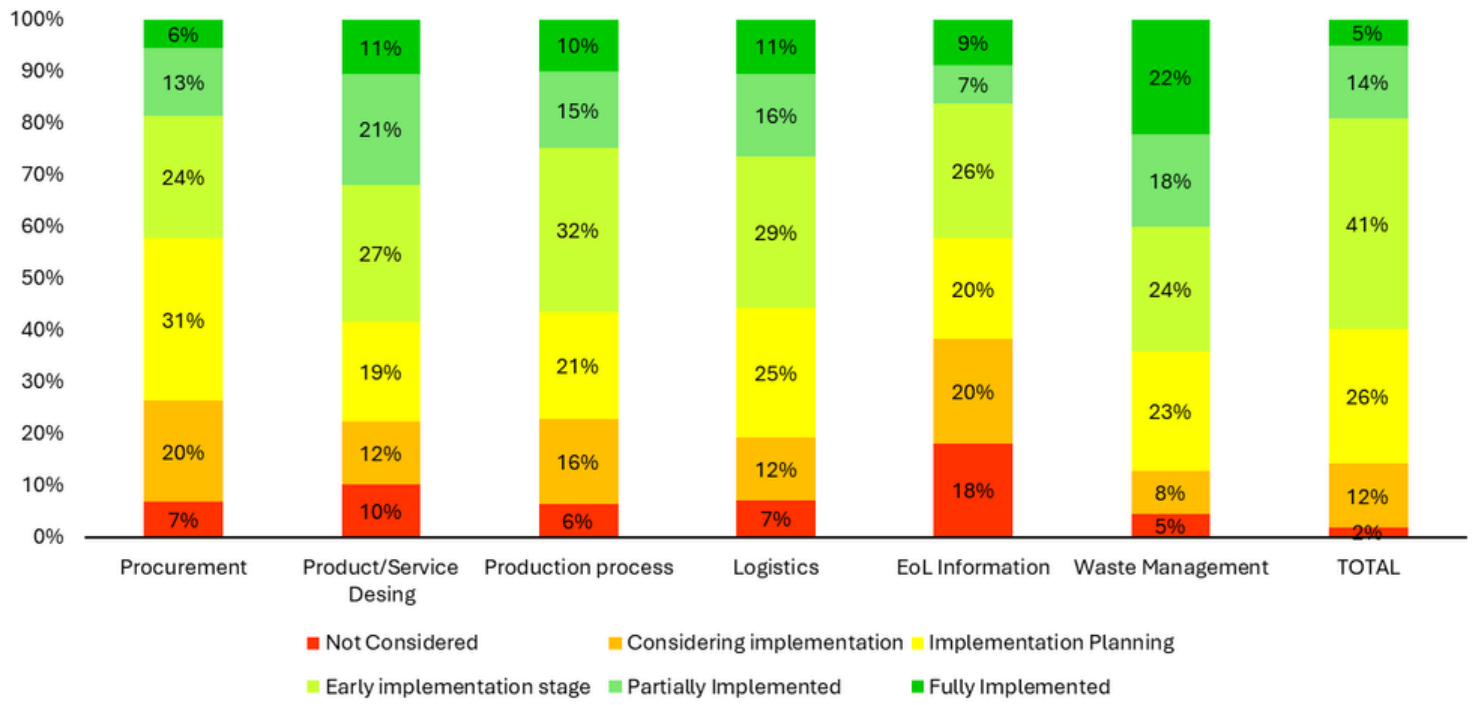
- The procurement phase lags in advanced implementation levels, with only 19% of companies reporting high implementation (partial + full); and half of companies (51%) still considering or planning implementation. This indicates that circularity in sourcing practices is still at a nascent stage for many organizations.
  Product/service design and the production
- process phases are relatively comparable in their levels of implementation. In product/service design, 32% of companies report high implementation, suggesting a moderate focus on embedding circularity at the design stage. Similarly, in the production process, 25% of companies have achieved high implementation, highlighting an emphasis on improving resource and energy efficiency in manufacturing.



Circular Economy Performance

This bar chart provides an overview of the level of circular economy implementation across different phases of the life cycle.

- Logistics shows similar adoption, with 27% of companies having high implementation, and 37% are considering or planning circular practices implementation.
- Use and Consumption information on EoL is one of the least implemented phases, with only 16% of companies having reached implementation. The 18% of companies have not even considered integrating circularity into this phase, reflecting a significant gap in customer engagement and product lifecycle management.
- Waste management emerges as the most circular phase, with a combined 40% of companies reporting successful implementation. This suggests that regulatory pressures and established recovery practices drive notable progress in this area.



- Looking at the TOTAL column, only 2% of companies have not considered circularity at any phase, and a small 5% have fully implemented circular practices across all phases. The majority, however, remain in the early stages of implementation (41%), which indicates a general awareness and effort to incorporate circularity but highlights the need for additional support, resources, and policy incentives to accelerateprogressinthe circulartransition

Circular Economy Performance

Enterprises demonstrate varying levels of implementation of circular economy across all stages of life cycle, with certain practices being more widely adopted, while others face slower progress.*

- Purchasingpracticeshavemoderatelevelsofcircularityintegration,withsignificantadoptionoflocalsourcing(54%high implementation), reflecting an alignment with regional sustainability priorities. However, more complex practices, such as purchasing by-products (13%) or accrediting suppliers for circular economy criteria (19%), remain less implemented, indicating gaps in supply chain integration.

- Productdesignpracticeshighlightastrongerfocusonproductsdurability(51%),showinganemphasisoncreatinglong-lasting and reparable products. However, collaboration with external institutions to innovate for circularity is lagging (27%), suggesting missed opportunities to leverage external expertise for product innovation.

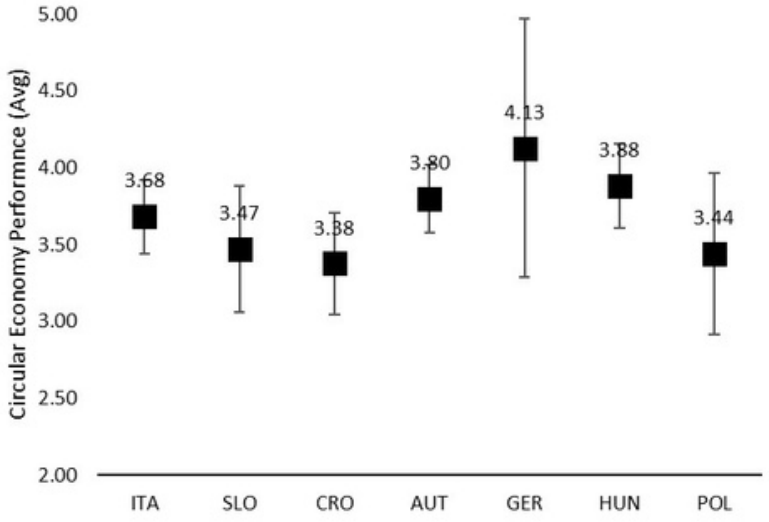
- Intheproductionprocessstage,efficientuseofenergy(47%)andrawmaterials(44%)isfairlycommon,butwastewater management and circular use of production waste show lower adoption rates. Logisticspracticesexhibitastrongfocusondeliveryrouteoptimization(49%and44%,respectively),reflectingeffortstoreduce emissions.
- However, the use of intermodal or low-impact transportation solutions remains less widespread.

- Theuseandconsumptionphasedemonstrateslimitedadoptionofpracticesthatengagecustomersinsustainablebehavior. While providing end-of-life information (39%) and facilitating product reuse (27%) are partially implemented, communication campaigns targeting external stakeholders for circularity goals are less common (19%).

- Finally,wastemanagementpracticesemergeintherecyclingcollectionofproductionandpackagingwaste,with58%and 53% of implementation, respectively. However, take-back programs and material recovery lag behind, indicating potential to close the loop on material use.

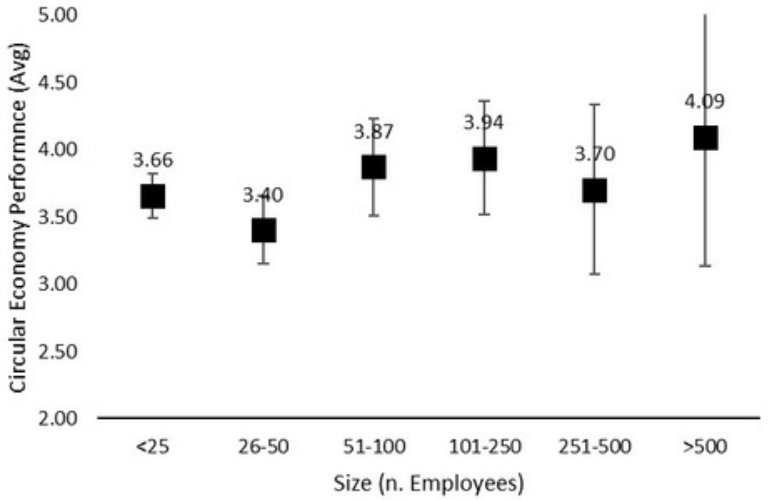
A detailed analysis of the implementation of each circular practice mapped is provided in the ANNEX I.

Circular Economy Performance

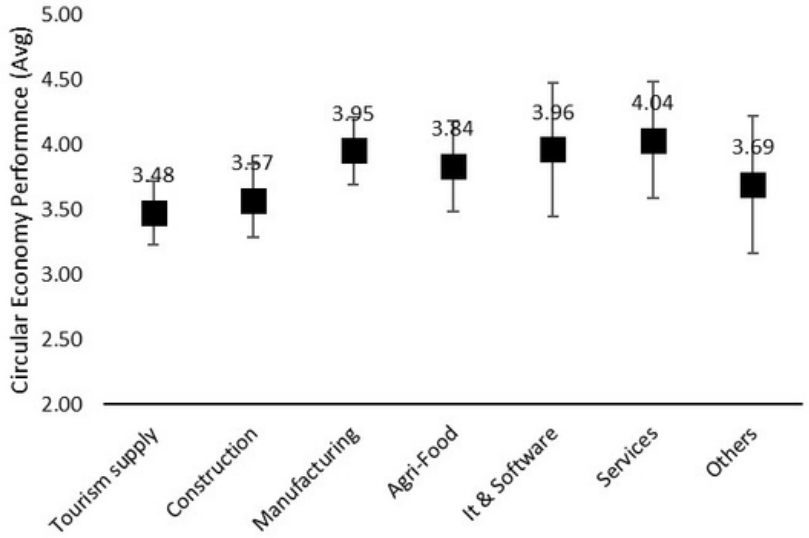


The graph shows the average circular economy performance across countries and the 95% Confidence interval. Germany stands out with the highest average score of 4.13, reflecting a higher level of circular economy practices, although it also shows notable variability among companies due to the limited sample. All the other countries follow closely, indicating an overall moderate adoption of circular practices.

While these differences highlight cross-country integration, these are not statistically significant. Even small, these difference can be potentially driven by variations in regulatory environments, market maturity, and policy support across countries. .

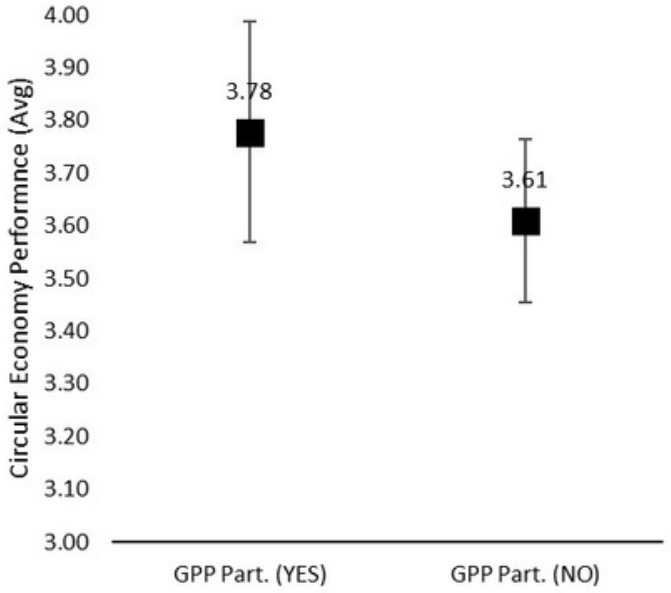


Interestingly, the differences between small and large enterprises are relatively low, suggesting that company size does not play a decisive role in circularity performance. Larger companies (>500 employees) achieve the highest average score (4.09), but this is accompanied by significant variability, likely reflecting the limited number of observations in this category. Small companies (<25 employees) also perform similarly (3.66), indicating that even resource-constrained firms are gradually adopting circular economy practices. The findings suggest that efforts to boost circularity should target companies across all size categories.



There are notable differences between sectors like manufacturing, services, and IT/software (highest performers) compared to tourism supply and construction (lower performers). However, these differences are not statistically significant, suggesting a common path across sectors toward circular economy practices. The findings indicate that the transition toward circularity is growing across diverse industries, emphasizing the widespread applicability of circular economy principles rather than sector-specific limitations. This highlights opportunities for cross-sectoral learning and collaboration to further enhance circularity efforts.

