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Green procurement and Circular Economy: Dynamics of public and private ecosystems

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This report demonstrates the reciprocal relationship between green procurement (GP) and circular economy (CE). As a procurement approach that prioritizes ethically sourced and environmentally sustainable goods and services, GP, whether at the national or firm level, plays a crucial role in enabling the CE. On the other hand, the adoption of CE practices, despite its current fragmentation at the national level, serves as an external driver for GP. Through an in-depth case study of SLB, a multinational technology company specializing in innovative environmental solutions for businesses, this report provides key insights into real-world GP practices and offers relevant recommendations to strengthen GP, which facilitates the transition to the CE.

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1. Green Procurement: An Enabler of the Circular Economy

The transition to a CE, characterised by a system that decouples economic growth and environmental degradation, aims to achieve sub-zero level of waste while enabling the regeneration of natural resources (Ellen Mccarthur Foundation, 2025). This economy, hailed by regulators and decision makers, requires developing closed loop operations that minimize reliance on virgin resources (Alhola et al., 2019).

To successfully transit to a CE, multiple enablers are required, including stakeholders' behavioural changes (Bertassini et al., 2021). One key enabler is green procurement, also known as environmental purchasing, which is defined as "*the set of purchasing policies held, actions taken, and relationships formed in response to concerns associated with the natural environment*" (Zsidisin and Siferd, 2001, p.69). By its very nature, GP, either in the public or private sector, requires selecting sustainable suppliers and sourcing environmental-friendly raw materials and/or products. These may include materials that are ethically sourced or circular - that possibly designed for reuse, recycling, remanufacturing, refurbishing, and repurposing. In this context, circularity criteria can serve as key purchasing indicators, contributing to foster circular ecosystems and promote sustainable supply chains (Sönnichsen & Clement, 2020).

At the national level, *green public procurement (GPP)* fosters the CE by developing favourable CE-based regulations, and integrating *circular criteria* (e.g., recyclability in design, reuse of materials, use of recycled materials, among others) into tendering processes. These criteria enhance tender performance by incentivizing businesses and individuals to adopt CE practices to meet the government's requirements (Sönnichsen & Clement, 2020). Moreover, GPP stimulates innovation in the private sector by encouraging the development of new circular products (e.g., product-service systems, digital products, environment based innovative products). In addition, it promotes industrial symbiosis and circular ecosystems, where collaboration among actors enhances resource efficiency (Alhola et al., 2019).

At the firm level, *GP* drives the development of the closed-loop operations since all supply chain players algin with circularity principles and share common environmental objectives (Winkler, 2011). This shift enables firms to minimize their environmental footprints by reducing inbound logistics' pollution, lowering environmental impact of raw materials, reducing energy consumption, and improving resource efficiency while fostering the sustainability performance of their entire supply chain (Ross and Jayaraman, 2009). By integrating reverse logistics, GP further facilitates waste reduction, allowing firms to recover

end-of-life products from customers and reintegrate them as secondary materials within the supply chain (Sönnichsen & Clement, 2020). Furthermore, GP enhances stakeholder collaboration by actively engaging customer in circular business models. By giving consumers a voice in product design and encouraging them to return used products for reuse/recycling/remanufacturing, GP strengthens circular supply chains and increase the success rate of circular business models (Appolloni et al., 2014).

