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Sufficiency in European Product Policies: Status Quo and Future Potentials

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Abstract: Technological innovations and efficiency measures have been the primary focus of many policies aimed at meeting global sustainability and resource security goals. However, it has been established in literature that these measures alone are unlikely to drive long-term sustainability or reduce absolute resource demands. Sufficiency-oriented approaches, which focus on slowing down and minimising resource use, are often overlooked in current policy frameworks and business strategies, especially in resource-intensive sectors like the electronics industry. Given the pressing need to address resource overconsumption and its environmental impacts, it is essential to explore how sufficiency can be incorporated into product policies. This paper analyses the current state of sufficiency-oriented measures in European product policies, taking consumer electronics and electrical devices as a case study, and proposes supplementary instruments that can advance sustainability targets. We also develop a categorization framework for sufficiency policies to lay the groundwork for future empirical research, which can help guide policy developments and encourage broader adoption of sufficiency strategies.

Introduction

While the transition to a circular economy (CE) is often seen as a key part of the solution to sustainability challenges and support our efforts to stay within planetary boundaries (Desing et al. 2020; McDonough and Braungart, 2002), most CE business and governmental strategies currently focus on efficiency (doing more with fewer resources) and consistency (developing technologies with minimal environmental impact). This approach emphasises decoupling environmental impacts from economic growth through resource efficiency measures, recycling targets and technological innovations, without addressing an overall reduction in material use (Bocken et al., 2022; Figge et al., 2014; Morseletto, 2020; York et al., 2022). Sufficiency, by contrast, calls for systemic change and absolute reduction of resource needs, by avoiding waste, extending product lifespans, and shifting social practices (Maitre-Ekern and Dalhammar, 2019). While there is an overlap between these three sustainability strategies (Rudolf and Schmidt, 2025), as shown in Figure 1, sufficiency-oriented measures, are also needed to realise global sustainability goals and resource security targets (Cordroch et al. 2022; IPCC, 2022; Sachs, 2015).

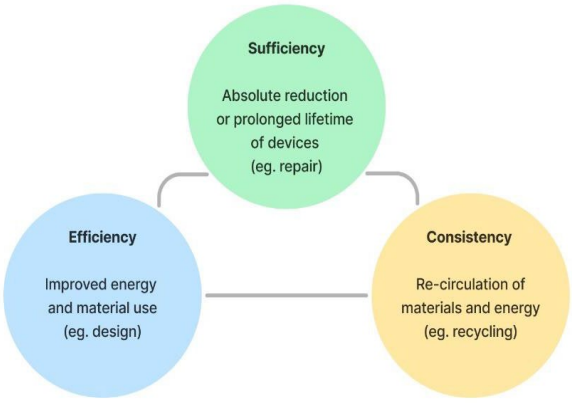

Figure 1: Interconnected sustainability strategies in EU product policies (own visual)

Despite growing recognition of its importance, sufficiency remains underrepresented in policy efforts (Zell-Ziegler et al., 2021; Calisto Friant et al., 2020), while mainstream eco-efficiency approaches have largely failed to achieve sustainable consumption patterns (Spangenberg and Lorek, 2019). Sufficiency approaches face resistance from various stakeholders (Gumbert et al. 2022; Suski et al. 2023). Businesses view sufficiency as a threat to their operations based on profit maximisation

(Bocken and Short 2016), and thus, most sufficiency-oriented business initiatives remain a niche (Niessen and Bocken, 2021). Policymakers also fear losing public support due to negative perceptions of sufficiency, such as its association with deprivation (Mont and Lehner, 2023). However, public legitimacy for sufficiency policies is growing gradually in the Global North (O'Dell et al., 2024; Jenny et al, 2024; Lage et al. 2023).