Circular Economy Performance



- The comparison of circular economy performance between companies participating in public procurement (GPP Part. YES) and those that do not (GPP Part. NO) reveals a significant difference. Companies engaged in public procurement exhibit a higher average circular economy performance (3.78) compared to non-participating companies (3.61). These findings suggest that participation in public procurement processes could act as a catalyst for adopting circular economy practices.
- The regression analysis further supports this observation, indicating that participation in public procurement has a positive and statistically significant effect (ß=0.191, p=0.00054) on circular economy performance. Thus, companies involved in public procurement score 0.191 points higher in circularity than their counterparts.
- These findings highlight the potential of public procurement as a policy tool to drive circular economy innovation among companies. By participating in procurement processes that prioritize green or circular criteria, companies may be incentivized to align their practices with circular economy goals. This underscores from one hand, the importance of incorporating circular and green criteria into public procurement strategies to encourage sustainable innovation in the private sector, and from the other hand making companies aware of the benefits related to participation in public procurement.

Circ_ec_perf	Coefficients	SE	t Stat	P-value	Lower 95%	Upper 95%
Intercept	3.148	0.164	19.146	1.9E-51	2.824	3.472
pp_part	0.191	0.054	3.503	5.4E-04	0.084	0.298

Barriers

Companies aiming to participate in C/GPP often face complex challenges, ranging from regulatory to financial constraints. These barriers can significantly hinder companies' ability to compete and innovate within public procurement processes, making it essential to address and mitigate them for the successful creation of a circular supply. Indeed, the barriers can prevent businesses from fully committing to CE strategies, reducing the overall effectiveness of public procurement in driving sustainability goals.

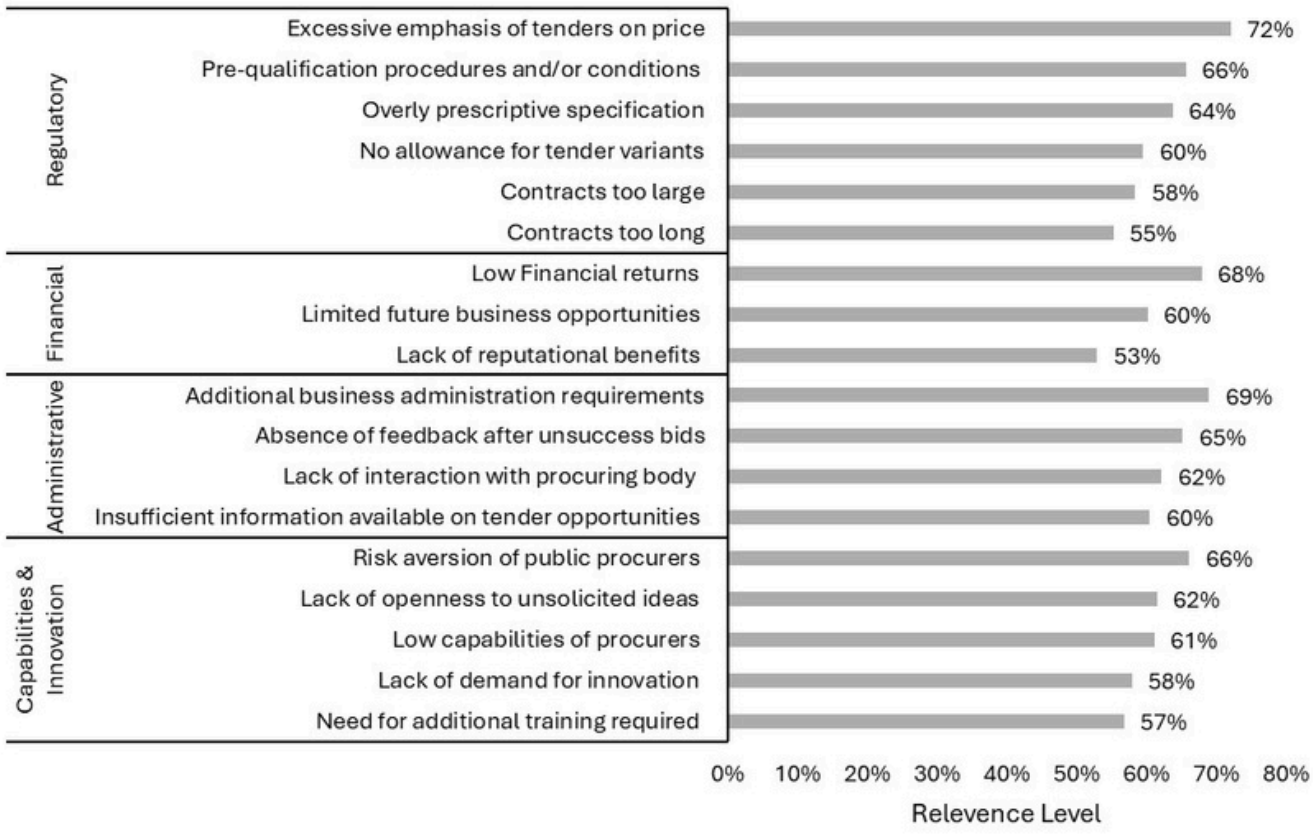
By understanding these barriers, policymakers and procuring bodies can develop targeted solutions to support companies in overcoming them, thus enhancing participation in green or circular procurement processes.
The barriers investigated in this study can be broadly classified into the following categories:

- Regulatory:Theseincludeissuesrelatedtooverlyprescriptivespecifications,thelackofflexibilityintender,andthe stringent pre-qualification procedures. These factors can limit innovation and discourage smaller companies from parti cipating.
- Administrative:Companiesoftenfaceexcessiveadministrativeproblems,suchasadditionalbusinessadministration requirements and unclear tender documents. Limited feedback after unsuccessful bids and insufficient information on tender opportunities further complicate participation.
- Financial:Lowfinancialreturns,lackoffuturebusinessopportunities,andtheperceivedlackofreputationalbenefitsfrom C/GPP participation can make it financially unattractive for companies to engage in circular procurement.
- CapacityandInnovation:Theseincludethelimitedcapabilitiesofpublicprocurerstomanageinnovativesolutions,risk aversion, and a lack of demand for innovation in tenders. Such barriers can limit the growth of CE practices in the market.

The analysis of barriers helps highlight which barriers are most impactful and how they vary across different types of businesses and sectors.

Barriers

The following graph highlights the main barriers faced by companies when participating in public procurement processes, particularly regarding the integration of circular economy principles.



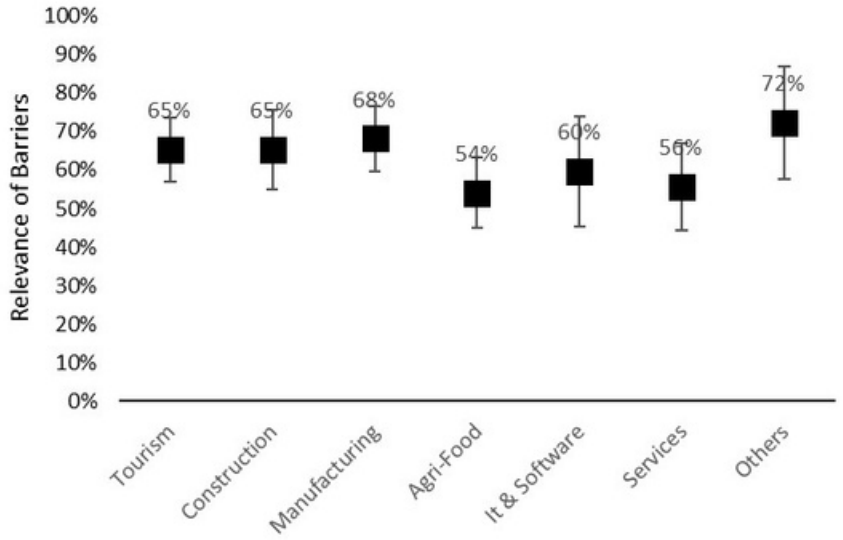
Surprisingly, the barriers exert a similar level of pressure, with averages of 62% for regulatory, 60% for financial, 64% for administrative, and 61% for capabilities & innovation.

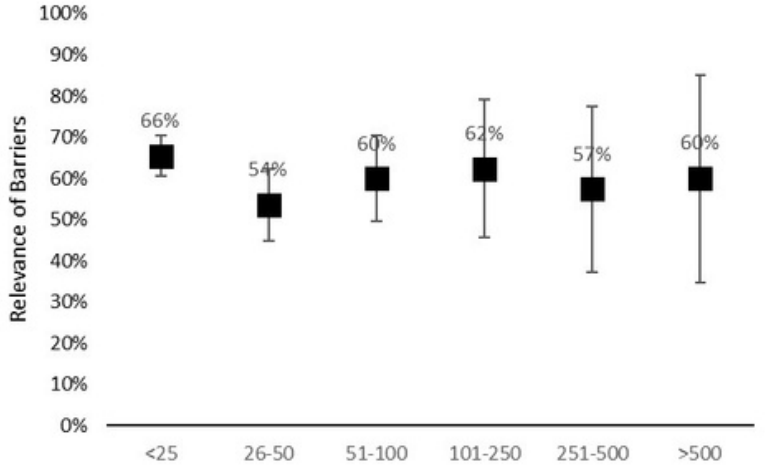
Among the most significant barriers, excessive emphasis on tenders based solely on price (72%), additional administrative requirements (69%) and low financial returns (68%) stand as major obstacles, discouraging companies from engaging C/GPP.

Conversely, barriers like long contract durations (55%) and the perceived lack of reputational benefits (53%) appear less critical but are still noteworthy in shaping participation.

The results highlight the importance of addressing barriers to foster broader engagement in C/GPP processes. For example, introducing more flexibility in tenders and less emphasis on the price, could significantly reduce the perceived difficulty of parti cipation.

Barriers



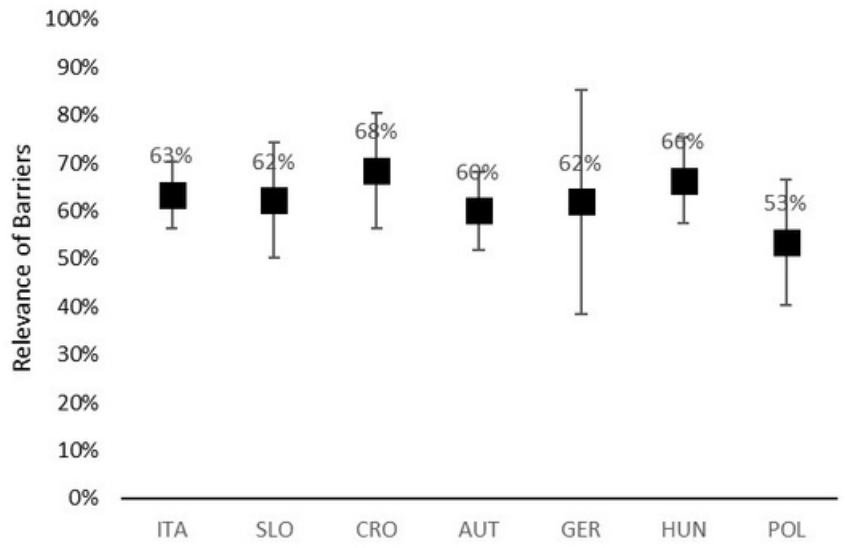


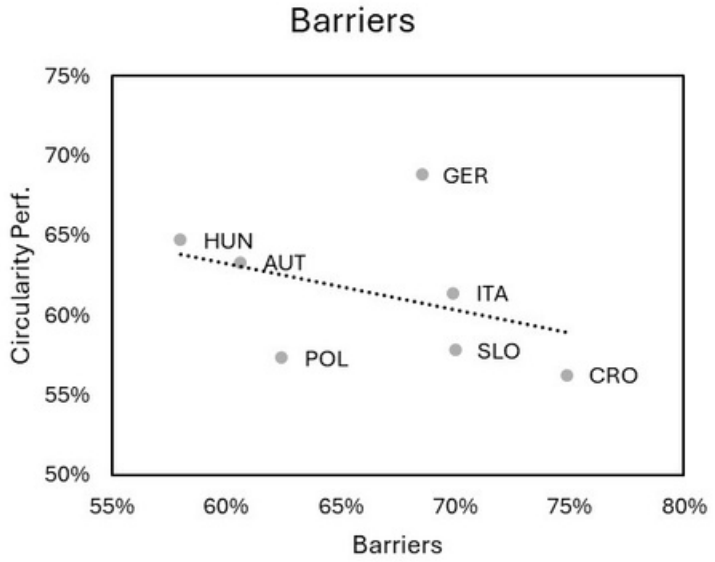
The analysis of barriers across sectors reveals that manufacturing companies experience the highest relevance of barriers, at 68%. In contrast, the agri-food sector perceives the lowest relevance of barriers at 54%, potentially due to more streamlined regulatory or financial constrains. Other industries, such as IT & Software and services, shows average levels, with barriers being less prominent than in manufacturing but still significant enough to require attention.

As expected, the smallest companies (<25 employees) report the highest perceived barriers (66%), likely due to resource constraints that amplify the challenges posed by regulatory, financial, and administrative obstacles. Interestingly, companies with 26-50 employees report the lowest barriers (54%), possibly due to a more focused and adaptive organizational structure. Larger companies (>500 employees) show higher variability, reflecting the diverse challenges faced across operations and tender types.

It's worth to note that the differences by country, sector and size are not statistically significant.

Impact of Barriers on Circularity Performance





The findings reveals that the perception of barriers is relatively consistent across countries, despite differences in policy frameworks and production contexts. This uniformity highlights the shared nature of challenges companies face in participating in C/GPP.
Poland, however, stands with slightly lower perceived barriers compared to other nations, while the perception in Germany seems to have high variability due to the small number of companies involved-

The scatterplot suggests an inverse relationship between perceived barriers and circularity performance. Countries with higher reported barriers tend to exhibit lower circularity performance, indicating that significant obstacles in regulatory, financial, and administrative domains might discourage companies from adopting circular economy practices.

