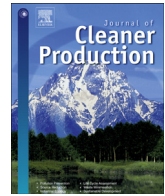




Contents lists available at ScienceDirect

Journal of Cleaner Production

journal homepage: www.elsevier.com/locate/jclepro

Institutional entrepreneurship enablers to promote circular economy in the European Union: Impacts on transition towards a more circular economy

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ARTICLE INFO

Article history:

Received 5 December 2019

Received in revised form

26 August 2020

Accepted 24 October 2020

Available online xxx

Handling editor: Yutao Wang

Keywords:

Circular economy

Institutional entrepreneur

Enablers

Circular economy impacts

Circular economy strategy

Circular economy transition

ABSTRACT

Circular economy supposes a transformational and radical process of change from a linear to a circular economic model, where every production phase represents a systemic shift at all levels. Nevertheless, CE philosophy is easy to understand but very complex to put into practice. For that reason, using institutional entrepreneurship theory, institutional enablers to push the transition to a more CE in the European Union will be analysed. In particular, the impacts achieved by CE strategies are oriented to priority CE goals. Thus, this empirical study based on a public consultation survey uses structural equation modelling to analyse links between institutional entrepreneurship enablers and impacts on CE strategies oriented to main CE goals. The findings support the effectiveness of acting like an institutional entrepreneur to force transformational and radical changes, although differences are found between enablers and the impacts of CE. The paper concludes with some useful reflections for institutions and policy-makers in order to maximise the efforts taken to effect changes at all levels.

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1. Introduction

There is a consensus worldwide regarding the necessity of encouraging more sustainable development and of balancing economic, social and environmental issues. There is also a growing number of voices advocating a change in production processes and consumption modes (Alonso-Almeida et al., 2020).

The circular economy (CE) is postulated as a possible solution by changing the mode of production, the use of raw materials and minimising or even eliminating waste (Bianchini et al., 2018; Szita, 2017). Some authors state that a more extensive notion of circular economy should include the development of green technologies, strong cooperation among different agents and a push on the part of public inventions to raise awareness and promote sustainable production patterns (Pattanaro and Gente, 2017). The Ellen

MacArthur Foundation asserted that CE

Entails gradually decoupling economic activity from the consumption of finite resources and designing waste out of the system. Underpinned by a transition to renewable energy sources, the circular model builds economic, natural, and social capital. (....) Transitioning to a circular economy does not only amount to adjustments aimed at reducing the negative impacts of the linear economy. Rather, it represents a systemic shift that builds long-term resilience, generates business and economic opportunities, and provides environmental and societal benefits. (Ellen MacArthur Foundation, 2019).

Nevertheless, Domenech and Bahn-Walkowiak (2019) advise that while the CE philosophy is easy to understand, it is very complex to put into practice. The process of change from a linear to a circular economic model is multilevel, with three different levels: macro, meso and micro (Florida et al., 2019). According to the aforementioned authors, at the macro level, political agreements can help to reduce climate change and promote innovations in companies and industrial and technological networks. At the meso level, policies promote innovations in industries, and at the micro

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level, economic incentives supporting the adoption of renewable energies and recycling aimed at companies and individuals. In fact, eco-innovations are a good first step towards more circular processes of production and business but are not enough per se (Florida et al., 2019). Moreover, stakeholder awareness and combined action is a big challenge to CE diffusion from the macro to the micro level (Adams et al., 2017).

Thus, institutional support is needed in order to promulgate changes at the national level in both businesses and in society (Llach et al., 2015). However, CE adoption and its diffusion requires more than simple support because it supposes radical changes at all levels.

According to neoinstitutional theory, organisations at all levels can act as 'institutional entrepreneurs' (Ahrens and Ferry, 2018). These authors point out politicians and officials as institutional entrepreneurs who pursued changing the operation and meanings of a very institutionalised field, specifically well-being. They pursue these changes as one of the participants in this field, therefore seeking 'change from within'. Institutional entrepreneurship (IE) promotes changes in the environment using different politics, strategies, activities and means (Greenwood and Suddaby, 2006). Most previous research on IE has focused on qualitative research, with an emphasis on the macro level. For that reason, the latest research (Ahrens and Ferry, 2018) has stressed the importance of explaining empirically how organisational actors drive these types of changes and their effectiveness with respect to changes.

