

MISSION-ORIENTED POLICY AS A CATALYST FOR TRANSITION TO A CIRCULAR ECONOMY

*Lina Dagiliene, Jurgita Bruneckiene,
Viktorija Varaniute, and Justina Banioniene*

Introduction

A transition to a circular economy “must be understood as a fundamental systemic change instead of a bit of twisting of the status quo to ensure its impact” (Kirchherr et al., 2017, p. 229). This is a complex process that requires systemic transformations (Senge et al., 2007), which simultaneously involve deep, system-wide and rapid change in a complex multi-actor setting (Aarikka-Stenroos et al., 2021). Transformational change affects the entire system (Korhonen et al., 2018) and is not limited to certain products, single companies, or individual regions (Termeer & Metze, 2019). Therefore, the multi-level approach (Geels & Schot, 2007), which emphasises interactions among multiple actors and the need to facilitate profound change and make it irreversible, is widely applied in discussing key catalysts in circular economy (CE) transitions.

The problem is that various sustainability transitions are characterised as being too slow. For example, in the context of global climate change, Roberts et al. (2018) describe the struggle to achieve the 2.0-degree limit set by the Paris Agreement, let alone its 1.5-degree desired goal. Another example is given by van den Bergh (2020), who compares recycling rates and the speed of ecosystems and economic systems. Van den Bergh (2020) notes that unlike the economy, ecosystems are distinguished by high recycling rates, and some recycling time scales are very long; meanwhile, the current recycling level is far too slow to achieve a closed loop (Ghisellini et al., 2016). The dynamics of circular innovation also indicate that the slow process of technological and economic transformation should be considered more of a reform than a revolution (Cainelli et al., 2020).

Considering the above-mentioned challenges regarding modest CE transitions, we provide an overview and conceptualisation of how mission-oriented policy can act as a catalysing factor in the transition to a CE. The transition to a CE occurs at multiple levels (Aarikka-Stenroos et al., 2021) and requires a new approach to the formation of CE policy (Murray et al., 2017). Our key assumption is that the public sector should be a key partner in solving sustainability issues, rather than just a facilitator of growth (Hekkert et al., 2020; Mazzucato, 2013) to guarantee social, economic, and environmental sustainability. In the transformation to a CE, the role of the public sector should be much more active and larger than just creating the right infrastructure for waste management and setting the rules. Many contemporary grand challenges cannot be

solved through purely scientific and technological solutions (Hekkert et al., 2020). Instead, these challenges require a long-term commitment from public, private, and non-profit sector representatives (Mazzucato, 2018). In many cases, addressing these challenges will require changes in regulations and tax policy as well as strengthening civic engagement in changing consumption patterns (Hobson & Lynch, 2016).

This chapter starts by focusing on the public sector as a catalyst at the broader EU level. It presents a theoretical argument for how the public sector can act as a catalyst in CE by involving existing public policies that support the transition to the CE, collaboration with stakeholders, and a mission-oriented policy. It is unlikely that any single European country, no matter how advanced from an environmental point of view, can fully achieve a CE. However, at the EU level, real progress can be achieved through concrete missions for societal challenges, the experience of a multi-level governance system, and the scale and diversity of talent and ideas (Mazzucato, 2018).

To foster new industrial transitions, the European Commission initiated the Pilot Action on Regions (European Commission, 2019) to test new policies and to facilitate the development of novel co-creation approaches and regional collaboration towards growth and higher productivity. Ten regions and two small member states were included in the pilot action. Among the selected pilot countries, Lithuania's pilot objective was to develop a CE roadmap throughout its national industries. The case of this country is well-suited for analysis, as it actively applied innovative policies during the analysed period to promote the industrial transition to a CE. The study considered Lithuania in the broader context of the Baltic Sea region to understand the level of CE implementation that has been achieved in these countries and why a gap between the countries has appeared. In addition, the research sought to identify the role of public policy in circular transformations, comparing the distribution of responsibility for environmental protection in the countries by evaluating the efforts of different stakeholders in terms of economic value through spending on environmental protection.

Many governments in the EU have subscribed to mission-oriented innovation policies aiming to address grand societal challenges (Wittmann et al., 2021). The transformation towards the CE is itself a grand challenge, which is exactly what a well-designed mission can achieve (Mazzucato, 2018). Wittmann et al. (2021) emphasise the role of the public sector in mission-oriented policy, drawing attention to the implementation process and governance requirements as key features of mission implementation. Identification of the country's CE policy readiness for a mission-oriented approach (the coherence and integrity analysis) provides the state of the art needed for the CE policy design process and the creation of dedicated instruments. Such an analysis narrows the gap between the conceptual debate and policy implementation in practice.

Using a mission-oriented policy approach for analysing public policies as catalysts for CE transitions, this chapter also presents the case of the co-creation of the roadmap for Lithuania's industrial transition to CE. The case description reveals that Lithuania's industry is only 3.3% circular; however, it has tangible potential for circularity. To reach this potential, active participation in the co-creation process and systematic dialogue with different stakeholders should be ensured to prepare the public strategic documents based on co-creation principles.

Finally, this chapter reveals the key multi-level challenges for a transition to CE through the lens of the public sector. In line with Wittmann et al. (2021) and Mazzucato (2018), we argue that these challenges could be solved by focusing on the preparation of public strategic documents based on co-creation principles and by ensuring a co-creation process involving different stakeholders, which enable benefits to be gained from synergy and the creation of a higher value for the whole circular ecosystem.

Public sector as a catalyst for the circular economy transition

Circularity strategies range from extending and/or intensifying the use of the product and product services (Tukker, 2015) to recycling or recovering useful materials at the end of product life. Therefore, institutional conditions play an important role in transforming these strategies into action. The determination of who bears the costs of externalities (Moreau et al., 2017) – that is, environmental impacts (e.g., waste management or resource scarcity) – relates directly to institutions and particularly to the public sector.

This study reviews the role of the public sector as a catalyst for the CE transition from three perspectives: 1) the direction of public policies and the need for the public sector to play a more active role, 2) collaboration with stakeholders, and 3) a mission-oriented policy.

Direction of public policies in the circular economy

Policies that support the transition to a CE can be developed in a centralised or decentralised manner (Bauwens et al., 2020; Lieder & Rashid, 2016). For example, centralised waste management can involve a single centralised waste treatment technology, with little regard for the low predictability of the waste sector (Corvellec et al., 2021). Waste collection, sorting, and recycling can be carried out in centralised facilities, entirely under the responsibility of large producers and with minimal consumer-driven interventions (Bauwens et al., 2020). Without political reforms and appropriate institutional conditions, the level of recycling in the economy will remain low at the regional and global levels (Haas et al., 2015; Moreau et al., 2017). Therefore, centralised waste management policies including measurable targets have direct impacts on the rates of recycling (Dagilienė et al., 2021).

Among the most prevalent top-down policies and strategies are taxation reforms that incentivise the expansion of markets for secondary raw materials and repair activities (Lazarevic & Valve, 2017), changes in the tax base from resources to labour (Stahel, 2010), the empowerment of public procurement (Witjes & Lozano, 2016), and product policy, such as extended producer responsibility, mandatory warranty service requirements, or the mandatory disclosure of expected lifetime information to consumers (Lazarevic & Valve, 2017). Proponents of bottom-up policies usually support a decentralisation agenda (Lazarevic & Valve, 2017) and a market-driven approach with a focus on market competition and minimal state intervention, supply chains, collaborative business models, and product design. For example, responsible waste management activities can be organised by involving consumers and community organisations more closely in various waste recycling and reduction programmes (Bauwens et al., 2020).