Drivers

Drivers for companies to engage in C/GPP refers to factors that not only incentivize businesses to innovate, but also help them to aligntheiroperationswiththe evolvingdemandsofthe publicsector,fosteringa strongerand morecircularsupply.

Since drivers act as motivating elements that push companies to participate in C/GPP, by identifying them it is possible to understand what encourages companies to innovate and actively adopt circular practices. Recognizing and enhancing these driversisessentialforboostingboththe qualityand quantityofcircularsupply.

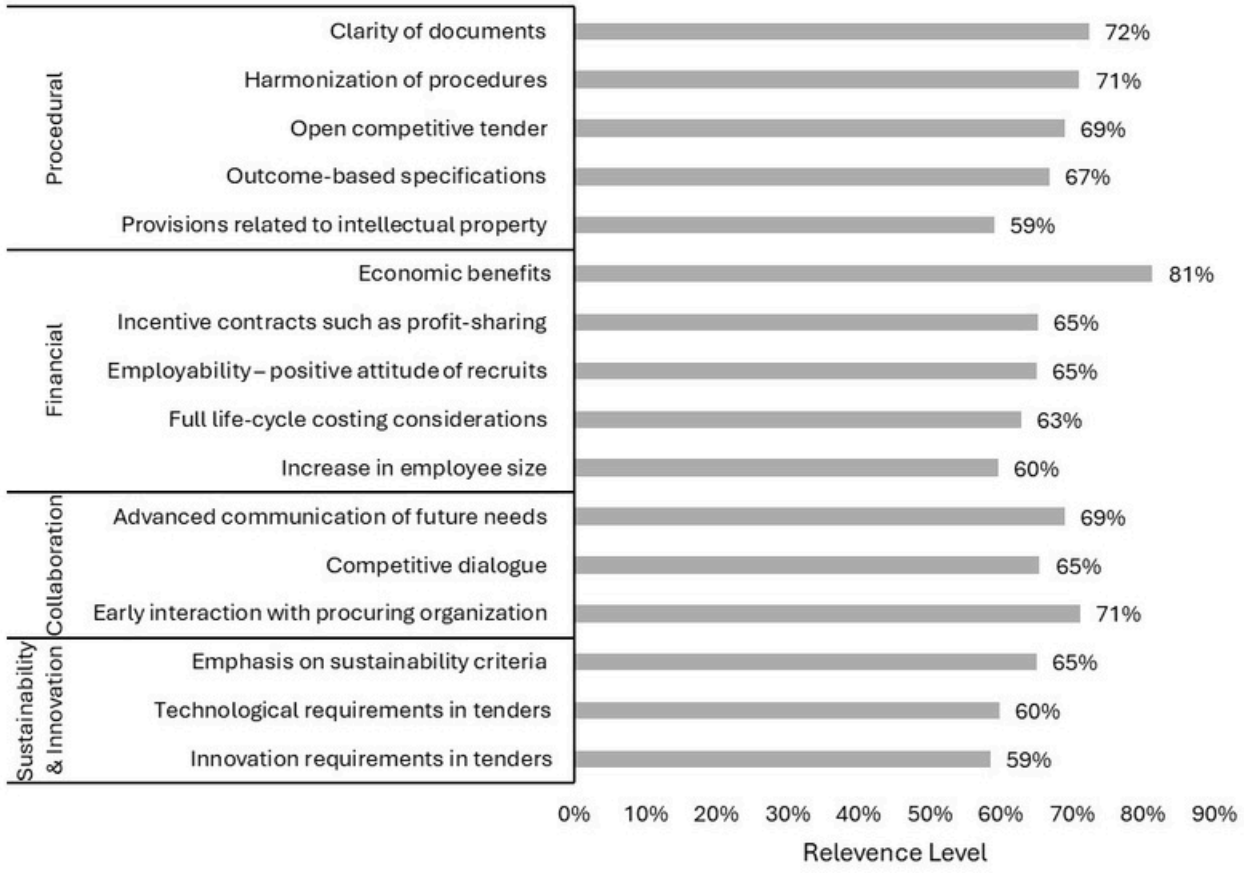
Thedriversinvestigatedinthisstudy canbebroadlyclassifiedintothe followingcategories:

- Collaborative and Communication Drivers: Early interaction with procuring organizations, competitive dialogue, and advanced communication of future needs provide companies with the support and transparency needed to tailor their solutions and innovate.
- Organizational and Human Capital: Factors such as employability (positive attitudes of new recruits), meeting client requirements, and increases in employee size motivate companies to participate, as C/GPP enhances organizational growth and capacity building.
- Financial and Procedural Drivers: These include incentive contracts (e.g., profit-sharing), full life-cycle costing considerations, and economic benefits. Additionally, drivers like harmonization of procedures, provisions related to intellectual property, and clear documentation help streamline the process and reduce administrative burdens.
- Innovation: These drivers reflect the increasing emphasis on sustainability and innovation in public procurement, such as the inclusion of circular criteria, technological and innovation requirements in tenders, as well as outcome-based specifications.

The analysisofdriversprovidesinsightintothefactorsthatmostsignificantlyencouragecompaniestoparticipateinC/GPP.

Drivers

The following graph outlines the key drivers that motivate companies to engage in public procurement processes, particularly focusing on the integration of circular economy practices.

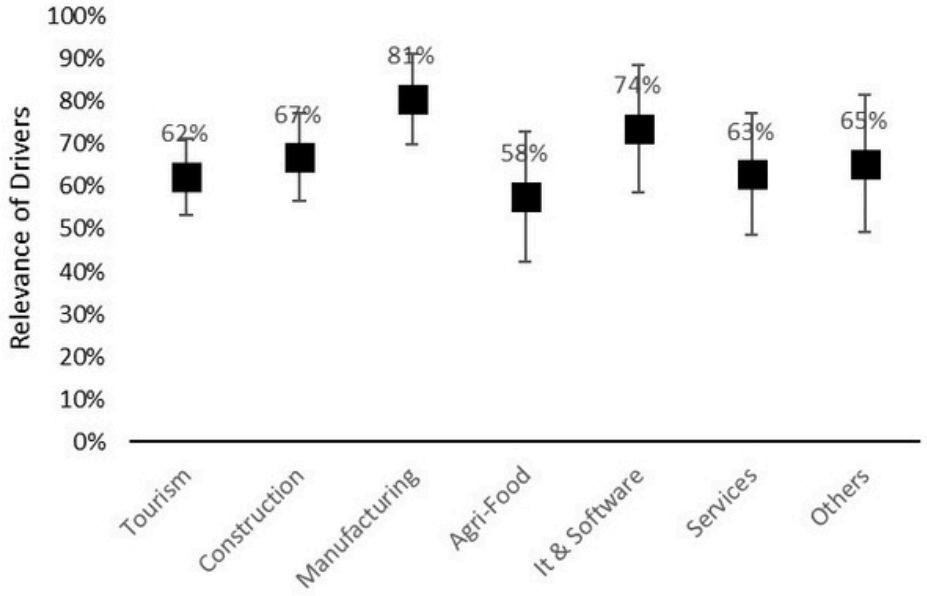


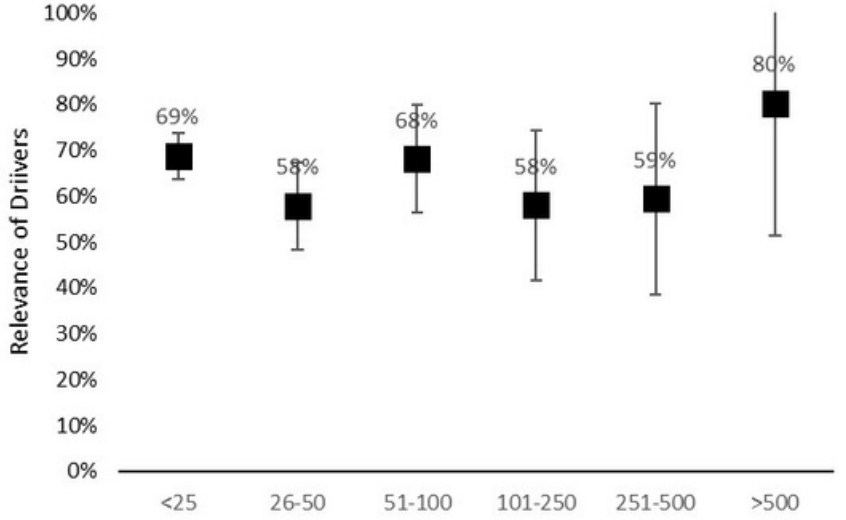
The findings indicate that collaboration communication drivers (69%), clear procedural elements (68%), and financial incentives (67%) are perceived as the most relevant, exceeding the importance attributed to sustainability and innovation drivers (61%). This is notable as it highlights that sustainability is not yet a top priority, leaving room for improvement both for companies and public administrations.

Among the most significant drivers are "economic benefits" (81%), "clarity of documents" (72%), and "early interaction with procuring organizations" (71%), emphasizing the importance of transparency, support, and economic benefits. Conversely, less relevant drivers, such as "provisions related to intellectual property" (59%), "innovation requirements in tenders" (59%), and "technological requirements in tenders" (60%), suggest that there is still progress to be made in fully integrating innovation criteria into public tenders.

While the differences between the most and least relevant drivers are relatively small, these findings provide clear insights into optimizing policies to better foster circular innovation.

Drivers



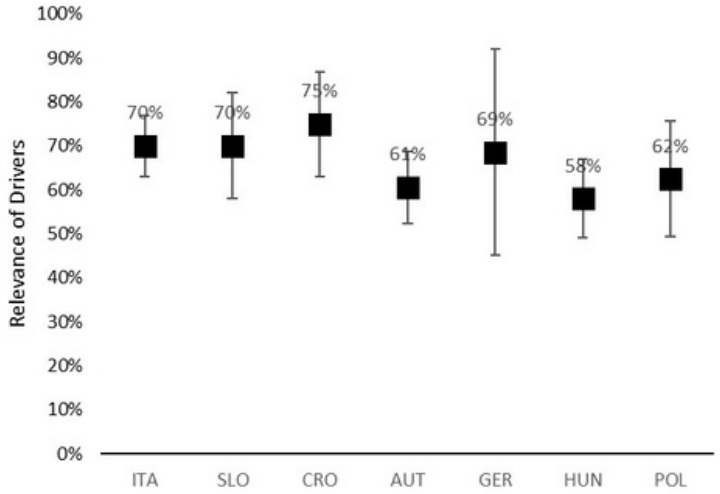


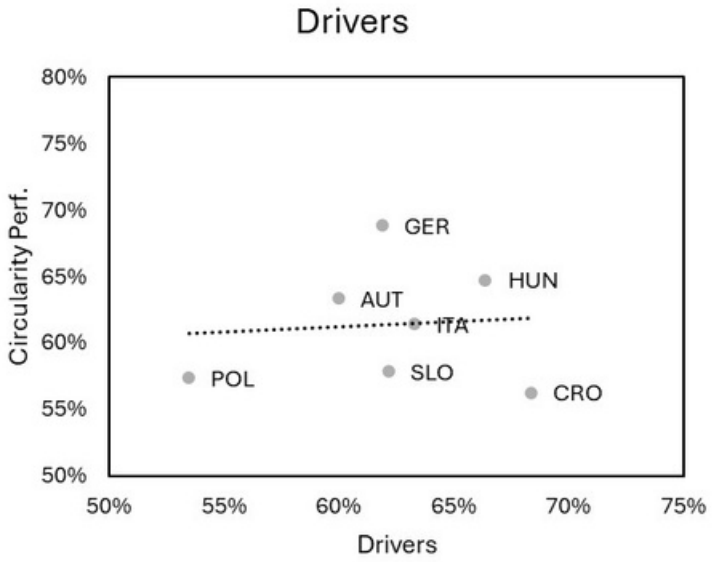
The relevance of drivers for engaging in C/GPP varies across sectors and company sizes. Manufacturing and IT & Software sectors show the highest perceived importance of drivers, with values of 81% and 74% respectively, suggesting these industries find C/GPP drivers more aligned with their operational and strategic goals. In contrast, the Agri-Food sector reports the lowest relevance, at 58%, highlighting potential mismatches between procurement and industry-specific needs. The small differences across sectors indicate that drivers are broadly applicable, though targeted adaptations might enhance sector- specific engagement.

Larger companies (over 500 employees) exhibit the highest relevance of drivers at 80%, likely due to their greater capacity to respond to C/GPP requirements and leverage potential benefits. In contrast, medium-sized companies (26-50 and 101-250 employees) report lower values around 58%, reflecting resource constraints or limited alignment with procurement demands.

These variations underline the need for strategies to effectively motivate companies of different sizes to participate in C/GPP initiatives.

Impact of Drivers on Circularity Performance





The analysis of drivers across countries reveals moderate variability in their perceived relevance. For instance, Croatia shows the highest average relevance (75%), while Austria records the lowest (61%). Despite these differences, the variations are not statistically significant, indicating a broadly uniform perception of drivers' importance across countries. Notably, the large variability observed in Germany is attributed to a smaller sample size, which affects the consistency of responses.

The scatter plot comparing the relevance of drivers with circularity performance demonstrates no significant trend. This lack of correlation highlights that while drivers are important for encouraging participation in circular procurement, they do not directly explain variations in circularity performance across countries.

Perceived innovativeness of Public Procurers

In this analysis, we focus on two main constructs to assess how innovative public procurers are perceived to be by supplier companies: (1) Public vs. Private Sector Customers Innovation and (2) Public Procurers' Innovativeness.