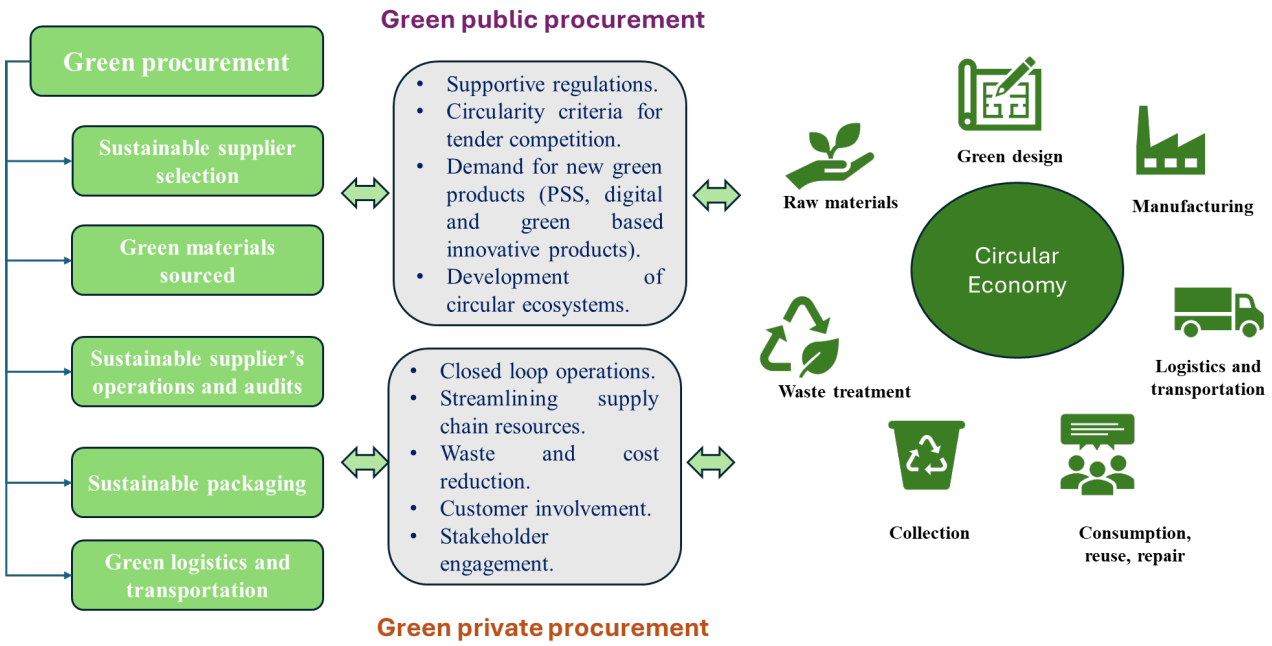


Figure 1: Green procurement and the circular economy

2. *The CE: Demand-Driven Factor of Green Procurement*

In the private sector, both internal and external factors (Table 1) drive GP. Along with the increasing concern with the CE by regulators, competitors, customers and society, the CE adoption, despite its current fragmentation at the national level, can serve as a demand-driven factor for green corporate procurement, especially for firms that are still engaging with the linear economy model (Wijayasundara et al., 2022). For example, in the chemical industry, when the CE is being implemented by various change agents, such as LanzaTech implements the CE by capturing carbon emission as inputs for other production processes, other companies are more likely to consider using more sustainable feedstock, e.g., recycling plastics, in response to institutional pressures from growing circular businesses.

Drivers	Specific factors
Internal factors	• ***Leadership and top management commitment*** and support aligning with the *upper echelons theory* (Hambrick & Mason, 1984; Yen & Yen, 2012; Anin et al., 2024). • GP can be ***financially advantageous*** when recycled materials are cheaper than virgin materials (Wong, San Chan, & Wadu, 2016). • Close collaboration with suppliers, supplier environmental certification, and assessment increases ***trust in GP*** and circular practices. For instance, H&M's partnership with suppliers facilitates GP and circular practices. • Integrating GP with business strategy positions it as a key driver for ***competitive advantage*** (Leppelt et al., 2013). • High ***agency conflicts*** between suppliers and focal firms may hinder GP adoption due to perceived risk of opportunistic behaviours from suppliers (Leppelt et al., 2013). • The alignment between ***sourcing capabilities*** and ***organizational structure*** can reduce GP costs (Plugge and Bouwman, 2013).
External factors	• ***Regulations and policies*** on sustainability, CE, and GPP serve as catalysts for corporate GP adoption (Chan et al., 2012). • Growing ***customer preferences*** for environmental-friendly products or recycling materials encourage firms to engage in GP (Björklund, 2011). • ***Industrial regulations***, ***norms***, and ***competitors' sustainability performance*** drive firms towards GP (Ghosh, 2019). • ***Society acts*** as a watchdog, monitoring corporate sustainability performance. Firms respond to societal expectations to maintain corporate social responsibility (CSR), and therefore, fosters GP as firms want to comply with social demands according to institutional and legitimacy theory (Walker, Di Sisto, & McBain, 2008).

Table 1. Drivers of green procurement

3. Green procurement: lessons learned from SLB

Known as a multinational oilfield services company, SLB, founded in 1926, is operating in an environmental-sensitive industry. Gradual transforming towards a more sustainable corporate citizen, SLB currently focuses on energy innovations for a balanced planet (SLB, 2025). As rated by CSRHub as of February 2025, the current CSR score of SLB is 87 out of 100 while the sustainability score of the company is 74/100 by LSEG, implying its good CSR and sustainability performance.

Over the past three years, the company has invested in training programs on the CE for its procurement and supply chain managers and officers, delivered by the University of Exeter. Note that, the UKRI Interdisciplinary Centre for Circular Chemical Economy (CircularChem) was commissioned to conduct a series of six webinars from 2023 to 2024. These sessions aim to equip SLB's professionals with knowledge of CE approaches, good practices, and the potentials of CE within the chemical industry.