While most scholars agree that sufficiency is unavoidable, there has been an intensive debate about what sufficiency entails and how it should be defined (Jungell-Michelsson and Heikkurinen, 2022). Sufficiency has transitioned among scholars from being viewed as a moral responsibility of individuals, to the basis for unavoidable policy interventions (Lage et al., 2024, Santarius, et al., 2022; Spangenberg and Lorek, 2019). Literature highlights that relying on individual or organisational sufficiency leads to a slow and marginal progress that lacks widespread adoption, as mainstream social, economic, and policy frameworks deeply influence the possibilities to act (Greene et al., 2024).

Consequently, systemic approaches through policy interventions are necessary to enable sufficiency on a larger scale (Mont et al., 2022). Scholars have thus emphasized the need for further research on advancing sufficiency strategies in policies and identifying the factors that hinder their implementation. (e.g. Iten et al., 2024). In this conference paper, we aim to contribute to the literature by analysing the current state of European product policy efforts to advance sufficiency strategies, including the promotion of lower and slower consumption practices, while also exploring potential future policy approaches.

Defining sufficiency in policymaking

Most sufficiency literature examines what is required to achieve dual ecological and social goals - staying within planetary boundaries while ensuring social equity. Another key stream focuses on "action-oriented" approaches to achieving these objectives (Iten et al., 2024). Scholars debate whether the focus of sufficiency is solely on reducing consumption and/or production (e.g. Figge et al., 2014), whether it is a state to achieve or if it also involves a transformative process involving shifting to slower consumption practices (Speck, 2016) and slower production or service practices (Zechiel, 2024; Niessen and Bocken, 2021). Additionally, scholars explore the concept of "enoughness," including both its upper and lower limits and what those entail (Spengler 2016; Tröger and Reese 2021).

Instead of applying the definition of sufficiency as non-consumption (e.g. Stengel, 2011), we decided to adopt a broader yet pragmatic definition. Drawing on Lange et al. (2023) and Speck (2016), we define sufficiency in product policies as a strategy to reduce the overall resource demands of end-use products by transforming social practices and integrating accessible, low-impact options — such as lessen and slow down — into consumption and production patterns. "Lessen" aims to reduce absolute quantities of products by avoiding overconsumption or limiting sales. "Slow down" focuses on decelerating consumption and production by qualitative product changes and supporting extended lifetime practices. Guided by Zechiel (2024), our focus centres on reducing overconsumption among high-consuming classes and addressing overproduction, rather than questioning basic human needs. Through our analysis, we aim to contribute to research that seeks to develop a set of measures to guide policymakers toward more sufficiency-oriented strategies (e.g. Best et al., 2022).

We have decided to focus specifically on electronic and electrical devices in this work as a case study, as the electronics industry is among the top eight sectors contributing to over 50% of global carbon emissions (Singh and Ogunseitan, 2022), and discarded electronics are among the most problematic and fastest increasing waste streams (Baldé et al, 2024). While the absolute reduction of material consumption has clear environmental benefits, promoting product longevity through durability and repairability also reduces the environmental impact associated with resource extraction, manufacturing, and disposal (Cordella et al., 2021). Moreover, encouraging durability and repairability can reshape the relationship between manufacturers and consumers, requiring greater responsibility for product care from both sides (Beyeler & Jaeger-Erben, 2022), that may challenge the underlying linear material culture of novelty-seeking fuelling early product replacements (Jaeger-Erben et al., 2021a). Our guiding research questions are as follows:

1. What is the status quo of sufficiency strategies in current European product policies?
2. What policy instruments can foster sufficiency-oriented lifestyles and business practices in the consumer electronics sector?

Methods

Since scholars agree that few sufficiency-oriented policies have been implemented (e.g., Zell-Ziegler et al., 2021; Mont et al., 2022), we take a pragmatic approach to analysing the current state of sufficiency in European product policy, and like other scholars (e.g. Iten et al., 2024; Lage et al, 2024), we examine policies that may achieve sufficiency outcomes, even if they are not explicitly labelled as such.