These two opposite approaches should be joined to achieve a meaningful transition to the CE. Innovative policies, meaning more than a top-down approach, are needed to encourage citizen engagement beyond green consumerism (Johansson & Henriksson, 2020).

For the public sector to become an active catalyst for the CE's transition, it is important to actively engage in the governance of transformation (Termeer & Metze, 2019). Governments can contribute to circular transformational change by accumulating a series of small wins, including the continual transformation of the linearly organised governance system. Türkeli et al. (2018) emphasise the lack of in-depth knowledge on the governance of a transition to the CE through appropriate supporting mechanisms and tools. Mazzucato (2013) emphasises the active role of the public sector through the creation of proactive, innovation-led strategies and policies, and by financing the most uncertain phases of innovation research and development, which are too risky for the private sector.

Collaboration with stakeholders as a catalyst for the transition to the circular economy

The transition to a CE is a continuous process within which production systems, consumption patterns, society, and the broader context continue to evolve (Murray et al., 2017; Velenturf & Purnell, 2021). When investigating changes in environmental policies in the context of a CE, Johansson and Henriksson (2020) emphasise the prevalence of marketisation in driving the discourse around public policies. The process of marketisation is justified by the fact that the state is too big to be effective (Mazzucato, 2013), so it should transfer services and encourage the private sector through eco-innovation (Cainelli et al., 2020), tax reductions, and similar incentives. However, Dagiliene et al. (2021) argue that the local government actions typically used to foster the transition to a CE relate mostly to appropriate waste collection and infrastructure, whereas activities encouraging the development of secondary markets or co-creating local recycling and reuse conditions with regional stakeholders are almost absent. Therefore, the development of local recycling conditions (van den Bergh, 2020) might foster regional closed loop systems. Johansson and Henriksson (2020) point out that the current political discourse shifts the responsibility for circularity from the state to industrial companies and entrepreneurs, which can actually lead to weak circularity. By contrast, a strong concept of circularity requires changing the culture of collaboration across a network of producers and consumers (Korhonen et al., 2018), and the public sector need to be responsible for creating a circular value ecosystem based on responsible resources management.

The previous literature implies that the acceleration of sustainability (circular) transitions is most politically effective when environmental benefits are combined with issues of concern to citizens, such as personal health or security (Roberts et al., 2018). Examples of successful circular actions and transitions support this finding. Sweden's biogas sector has one of the highest shares of renewable resources in the EU (Eurostat, 2018). Such achievements are the result of large investments in the production of renewable energy, active cooperation between public and private companies, and an advanced value chain from the pre-treatment of raw materials to the production of biogas for different usage purposes (Kanda et al., 2021). Lithuania achieved high rates of recycled plastic packaging waste after the state promoted successful cooperation among Lithuanian beverage producers, importers, and sellers, who manage the activities of the country's system according to the principle of extended producer responsibility, as well as consumers, retailers, and municipalities. Around 3,000 collection points, namely manual collection points and reverse vending machines, exist throughout Lithuania, mainly located near supermarkets in each municipality. This successful public-private collaboration collects nine out of ten beverage cans, or 92% of one-way glass and plastic bottles marked with the deposit system mark, which are placed on the market each year. This example confirms that to accelerate the transition to the CE, policy incentives should focus on support for reuse schemes and take-back programs that enable reuse and recycling (Ranta et al., 2018), and diffusion of responsibility (Murray et al., 2017).

Mission-oriented policy as a catalyst for the transition to the circular economy

The emerging concept of mission-oriented policies targeting complex and multidimensional societal problems, including CE, is particularly insightful. Mission-oriented policies require innovation by diverse public and private actors and different sectors (Mazzucato, 2018). Such policies should emphasise a reorientation from a narrow focus on short-term economic progress to a wider focus on long-term multidimensional prosperity (Velenturf & Purnell, 2021). In addition to aiming for success, mission-oriented policies must enable bottom-up experimentation and learning to ensure dynamic feedback in the innovation process (Mazzucato, 2018). Mission-oriented

policies tend to involve a greater diversity of stakeholders influencing and influenced by strategic policy agendas, in addition to established innovation systems built around industrial companies, consumers and local communities (Bauwens et al., 2020). A successful transition to a sustainable CE requires matching business models, policies, and technologies to local contexts rather than assuming that one size fits all (Velenturf & Purnell, 2021).

Missions should not aim to achieve results through a single solution or technology but remain open to different types of solutions (Mazzucato, 2018). The key underlying assumption is that transformational processes are based on uncertainties and changing individual perceptions and practices (Schulz et al., 2019). Thus, to achieve CE transitions beyond their technical aspects, it is important to understand how companies and citizens become – or fail to become – part of new collective practices. Missions typically require the integration of a range of technological and social innovations (Hekkert et al., 2020). For example, the Mission Zero initiative in Sweden to reduce traffic accidents led to a combination of new safety technologies in cars, suitable infrastructure, and institutional change. To demonstrate the transformative potential of the mission and the challenges in the implementation process, Wittmann et al. (2021) provide the illustrative case of the diverse missions of Germany's Hightech Strategy 2025. The mission of creating sustainable and circular economies can be considered a transformer, although the focus is on the activities of producers and consumers, with the transformation receiving only limited attention.

Therefore, mission-oriented policies might contribute to a system-wide circular transformation. In the next section, we present the case of Lithuania, 1 of 12 pilot regions that initiated a circular industrial transition through the mission-oriented European Commission (EC) pilot action industrial transition programme.

Lithuania in the Baltic Sea region

The goal of this section is to introduce Lithuania in the broader context of the Baltic Sea region. We compare countries using selected CE indicators from the EU monitoring framework on CE progress (European Commission, 2018). We carry out an analysis of countries in the Baltic Sea region by comparing each country's indicator value with the EU value and expressing the difference as a percent.

The level of economic development is measured by GDP per capita, expressing the economic gap and economic power among the Baltic Sea countries. As presented in [Table 10.1](#), Denmark, Germany, Sweden, and Finland have more than twice the GDP per capita of Poland, Latvia, Lithuania, and Estonia. Therefore, the eco-innovation index corresponds to the GDP per capita, suggesting that economically stronger countries have more resources to create and implement eco-innovations.

Based on Eurostat data, Germany and Estonia's circular material use rates exceed the average EU value and are constantly growing. By contrast, Latvia and Lithuania have the lowest rates of circular material use. Denmark, Poland, Finland, and Sweden remain modest economies compared to the average level of circular material use in the EU. Analysis of domestic material consumption per capita shows that Finland and Estonia consume more than the other Baltic Sea countries, and their consumption levels are more than twice the EU level. Furthermore, in addition to being the largest consumer of domestic materials, Finland has recently experienced a trend of growing consumption. Furthermore, Sweden, Lithuania, and Latvia show increasing levels of domestic consumption, but only Latvia has a domestic material consumption level close to the EU average.

Germany and Denmark have the highest recycling rates, at 67.0% and 53.9%, respectively. In other countries, the recycling rate varies between 38% and 45%, excluding Estonia, which has a 28.9% recycling rate. Furthermore, Estonia and Poland have low eco-innovation indexes; however, these indexes have positive tendencies.