SLB - Schlumberger NV: ❖ **Founded in 1926 as an Electric Prospecting company.** ❖ **SLB has been changing its business portfolios from time to time.** ❖ **The company currently aims to become a global technology company offering "energy innovative for a balanced planet".**	
Products & Services	**Sustainability Profile (as of Feb 2025)**
• **Decarbonising Industry** • **Innovating in Oil & Gas** • **Scaling new energy systems** • **Delivering digital at scale**	• CSRHub: 87/100 • LSEG: 74/100 • Strengths: High social and environmental scores (over 80/100). • Weaknesses: Moderate governance score (50/100)

Table 2. SLB profile

As a part of CircularChem's webinar series, a survey was conducted among SLB's procurement professionals to gather insights into the key criteria for supplier selection and order placement. A total of 64 responses were collected across the six webinars. While respondents considered ***different factors*** when selecting a potential supplier, spanning from product price to product and service quality, sustainability, risk management, and other aspects, just *over half agreed that* sustainability criteria, such as recycled materials and products' carbon footprints, were important for selecting suppliers and placing orders – see Figure 2.

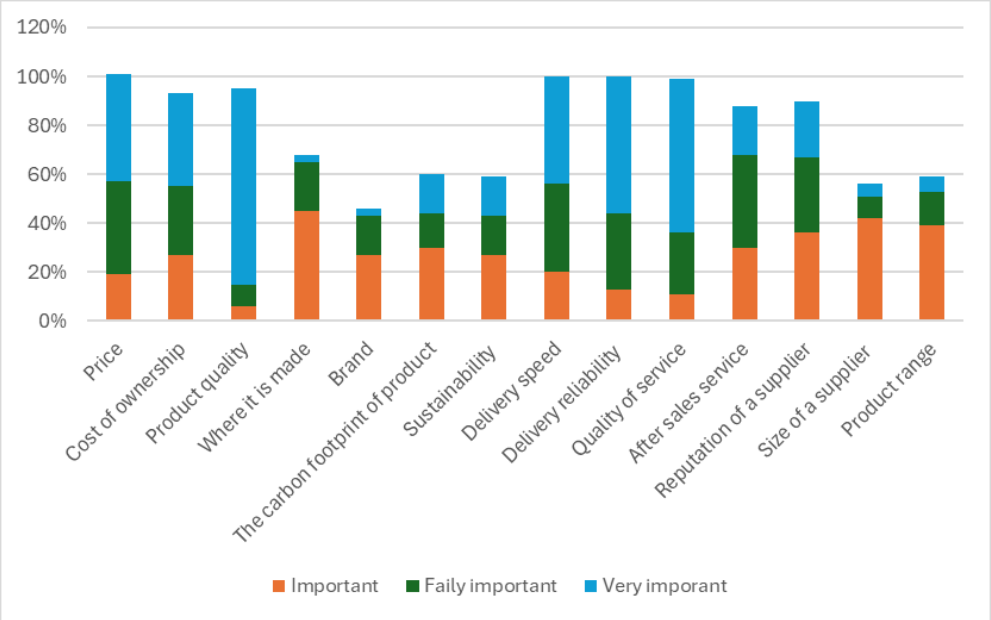


Figure 2. Supplier selection criteria at SLB*

*Notes: This analysed is based on 64 responses across the six webinars.

When asked about additional selection criteria, participants suggested several other key factors across different aspects of product and service quality, responsiveness, lead time, supplier's capacity and the alignment between suppliers' operational and business strategies with the purchaser, risk management, CSR and sustainability. However, conventional factors such as price, product and service quality, delivery speed, among others, remained the primary considerations in choosing their suppliers (Figure 3).

Figure 3. Additional supplier selection criteria suggested by SLB professionals.

In addition, questions raised by SLB professionals and discussions during and after the webinars provided valuable insights into the perspectives of the company's change agents. These interactions highlighted key lessons learnt from this case.

Key Lessons Learnt

The SLB case study (webinars, open discussions among participants and between participants and guest speakers, questions raised by participants) combined with the relevant literature, served as guiding theoretical frameworks, demonstrates several key lessons learnt in terms of GP and the transition to the CE viewed from a purchasing perspective.

1) Leadership, awareness, commitment and support:

- ***Leadership's awareness, commitment and support*** are critical for advancing the CE transition through GP, as suggested by the *upper echelons' theory* (Hambrick & Mason, 1984). Strong leadership drives managerial agents and employees to engage with sustainable purchasing practices (Appolloni et al., 2014). For SLB, its leadership and top management demonstrated a clear understanding of the CE transition and recognized procurement as a strategic lever. Therefore, SLB invested in customised training activities for its procurement and supply chain professionals.