The European Commission is pushing CE throughout the European Union (EU), spurred by European institutions in order to face global problems such as climate change, raw material depletion and change production and consumption patterns (Almeida et al., 2014). Nevertheless, CE supposes a radical change in most countries. Therefore, the European Commission could act as an institutional entrepreneur to accelerate change due to the complexity of the environment and the differences between the countries involved (Rodríguez-Anton et al., 2019). Nevertheless, research on this approach to linking IE and CE has been scarce until now (Elliot, 2016). In fact, according to the best of our knowledge, the role of the European Commission as institutional entrepreneur has not been explored yet. Therefore, the European Commission's strategies and the impacts of promoting CE could be considered to be in their early infancy.

Therefore, this study is exploratory in nature with a twofold goal: first, to use IE theory linking the main IE enablers with CE principles in order to promote CE; second, to use structural equations to empirically analyse the impact of the main IE enablers on CE in order to promote CE.

This research contains several contributions to the advancement of IE and CE in both academia and practice. Firstly, it sheds light on IE, providing empirical evidence for the role of institutions as agents of divergent change. Secondly, it analyses the most effective enablers to push divergent change, like CE. Thirdly, it measures the impacts of IE enablers on CE. Those contributions allow more in-depth insight into addressing enablers' ability to achieve their goals, in this case regarding CE. In addition, this paper clearly contributes to the concept of cleaner production, shedding light on the advances in CE, like ways to use raw materials, energy and water more efficiently and the elimination of waste.

Finally, the paper is organised as follows: the next section reviews the literature on institutional entrepreneurship enablers and impacts on circular economy and defines the hypotheses. The following section describes the data collection and methodology used. Thereafter, the study results are presented, followed by a discussion of these results and contrasts with the hypotheses. The paper ends with some conclusions, implications for practice and policymakers, and suggestions for further research on the topic.

2. Literature review

2.1. Institutional entrepreneurship power

The concept of institutional entrepreneurship (IE) was introduced by DiMaggio in 1988. IE is a process that contributes to radical changes in the institutional environment where this process takes place. This process could include new organisational structures, new business models, new operating systems and procedures, among other types of innovations (Battilana et al., 2009; DiMaggio, 1988).

Therefore, an institutional entrepreneur can be an organisation or a group of organisations. An institutional entrepreneur is an actor who leverages resources to create or transform an existing institutional context by introducing new ideas (Elliot, 2016) and favouring change (Covaleski et al., 2013). They do not only look for and propose new opportunities, but they also build them, introducing new concepts and innovations to change a certain situation (Almeida et al., 2014).

To be considered an institutional entrepreneur, an organisation or group should comply with the following requirements (Battilana et al., 2009): 1) initiate a divergent change and 2) participate actively in the transformation. A divergent change is a change that breaks with the institutionalised model in a certain institutional context, in contrast with a nondivergent change, which is aligned with the reference institutional environment (Battilana et al., 2009). Therefore, an institutional entrepreneur is a change agent with the volition to conduct the change (Elliot, 2016). An institutional entrepreneur can appear at different institutional levels, fields and profiles (Dorado, 2005). Thus, Dorado (2005) asserted that institutional entrepreneurs could be powerful actors with sufficient resources, such as governments, supranational organisations, corporations and other similar agencies, to promote change. Nevertheless, the union of multiple stakeholders with similar strong interests could also act like an institutional entrepreneur and bring about the change collectively.

In addition, Battilana et al. (2009) asserted that there are two enabling conditions for institutional entrepreneurship: 1) field characteristics and 2) actors' social position. Field characteristics include the existing conditions where the institutional entrepreneur is embedded and expects to wield influence. Crisis situations constitute a first form of field characteristics where new ideas proliferate in response to such situations (Child et al., 2007). Actors' social position, according to Battilana et al. (2009), refers to a formal position as well as a legitimate socially constructed identity. Actors' social position is relevant because actors with a high-status position are at the centre of the field (Shils, 1975) and have access to resources and the capability to engage different stakeholders and persuade them to change (Greenwood and Suddaby, 2006). Findings have also suggested that high-status institutional entrepreneurs are likely to conduct disruptive changes because they could try to achieve the change towards different means by using different approaches.

Lawrence et al. (2009) identified different types of power to achieve a greater degree of acceptance and contribution to the change. The power exercised by law used to be defined as the main cause of change, but it does not always achieve the desired impacts, nor does it do so with enough speed (Elliot, 2016). Sometimes the impacts can even be contrary to what was expected (Sauvé et al., 2016). Thus, this type of power could be becoming too weak to push real divergent changes due to a significant increase in regulatory pressure (Covaleski et al., 2013). Therefore, along with laws, it is necessary to use other types of drivers.