Table 10.1 CE indicators in the Baltic Sea region

Country	GDP per capita		Circular material use rate		Domestic material consumption per capita		Recycling rate of municipal waste		Eco-innovation index		Positive indicator	Negative indicator
	Euro		%		T/capita		%		Index		0–20%	0–20%
	2020		2020		2020		2020		2019		21–40%	21–40%
	Positive		Positive		Negative		Positive		Positive		41–60%	41–60%
Denmark	53,600	↑	7.7	↓	23,913	↓	53.9	↑	146	↑	61–80%	61–80%
Germany	40,490	↑	13.4	↑	13,291	↓	67.0	↓	123	↓	81–100%	81–100%
Estonia	20,190	↑	17.3	↑	28,356	↓	28.9	↑	73	↑	101–120%	101–120%
Latvia	15,500	↑	4.2	↓	14,896	↑	39.6	↑	86	↑	121–140%	121–140%
Lithuania	17,710	↑	4.4	↑	20,043	↑	45.1	↓	82	↑	141–160%	141–160%
Poland	13,650	↑	9.9	↓	17,014	↓	38.7	↑	59	↑	161–180%	161–180%
Finland	43,030	↑	6.2	↑	33,075	↑	41.6	↓	145	↑	181–200%	181–200%
Sweden	45,940	↓	7.1	↑	24,647	↑	38.3	↓	143	↑	>200%	>200%

Source: Eurostat (2022).

Notes

↑/↓ – indicator is increasing/decreasing. The trend is estimated by comparing the indicator value for the presented year with the average value during the last five years.

Colour scales express the differences between countries, where the most intensive grey shows the lowest benefit to society and vice versa. Also, the positive indicators show growing benefits for society when the indicator's value increases, while the negative indicators show decreasing benefits to society when the indicator's value increases.

When comparing deviations in national expenditures, Estonia had the highest level of GDP spent on environmental protection (2.4%) in 2018, followed by Sweden (2.1%) and Germany (2.2%). Lithuania, Finland, and Latvia spent the lowest part of their GDP on environmental protection. Furthermore, the structure of environmental protection expenditures varies greatly between the selected countries (see Figure 10.1). For example, in Poland, households incur more than half of the country's expenditure on environmental services, followed by Denmark at 36%. By contrast, household expenditure on environmental protection varies between 19% and 23% in Germany, Latvia, Lithuania, Finland, and Sweden. Estonia and Sweden spend the highest portion of general government expenditure on environmental protection. The portion of expenditure on environmental protection borne by corporations varies between 60 and 67% in Germany, Finland, Estonia, Lithuania, and Latvia. In Poland, however, spending by corporations makes up only 26% of the country's total expenditure on environmental protection.

Environmental protection expenditures allow us to measure a country's efforts to prevent, reduce, and eliminate pollution or to reverse the degradation of the environment (Eurostat, 2022). Although these efforts only represent those circular activities that can be expressed in the form of economic value, environmental protection expenditures illustrate the distribution of environmental responsibility in a country. In addition, the allocation of responsibility is a key public policy concern, because a fair distribution of responsibility leads to positive changes in the transition

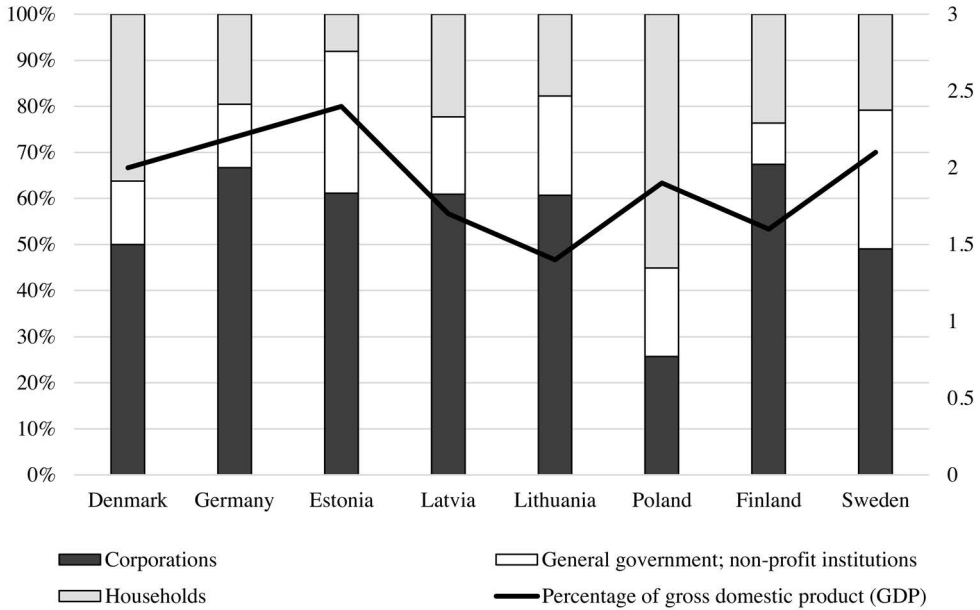


Figure 10.1 National expenditures on environmental protection: Structure by institutional sector and percentage of GDP.

Source: Eurostat (2022).

to a CE. Considering that the implementation of a CE requires the involvement of companies and changes in consumer behaviour, shifting costs from the government to companies and consumers can indicate and lead to positive changes towards circularity.

In summary, as an economically strong country, Germany has a modest domestic material consumption rate and a high performance in the usage of circular materials and recycling. The country's high level of national expenditure on environmental protection and the high level of corporation expenditure could be the reason for its successful circular transitions compared to other countries in the Baltic Sea region. By contrast, Poland has the lowest GDP per capita, as well as the lowest eco-innovation index together with the lowest portion of corporate expenditure on environmental protection. This could explain why Poland's recycling rate is only 38.7%, as households, instead of corporations, incur the largest part of the country's environmental expenditure.

Historically, Lithuania has had a strong focus on energy, material efficiency, and waste management. The growing consumption of domestic material aligned with the volume of waste generation indicates an increase in consumption in society, although consumerism in Lithuania is weaker than in economically stronger economies. Lithuania still lags behind in areas such as circular design, prioritisation of alternative business models, incorporation of digital technology, and innovation. As a positive sign, companies pay more attention to sustainability and issues related to CE.

Readiness of circular economy policy for a mission-oriented approach

Mission-oriented policy refers to policies designed to solve grand challenges and support transformative system change. However, the readiness for a mission-oriented approach to public policy at the legislative level is a serious prerequisite for success. Policy readiness is understood as

Research approach:	Mission-oriented policy	
Research focus:	Coherence analysis	Integrity analysis
Data analysis method:	Descriptive analysis of formal documents: name, geographical coverage, period of validity, date of approval, components, reference areas.	Qualitative content (text content / thematic) analysis: meaning of sentences related to mission-oriented policy approach criteria and logical interconnections among different documents

Figure 10.2 The framework for the analysis.

the willingness, capability, and ability of governments and policymakers, declared in the public documents, to incorporate further changes and implement particular practices, which support the transition towards a CE and sustainable development. The interoperability between strategic documents is crucial, both from a vertical (coherence) and a horizontal (integrity) perspective.

Research methodology

The research methodology used to determine the readiness of CE policy for a mission-oriented approach by analysing public policies as catalysts for the CE transition is presented in Figure 10.2.

Research on CE policy readiness is based on Mazzucato's (2018) mission-oriented policy approach, which is characterised by the criteria shown in Table 10.2.

The research focuses on coherence and integrity analysis. Coherence is understood as a clear relationship between documents over time and at different hierarchical levels. Integrity is understood as how the document flows logically, that is, how the goals set for the CE, their decentralisation across key actors, and tangible indicators to measure progress are included in the analysed documents.