We apply the parameters outlined below to enable us to identify and categorise sufficiency in current product policies:

1. Product stage: Upstream supply chain / Design and Production / Retail and Purchase/ Use-Phase / End-of-Life
2. Levels of sufficiency – Determining which sustainability strategy a specific measure belongs to is not always straightforward, as some measures may produce overlapping outcomes with efficiency or consistency. This led Fischer et al. (2013) to create a scale to measure the level of sufficiency-orientation: none to slight (e.g. use of smaller appliance) / medium (e.g. less convenient appliance) / strong (e.g. a time-intensive behavioural change, such as refraining from using a device for a period of time) / very strong (e.g. doing without appliance, complete change of practice)
3. Policy instrument type: regulation, information-based, planning and infrastructure provision, economic measure (Heyen et al. 2013)
4. Push (eliminating counterproductive practice) or pull measure (supporting stakeholders to take up more sustainable practices, such as producing or consuming more sustainable products and services) (Gröne, 2016; Lage et al., 2024)

Status quo of sufficiency in European product policies

While the second European Circular Economy Action Plan (COM 2020/98) has oriented product policies to encompass more the entire product lifecycle, most circularity strategies still focus on downstream approaches and end-of-life processes such as recovery and recycling (Baldassarre and Saveyn, 2023; Calisto-Friant et al. 2024). However, the Ecodesign for Sustainable Products Regulation (ESPR) (EU 2024/1781), the Directive on the Repair of Goods (EU 2024/1799) and the updated Battery Regulation (EU 2023/1542) represent a recent policy shift toward extending product lifetimes. They establish minimum design requirements for selected products entering the European market, extending beyond energy efficiency standards to include criteria for durability and repairability, such as easier removability of portable batteries.

They also mandate that producers provide spare parts and repair services within a reasonable time and at a reasonable price and strengthen consumer repair rights such as extended consumer warranties after repairs. Upcoming repairability labels aim primarily to encourage sustainable product choices among consumers, while also potentially prompting manufacturers to change their product designs. All these policy developments may lead to slower consumption that can be identified as a sufficiency strategy.

Nevertheless, current European measures primarily focus on improving product quality, without adequately addressing the unsustainable levels of resource consumption and the underlying linear structures driving them. While ecodesign standards promote the design of more durable and repairable products, repair and reuse remain economically less viable options for consumers. For instance, it remains unclear what constitutes 'reasonable' pricing for spare parts and repairs. Additionally, fast product turnover driven by linear business strategies is barely addressed. The only exception is that the ESPR also includes an upcoming ban on returned and unsold goods, which could encourage producers and retailers to reconsider overproduction and wasteful practices. However, this ban will initially apply only to textiles and footwear, with only mandatory reporting required for other product categories. See Table 1 below for an overview.

European Union:	Product stage	Sufficiency level	Instrument type	Push or pull measure
Extended Ecodesign Regulation: minimum requirements on durability, lifetime, repairability of products, limiting anti-repair practices; mandatory availability of certain spare parts	Design, Production and Use-phase	Strong	Regulation	Push for producers, Pull for consumers and repairers
Right to repair: extended warranty, online repair platform, service price form, manufacturers have to repair products within a reasonable time and for a reasonable price	Design, Production and Use-phase	Medium	Regulation and Information	Push for producers, Pull for consumers and repairers
Updated Battery Regulation: more removable and replaceable portable batteries, performance and durability standards	Design, Production and Use-phase	Medium	Regulation	Push for producers, Pull for consumers and repairers
Repairability labelling: based on repair index	Design, Retail and Purchase	Medium	Information	Pull for both producers and consumers
Digital product passport: information on product's origin, materials, environmental impact, disposal and possibility for repair data	All stages	Medium	Information	Pull for all stakeholders
Member states:	**Product stage**	**Sufficiency level**	**Instrument type**	**Push or pull measure**
Criminalisation of planned obsolescence (France and Italy)	Design and Production	Strong	Regulation	Push for producers
Banning the destruction of unsold goods (France, and coming up on EU level)	Retail, Purchase and End-of-Life	Very strong	Regulation	Push for producers, retailers and consumers
Repairability and durability scores (France)	Retail and Purchase	Medium	Information	Pull for both producers and consumers
Extended Producer Responsibility with eco-modulation for repairability and durability, and with a repair fund for post-warranty repairs (France)	Design, Production and Use-Phase	Medium	Economic	Push for producers, Pull for consumers
Tax incentives for repairs (e.g., in Sweden)	Use-Phase	Medium	Economic	Pull for consumers and repairers
Repair vouchers (Austria and Germany)	Use-Phase	Medium	Economic	Pull for consumers
Supporting the cooperation between stakeholders in recycling centres and those involved in reuse and repair (many municipalities, eg., Brussels)	End-of-Life and Use-Phase	Strong to Very strong	Planning and infrastructure provision	Pull for stakeholders involved in repair and reuse
Supporting community repair facilities, such as repair cafés (e.g., public funding in Germany)	Use-Phase	Strong to Very strong	Planning and infrastructure provision	Pull for stakeholders involved in repair and reuse