Learning from external sources through official training activities, as demonstrated by SLB, plays a critical role in motivating employees to embrace change. During webinars, SLB professionals actively engaged with guest speakers and industry experts, seeking insights into external CE practices. Real-world examples, such as CE initiatives at leading companies like BASF and LanzaTech, acted as institutional forces (Grob & Benn, 2014), encouraging employees to reconsider their roles and align their personal goals with the company's sustainability and circularity vision. This lesson derived from the SLB case study aligns with institutional theory (Meyer & Rowan, 1977), illustrating how organizations can proactively learn from others to drive change. Several questions on best practices related to legal or contractual set up of conversations with different types of stakeholders (e.g., suppliers, competitors) to facilitate collaborative work were raised during webinars, demonstrating willingness to learn from outsiders in terms of GP.

2) The role of change agents:

- Procurement managers and officers across regional operational sites (e.g., SLB global branches) act as ***critical change agents*** for transforming to GP (Vejaratnam, Mohamad, & Chenayah, 2020). Therefore, ***educating*** and ***empowering*** these change agents and creating ***effective internal communication systems*** are essential to foster changes company-wide.
- Progress of changes should be ***managed, monitored and adjusted timely*** to ensure the alignment between GP and business strategies, which is a critical success factor (Leppelt et al., 2013).

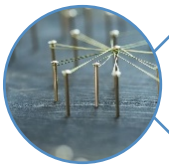
3) A comprehensive blueprint for GP implementation:

- A holistic blueprint on the implementation of GP and CE at either a business unit or an entire organisation must be ***developed, approved, and communicated effectively*** within firms and across their supply chains. This ensures a shared understanding of GP objectives. This lesson emerged from questions raised by SLB professionals and open discussions on how to implement the CE, challenges and enablers for the implementation of CE and GP.

Discussion: *The* ***timeframe*** *needed to implement the circular economy.*

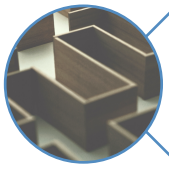
Discussion: *The* ***role of technology or customer buy-in*** *in the circular economy.*

- The blueprint should provide a clear ***roadmap*** for transforming towards GP and CE, detailing key elements such as allocated resources, milestones and achievements, performance indicators, and risk management plan. All these considerations need to align with the company's business strategies, organizational structure, leadership capacity, workforce competency, customer relationship and demand, regulations, among others (Leppelt et al., 2013; Plugge and Bouwman, 2013).



***Discussion**: How to **identify and cultivate true partnerships** on either side of the value chain towards circularity?*

***Discussion**: **The availability of industrial standard metric or indicators** for companies to evaluate their current level of contribution to circular economy.*



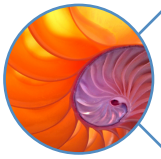
***Discussion**: **Challenges** of working collaboratively with competitors to meet a common target of implementing circular economy concepts in some real-world cases and **solutions** to these challenges.*

4) Stakeholder's engagement

- The success of GP and CE depends on the effectiveness of stakeholder's engagement (e.g., the agreement among employees, the alignment in interests between suppliers and focal firms, the involvement of customers, and the supportive regulatory environment) (Kunz, Mayers, & Van Wassenhove, 2018). *Timely information sharing* and *effective communications* are key for engaging stakeholders. Stakeholder's engagement was popularly discussed by participants during webinars.

***Discussion**: Current practices in **supplier partnerships** and engagement and benefits for these partnerships in terms of Scope 3 emission reduction.*

***Discussion**: How to encourage **smaller businesses** to make the shift in mindset to buy into CE.*



***Discussion**: How to **change perceptions of suppliers,** especially smaller ones towards the CE.*

- Different stakeholders contribute unique resources to support the GP and CE transition. To maximize impact, these resources must be used efficiently and transparently,

making ***accountability*** *and* ***trust*** *as* key factors in resource management (Di Vaio et al., 2023). Since CE is often perceived as a high-risk investment, it is crucial to shift stakeholders' mindsets and convince board members to invest despite the significant upfront costs.

- ***The role of customers*** must be emphasized throughout the purchase, operation, and distribution of products and services. For example, when selecting suppliers, SLB procurement professionals often assess their suppliers' capacity to hold stock and may consider whether their suppliers engage in circularity practices. Therefore, from the suppliers' perspective, meeting customer requirements is essential, and alignment in values between a company and its customers plays a critical role in decision making.