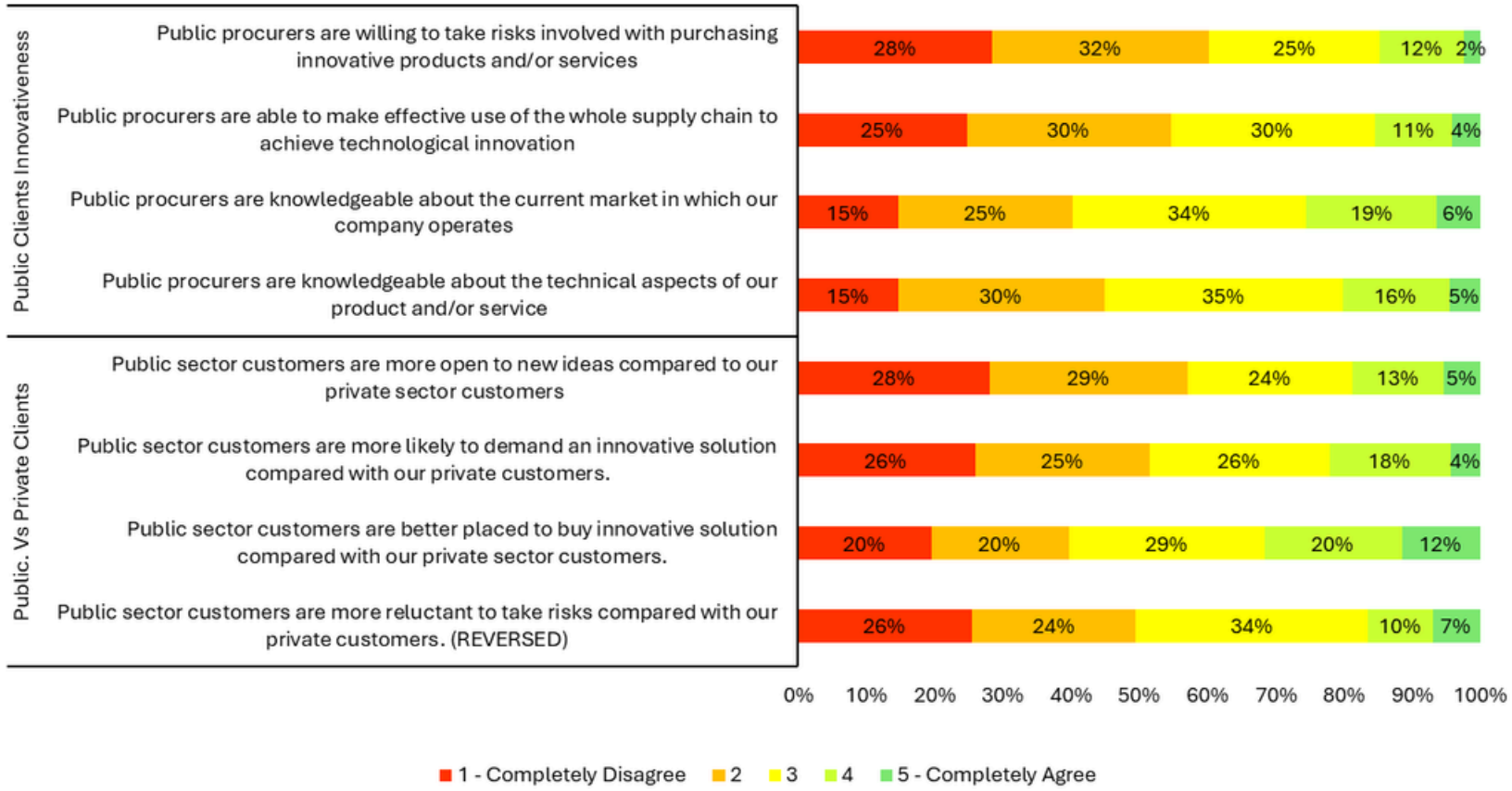
1. Public vs. Private Sector Customers Innovation: evaluates how public sector customers compare with private sector customers regarding their openness to innovation. The key dimensions include the perceived willingness of public procurers to take risks, their readiness to purchase innovative solutions, and their openness to new ideas. Understanding these differences is important because the public sector's willingness to engage with innovative solutions can encourage companies from participating in C/GPP processes.
2. PublicProcurer'sInnovativeness:Thisconstructexaminespublicprocurers'capabilitiesthatinfluenceinnovationadoption.It includes their knowledge of technical aspects and market dynamics, as well as their ability to effectively impact on the companies' ability to coordinate the supply chain. Additionally, it assesses their willingness to take risks in purchasing innovative products and services. These factors directly impact the development of circular supply and the success of C/GPP initiatives.

Perceived innovativeness reflects the likelihood of public procurers supporting C/GPP initiatives. If public clients are seen as reluctant to innovate, companies may hesitate to invest in sustainable, circular solutions. On the other hand, if public procurers are viewed as knowledgeable, proactive, and willing to adopt new technologies or solutions, this can drive engagement from companies, encouraging them to develop circular product and services.

Analyzing these constructs helps understand how public procurers can foster stronger partnerships with companies in creating a circular supply. By being more open to innovation, public procurers can significantly impact a company's decision to engage in C/GPP, thus promoting a broader adoption of circular economy practices.

Perceived innovativeness of Public Procurers

Perceived Innovativeness of Public Procurers was measured by assessing how supplier companies perceive public procurers' willingness to take risks and foster innovation. This evaluation was conducted both in relation to the specific activities of public procurers and in comparison with the companies' private sector customers.



Perceived innovativeness of Public Procurers

The results provide a comprehensive picture of how public sector customers and public procurers are perceived in terms of innovativeness from their suppliers, also in comparison with private sector counterparts.

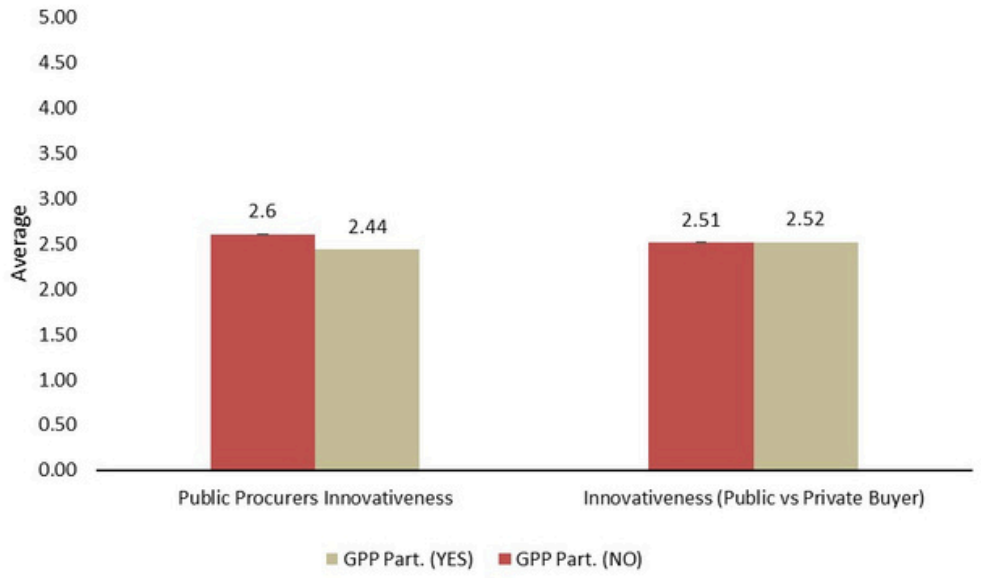
- Companies show slightly positive perceptions of Public Procurer Innovativeness. While public procurers are moderately recognized for technical and market knowledge, only a small proportion of companies strongly agree that public procurers are proactive in leveraging supply chains and taking risks for innovative solutions. The low scores in these critical areas highlight the need for public procurement strategies to align better with innovation-driven goals.

- WhencomparingPublicvs.PrivateSectorCustomersInnovation,thereisaclearperceptionthatpublicbuyerarelesslikely to embrace innovation. Over half of respondents (50% or more combining negative agreement scores "1" and "2" scores) agree that public sector customers are more reluctant to take risks, compared to private buyers. Similarly, significant portions find public customers less demanding or open to innovative solutions, with only a small fraction perceiving high openness or demand for new ideas (32%, combining the positive agreement scores “4” and “5”).

The findings suggest a gap between expectations and practices in public procurement. Strengthening risk-taking behavior and fostering innovative demand from public clients could play a pivotal role in encouraging supplier engagement, thereby accelerating circular and green procurement practices.

Perceived innovativeness of Public Procurers

This chart highlights the perceived innovativeness of public procurers and the comparison between public and private buyers, as perceived by companies that participated and those that did not participate in C/GPP over the past three years.



The perceived innovativeness of public procurers remains generally low, around the midpoint of the scale (1-5). Surprisingly, companies that have not participated in GPP over the last three years exhibit a slightly higher perception of public procurer innovativeness compared to those that did participate. This result may reflect higher expectations from participating companies, as these businesses have direct experience with public procurement processes and may find public procurers lacking in innovation-supportive behaviors. On the other hand, non-participating companies may perceive public procurers from an external, less critical perspective, leading to slightly higher scores.

Regarding the comparison between public and private buyers' innovation orientation, no significant difference is observed between companies that do or do not participate in GPP. Both groups of companies tend to perceive public sector customers as less innovative than their private counterparts. This result suggests a systemic issue, where the public sector is broadly viewed as less willing to adopt innovative solutions, regardless of direct involvement in public procurement.

The findings underscores the need for public procurers to actively demonstrate openness to innovation and foster practices that distinguish them from private buyers in terms of supporting sustainable and innovative solutions.

Strategies for C/GPP

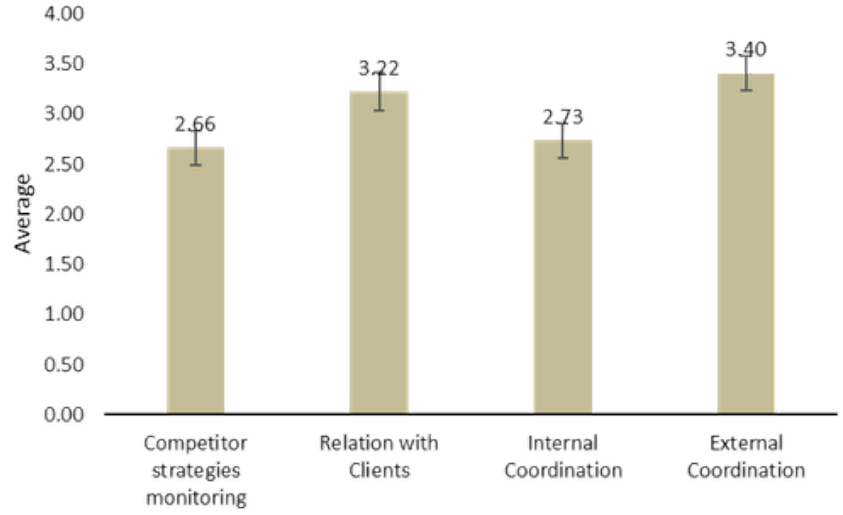
Companies can adopt a range of strategic approaches to enhance their participation in C/GPP. These strategies help businesses remain competitive in public tenders while aligning with CE requirements. This section focuses on four key strategic areas that influence a company's ability to engage successfully in C/GPP:

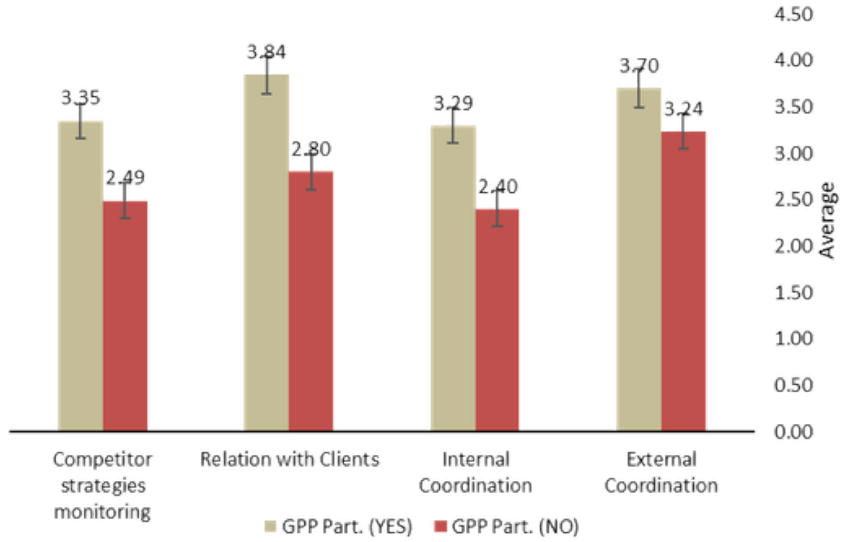
1. Competitor Strategies Monitoring: Monitoring competitors' actions in the public sector is crucial for companies looking to stay competitive. By regularly assessing competitor marketing efforts and market behaviors, businesses can adapt their own strategies to respond quickly and efficiently to changes in the market.
2. Relation with Clients: Building and maintaining strong relationships with public sector clients is a key factor in C/GPP success. Regularly discussing the needs of public customers and aligning business strategies with these needs helps companies create long-term, value-based relationships, which are essential for fostering trust and collaboration in sustainable procurement.
3. Internal Coordination: Effective internal coordination is critical for ensuring that different functions within the organization are aligned with the company's C/GPP. This includes regular integration of activities based on public sector customer needs, and communication between departments to ensure consistency and efficiency in project implementation.
4. External Coordination: Collaborating with key suppliers and external partners is another fundamental strategy for C/GPP. Effective external coordination allows companies to integrate their suppliers into the C/GPP processes, ensuring that logistical, operational, and strategic activities are aligned with sustainability goals. By maintaining strong relationships with suppliers and partners, companies can better meet the demands of public tenders while achieving circular economy objectives.