Table 1: Policy interventions to advance sufficiency in products' lifecycle (own table)

Some member states have also implemented product policies to advance sustainable consumption. For instance, France and Italy have introduced legislative measures to combat planned obsolescence, aiming to reduce the number of products entering the market with intentionally poor design (Dalhammar et al., 2022). Unlike the upcoming European ban on the destruction of goods, France's ban also includes electronics, and Germany has already implemented a reporting mechanism (Roberts et al., 2023). Furthermore, many municipal governments support reuse and repair for local stakeholders by allowing diverting items and spare parts from recycling centres (Dalhammar et al., 2021; Zucaro et al., 2022), with the updated EU Waste Framework (EU 2018/851) supporting these efforts by calling for treating end-of-life objects as resources rather than waste and emphasising the priority to reduce waste. Additionally, community repair initiatives, such as those in Germany, are state funded by up to 3000 Euro, enabling the adoption of a stronger repair culture (BMUV, 2024).

Economic measures have been also adopted by national and local municipalities to enable consumer repairs (Meyer and Molnár, 2024). In France, a repair fund was established to offer discounts on repairs, financed through eco-modulation fees paid by manufacturers. However, this measure was found to have limited effects on product design and consumer practices due to minimal incentives (Right to Repair Europe, 2024; Micheaux and Aggeri, 2021). Moreover, while the European VAT revision (EU 2022/542) extended tax reductions possibilities to household appliance repairs, no member state has implemented this yet, only to other products such as shoes and bicycles (Dalhammar et al., 2022). In Sweden, labour costs are partially deductible from taxes when repairs take place in homes. As a different approach, Austria and Germany have introduced repair vouchers to subsidise consumer repairs, but these are planned as temporary measures and do not challenge the mainstream linear market (Molnár and Jaeger-Erben, 2025). As voucher schemes are financed from public funding, they also do not have any direct financial effect on producers.

Possible Future Directions for Circular Product Measures for Sufficiency

Many stakeholders recognize the need for a radical transformation in our production and consumption systems to enable sustainable development (e.g., COM 2020/98; Kreinin et al., 2024). However, comprehensive sufficiency strategies are largely absent from policy implementation at both the European and national levels. Some scholars argue that true sufficiency policy requires a transformative shift in the entire sociopolitical and economic systems and not just adapting existing measures (Callmer and Bradley, 2021), a so-called “deep” transformation instead of a “superficial” one (Newell et al., 2021). This section offers suggestions to strengthen sufficiency in product policies. As visualised below in Figure 2, most current policy measures target only the design and use-phase of electronics. Our policy recommendations that are not yet implemented are marked in red.