The coherence analysis identifies the characteristics of the formal documents: name, geographical coverage, period of validity, date of approval, components, and reference areas. The aim of this analysis is to identify whether and what kind of technical overlap exists between documents.

The integrity analysis covers qualitative content analysis, which includes text content/thematic analysis, that is, the meaning of sentences related to mission-oriented policy characteristics and logical document interconnections. The goal of this analysis is to identify readiness for public policy transformation toward a mission-oriented approach.

The starting point for the analysis is 1 October 2021. This date was chosen because it is 1.5 years after the adoption of the New Circular Economy Action Plan (COM/2020/98) in 2020. This date is also considered transitional or preparatory as it is characterised by the transition from the 2014–2020 programming period to the 2021–2027 period.

Documents were selected for the research based on the criteria that they are directly related to strategic development and the CE. Keywords directly related to strategic development include 'strategic development', 'progress', and 'economic resilience'. Keywords directly related to the CE include 'circular economy', 'waste production', and 'waste recycling'. Keywords indirectly related to the CE (cognate words) include 'sustainable development', 'environmental protection', 'environmental education', 'waste', 'green', 'climate change', 'reduction', 'sorting', and 'recycling'.

Table 10.2 Mission-oriented policy approach criteria for strategic documents

<i>Criteria</i>	<i>Description</i>
The mission (namely transformation towards CE) should be well defined.	<p>Missions must be clearly framed in context. Mission objectives should be set in an ambitious manner.</p> <p>Mission objectives should provide legitimacy, such as relevance to the sustainable development goals (SDGs), EU priorities, and/or member state priorities.</p> <p>Missions should engage as much as possible with member state strategies, including industrial ones.</p>
A mission comprises a portfolio of various projects.	<p>Missions should not be achievable by a single development path or a single technology.</p> <p>Missions must define a concrete target and objectives.</p> <p>Appropriate indicators and monitoring frameworks must be established to measure progress.</p>
Missions should result in investments in different sectors and involve different types of actors.	<p>Missions should be framed in such a way as to spark activity across and among multiple scientific disciplines (including the social sciences and humanities) and across different industrial sectors and different types of actors (public, private, third sector, and civil society organisations).</p>
Missions require concerted policy making, in which priorities are translated into concrete policy instruments and actions to be carried out at all levels of the public institutions involved.	<p>Missions must be clearly framed in terms of time and responsibilities (i.e., a clear timeframe within which actions should take place). Although missions should involve a variety of public institutions, a strategic division of labour among them, with well-defined responsibilities for coordination and monitoring, is crucial.</p>

Source: Based on Mazzucato (2018).

The analysis was based on 86 documents at different hierarchical levels (see Table 10.3): the EU level (four units), national level (eight units), regional level (ten units) and municipal level (66 units), namely municipal strategic development plans (60 units) and municipal waste management plans (six units).

Of the 60 strategic development plans of the Lithuanian municipalities, only 29 (48.3% of all plans) were newly prepared or updated during the 2021–2027 programming period.

Coherence analysis

Achieving coherence among EU, national, regional, and municipal documents, necessary for the country to stimulate more active CE transitions, takes time; this can lead to delays in the compatibility of lower-level documents with higher-level documents. Documents from the different hierarchical levels according to their approval date are presented in Figure 10.3.

The fastest achievement of coherence, meaning the shortest time between document approval dates, is seen between the EU-level documents and the national-level documents, which are oriented towards the progress of the entire Lithuanian economy (by National Progress Plan for 2021–2030) and waste management (by National Waste Prevention and Management Plan for 2021–2027 [draft]). By contrast, the focus on industrial transformation at the strategic level is delayed, as the Roadmap for Lithuania’s Industrial Transition to a Circular Economy was approved in March 2022.

Table 10.3 Research objects

<i>EU level</i>	<i>National level</i>	<i>Regional level</i>	<i>Municipal level</i>
The European Green Deal (COM/2019/640)	Lithuania’s Progress Strategy ‘Lithuania 2030’	Regional strategic development plans.	Municipal strategic development plans.
The New Circular Economy Action Plan (COM/2020/98)	National Progress Plan for 2021–2030	Regional waste management plans.	Municipal waste management plans.
A New Industrial Strategy for Europe (COM/2020/102)	The National Climate Change Management Agenda		
EU Directive 2008/98/EC on Waste (latest updated 2018/851).	Economic Recovery and Resilience Building plan ‘New Generation Lithuania’		
	Roadmap for Lithuania’s Industrial Transition to a Circular Economy		
	Roadmap for the Integration of the Lithuanian Industry into European Value Chains		
	The Roadmap for Lithuanian Industry Digitization 2020–2030		
	National Waste Prevention and Management Plan for 2021–2027 (Draft).		

In a CE, it is critical to seek ambitious goals, namely those set at the EU and/or national levels and at the local levels (i.e., at the regional and municipal levels). The regional development plans have been updated with minimal emphasis on the circular transformation of the entire socioeconomic system (including industries and society). For Lithuanian municipalities, circular transformation guidelines typically arise from EU- and national-level documents, which actually override regional-level documents, while the term ‘circular economy’ is not even directly included or reflected in the CE family of terms such as ‘sustainable’, ‘green’, or ‘clean’.

The waste management system is based on the regional principle; that is, ten regional waste management centres cover all Lithuanian municipalities. According to local governance laws, municipalities are responsible for the implementation of municipal waste management systems



Figure 10.3 Documents of different hierarchical levels according to their approval date.

and the organisation of the collection and recycling of secondary raw materials. Municipalities prepare municipal waste management plans, which are to be integrated into regional waste management plans and ultimately aligned with the National Waste Prevention and Management Plan for 2021–2027. The lack of coherence in time is also seen in municipal waste management documents. During the analysis period, municipal waste management plans in Lithuania for the 2021–2030 period were either not publicly available or were already enforced, but their preparation took place earlier than the active and significant integration of the concept of CE into strategic documents.

Integrity analysis

The integrity analysis of the strategic documents based on the identified criteria of Mazzucato (2018) indicates a readiness for a public policy transformation towards a mission-oriented approach.

Missions should be well-defined

The Lithuanian Progress Strategy ‘Lithuania 2030’ (prepared in 2012) and the Lithuanian National Progress Plan for 2021–2030 (prepared in 2020) can be considered a strategic basis for the circular transformation of the entire ecosystem. The objectives set at the EU level are directly reflected and aligned with four national documents through four objectives:

- Reorientation of the industry towards climate neutral practices.
- The use of renewable energy and increased efficiency.
- The use of alternative fuels in the transport sector and sustainable mobility.
- Waste reduction and efficient management.

As expected, the clearest targets at the EU and national level are related to waste management and show clear directions: waste prevention, primary sorting, and the development of waste management capacity. Therefore, the focus is on answering the question of how much (e.g., the share of municipal waste prepared for reuse and recycling should reach 60% by 2030). Municipalities include CE-related objectives and at least the minimum measurement indicators in their strategic plans.

Even though the industrial sector plays a critical role in the CE, it is not clear how the industry will become circular. The New Circular Economy Action Plan (COM/2020/98) and the New European Industrial Strategy (COM/2020/102) and its latest update in 2021 only indicate guidelines or possible directions on a broad scale. The same situation is seen in Lithuania; Lithuania’s National Progress Plan 2021–2030 indicates possible directions with a focus on the use of secondary raw materials, eco-innovation, energy efficiency (savings), and reduction of greenhouse gases and sets targets for the industrial sector (answering the question of how much); however, it provides no detailed guidelines on how to achieve these goals. More detailed information is provided in the Roadmap for Lithuania’s Industrial Transition to a Circular Economy.