These strategies are crucial for companies seeking to succeed in C/GPP. Monitoring the competition, building strong relationships with clients, and maintaining both internal and external coordination enable companies to not only compete effectively in public procurement but also contribute to the broader adoption of circular and green procurement practices.

Strategies for C/GPP

The company's strategies that contribute improving companies' performance and competitiveness in the C/GPP are analyzed considering four key areas: monitoring competitor strategies, building strong relationships with public clients, ensuring internal coordination across functions, and fostering effective external coordination with suppliers and partners.



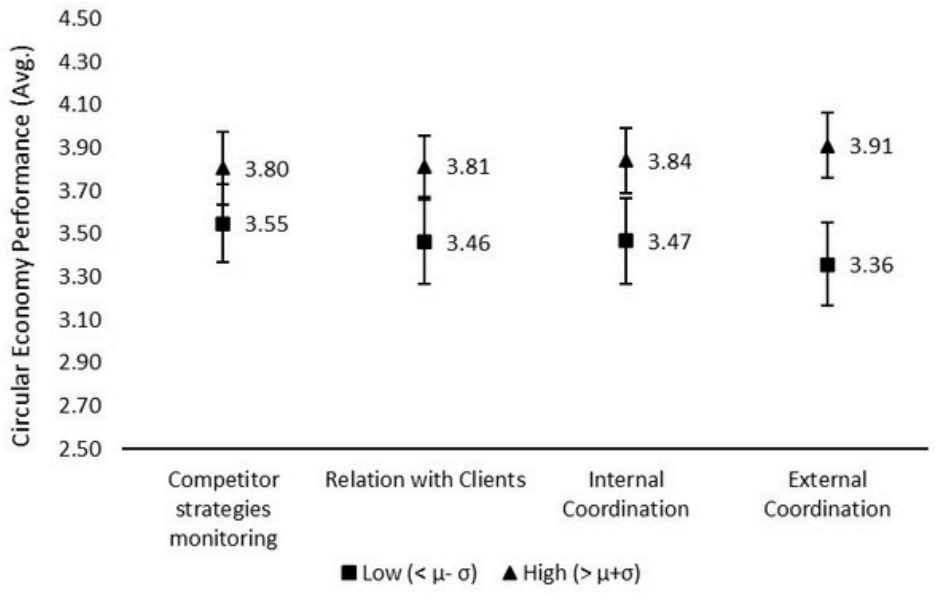


The analysis of strategies for C/GPP reveals how companies are strategically equipped to successfully participate in C/GPP and implement circular economy. Companies demonstrate the highest focus on external coordination (3.40) and relationship building with clients (3.22). These strategies highlight a strong emphasis on external partnerships and client engagement as central components for success in C/GPP. Conversely, internal coordination (2.73) and competitor strategy monitoring (2.66) score lower, suggesting potential areas for improvement in aligning internal functions and staying competitive in the public procurement market.

When comparing companies by GPP participation, those actively involved in GPP outperform non-participants across all strategic areas. The largest gaps are observed in relationship building with clients (3.84 vs. 2.90), Competitor monitoring (3.35 vs 2.49), underlining the importance of closer alignment with client and supplier needs and competitive positioning on the market to enhance participation in C/GPP. Further, companies participating in C/GPP also show higher, internal coordination (3.29 vs 2.40, suggesting the value of adopting proactive strategies in internal alignment between different departments and functions.

How Strategies for C/GPP affect circularity

The strategic approaches companies adopt play a pivotal role in facilitating the implementation of circular economy (CE) practices. Strategies such as competitor monitoring, building strong relationships with clients, and enhancing both internal and external coordination create an enabling environment for the integration of circularity into business operations.



The graph compares the CE performance of companies with low and high adoption of strategies, considering the average and standard deviation. Companies with high adoption of these strategies consistently outperform those with low adoption in CE performance across all four strategic areas. For instance, the difference in CE performance between high and low adopters is particularly significant for external coordination (3.91 vs. 3.36) and internal coordination (3.84 vs. 3.47), underscoring the importance of aligning internal processes and collaborating with external stakeholders to achieve CE goals.

Interestingly, the role of competitor strategies monitoring and relationships with clients also demonstrates notable impacts (3.80 vs. 3.55 and 3.81 vs. 3.46, respectively). These findings suggest that fostering competitive insights and strong client relationships not only enhances CE integration but also supports companies' ability to align with public sector expectations.

These evidence highlights the necessity for companies to prioritize strategic alignment as a main enabler for advancing their circular economy objectives.

Organizational Learning and Adaptation

In the context of C/GPP, a company's ability to learn and adapt is critical for implementing circular economy action and maintaining a competitive advantage. Organizational learning refers to how well a company acquires, shares, and utilizes knowledge, while adaptation reflects the company's capacity to reconfigure resources and respond to new opportunities or challenges. In this section, three key constructs related to organizational learning and adaptation are evaluated:

1. Information Acquisition: refers to the company's ability to gather relevant knowledge about the CE. It assesses how companies experiment, innovate, and gather information beyond their current market and technological boundaries. The focus is on how well companies integrate new knowledge areas and identify key trends that are essential for future decision-making in circular initiatives.

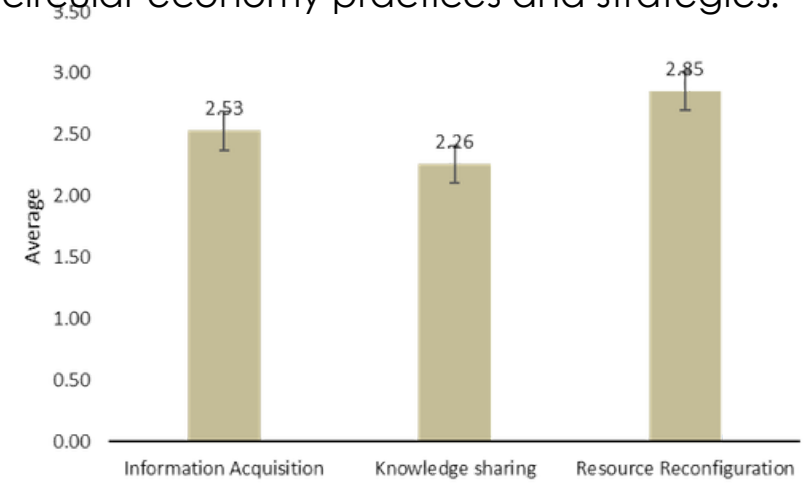
2. KnowledgeSharing:referstohoweffectivelyknowledgecirculatewithinthecompany.Itassessesthecommunication processes that ensure employees and managers are informed about circular economy initiatives and that information is stored, reported, and shared within the organization. The ability to share knowledge effectively is essential for building organizational memory and facilitating continuous learning and improvement in circular economy projects.

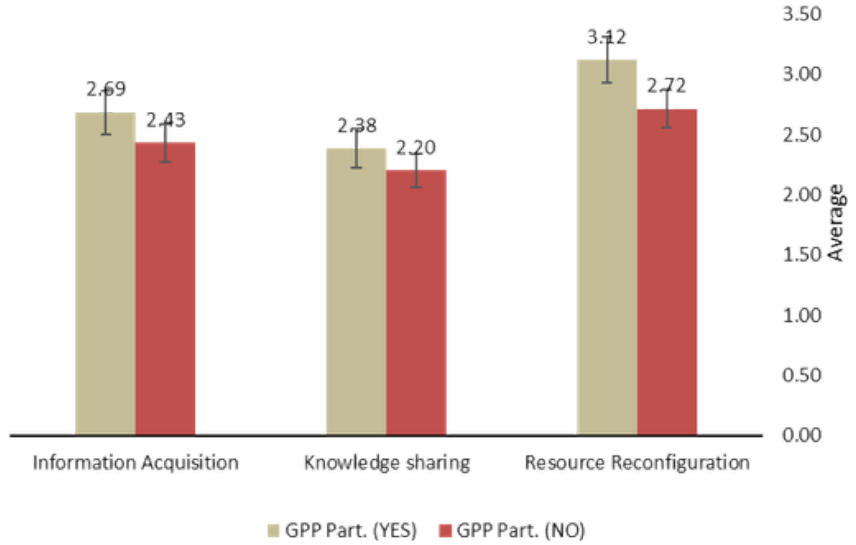
3. ResourceReconfiguration:Thisconstructlooksatthecompany'scapabilitytoadjustandrealignresourcestomeetthe demands of CE projects. It includes the evaluation of human resources, coordination among different functions, and the company's ability to implement strategic changes. Effective resource reconfiguration is crucial for ensuring that a company can adapt quickly to market changes, integrate new innovations, and stay competitive in C/GPP.

Organizational learning and adaptation are essential for the long-term success of companies involved in C/GPP. By continuously acquiring new knowledge, sharing insights, and reconfiguring resources, companies can not only meet current CE standards but also position themselves to anticipate future trends..

Organizational Learning and Adaptation

The way how companies adapt and evolve in response to changes in the circular economy and public procurement can drive companies towards GPP Commitment. The focus on learning and adaptation is on three key aspects that reflect the extent to which companies are able to gather relevant information, distribute insights internally, and reallocate resources to effectively implement circular economy practices and strategies.



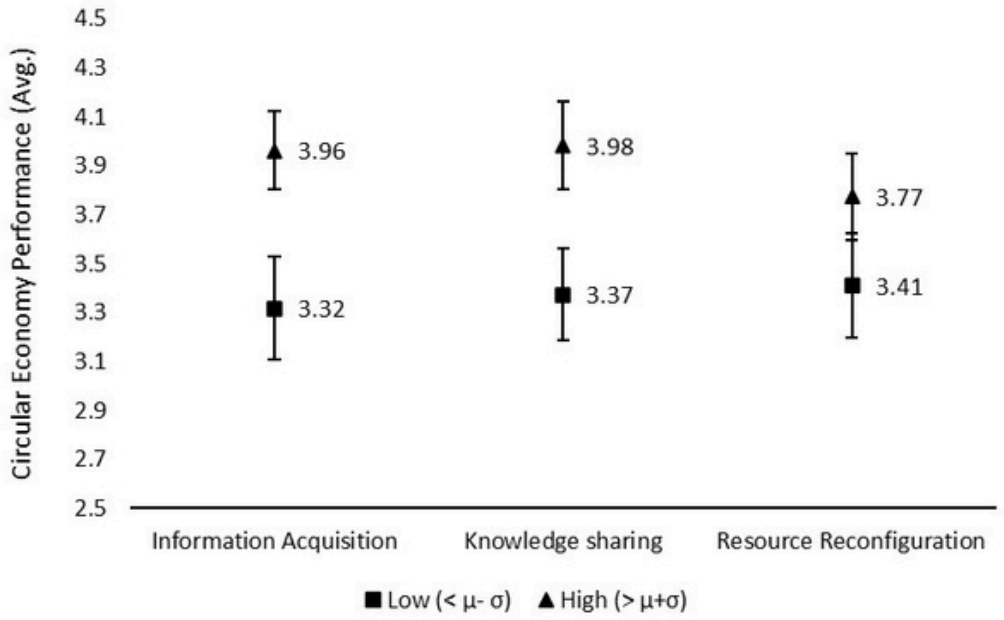


The analysis of organizational learning and adaptation constructs reveals that resource reconfiguration scores the highest average among the three constructs, indicating that companies prioritize their ability to reallocate and adapt resources effectively for circular economy projects. In contrast, knowledge sharing shows the lowest average, highlighting a significant challenge in fostering internal communication and information circulation related to circular economy initiatives. Information acquisition, while moderately implemented, underscores the need for companies to strengthen their efforts in exploring new knowledge areas and identifying emerging trends in the circular economy.

Companies engaged in GPP exhibit higher performance across all constructs. The most pronounced difference is in resource reconfiguration, where participating companies score significantly higher, reflecting their stronger capacity to adapt to the demands of circular public procurement. Information acquisition and knowledge sharing also show modest but consistent improvements among GPP participants, suggesting that exposure to public procurement processes fosters broader organizational learning and strategic alignment with circular economy goals.

How Organizational Learning and Adaptation affect circularity

~~Organizational learning and a~~daptation skills are critical enablers of circular economy implementation. These organizational capabilities allow companies to explore new knowledge areas, effectively share insights across the organization, and reconfigure resources to meet the demands of CE initiatives. By leveraging on these capabilities, companies can better align with CE objectives and respond to market or regulatory demands.



The graph highlights the differences in CE performance between companies with high and low levels of learning and adaptation capabilities, based on the average and standard deviation.

Companies highly oriented in acquiring external information have a circular economy performance score of 3.96, compared to 3.32 for those with low information acquisition. This demonstrates that acquiring diverse and forward-thinking knowledge significantly boosts CE performance. Similarly, in knowledge sharing, companies with high levels score 3.98 on average, reflecting the importance of effective internal communication in driving CE outcomes. For resource reconfiguration, the gap is also evident, with companies scoring 3.77 for high skills versus 3.41 for low skills. This suggests that the ability to realign resources and adapt to change is also a key differentiator in CE success.

The results underscore the critical role of organizational learning and adaptation in shaping CE implementation, emphasizing the need for companies to invest in these areas to remain competitive in the context of circular and green public procurement.

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Section 2
Circular Economy Supply Discussion



Turning Barriers into Opportunities

Understanding barriers is not merely about identifying challenges but also about transforming them into actionable opportunities for companies to strengthen their participation in GPP.