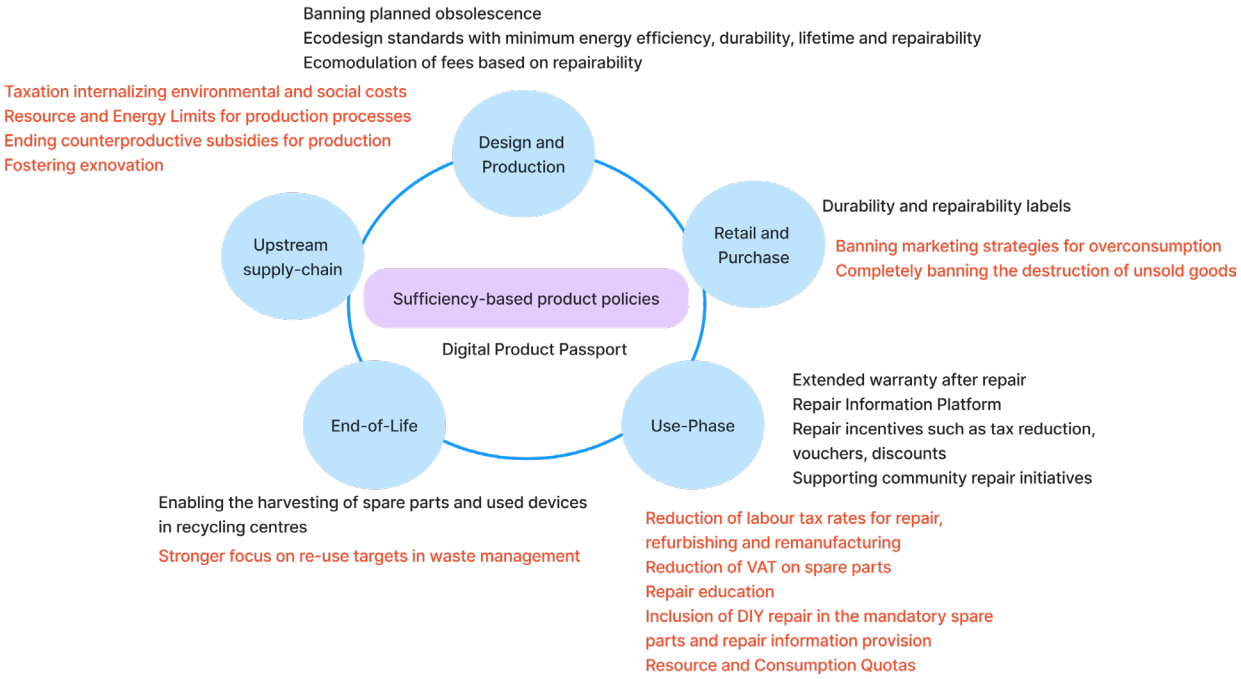

Figure 2: Status quo and future possibilities for a sufficiency-oriented product policy framework (own visual)

Supporting a transformation within production systems

For a truly sustainable circular economy, policies must encourage a shift towards "making do with less" and encouraging moving beyond profit growth as primary objectives of businesses and GDP growth for states (Bocken et al., 2022). Possible policy interventions could include:

1. Limiting the Externalization of Costs: The low costs of new products must be addressed to slow down product replacements. While the market price of a product currently excludes negative social and environmental externalities, the mandatory "true price" would account for these, incorporating both social issues (e.g., forced or child labour, health risks, inadequate wages) and environmental issues (e.g., air pollution, fossil fuel consumption, and land use changes) (Malinauskaite and Jouhara, 2024). Additionally, counterproductive state subsidies, such as those for fossil fuels, should be eliminated.

2. Tax incentives: Labour taxes on repair services should be reduced in Europe, while taxes on production processes should be increased. Raising corporate tax rates based on resource use would encourage more sustainable production practices. For example, higher taxes could be imposed on non-durable or non-repairable items.

3. Differentiated Producer Responsibility Fees: Manufacturers of short-lived products should pay higher fees into extended producer responsibility schemes than those producing durable goods. This would discourage planned obsolescence and incentivize product longevity.