In a noticeable trend, municipalities, especially those of the largest Lithuanian cities, create their visions in alignment with sustainable development goals (e.g., green municipalities, sustainable development and growth, socially responsible businesses and communities, smart and green economies, green infrastructure); however, they include no clear focus on becoming circular. The term ‘circular economy’ is not directly reflected in the priorities or goals of any municipality. The

Table 10.4 Integration of CE-related documents at the national, regional, and municipal levels in Lithuania

Focus	National level	Regional level	Municipal level
Whole ecosystem (public sector, industry and business, society)	<ul style="list-style-type: none"> Lithuania's Progress Strategy 'Lithuania 2030'^a. National Progress Plan for 2021–2030^a. The National Climate Change Management Agenda. Economic Recovery and Resilience Building Plan 'New Generation Lithuania'. 	Regional strategic development plans ^a	Municipal strategic development plans ^a
Industry and business	<ul style="list-style-type: none"> Roadmap for Lithuania's Industrial Transition to a Circular Economy^a. Roadmap for the Integration of the Lithuanian Industry into European Value Chains. Roadmap for Lithuanian Industry Digitization 2020–2030. 	-	-
Waste	<ul style="list-style-type: none"> National Waste Prevention and Management Plan for 2021–2027 (Draft)^a. 	Regional waste management plans ^a	Municipal waste management plans ^a

Note

^a Analysed documents related to CE in this research.

term 'circular economy' appears only in the Lithuanian National Progress Plan for 2021–2030, and this may be one reason that this term was not found in municipal strategic plans that were approved through the end of 2020 (all except for one municipality). Only 10 of 29 (35%) strategic plans approved through 1 October 2021 directly used the term 'circular economy'. Municipalities rarely name waste as a raw material or emphasise the extension of life cycle objects.

A mission comprises a portfolio of various projects

The CE concept is directly correlated with several major Lithuanian strategies and roadmaps, covering various focuses (see Table 10.4).

Missions should result in investments in different sectors and involve different types of actors

In strategic documents, CE is mainly identified as an opportunity, whereas climate change and pollution are identified as threats. This shows that coherence among the economy, the social environment, and the natural environment is the dominant aspect in the project's implementation.

Despite the fact that strategic documents aligned with the CE (see Table 10.4) cover the whole ecosystem (public institutions, industry, business, and society), industry and business in Lithuania receive the latest attention at the national level, while they receive attention in a fragmented way (through strategic plans) or not at all at the municipal and regional levels.

Missions require joined-up policymaking

The principle of hierarchical integration dominates in municipal strategic documents. For example, the municipal strategic development plan was prepared considering national-level documents important for CE transformation, although EU-level documents are rarely mentioned. The principle of horizontal integration is fragmented and is usually limited to a specific function, for

example, tourism or mobility. Municipal strategic development plans rarely mention the regional centres or main cities of the region where the municipality is located. Neighbouring municipalities consider cooperation only in the fields of public transport and tourism and in the development of a common water supply and wastewater infrastructure, while in the CE context, they fail to emphasise cooperation between different sectors from different municipalities (e.g., for industrial symbiosis). Furthermore, most municipalities compared the current situation in their territory with similar municipalities and the averages for Lithuania and their region. However, in the context of CE, comparisons with indicators from neighbouring municipalities, especially regional centres (cities), are also important.

As a mission-oriented policy could be used to solve wicked problems, the next section introduces an example of this type of policy by analysing the Lithuanian Industrial Circular Economy Transition Roadmap in detail according to key capabilities (such as a well-defined mission, a portfolio of various projects that comprised the mission, joined policymaking, and the involvement of different types of stakeholders).

Example of mission-oriented policy: Roadmap for Lithuania's Industrial Transition to a Circular Economy

The project Roadmap for Lithuania's Industrial Transition to a Circular Economy was the first co-creation project in Lithuania and can be considered an example of a mission-oriented policy to catalyse the CE transition in Lithuania. This project aimed to envisage specific actions that could help maintain the competitiveness of the country's industry while considering the principles of the CE.

Since 2018, the Ministry of Economy and Innovation has participated in the pilot project Industrial Transformation in the Regions initiated by the EC. Through this project, it was determined that the biggest shortcoming of Lithuanian industry is its lack of a unified vision and action plan for the transition to a climate-neutral CE. Therefore, in October 2020, the project Preparation of the Lithuanian Industrial Transition to the Circular Economy Roadmap was launched.

During the co-creation process, a comprehensive map of the circular ecosystem was compiled, identifying key stakeholders, organisations and associations in this field who wished to assume responsibility for the long-term viability and sustainability of the Roadmap for Lithuania. In this process, a systematic dialogue was used that allowed representatives of different stakeholders to share information, collaborate and discuss common goals, thus encouraging participants to change their beliefs, strengthen their relationships, and take responsibility to help them find a strong common ground for the future. As the project implementation period was from 2020 October to 2021 December (15 months), the systematic dialogue process for the development of the Lithuanian Industrial Circular Economy Roadmap was comprised of four stages (Science, Innovation and Technology Agency, 2022a):

- **Preparation:** activities such as mapping the CE ecosystem; conducting an industry questionnaire; policy and legislative analysis; formation of a coordination group for the Lithuanian Industrial Circular Economy Roadmap; selection and validation of the methodology; kick-off meeting for presentation of the project; invitation to a wider list of stakeholders.
- **Identifying the vision of a CE:** activities such as the vision/scenario session, that is, the context and CE's influencing factors, and an additional educational session.
- **Strategic directions:** activities such as periodic meetings of the coordination group; identification of strategic directions within the strategic policy groups and industry sectors' representatives.

- **Preparation and development of the roadmap draft:** activities such as periodic meetings of the coordination group; presentation of the draft of the Lithuanian Industrial Circular Economy Roadmap project; presentation of the roadmap to various stakeholders; approval of the roadmap.

Mission-oriented policies generally involve a large diversity of stakeholders who can influence not only policy agendas and well-established innovation systems but also society as a whole, including incumbent firms, consumers, and local communities. The co-creation of this roadmap was based on the stakeholder map, a voluntary coordination group of 50 representatives and experts from government, industrial, business, non-governmental, municipal, waste management, consumer, science, and educational institutions. The role of the coordination group was to ensure the equal representation of different interest groups, to support their motivation and to express the relevant needs of various stakeholders. Representatives of various industries (such as food and agriculture, construction, textile, furniture and wood products, plastics and packaging) were actively involved.

During the process of developing the Roadmap for Lithuania's Industrial Transition to a Circular Economy, a series of events was organised (see [Figure 10.4](#)). These events allowed us to get acquainted with the different stakeholders' attitudes towards the CE and to understand how the transition of the Lithuanian industry from the linear economy to the CE could be better implemented by combining different experiences.

As a result of this project, the following documents were prepared (Science, Innovation and Technology Agency, 2022c):

- An analysis of the circularity of Lithuanian industry.
- The vision of Lithuanian industry based on the principles of co-creation and partnership.
- 'Roadmap for Lithuania's Industrial Transition to a Circular Economy'.