- Forbusinesses,awarenessofbarrierssuchasoverlyprescriptivetenderrequirements,administrativeburdens,orlow financial returns can drive strategic adaptations. For instance, companies can use administrative barriers as a basis to streamline internal processes and invest in digital tools to enhance bid preparation efficiency. Similarly, recognizing financial constraints can lead to partnerships with other firms to share risks or leverage innovative funding models.
- Public authorities play a crucial role in turning barriers into opportunities. By improving the clarity of tender documents and providing feedback after unsuccessful bids, they can foster a learning environment for companies, especially SMEs. For example, introducing more flexible and modular tender specifications allows businesses to propose innovative solutions aligned with circular economy goals, thus reducing perceptions of rigidity.

- Moreover, capacity-building programs initiated by PAs to address procurement risk aversion and low innovation demands can help suppliers become more competitive while fostering innovation in tenders. The collaborative effort between companies and public bodies to identify and minimize barriers can create a dynamic, mutually beneficial procurement landscape that encourages innovation and circular economy.

Leveraging Drivers to Facilitate Participation in GPP

Drivers act as critical motivators for companies to embrace GPP and leveraging them effectively can significantly enhance participation. For businesses, drivers like economic benefits and incentive contracts provide tangible rewards, while elements such as clarity of documents and early interaction with procurers build trust and streamline processes.

- Companiesshouldactivelyengageincompetitivedialoguesandleverageopportunitiestocommunicatetheirinnovative capacities to public buyers. For instance, firms can use early interactions to showcase their ability to meet circularity requirements, thus positioning themselves as reliable partners.
- Public authorities, on the other hand, must amplify drivers by designing procurement processes that are not only financially appealing but also encourage innovation and sustainability. While procedural and financial drivers are perceived as highly relevant, the relatively lower emphasis on sustainability and innovation drivers points to an opportunity. Thus, PAs should prioritize the inclusion of circularity criteria, technological specifications, and innovation demands in tenders to foster a robust market for sustainable solutions.
- Aligning innovation drivers with clear economic benefits can create a dual incentive for companies to invest in CE practices. For example, tender requirements focusing on life-cycle costing not only push firms towards sustainable solutions but also ensure cost competitiveness in the long term. By bridging procedural efficiency with sustainability incentives, public authorities can create a comprehensive framework that boosts both company participation and the transition towards a circular economy.

Innovation demand from suppliers: a call for PAs

The findings revealed that public procurers are generally perceived as less innovative than private buyers, with limited openness to innovation and risk-taking. Additionally, companies that participated in GPP tenders did not perceive public buyers as significantly more innovative compared to non-participants, highlighting a need for improvement in fostering innovation through public procurement processes. To this purpose, PAs could rely on several strategies.

- PAsneedstoactivelyimprovetheirunderstandingofthetechnicalaspectsofproducts/servicesandmarkettrends.Thiscanbe achieved by regularly consulting with industry experts, organizing collaborative workshops with suppliers, and staying updated on technological advancements. This knowledge enables public procurers to draft tenders that better align with market dynamics and enterprises capabilities, while incentivize innovation.
- To be competitive, public procurers need to demonstrate greater willingness to take risks in purchasing innovative products and services. They can establish pilot programs or innovation-friendly procurement frameworks that allow for experimentation without the fear of failure. For example, PAs could set specific tenders exclusively for innovative or experimental solutions, signaling their openness to cutting-edge ideas.

- Public procurers can adopt a more proactive role in facilitating collaboration along the supply chain. By promoting partnerships among suppliers, subcontractors, and other stakeholders, they can drive innovation at multiple level. For example, tenders could include criteria that reward suppliers for involving local or circular supply chain partners, thus enhancing coordination and sustainability.

- Transparency and dialogue between PAs and companies can benefit both parties and speed the circular transition. PAs should encourage continuous feedback loops with suppliers to identify bottlenecks and share insights. Regularly scheduled meetings, surveys, and debriefing sessions after procurement processes can build trust and improve perceptions of innovation.

Organizational strategies enabling circular supply

The strong relation between strategic organizational strategies and Circular Economy performance underscores the importance of targeted interventions to enhance the company's readiness to implement circular practices across the value chan.

- CompetitorMonitoring:Monitoringtheactionsofcompetitorsprovidesvaluableinsightsintotheinnovativepracticesbeing adopted in the market, particularly in the context of C/GPP. Companies that actively analyze their competitors' approaches can identify emerging trends, such as sustainable material sourcing or advanced recycling systems, and adapt these practices within their own operations.
- Client Relationships: Establishing strong relationships with public sector clients is another critical lever for integrating circularity. By engaging in open dialogues with public organizations, companies can align their supply with procurement criteria. This can be facilitated by regular communication, where public buyers' feedback on circularity is incorporated into product or service improvements. Additionally, collaborative efforts to co-develop circular solutions can foster trust and enhance long-term partnerships, which are vital for successful participation in circular and green procurement tenders.

- Internal Coordination: Within the organization, effective coordination across departments ensures that circularity is embedded in all aspects of the business. For instance, by holding interdepartmental meetings focused on public procurement needs, companies can align their marketing, logistics, and production teams toward a unified circular strategy. This internal cohesion enables the integration of customer requirements, such as circular design or sustainable production methods, into the company's operations.

- External Coordination: Collaboration with external partners, including suppliers and logistics providers, is essential for establishing circular supply chains. Companies that engage suppliers in sustainable practices, such as sourcing recycled materials or developing take-back systems for end-of-life products, can ensure a consistent flow of circular resources. Additionally, fostering strong relationships with logistics partners to implement eco-friendly transportation solutions further enhances a company's ability to meet circular economy principles. This external alignment also amplifies the company's capacity to deliver sustainable value in public procurement contexts.

Leveraging Organizational learning and adaptation for circular supply

The successful integration of Circular Economy principles into business operations depends significantly on how well organizations can learn, share knowledge, and adapt their resources. Organizational learning and adaptation represents practical enablers that shape a company's ability to innovate and meet sustainability goals. These capabilities form a continuous loop: acquiring relevant information, effectively disseminating it, and reallocating resources based on insights and changing environment. Companies that are equipped with these capabilities not only enhance their CE performance but also build a competitive edge in green and circular public procurement contexts.

- InformationAcquisitionplaysacriticalrolebyenablingcompaniestoexploreandgatherinsightsaboutCE.Firmscanbenefit from experimenting with novel practices and identifying new areas of knowledge. For example, expanding beyond existing technological boundaries and exploring emerging circular trends can help identify critical gaps in the companies' operations and plan the implementation of CE practices . This proactive approach to learning fosters circular innovation and make companies ready to effectively address the challenges posed by the circular transition.

- KnowledgeSharingensuresthattheinsightsandinformationgatheredarenotstoredbutflowacrosstheorganization.By maintaining detailed records of CE initiatives, fostering open communication between departments, and using structured guidelines or repositories, companies can enhance their institutional memory and share knowledge on best practices. Such practices create a cohesive framework for employees to align their actions with CE objectives, ensuring that past lessons inform current and future decisions.

- ResourceReconfigurationisthebridgethatturnslearningandknowledgeintoactionableresults.Byreallocatinghuman resources efficiently and responding rapidly to both market changes and competitors' actions, companies enhance their flexibility. Coordination with suppliers and other organizations, combined with effective internal collaboration, ensures that all stakeholders are aligned with the company's CE strategy for circular economy implementation.

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Section 3
Conclusion



Investigating Circular Transition through C/GPP: A Dual Perspective on demand and supply

The Initial Assessment was designed to evaluate the state of circular economy integration across two key areas: circular supply practices within enterprises and the incorporation of green criteria in public procurement processes. This dual perspective aimed to uncover the main drivers and barriers that influence these efforts, alongside organizational enablers and strategies that support the transition to circularity.

- Forenterprises,thesurveyfocusedonassessingtheircirculareconomyperformance,identifyingchallenges and opportunities, and exploring how they adapt and learn to meet public procurement requirements and the most effective organizational strategies.

- TheanalysisofPublicAdministrationsaimedtounderstandtheirapproachtoGPPintegration,thebarriers they face, and their perceptions of supplier commitment to green procurement, as well as the learning and adaptation drivers.

The study was built on a robust methodology, combining insights from academic and grey literature. The survey, translated into seven languages, was disseminated across seven Central European countries: Italy, Poland, Austria, Croatia, Slovenia, Hungary and Germany. Thanks to the collaborative efforts of the CE-Prince project partners, a total of 398 enterprise responses and 232 from public administrations were collected, providing a comprehensive overview of circular economy in demand and supply.

Insights into Enterprises and Circular Economy Implementation

The enterprise survey revealed a mixed picture of circular economy adoption. While certain lifecycle phases, such as waste management, showed higher implementation levels, other phases, like logistics and the use and end-of-life information of products, remained underdeveloped. This highlights significant opportunities for improvement, particularly in areas where customer engagement and lifecycle management are crucial.

Enterprises face a range of barriers, from administrative burdens and financial constraints to regulatory challenges. However, the survey also identified important drivers, including economic benefits, procedural clarity, and early interaction with public buyers. Interestingly, sustainability and innovation-related drivers, despite their long-term importance, were less emphasized, pointing to potential areas for policy enhancement.

Organizational strategies played a pivotal role in addressing these challenges. Enterprises with strong market orientation, effective coordination mechanisms, and robust learning capabilities were better positioned to align with GPP requirements and integrate circular practices systematically.

Public Administration Insights into GPP Integration

The survey highlighted considerable variability in how PAs integrate GPP criteria across different product categories. While certain sectors showed higher adoption rates, there remains a lack of consistent emphasis on green and circular innovations in procurement practices.

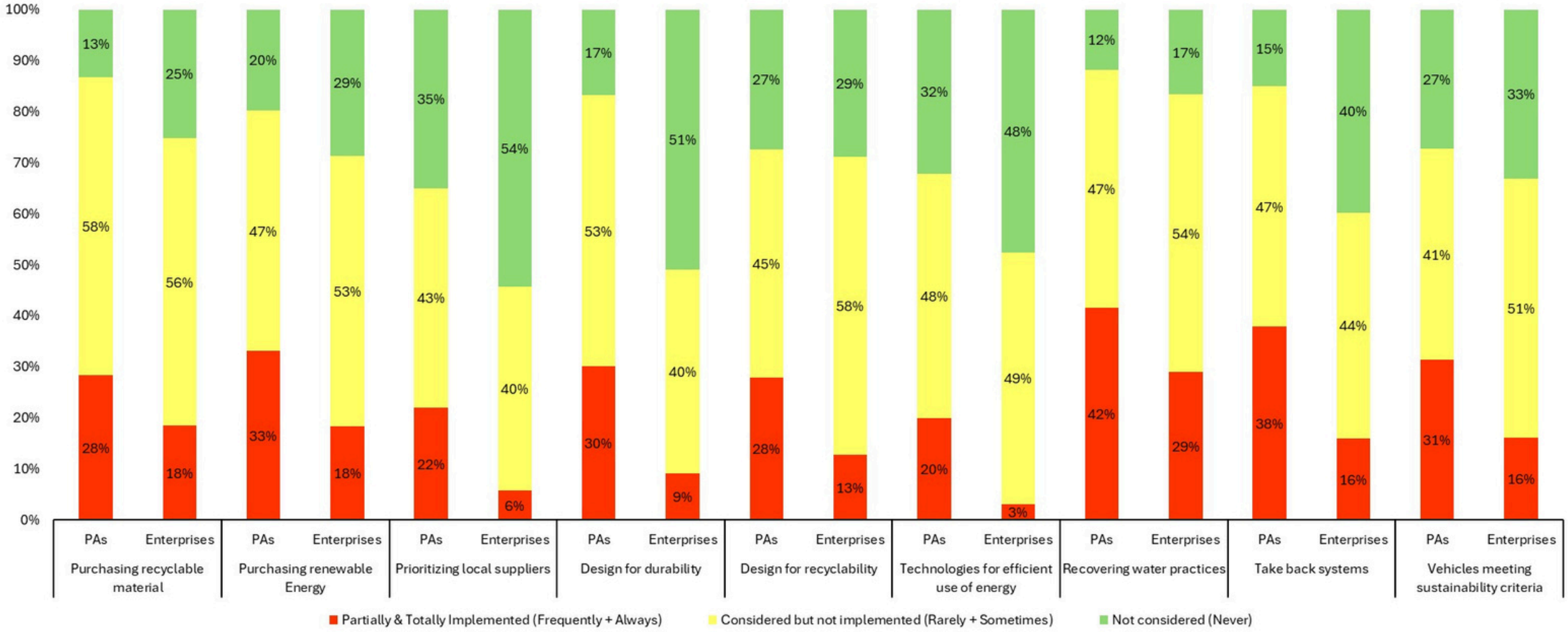
Barriers such as unclear procedures, risk aversion, and administrative inefficiencies continue to hinder the adoption of GPP. However, drivers like economic benefits, clear documentation, and early interaction with suppliers provide significant opportunities for improvement.

The findings also shed light on the mixed perceptions PAs hold about supplier commitment to GPP. While some suppliers are seen as proactive, others are perceived as needing greater awareness and engagement. This points to the need for stronger collaboration and capacity-building initiatives.

PAs themselves recognize the importance of internal learning and adaptation strategies to improve GPP implementation. By enhancing their capacity for external information acquisition and internal knowledge diffusion, and feedback mechanisms loop with suppliers, PAs can accelerate the integration of circular economy principles into public procurement and better stimulate the private sector toward circular transition.