4. Slower innovation cycles and incentivized exnovation: While technological innovation is essential for sustainability, it often falls short in displacing deeply rooted unsustainable structures. For example, more resource- and energy-efficient products do not necessarily lead to an overall decrease in resource use, due to factors like rebound effects and increased consumption (Laurenti et al. 2015). Exnovation is the deliberate phase-out of unsustainable technologies, infrastructure, and practices to achieve socio-ecological sustainability. This process can be facilitated through "exnovation governance," which involves policies and strategies designed to support and manage this transition (Heyen et al., 2017). Through setting standards, for instance, policymakers can encourage longer product lifespans and reduce constant product upgrades, fostering a more sustainable innovation approach.

5. Product standards: Policymakers could set absolute limits on energy and resource consumption standards for products, regardless of size or type (Calwell, 2010). Additionally, life cycle cost assessments used as the basis for setting legal standards under the Ecodesign Directive could incorporate social costs of carbon (Sonnenschein et al., 2019).

6. Sufficiency Investment Funds: Governments could establish funds specifically for sufficiency initiatives and for businesses with sufficiency aims. Institutional investors, such as pension funds, should be also encouraged to prioritize investments for sufficiency initiatives (Bocken and Short, 2021).

Supporting consumer behaviour change for more sufficiency

While transforming production and business practices is crucial, promoting changes in consumer behaviour towards more sufficiency is equally important. Scholars suggests that information-based approaches such as product labels alone are insufficient to support a change in consumption practices (Sahakian and Dobigny, 2019), and to create lasting impacts, stronger instruments such as regulations and economic incentives are needed (Spangenberg and Lorek, 2019). Potential policies include:

1. Promote a Circular Society Mindset: Policy makers should encourage a shift in consumer roles from passive users to active caretakers and value-creators of products. In a “circular society” (Jaeger-Erben et al., 2021b), consumers should have the right to own, repair, and modify their electronics, with equal access to information and spare parts. Education for repair skills should be promoted in schools and vocational training programmes, as being able to repair devices would encourage a more sustainable human-device relationship (Van der Velden, 2021) and a material culture against novelty-seeking (Jaeger-Erben et al., 2021a). Another approach could be to regulate advertising strategies that promote over-consumption, such as through bulk purchase discounts (Bocken and Short, 2021).

2. Economic Incentives for Sustainable Consumer Practices: Longer product use, device care, and the reuse of products can be incentivized through vouchers and similar measures that reward consumers for their actions.

3. Product regulation strategies that increase costs could promote sufficiency by encouraging the consumption of fewer and higher-quality goods. Previous studies highlighted that product price and quality are key factors influencing consumer willingness to repair products (Mrad et al., 2025; Fachbach et al., 2021). Higher product prices could also reduce potential rebound effects that might occur when lower prices of other products or services result from improvements in efficiency or labour cost reductions—an issue commonly associated with efficiency measures (Pufé, 2017).

4. Resource and Consumption Quotas: As a more radical measure, quotas on high-impact resource activities could be imposed to directly limit excessive use. However, this approach may raise challenges related to democratic planning beyond growth (Durand et al., 2023).

5. For a long-lasting change in consumption practices, alternative, more sustainable consumption activities must be better linked to practices that are part of people’s routines (Spurling et al. 2013). For instance, more repair facilities could be placed in popular places, such as in shopping malls.

Conclusion

Given the need for sufficiency strategies to reduce societal resource demands, this work analysed the current state of European product policies and proposed supplementary instruments to enhance their effectiveness. Our analysis reveals that more radical measures are necessary to support sustainable production and consumption practices. Upcoming policy frameworks, such as the Circular Economy Act must focus on strategies beyond efficiency measures to reduce resource needs; however, it currently falls short in this regard (Euractiv, 2025). While this study presents the results of a literature and policy review, future research could gather empirical data from relevant stakeholders to refine our conceptual framework and better understand how the proposed sufficiency-oriented measures could function in practice.

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