The authors of the 'Roadmap for Lithuania's Industrial Transition to a Circular Economy' noted that the analysis of Lithuania's circularity revealed a wicked problem, namely "that only 3.3% of Lithuania's industry is circular, which means that the circularity gap exceeds 96%" (Science, Innovation and Technology Agency, 2022d). According to the Science, Innovation and Technology Agency (2022d), the Circularity of the Lithuanian Industry Analysis also presented Lithuania's portfolio, which presented Lithuania's current policy readiness for a circular industrial transition; a SWOT analysis, infrastructure analysis, opportunities analysis based on industrial sectors such as food and agriculture, construction, textiles, plastics and packaging, and furniture; and recommendations for Lithuania's industry transition to more of a CE by paying attention to regulatory framework, market, technological, governance, and cultural aspects. The analysis of Lithuania's circularity also revealed that "the Lithuanian economy has tangible potential for circularity" (Science, Innovation and Technology Agency, 2022d).

The vision and mission of the 'Roadmap for Lithuania's Industrial Transition to a Circular Economy' were expressed through both long-term (2050) and short-term (2030) goals. The three long-term goals were closely correlated with the EU's industrial transformation goals: full circularity, ensuring competitiveness, and climate neutrality. The short-term goals that were refined during the co-creation process include increasing competitiveness, creation of innovation, creation of a market for secondary raw materials, ensuring cooperation, establishment of a mechanism for the functioning of the CE, availability of raw materials, creation of a CE infrastructure, creating an environment for new business models, education and science, promoting sustainable consumption, and changing socioeconomic patterns (Science, Innovation and Technology

Mission-oriented policy as a catalyst

Event	Introductory event: Establishment of the Lithuanian Industry Transition to the Circular Economy (coordination group)	Introductory event: Establishment of the Lithuanian Industry Transition to the Circular Economy	Lithuanian Industrial Circular Economy Roadmap: Process and Benefits	Lithuanian Industrial Circular Economy Roadmap: Session of the Circular Economy context
Aim	To inform interested stakeholders of government, business, associations, non-governmental organizations, science and education, consumers, waste sectors, experts about the Lithuanian Industrial Circular Economy Roadmap and its development process.	To inform interested stakeholders of government, business, associations, non-governmental organizations, science and education, consumers, waste sectors, experts about the Lithuanian Industrial Circular Economy Roadmap and its development process.	To introduce the process and benefits of Lithuanian Industrial Circular Economy Roadmap.	Gain basic knowledge of the Circular Economy; To gain a general understanding of the level of perception in Lithuania; To get acquainted with the tendencies; Raise expectations, fears, success factors for successful further cooperation
Date	2021-02-25	2021-03-10	2021-03-18	2021-03-25
Event	Lithuanian Industrial Circular Economy Roadmap: Good practices	Lithuanian Industrial Circular Economy Roadmap: Scenarios and vision	Lithuanian Industrial Circular Economy Roadmap: Discussion of strategic directions	Circular Economy Conference ‘How Can Industry Lead the Transformation to a Green and Circular Economy?’
Aim	By bringing together key stakeholders to learn about best practices in the Circular Economy in different levels.	By mobilizing key stakeholders, using the methods of co-creation, systematic dialogue and scenario development, to refine the transition of Lithuanian industry from linear to the Circular Economy: possible scenarios and vision, common points of contact and understanding.	By mobilizing key stakeholders, using the methods of co-creation, systematic dialogue and scenario development, to refine the transition of Lithuanian industry from linear to the Circular Economy strategic directions and identify concrete proposals from various stakeholders.	To present the roadmap of the Lithuanian Industrial Circular Economy.
Date	2021-04-22	2021-07-08	2021-08-13	2021-12-17

Figure 10.4 Events to develop the roadmap for Lithuania’s Industrial Transition to a Circular Economy.

Source: Based on Science, Innovation and Technology Agency, 2022b.

Agency, 2022e). The mission of the roadmap includes multiple aspects, such as 1) setting conditions, including creating or improving the regulatory environment, development of technological renewal and innovation, dissemination of knowledge-intensive innovations, the creation of a sustainable funding model, and 2) the definition of the CE monitoring indicators and evaluation system (Science, Innovation and Technology Agency, 2022e). The co-creation and systematic dialogue process for the development of the roadmap involved and ensured the equal representation

of different stakeholders with different biases in terms of knowledge, competencies, interests, and responsibilities. In such processes, the collaboration and cooperation between different stakeholders is the key aspect (Bauwens et al., 2020; Velenturf & Purnell, 2021). Participation in this co-creation process through fruitful discussions led to new knowledge sharing and a common understanding of the CE's complex and multifaceted issues.

Challenges to implementing circular economic policies

The various stakeholders in the value chain have different goals and attitudes, leading to contradictions and tensions when working to achieve and reconcile different goals. For example, if more secondary materials, such as regenerated-recycled cotton, are used in production, this can be seen as an example of a circular action. However, the quality of such products may be lower and have a shorter useful life. This is contrary to the idea of circularity, which aims to keep products on the market as long as possible. Obviously, the needs and complexity of the plurality of stakeholders raise challenges in promoting transitions to the CE from a public sector point of view.

The coherence and integrity among EU, national, regional, and municipal documents take time; for this reason, the Lithuanian CE policy remains at an early stage. Not all documents, especially at the municipal level, are prepared as guidelines for how ecosystem actors should be involved in the transition to CE. The coherence and integrity analysis of CE policy in Lithuania, as well as the overview of the roadmap, identified several challenges that must be overcome (see Figure 10.5).

One way to reduce ambivalence is to set clear goals and strategies. The European Commission has established common EU goals for the recycling of municipal waste by 2030 (65%) and packaging waste (75%). Such measurable targets in areas related to waste management reduce ambiguity and can facilitate transitions to the CE. The analysis of Lithuania's policies shows that although the visions or priorities set out in many municipalities' strategic plans emphasise the environmental dimension, no concrete environmental indicators (circular) are included in the monitoring system. Only a few municipalities have quantified environmental indicators in the vision or impact indicators group. To meet this challenge of a lack of measurement, a common list of monitoring indicators

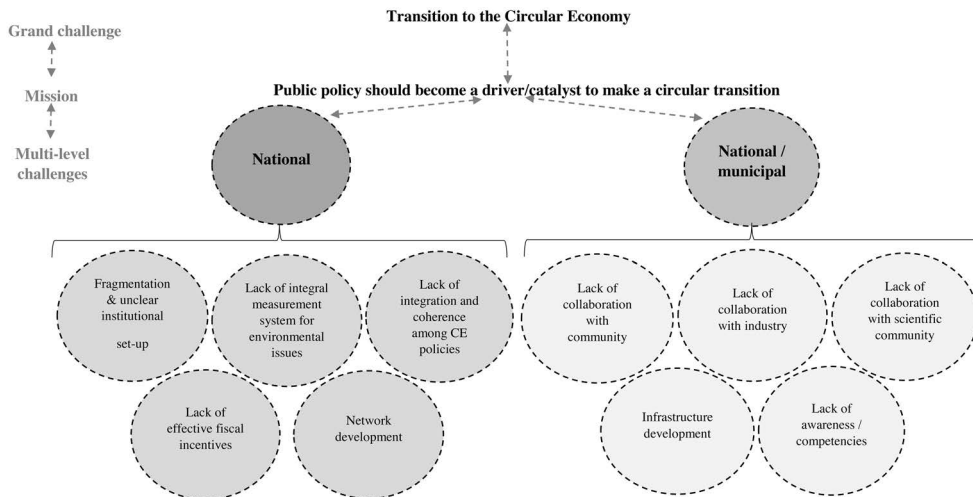


Figure 10.5 Key multi-level scale challenges for the transition to the CE from a public sector perspective.

should be introduced, specifying the indicators and the methodology for calculating them, as the existing indicators in the monitoring systems are different, making it impossible to measure and compare progress between different municipalities. However, other important areas of the CE, such as eco-design, reuse, and remanufacture, do not have clear measurement objectives, so the challenge of ambivalence remains.