Discussion*: How to bring clients along for the journey with the same level of understanding of the value proposition across the value chain?*

- ***Inverse logistics and take back system*** need to be strengthened to support the closed loop operations in the CE (Winkler, 2011). Viewing from a purchasing perspective, these systems enhance GP by enabling suppliers to collect wastes from end-use customers of focal firms and transform those into recycled materials. As highlighted by webinar participants, it is critical for companies to ensure long-term value co-creation with both suppliers and customers, providing benefits to all stakeholders.
- ***Industrial symbiosis,*** a collaborative model where firms across industries recover waste or exchange surplus resources, has emerged as a critical enabler for GP and CE transitions. For example, LanzaTech's innovative technology captures carbon emissions from steel mills, such as those from Shougang Group, and converts them into ethanol. By repurposing waste into valuable inputs (e.g., carbon emissions, scrap materials), businesses can minimize waste and operational costs while improving their environmental reputation and sustainability profiles (Baldassarre, et al., 2019; Xu et al., 2025).

Key Recommendations

The reciprocal relationship between the GP and CE highlights the importance of utilising GP as a driver for CE (Sönnichsen & Clement, 2020), while leveraging institutional pressures from CE practices to further promote GP (Wijayasundara et al., 2022). In practice, while there is some awareness of sustainability, carbon footprint and CSR, with many firms considering these factors in supplier selection and order placement, the actual implementation of these principles remains limited because of several barriers (e.g., financial barriers, including high costs, lack of legitimacy, unsupportive regulations, poor commitments from suppliers, industrial specific barriers, etc.) (Appolloni et al., 2014). The following recommendations are based on the analysis of the current challenges, requirements for accelerating the GP and CE transition. These recommendations cover perspectives of five key actors: regulators, focal firm, suppliers, customers, and financiers.

Stakeholder	Recommendations
Regulators	• ***Green public procurement:*** This practice lays the foundation for GP regulations and supplier selection criteria, fostering the growth of circular business ecosystems. • ***Favourable regulatory environment:*** Supportive regulatory frameworks are essential to drive the circularity in the private sector.
The focal firm	• ***CE culture & leadership's commitment and support***: Building a CE culture and securing the leadership's commitment can shape internal stakeholders' behaviours towards CE, leveraging GP as a strategic tool. • ***GP evaluation and integration***: Evaluating current procurement practices, focusing on levers, enablers, and challenges, can facilitate the development of effective GP strategy that seamlessly integrates into business and operational strategies. • ***Comprehensive training programs***: Offering targeted training programs that cover the technical aspects and procedures of GP (e.g., bidding criteria and supplier selection, order placement and firm-supplier relationships), to raise awareness and improve capabilities. • ***Performance monitoring mechanisms***: Establishing robust monitoring systems facilitates sustainability audits, order tracking, sustainable inventory management, and GP risk management.
Suppliers	• **Compliance with sustainability and circularity criteria**: Adapting business operations to meet sustainability and circularity standards set up by focal firms ensures long-term compliance and competitiveness.

	• ***Sustainability risk identification***: Identifying potential risks and developing resilience and compliance plans supported by focal firms helps mitigate both supplier and supply chain vulnerabilities. • ***Supply chain transformation:*** Transitioning entire supply chains toward sustainability and CE can strengthen overall competitiveness, positioning supply chains as unified, resilient market players.
Customers	• ***Sustainability linked demands***: Increased demand for sustainable and circular products drives supply chains towards GP and CE acceleration. Therefore, raising customer awareness of their role in influencing these shifts is essential • ***Willingness to be involved***: Engaging customers in purchasing decisions, product design, and manufacturing processes strengthens demand-supply alignment while reinforcing sustainability goals.
Financiers	• ***Financing mechanisms:*** Developing innovative financial mechanisms and optimizing existing ones can help firms overcome financial challenges associated with GP and CE transition. Financiers should promote green or sustainability-linked debt instruments. • ***Credit risk management:*** Effective credit risks management requires accurate credit risk estimation, incorporating sustainability criteria, rigorous monitoring, and contingency planning. Enhancing borrower disclosure quality, ensuring accountability, and enforcing suitable debt covenants can mitigate financial risks.

Table 3. Key recommendations

4. Concluding remarks

Accelerating the CE requires a system approach, leveraging several enablers while demolishing barriers that hinder progress (Xu et al., 2025). From the purchasing perspective, GP is a key that can be achieved by joint efforts of all stakeholders in a complicated ecosystem: focal firms, suppliers, customers, financiers, and regulators. Therefore, it is essential for the companies to consider the roles of these actors and to utilise well their roles in accelerating the transition to GP and CE. At the national level, green public procurement for circular products can be an effective approach to promote the CE in the private sector.

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