Comparison Circular Demand vs. Circular Supply

The following graph presents a comparison between enterprises and public administrations based on parallel survey questions aimed at mapping the integration of circular economy practices in supply and demand. For enterprises, the implementation of circular practices was measured by their degree of adoption, while for public administrations, the integration of circularity criteria in public tenders was assessed by their frequency of application (as indicated in the parentheses in the graph).



Comparison Circular Demand vs. Circular Supply

The comparison between the adoption of circular criteria in Pas' tenders and circular economy strategies in Enterprises highlights significant gaps in the implementation of circular practices, particularly in areas such as purchasing renewable energy, recovering water practices, and take-back systems.

- While enterprises show a higher level of implementation in these areas (e.g., 29% of enterprises for renewable energy vs. 20% of PAs; 40% of enterprises for take-back systems vs. 15% of PAs), public administrations lag behind in integrating these criteria into tenders. This gap underscores the need for PAs to strengthen procurement requirements and incentives for circular practices.
Conversely, prioritizing local suppliers demonstrates strong alignment between PAs and enterprises, with
- enterprises showing even higher implementation (54%) compared to PAs (35%). This alignment suggests that fostering local supply chains is a shared priority, but PAs could further leverage this practice by promoting local partnerships through targeted incentives.

- A notable concern is the low implementation of recovering water practices and design for recyclability across both sectors, suggesting a broader systemic issue rather than a specific perspective on the demand or supply side. As discussed in the previous chapters, strategies to address these gap include knowledge-sharing initiatives and co-development of water recovery and recycling systems between public buyers and suppliers.

Comparison Circular Demand vs. Circular Supply

- While some alignment exists in areas like technologies for efficient energy use (48% of enterprises vs. 32% of PAs for partial or total implementation), the gap reflects a missed opportunity for PAs to adopt enterprise-driven innovations in procurement processes. Public Administrations could capitalize on private sector advancements by designing tenders that reward energy efficiency technologies and encouraging innovation-friendly collaborations.
- Design for durability demonstrates a relatively high implementation rate in enterprises (51%), yet PAs fall behind with only 17% partial or total integration. This highlights the need for PAs to incorporate durability requirements into contracts, ensuring public demand promotes long-lasting, repairable products aligned with enterprise capabilities.

- The aggregated averages for circularity practices reveal a significant gap between PAs and Enterprises in terms of implementation. While Enterprises show higher alignment with circularity practices (36% partially or totally implemented) compared to PAs (22%), a notable proportion of PAs (30%) have not considered these practices at all, almost double the percentage of Enterprises (14%). This indicates that while circularity is more embedded in Enterprises' operations, PAs still lag in integrating circularity criteria into their procurement processes. The similarity in the "considered but not implemented" category (50% for Enterprises, 48% for PAs) suggests shared challenges, such as lack of resources and operational readiness to fully implement circular practices.

Comparison Circular Demand vs. Circular Supply

- Although countries have developed GPP criteria, there are significant disparities in the adoption of environmental criteria. Inconsistency is particularly evident regarding mandatory GPP criteria within the Partner Countries compared to existing policies, which may be due to:

  - o Lack ofknowledge from publicadministrations.
  - o The fragmentation caused by variations in the product and service categories prioritized and covered bymandatory compliance in each Country.
  - o Most responses were provided by public administrations operating at the local and municipal levels, and the procurement policies in some countries impose varying levels of compliance for sub-national entities (e.g., Austria, Germany).

  The observed divergences highlight the need for greater harmonization and standardization of GPP approaches and standards to make its adoption more homogeneous and consistent across the EU countries.

- Italy's CAM integration into public procurement processes: despite the mandatory requirement of CAM integration into public tenders, the data show that all product and service categories face a certain share of low integration, with some categories facing a significant share of "never" responses(see Annex II), hence suggesting that these areas encounter systemic or practical barriers to adopting CAM, and a need for targeted strategies to overcome sector-specific challenges.

Barriers as Challenges for Circular Transition

Overcoming present barriers represent opportunities for circular transition in both the public and private sector.

- For enterprises, recognizing challenges such as administrative burdens or low financial returns can drive internal innovation. For example, companies can streamline processes, invest in digital tools, and build strategic partnerships to overcome these hurdles. Similarly, addressing financial constraints through innovative funding mechanisms can help enterprises better align with circular procurement demands.

- Public Administrations have a crucial role in transforming barriers into enablers. Improving the clarity of tender documents, offering meaningful feedback, and creating flexible procurement frameworks can empower companies, particularly SMEs, to participate more effectively. Programs that address risk aversion and promote collaboration between suppliers and PAs are particularly vital for fostering a dynamic procurement landscape that supports circular economy goals.

Collaboration between companies and public administration is key. Joint workshops, continuous dialogues, and shared capacity-building efforts can ensure that both sides are better equipped to overcome barriers and achieve circularity.

Drivers as Enablers of Circular Economy

Emphasizing present Drivers is a key strategy to boost circular transition in both the public and private sectors. Drivers such as economic benefits, early collaboration, and procedural clarity are essential to fostering participation in GPP. Enterprises that proactively rely on these drivers can strengthen their competitive advantage, aligning their operations with circular economy principles. However, the relatively lower focus on sustainability and innovation drivers underscores a critical gap. Addressing this gap provides an opportunity for both enterprises and public administrations to amplify the role of these elements as catalysts for a systemic shift toward circularity.

Public Administrations can play a transformative role by embedding lifecycle costing, sustainability incentives, and innovation-friendly criteria into procurement processes. Establishing trust through early collaboration, competitive dialogues, and transparent communication channels enables enterprises to align their offerings with public sector demands. These efforts create a supportive framework, encouraging broader adoption of circular practices and fostering a symbiotic relationship between public procurement and the private sector.

Suppliers' perception of Public Buyers' Innovativeness

The findings highlight a crucial aspect of how companies perceive public buyers in terms of innovativeness.

Generally, public buyers are viewed as less innovative compared to their private counterparts, with companies participating in Green Public Procurement (GPP) processes expressing similar sentiments to those that do not participate. This perception reveals systemic challenges within public procurement environments where risk aversion and limited openness to experimentation persist.

Interestingly, companies that have not participated in GPP tend to perceive public buyers as slightly more innovative than those with experience in these processes. This counterintuitive result could stem from higher expectations among participating companies who directly encounter the rigidity or lack of proactive engagement by public buyers. Non-participants, on the other hand, may evaluate public buyers from an external perspective, influenced by idealized assumptions rather than operational realities.
To address these perceptions, public buyers must proactively demonstrate their commitment to innovation. This includes introducing more flexible tender requirements, emphasizing innovation in procurement criteria, and fostering an open environment where suppliers feel encouraged to propose novel solutions.

The role of public administration in enhancing suppliers' commitment to GPP

Public Administrations play a crucial role in enhancing supplier knowledge and fostering greater commitment to Green Public Procurement. Survey results indicate that while PAs recognize the importance of supplier engagement, gaps persist in effectively communicating circular requirements and expectations.

- To bridge these gaps, PAs can initiate targeted workshops and training programs designed to enhance supplier understanding of technical aspects and circular criteria. Sharing real-world case studies and successful tender examples can demonstrate tangible benefits and provide actionable insights for suppliers.

- PAs can support suppliers in transitioning towards greener practices by providing clear guidance on certification schemes, renewable energy integration, and sustainable production methods. This includes offering practical tools, such as checklists and templates, to streamline compliance with green criteria.

- Procurement practices can serve as levers for promoting supplier commitment. By rewarding sustainable and innovative solutions through tender evaluation criteria, PAs incentivize suppliers to invest in circular strategies. These efforts create a virtuous cycle where increased supplier commitment leads to more sustainable outcomes in public procurement.

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Section 4

Additional observations



Additional observations

This study offers a comprehensive evaluation of circularity in public and private sectors, providing an initial benchmark for understanding trends, barriers, and drivers in the transition to a circular economy. Based on 398 responses from enterprises and 232 from public administrations across seven countries, the findings highlight the current state of circular procurement and supply practices within the project's countries.

The survey design ensured a rigorous approach, including translations into seven languages, carefully formulated questions, and anonymity to encourage truthful responses. To address potential biases, reverse-coded scales were used, and dissemination materials emphasized the need for knowledgeable respondents. While robust, the study acknowledges few limitations. The sample size may not fully represent the diversity of

practices across all regions, sectors and organizational types, thus affecting representativeness and inter-country comparison. Also, limited understanding of green procurement concepts in certain regions and varying levels of awareness about circular economy practices may have further restricted broader participation, especially among enterprises. Furthermore, self-reported data may introduce biases, such as over-estimating circular practices or underreporting barriers. Finally, differences in cultural interpretations and internal communication structures further influence response consistency.

Additional observations

While quantitative analysis derived from this study provides valuable insights, it may obscure contextual and country-specific nuances that qualitative methods are better suited to uncover. To complement this approach, qualitative assessments in the form of semi-structured interviews are underway: five enterprises and five public administrations per country are being interviewed with the aim to capture deeper insights into circularity, such as organizational culture, informal practices, and contextual challenges. The interviews address nuances that quantitative methods may overlook, ensuring a more holistic understanding of circular economy integration. The extent to which respondents are informed and knowledgeable—regardless of their number compared to the overall sample size—is what makes interviews both insightful and a valuable complement to surveys.

To conclude, despite some methodological limitations, the study provides valuable insights into the circularity landscape. By combining quantitative and qualitative approaches, it lays a strong foundation for future research and practical strategies to advance circular procurement and supply practices.

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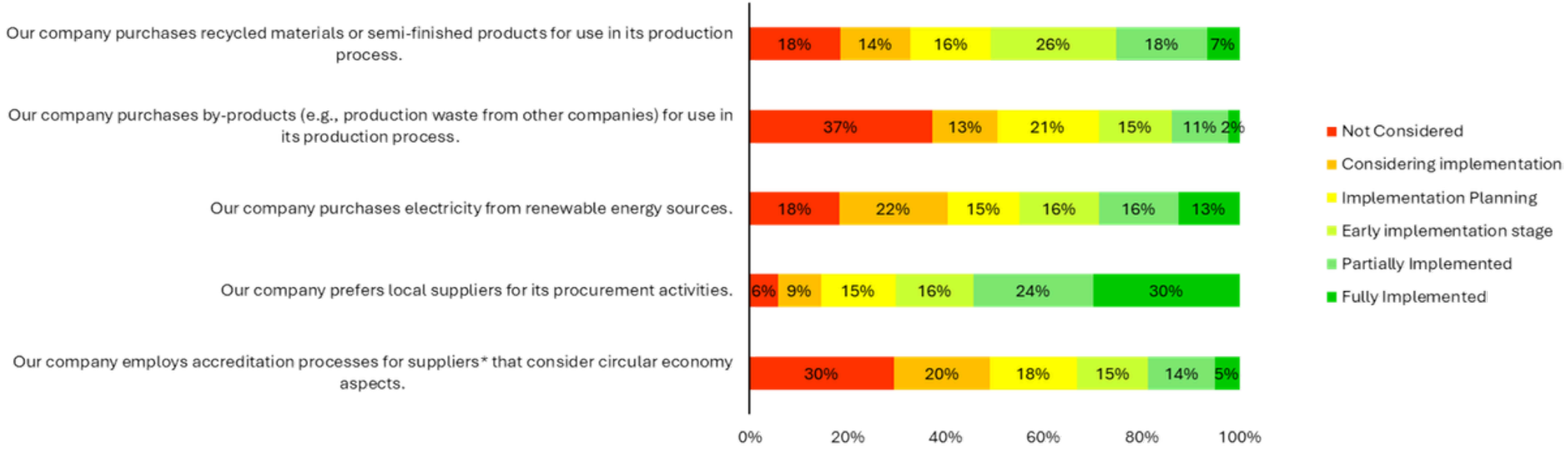
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Annex I
Circular Economy Supply



Circular Economy in Purchasing

Circular Purchasing refers to the sourcing of recycled materials, by-products, and the preference for local, sustai nable suppliers. It also evaluates supplier accreditation processes based on circularity principles.

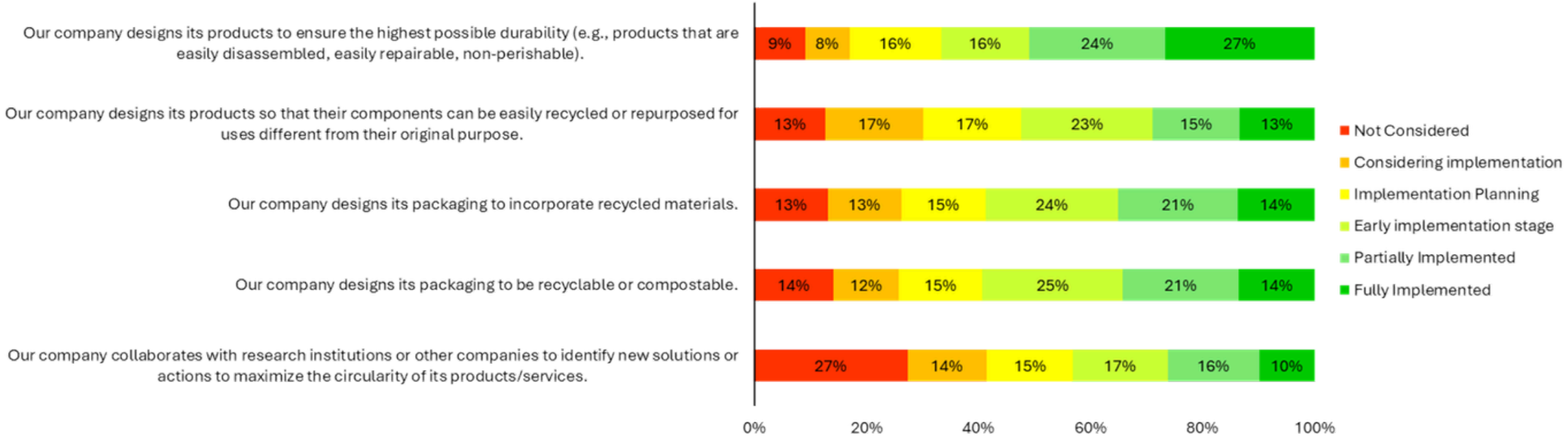


Among the circular purchasing practices, prioritizing local suppliers stands out as the most implemented, with 54% of companies reporting partial or full implementation. Businesses recognize the importance of supporting local procurement as a means of fostering circular economy. Conversely, Supplier accreditation for circular economy considerations also lags, with just 19% of companies reaching partial or full implementation and 30% not considering it. This highlights a gap in formalizing circular purchasing strategies through rigorous supplier evaluation processes.