Thus, institutional entrepreneurs can use so-called soft power (De Jesus and Mendoca, 2018). This type of power refers to the

Table 1
Previous research on Institutional Entrepreneurship.

Authors	Place	Object of analysis	Methodology	Level of analysis	Mobilisation of resources	Collaboration among actors	Support knowledge building
Burns (2000)	UK	Chemical manufacturer	Qualitative approach; longitudinal case study	Micro			
Greenwood and Suddaby (2006)	USA	Big Five auditing companies and regulatory governing bodies	Qualitative approach;	Meso			
Covaleski et al. (2013)	USA	longitudinal case study US Welfare Program	Qualitative approach; case study	Macro			
Almeida et al. (2014)	Brazil	Danone	Qualitative approach; case study	Micro			
Jolly and Raven (2015)	India	Wind energy	Qualitative approach; longitudinal case study	Meso			
George et al. (2015)	India	Emergency management	Qualitative approach; case study	Macro			
Elliot (2016)	Sweden	Four big banks	Qualitative approach; longitudinal case study	Meso			
Ahrens and Ferry (2018)	UK	Newcastle City Council	Qualitative approach; longitudinal case study	Macro			
Gasbarro et al. (2018)	Italy	Small companies in clean energy sector in Tuscany	Qualitative approach; case study	Meso			
	Sweden	City of Goteborg	Qualitative approach; case study	Macro			

Note: Grey shaded boxes means that that article analysed the impact of the enabler.

ability to promote change through technical and economic means, changing values and practices by shaping attitudes and preferences. Thus, the institutional entrepreneur 1) leverages resources to transform the institutional context, 2) initiates and participates actively in the change and 3) uses their position to engage different actors to promote the desired change. There is a consensus that a balance between both types of powers is needed to push radical changes. Previous research has found the main enablers deployed by IE (see Table 1).

The first enabler is related to the mobilisation of resources needed to promote change (Battilana et al., 2009). Thus, the European Commission funds tools and programmes for researching CE and its transfer to markets (De Jesus and Mandoca, 2018). Institutional entrepreneurs contribute to transforming the existing systems by disseminating new ideas and increasing awareness of new opportunities (Gasbarro et al., 2018). Therefore, an adequate effort in R&D helps to create a skill base for CE (Brown et al., 2019). The creation of technical solutions is essential to create life-cycle scenarios for new products and processes for CE strategies. Thus, the mobilisation of resources is essential to creating and disseminating circular products and processes among businesses, especially small companies. In fact, existing CE solutions are entering the market very slowly due to barriers linked to investments (de Jesus et al., 2019).

Obviously, the mobilisation of funds is a requirement to promote CE in order to introduce new managerial practices and business models and to adopt the principles and strategies of CE. In addition, financial resources can convince other actors at lower levels to commit to change because divergent change is costly (Boons et al., 2013). In fact, financial incentives are very powerful during the early stages of introducing a divergent change because in this period new ideas might be unpopular (Greenwood and Suddaby, 2006). Nevertheless, little is known about how institutional entrepreneurs mobilise financial resources.

The second proposed enabler is the collaboration or creation of alliances between different actors with different backgrounds in order to promote new ideas and the skills needed to push transformations at all levels. Translating the CE core vision into practice is difficult without multicollaboration activities in order to generate data, perform experiments and assess the feasibility of reusing materials. For that reason, actions to foster collaboration are required (Domenech and Bahn-Walkowiak, 2019). Thus, collaboration among different actors is a key issue to develop the ideas needed for a CE and to build the solution (Brown et al., 2019).

Finally, the third enabler is supporting knowledge building. In the EU territory, CE is considered a desired end-state (de Jesus et al., 2019; De Jesus and Mandoca, 2018; Morsetto, 2020). Rodríguez-Antón et al. (2019) have shown the efforts that the European Commission is making in pushing CE, such as directives and plans, are like coercive pressure. Nevertheless, despite these efforts, a number of researchers have indicated that a lack of support from national governments and other institutions is one of the main barriers to CE advancement (Bocken et al., 2018; Brown et al., 2019; de Jesus et al., 2019). On the other hand, de Jesus and Mendonça (2018) analysed the CE research published until 2015 and found that the main drivers of CE were institutional and regulatory drivers, which seems to underscore the entrepreneur role of institutions. On the other hand, a lack of knowledge about what CE is and how organisations can adopt and deploy its principles is the main barrier identified.