To be more circular, achieve more efficient waste management, and to avoid fragmentation, regional and municipal waste management plans and other documents must be prepared in parallel. In addition, to meet this challenge (i.e., the lack of integration and coherence between documents and the fragmentation of institutional set-up), more ambitious CE-related targets should be set within CE policies. Currently, the concept of the CE is mostly reflected in the lowest product or target-level indicators.

At the municipal level, cooperation with businesses and research institutions is fragmented, even though municipalities are aware of the importance of cooperation among all ecosystem actors. Following local governance legislation, the municipality's only function is to create suitable conditions for the development of business activities. However, the municipality is not intended to collaborate with business or build joint business networks. Thus, this function remains national, although it is needed at the municipal level, where the businesses operate. Therefore, an important challenge for the public sector is to create conditions for the development of a circular business model and to promote various CE initiatives, beyond what is written in the local governance laws – that is, to develop a network within local ecosystems. Despite the fact that all municipalities plan to develop a waste management infrastructure, the main challenges involve societal awareness regarding municipal waste sorting as well as local businesses' lack of environmental responsibility. These challenges lead to the need for infrastructure development. From the perspective of the public sector, this could be achieved through actions such as promoting the separation, recycling, and reuse of waste; developing a sustainable waste management system; implementation of CE principles of sharing and reuse in households; and developing and implementing a unified textile waste collection and management system.

One way to increase the awareness of the CE and environmental responsibility is to actively raise the level of knowledge and competences of society, businesses, and the public sector. It is obvious that Lithuanian municipalities increasingly aim to disseminate environmental information through educational and cultural programs. Another method is to organise various events that promote environmental protection initiatives. In addition, a lack of competence and knowledge exists among public sector specialists, especially in the regions. Most of them only equate the CE with a higher level of recycling. Staff training and competency building could be a way for public organisations to accelerate the transition to the CE.

Hence, we can state that the key multi-level scale challenges for the transition to the CE identified in this research are in line with the challenges of public policies related to the CE mentioned by Wittmann et al. (2021), Johansson and Henriksson (2020), Lazarevic and Valve (2017), and Stahel (2010). Therefore, institutional conditions, political reforms, and the active participation of the whole society play an important role in encouraging the public sector to become a catalyst for the transition to a CE.

Conclusions

The transition to a CE presents difficult governance challenges for policymakers. Therefore, the focus on mission-oriented policies targeting complex and multidimensional grand challenges is particularly relevant.

Currently, the public sector deals with CE issues mainly through waste management and recycling. Notably, the public sector has not played the role of an active catalyst in encouraging society and businesses to transition to a CE. Implementing the principles of a CE should be based on a mission-oriented policy, which could lead to a win-win situation for all stakeholders by reducing the circularity gaps in Lithuania. The ambivalence and lack of specificity and clarity related to CE in policy documents (setting targets and indicators) require a stronger interpretation of the concept and more resources (personal knowledge, initiative and leadership, networking) and time to achieve these goals.

Co-creation involves collaboration within the whole ecosystem among interested actors and the integration of various resources and unique capacities for overcoming challenges. Strategic documents created on the basis of co-creation gain advantages via synergy and are capable of creating higher value than they could otherwise. Such documents are aligned with mission-oriented policy and may enable the transition to a CE.

The co-creation process of the ‘Roadmap for Lithuania’s Industrial Transition to a Circular Economy’ revealed that, based on voluntary participation during open conversation, the different stakeholders not only reconciled different interests and competencies, but also developed a common motivation for the practical implementation of a circular transformation by setting long-term and short-term goals for Lithuania’s industrial transition to a CE. Analysis of the integrity of the roadmap revealed that all key capabilities (such as a well-defined mission, a portfolio of various projects) comprised mission, joined policymaking and the involvement of different types of stakeholders) met the requirements for a mission-oriented policy, which could be used to solve circularity challenges in Lithuanian industry.

Educational content

- The public sector must be a key partner in solving sustainability issues, rather than just a facilitator of growth, to ensure social, economic, and environmental sustainability.
- The active engagement of the public sector might foster the transition to a CE via a) integration of top-down and bottom-up public policies, b) collaboration with stakeholders, and c) implementation of a mission-oriented policy.
- The readiness of public policy for a mission-oriented approach at the legislative level is a serious prerequisite for success. The interoperability between strategic documents is crucial, both from a vertical (coherence) and a horizontal (integrity) perspective.
- Public policy that is created on the basis of co-creation principles gains advantages via synergy and is capable of creating higher value. The co-creation process develops common competences and motivates different stakeholders for the practical implementation of public policies.

References

- Aarikka-Stenroos, L., Ritala, P., & Thomas, L. D. W. (2021). Circular economy ecosystems: A typology, definitions, and implications. In S. Teerikangas, T. Onkila, K. Koistinen & M. Mäkelä (Eds.), *Research handbook of sustainability agency* (pp. 260–273). Edward Elgar Publishing. <https://doi.org/10.4337/9781789906035.00024>
- Bauwens, T., Hekkert, M., & Kirchherr, J. (2020). Circular futures: What will they look like? *Ecological Economics*, 175, 106703. <https://doi.org/10.1016/j.ecolecon.2020.106703>
- Cainelli, G., D’Amato, A., & Mazzanti, M. (2020). Resource efficient eco-innovations for a circular economy: Evidence from EU firms. *Research Policy*, 49(1), 103827. <https://doi.org/10.1016/j.respol.2019.103827>
- Corvellec, H., Stowell, A. F., & Johansson, N. (2021). Critiques of the circular economy. *Journal of Industrial Ecology*, 26, 421–432. <https://doi.org/10.1111/jiec.13187>