Purchasing by-products, such as production waste from other companies, shows the lowest levels of implementation, with only 13% of firms reporting partial or full adoption and 37% not considering it. This indicates that significant barriers remain in terms of market of by-products. Similarly, the use of recycled materials or semi-finished products have moderate implementation but still require significant efforts. The procurement of electricity from renewable energy sources (29% partial or full implementation) reflects increasing but not yet widespread adoption of greener energy solutions.

Circular Economy in Product Design

Circular Product Design refers to how products are designed for durability, repairability, and recyclability. It also examines the use of recycled materials in packaging and collaboration to enhance product circularity.

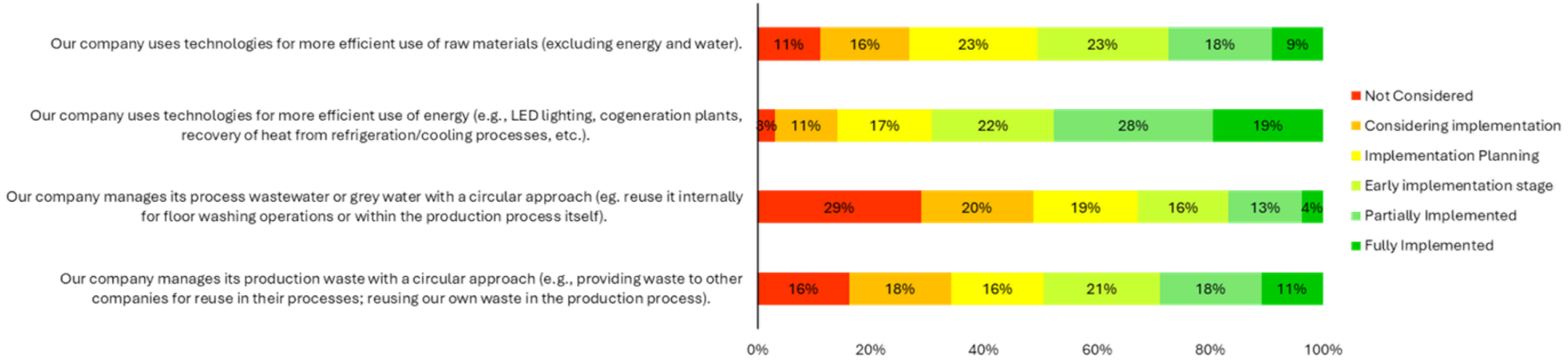


Designing products to ensure durability emerges as the most implemented practice, with 51% of companies reporting partial or full implementation. This reflects a focus on extending product lifecycles, also through repairability and disassembly. Incorporating recycled materials and ensuring packaging is recyclable or compostable are implemented by 35% of companies at partial or full levels, suggesting that companies are making progresses toward reducing waste and improving material reuse in their packaging strategies.

However, designing products for alternative uses or repurposing remains less common, with only 28% of firms reaching partial or full implementation. This may indicate challenges in innovating products to meet diverse post-use applications. Collaboration with research institutions or external partners to foster circular solutions is the least implemented practice, underscoring a gap in leveraging external expertise to drive innovation and overcome technical barriers to circularity.

Circular Economy in Production Process

Circularity in Production Process focuses on the use of technologies that optimize resource efficiency and reduce environmental impact, including circular management of waste and water within production processes.



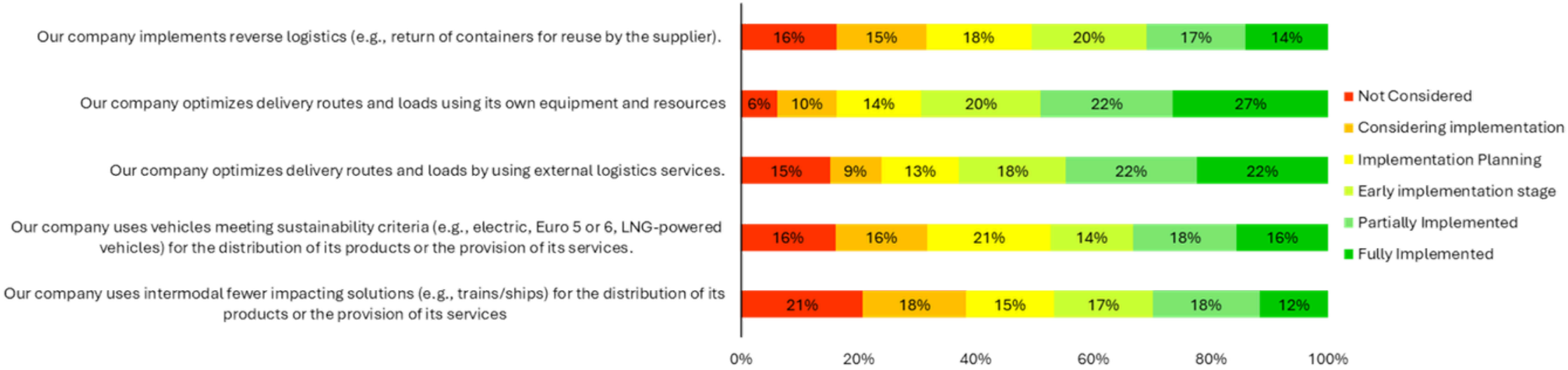
Technologies aimed at efficient energy use stand as the most widely implemented practice, with nearly half of the companies (47%) reporting partial or full implementation. This reflects a strong commitment to improving energy efficiency, likely driven by its dual benefits for cost savings and impact reduction. Conversely, technologies for the efficient use of raw materials are implemented at a more moderate level, with 27% of companies at partial or full implementation. This suggests that while resource optimization is recognized, it may require greater investment or technical capacity compared to energy-focused practices.

Water management in production processes exhibits lower levels of integration, with only 20% of firms implementing it and 29% not considering it at all. This highlights a strong area for improvement, as water reuse represents a critical aspect of circularity.

Lastly, managing production waste with a circular approach, such as reusing internally or providing to external companies, shows mixed results, with 29% of companies at higher implementation levels. However, the significant proportion of firms in earlier stages (55% considering or planning implementation) indicates substantial potential to enhance waste valorization practices.

Circular Economy in Logistics

Circularity in logistics practices like reverse logistics, optimizing delivery routes, and the use of sustainable transport solutions (e.g., electric vehicles, intermodal options).



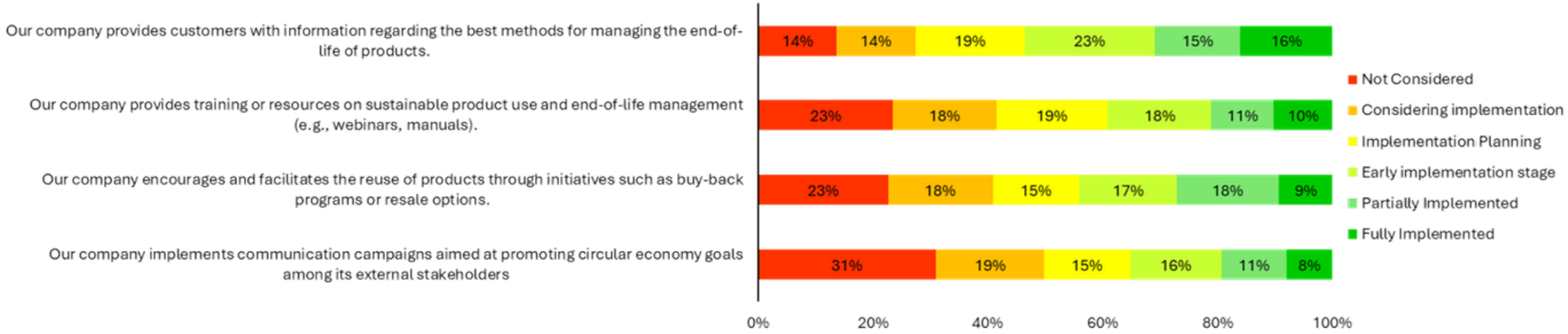
As expected, the optimization of delivery routes and loads emerges as the most widely implemented practice, with 49% and 44% of companies reporting high implementation respectively when using their own resources or external services. From one hand, this indicates a strong focus on internal logistics efficiency. On the other hand, it suggests that many companies using external services are equally sensitive to optimizing costs while also reducing impact. Reverse logistics has slightly lower adoption, with 31% of companies with high implementation. The adoption rate of reverse logistic, however, highlights huge opportunities for further enhancement in reverse supply chain integration.

The use of vehicles meeting sustainability criteria (e.g., electric or Euro 5/6 vehicles) shows a balanced spread, with 34% of companies reporting higher implementation levels and only 16% not considering yet this practice. This reflects an increasing but not universal shift towards greener distribution methods.

Finally, intermodal solutions with lower environmental impacts (e.g., trains, ships) are the least implemented practice, with only 29% achieving higher implementation. This indicates a potential area for growth, as such solutions often require substantial coordination and infrastructure investments.

Circular Economy in Use and Consume

Circularity in the Use and Consume measures how companies inform and support customers in sustainable use, repair, and reuse of products, including buy-back programs and training on circular practices.



Providing customers with information on end-of-life management for products highly implemented by 38% of companies. This suggests that companies recognize the importance of equipping customers with the knowledge to manage products after their use, but there is still significant room for growth.

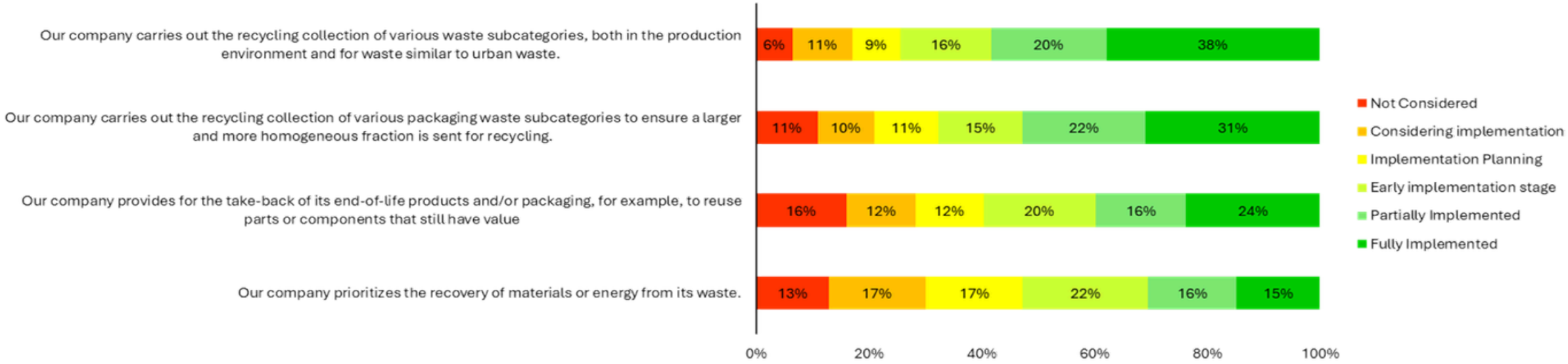
In contrast, practices like providing training or resources (e.g., webinars, manuals) on sustainable product use and end-of-life management are less widespread, with only 29% of companies reaching partial or full implementation. This indicates a potential opportunity to enhance customer education efforts to better align with circular economy goals.

Encouraging and facilitating the reuse of products through initiatives like buy-back programs or resale options has similar levels of implementation, with 26% of companies reporting partial or full adoption. While these initiatives are central to closing material loops, their relatively low implementation suggests that logistical and operational challenges may hinder wider adoption.

Communication campaigns aimed at promoting circular economy goals among external stakeholders are the least implemented practice, with only 19% of companies with high implementation. This highlights a need to strengthen external engagement strategies, as effective communication is key to fostering collaboration and driving broader circularity goals.

Circular Economy in Waste Management

EoL Circularity refers to the management of product and packaging waste, including recycling programs and take-back initiatives, with a focus on material and energy recovery.



The most implemented practice is the recycling collection of waste, both in production environments and for urban waste, where 58% and of companies report high implementation. This reflects a widespread acknowledgment of the need for systematic recycling practices to align with circular goals. Similarly, the recycling collection of packaging waste subcategories shows significant adoption, with 53% of companies highly implementing this practice. These actions ensure larger, more homogeneous fractions of waste are directed toward recycling, supporting better waste segregation and processing efficiency.

Take-back programs for end-of-life products or packaging, aimed at reusing valuable parts or components, are moderately implemented, with 40% of companies reporting partial or full implementation. While this approach promotes material recovery, its lower adoption compared to other practices may suggest operational barriers.

Lastly, recovery of materials or energy from waste is also implemented to a medium extent, with 37% of companies partially or fully adopting this practice. This reflects an effort to maximize value from waste streams, but further improvements could enhance the circularity of production processes.