Thus, there is a contradiction regarding governmental support and the promotion of CE at national levels. For that reason, the adoption of CE is very different in each country in the EU territory (Rodríguez-Anton et al., 2019). Nevertheless, some authors have pointed out that an optimal mix of rules, guides, standards,

certifications and educational set-ups promotes CE at all levels (De Jesus and Mandoca, 2018). CE transformation entails radical changes at all levels of an institutional environment (Boons et al., 2013). Therefore, in addition to exerting pressure to adopt, IE in key institutions, such as the European Commission in the case of Europe, could be key to promoting CE for all members.

2.2. Institutional entrepreneurship enablers and circular economy impacts

As mentioned previously, some voices advise that it is urgent to understand how IE is able to facilitate the emergence of CE (de Jesus and Mendonça, 2018). The current demand for environmental change is increasing among governments, businesses, citizens and other organisations worldwide. Change is a complex, political and multidimensional process that needs to be understood from different angles in order to achieve an insight that is able to manage it and measure its impact (Elliot, 2016). Transitioning from a linear economy to a circular one supposes a divergent change and requires an institutional entrepreneur to promote it. Morsetto (2020) has studied the targets of CE and asserted that although CE pursues several targets, the primary targets that are prioritised and applied are strategies oriented towards resource efficiency, extending product life and achieving useful application of material.

To achieve those CE goals, IE enablers in action (see Table 1) are required to implement these changes. The European Commission embodies the conditions necessary to be a proper institutional entrepreneur in entire EU countries. It has the power to adopt an active role in initiating a divergent change from linear to circular economy and in engaging actively in the change in the laws.

Thus, mobilising resources to drive the change towards a more CE is required because national governments and governmental organisations, industries or particular companies might not have the financial resources, knowledge or conviction to adopt a CE (Lieder and Rashid, 2016). Therefore, some authors have suggested ideas to promote circularity: subsidies, capital support, soft loans, incentives for research on the topic or supporting innovative business models (Brown et al., 2019). These authors also suggested that research funding could include proof of concepts, experiments and pilot scales, which could be extended from the top down if they are successful.

CE transition in Europe is currently slower than desired because changes remain incremental despite being radical or transformational (Alonso-Almeida and Rodríguez-Anton, 2019; Bianchini et al., 2018). CE remains open to how its targets are achieved (Morsetto, 2020). The main reason is that CE change is difficult to adopt and accelerate because of the power of inertia, resistance to change (Battilana et al., 2009) and a lack of real solutions to encourage CE (de Jesus and Mendonça, 2018; Lieder and Rashid, 2016).

Brown et al. (2019) summarised CE concepts and visions and asserted that the aim of CE is the efficiency of resources, managing obsolescence in order to extend the life of products and minimising waste by transforming it into a new input for production (Alonso-Almeida and Rodríguez-Anton, 2019). Therefore, as happened with other radical changes (Alonso-Almeida et al., 2016), the mobilisation of resources could be an enabler that facilitates the transition to a more CE with respect to engaging the main strategies, such as product-life extension, resource efficiency and the useful application of resources. Thus, in keeping with the previous research, the following hypotheses are suggested:

H1. Mobilisation of resources is an enabler to facilitate the transition to a more CE using strategies oriented toward improving product-life extension.

H2. Mobilisation of resources is an enabler to facilitate the transition to a more CE using strategies oriented towards resource efficiency.

H3. Mobilisation of resources is an enabler to facilitate the transition to a more CE using strategies oriented towards increasing the useful application of resources.

The European Commission could push CE by promoting the collaboration of different actors in product development, process design and new business models, among others (Brown et al., 2019). The main reason for this is because pursuing CE requires a search for new ways of doing things, and it requires different perspectives, types of resources and knowledge, and transversal collaboration (Adams et al., 2017; Brown et al., 2019). CE depends on technical advancement and the creation of markets which require active learning and creative processes from different sources (Brown et al., 2019; Morsetto, 2020). Given the current scant knowledge about CE, high levels of collaboration are a critical issue in all CE strategies (Morsetto, 2020). Collaboration among different actors contributes to finding a suitable context for experiments in order to reduce the complexity linked to CE solutions (Brown et al., 2019). Therefore, CE strategies require collaboration among different actors in order to promote the crucial 'breeding stock' to create CE solutions for all CE strategies: universities, public organisations, industries, businesses and society.