- Dagilienė, L., Varaniūtė, V., & Bruneckienė, J. (2021). Local governments' perspective on implementing the circular economy: A framework for future solutions. *Journal of Cleaner Production*, 310, 127340. <https://doi.org/10.1016/J.JCLEPRO.2021.127340>
- European Commission. (2018). *Monitoring framework on the circular economy*. <https://ec.europa.eu/eurostat/web/circular-economy/indicators>
- European Commission. (2019, May 8). *Industrial transition: No regions left behind*. https://ec.europa.eu/regional_policy/en/information/publications/brochures/2019/industrial-transition-no-regions-left-behind
- Eurostat (2018). *Renewable energy statistics*. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Renewable_energy_statistics
- Eurostat (2022). *Environmental protection expenditure accounts*. Retrieved, August 26, 2022, from: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Environmental_protection_expenditure_accounts
- Geels, F. W., & Schot, J. (2007). Typology of sociotechnical transition pathways. *Research Policy*, 36(3), 399–417. <https://doi.org/10.1016/j.respol.2007.01.003>
- Ghisellini, P., Cialani, C., & Ulgiati, S. (2016). A review on circular economy: The expected transition to a balanced interplay of environmental and economic systems. *Journal of Cleaner Production*, 114, 11–32. <https://doi.org/10.1016/j.jclepro.2015.09.007>
- Haas, W., Krausmann, F., Wiedenhofer, D., & Heinz, M. (2015). How circular is the global economy? An assessment of material flows, waste production, and recycling in the European Union and the world in 2005. *Journal of Industrial Ecology*, 19(5), 765–777. <https://doi.org/10.1111/jieec.12244>
- Hekkert, M. P., Janssen, M. J., Wesseling, J. H., & Negro, S. O. (2020). Mission-oriented innovation systems. *Environmental Innovation and Societal Transitions*, 34, 76–79. <https://doi.org/10.1016/j.eist.2019.11.011>
- Hobson, K., & Lynch, N. (2016). Diversifying and de-growing the circular economy: Radical social transformation in a resource-scarce world. *Futures*, 82(August), 15–25. <https://doi.org/10.1016/j.futures.2016.05.012>
- Johansson, N., & Henriksson, M. (2020). Circular economy running in circles? A discourse analysis of shifts in ideas of circularity in Swedish environmental policy. *Sustainable Production and Consumption*, 23, 148–156. <https://doi.org/10.1016/j.spc.2020.05.005>
- Kanda, W., Geissdoerfer, M., & Hjelm, O. (2021). From circular business models to circular business ecosystems. *Business Strategy and the Environment*, 30(6), 2814–2829. <https://doi.org/10.1002/bse.2895>
- Kirchherr, J., Reike, D., & Hekkert, M. (2017). Conceptualizing the circular economy: An analysis of 114 definitions. *Resources, Conservation and Recycling*, 127, 221–232. <https://doi.org/10.1016/j.resconrec.2017.09.005>
- Korhonen, J., Nuur, C., Feldmann, A., & Birkie, S. E. (2018). Circular economy as an essentially contested concept. *Journal of Cleaner Production*, 175, 544–552. <https://doi.org/10.1016/j.jclepro.2017.12.111>
- Lazarevic, D., & Valve, H. (2017). Narrating expectations for the circular economy: Towards a common and contested European transition. *Energy Research and Social Science*, 31, 60–69. <https://doi.org/10.1016/j.erss.2017.05.006>
- Lieder, M., & Rashid, A. (2016). Towards circular economy implementation: A comprehensive review in context of manufacturing industry. *Journal of Cleaner Production*, 115, 36–51. <https://doi.org/10.1016/j.jclepro.2015.12.042>
- Mazzucato, M. (2013). *The entrepreneurial state: Debunking public vs. private sector myths*. Anthem Press. Retrieved, August 26, 2022, from: <http://digamo.free.fr/mazzucato.pdf>
- Mazzucato, M. (2018). Mission-oriented innovation policies: Challenges and opportunities. *Industrial and Corporate Change*, 27(5), 803–815. <https://doi.org/10.1093/icc/dty034>
- Moreau, V., Sahakian, M., van Griethuysen, P., & Vuille, F. (2017). Coming full circle: Why social and institutional dimensions matter for the circular economy. *Journal of Industrial Ecology*, 21(3), 497–506. <https://doi.org/10.1111/jieec.12598>
- Murray, A., Skene, K., & Haynes, K. (2017). The circular economy: An interdisciplinary exploration of the concept and application in a global context. *Journal of Business Ethics*, 140(3), 369–380. <https://doi.org/10.1007/s10551-015-2693-2>
- Ranta, V., Aarikka-Stenroos, L., Ritala, P., & Mäkinen, S. J. (2018). Exploring institutional drivers and barriers of the circular economy: A cross-regional comparison of China, the US, and Europe. *Resources, Conservation and Recycling*, 135, 70–82. <https://doi.org/10.22201/fq.18708404e.2004.3.66178>

- Roberts, C., Geels, F. W., Lockwood, M., Newell, P., Schmitz, H., Turnheim, B., & Jordan, A. (2018). The politics of accelerating low-carbon transitions: Towards a new research agenda. *Energy Research and Social Science*, 44, 304–311. <https://doi.org/10.1016/j.erss.2018.06.001>
- Schulz, C., Hjaltadóttir, R. E., & Hild, P. (2019). Practising circles: Studying institutional change and circular economy practices. *Journal of Cleaner Production*, 237, 1–10. <https://doi.org/10.1016/j.jclepro.2019.117749>
- Science, Innovation and Technology Agency. (2022a, September 20). *Lietuvos pramonės perėjimo prie žiedinės ekonomikos kelrodžio parengimo projektas*. <https://mita.lrv.lt/lt/veiklos-sritys/mita-vykdomi-projektai/ze-kelrodis-pramonei/apie-projekta-3>
- Science, Innovation and Technology Agency (2022b, September 20). *Events*. <https://mita.lrv.lt/lt/renginiai/ziedines-ekonomikos-konferencija-how-can-industry-lead-the-green-and-circular-economic-transformation>
- Science, Innovation and Technology Agency (2022c, September 20). *Project results*. <https://mita.lrv.lt/lt/veiklos-sritys/mita-vykdomi-projektai/ze-kelrodis-pramonei/projekto-rezultatai>
- Science, Innovation and Technology Agency (2022d, September 20). *Analysis of circularity of the Lithuanian industry*. <https://mita.lrv.lt/uploads/mita/documents/files/Lietuvos%20pramones%20ziediskumo%20analize%20Circle%20economy.pdf>
- Science, Innovation and Technology Agency (2022e, September 20). *Roadmap for Lithuania's industrial transition to a Circular Economy: The first vision of Lithuanian industry based on the principles of co-creation and partnership*. https://mita.lrv.lt/uploads/mita/documents/files/Roadmap_final.pdf
- Senge, P., Lichtenstein, B., Kaeufer, K., Bradbury, H., & Carroll, J. S. (2007). Collaborating for systemic change. *MIT Sloan Management Review*, 48(2), 44–53. <https://sloanreview.mit.edu/article/collaborating-for-systemic-change/>
- Stahel, W. R. (2010). *The performance economy*. Palgrave Macmillan London. <https://doi.org/10.1057/9780230274907>
- Termeer, C. J. A. M., & Metzke, T. A. P. (2019). More than peanuts: Transformation towards a circular economy through a small-wins governance framework. *Journal of Cleaner Production*, 240. <https://doi.org/10.1016/j.jclepro.2019.118272>
- Tukker, A. (2015). Product services for a resource-efficient and circular economy – A review. *Journal of Cleaner Production*, 97, 76–91. <https://doi.org/10.1016/j.jclepro.2013.11.049>
- Türkel, S., Kemp, R., Huang, B., Bleischwitz, R., & McDowall, W. (2018). Circular economy scientific knowledge in the European Union and China: A bibliometric, network and survey analysis (2006–2016). *Journal of Cleaner Production*, 197, 1244–1261. <https://doi.org/10.1016/j.jclepro.2018.06.118>
- van den Bergh, J. C. J. M. (2020). Six policy perspectives on the future of a semi-circular economy. *Resources, Conservation and Recycling*, 160, 104898. <https://doi.org/10.1016/j.resconrec.2020.104898>
- Velenturf, A., & Purnell, P. M. (2021). Principles for a sustainable circular economy. *Sustainable Production and Consumption*, 27, 1437–1457. <https://doi.org/10.1016/J.SPC.2021.02.018>
- Witjes, S., & Lozano, R. (2016). Towards a more circular economy: Proposing a framework linking sustainable public procurement and sustainable business models. *Resources, Conservation and Recycling*, 112, 37–44. <https://doi.org/10.1016/j.resconrec.2016.04.015>
- Wittmann, F., Hufnagl, M., Lindner, R., Roth, F., & Edler, J. (2021). Governing varieties of mission-oriented innovation policies: A new typology. *Science and Public Policy*, 48(5), 727–738. <https://doi.org/10.1093/scipol/scab044>