According to the aforementioned studies, some actors alone could identify business opportunities to leverage over- or underutilised resources, finding innovative ways to source inputs and optimise the value of the residues. Nevertheless, other more complex CE strategies are not possible to achieve without collaboration among different actors (Domenech and Bahn-Walkowiak, 2019). Therefore, IE implies the existence of a critical actor in order to drive collaboration among the different levels.

Thus, an institutional entrepreneur has both the power and the capability to engage different stakeholders and to inspire them to work together in a certain direction regarding CE (Greenwood and Suddaby, 2006). In addition, IE can help to introduce collaborative innovative business models with final customer and strategic partnerships (Gasbarro et al., 2018) in order to facilitate the transition to a more CE. In accordance with previous research, the following hypotheses are enunciated:

H4. Collaboration is an enabler to facilitate the transition to a more CE using strategies oriented towards improving product-life extension.

H5. Collaboration is an enabler to facilitate the transition to a more CE using strategies oriented towards resource efficiency.

H6. Collaboration is an enabler to facilitate the transition to a more CE using strategies oriented towards increasing the useful application of resources.

Regarding the third enabler, in the specific case of CE, supporting knowledge building contributes to the dissemination of the knowledge about CE principles, strategies and practices that are needed for top-down CE development. In this sense, Morsetto (2020, p. 9) advised that CE goals require 'the careful application of programmatic and decision-making activities' to push CE strategies both from the top down and the bottom up. Capacity building includes multiple solutions, such as the usage of soft regulations regarding labelling or certification, public innovations as referents, and providing specific information, help for implementation as well as monitoring advances among others (Gasbarro et al., 2018; Llach et al., 2015).

Therefore, an increase in knowledge building concerning the main CE strategies, such as product-life extension, resource

efficiency and the useful application and dissemination of resources strategies could help to promote CE because the main barrier identified among companies to extending CE in Europe was the lack of knowledge about what CE is, technical solutions, ignorance of its benefits, uncertainty over CE's future or market acceptance (de Jesus et al., 2019; de Jesus and Mendonça, 2018). In fact, consumer education seems to be key to promoting this type of strategy to introduce CE to the market (Echegaray, 2016; Wieser and Troger, 2018).

In conclusion, an institutional entrepreneur could promote CE more extensively by supporting knowledge building at different levels and using different activities. Therefore, the following hypotheses are enunciated:

H7. Supporting knowledge building is an enabler to facilitate the transition to a more CE using strategies oriented towards improving product-life extension.

H8. Supporting knowledge building is an enabler to facilitate the transition to a more CE using strategies oriented towards pursuing resource efficiency.

H9. Supporting knowledge building is an enabler to facilitate the transition to a more CE using strategies oriented towards increasing the useful application of resources.

Fig. 1 presents the proposed model of study.

3. Sample and methods

3.1. Sample

This study used the Public Consultation on the Circular Economy of European Commission data base available at http://ec.europa.eu/environment/consultations/closing_the_loop_en.htm. This consultation was one of the basis to deploy the European Union

Table 2
Sample description.

Type of organisation:	N	%
Individual Person	337	26.3%
Private Enterprise	222	17.3%
Civil Society	135	10.5%
Public Authorities	74	5.8%
Professional Organisations	346	27.0%
Academic Organisations	47	3.7%
International Organisations	41	3.2%
Other	79	6.2%
TOTAL	1281	100.0%
Country:	N	%
EU	1230	96.0%
Non-EU	51	4.0%
TOTAL	1281	100.0%

Source: Own elaboration from Public Consultation on the Circular Economy of European Commission data.

Circular Economy Action Plan (available at <https://ec.europa.eu/environment/circular-economy/>).

This questionnaire was conducted with all interested stakeholders from May to August 2015. After debugging the sample, 1281 responses were obtained. Characteristics of the sample are presented in Table 2, detailed according to respondents' profiles. Aspects such as country or type of organisation were taken into account as control variables. The survey is included in Appendix 1. Despite the time which has elapsed since the questionnaire was conducted, we believe that the findings that can be extracted from the study are still valid due, on the one hand, to the breadth and representativeness of the responses obtained and, on the other, to the fact that the objective of transitioning towards a more circular economy remains in force.

The survey was separated into the six dimensions indicated in Fig. 1, representing the three institutional entrepreneurship

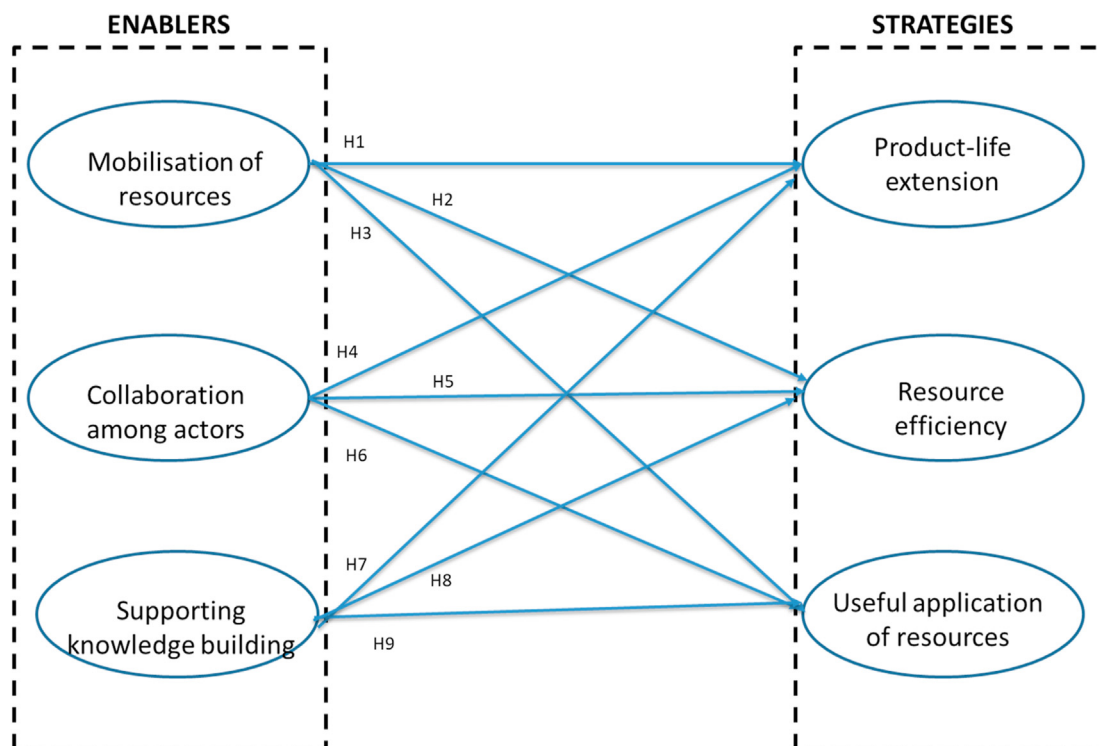


Fig. 1. Model and hypothesis.

Table 3
Variables and dimensions.

Dimension	Code	Variable
Mobilisation of resources	MOB1	Financing innovative projects or technologies relevant to the circular economy (from EU funds, e.g. Horizon, 2020)
	MOB2	Public incentives (e.g. financial guarantees) for private investors to finance projects conducive to the circular economy
	MOB3	Support for the development of circular economy projects (e.g. technical assistance)
Collaboration among actors	COL1	Support for innovative systemic approaches and cross-sectoral cooperation (e.g. industrial symbiosis and cascading use of resources)
	COL2	Partnerships with public authorities to help innovative businesses overcome potential legal obstacles to innovation
	COL3	Promotion of innovative business models for the circular economy (e.g. leasing and sharing)
Support knowledge building	SUP1	Support for capacity-building in public administrations
	SUP2	Support for market penetration of innovative projects through labelling, certification and standards, public procurement for innovation, etc.
	SUP3	Better monitoring the implementation and impact of policies contributing towards the circular economy agenda
	SUP4	Increasing the knowledge base by collecting and providing information and data e.g. on material flows, technologies and consumption patterns
Product-life extension	PIJFE1	Durability
	PIJFE2	Reparability: Availability of information on product repair (e.g. repair manuals)
	PIJFE3	Reparability: Product design facilitating maintenance and repair activities
	PIJFE4	Reparability: Availability of spare parts
Resources efficiency	REF1	Resource use in the use phase (e.g. water efficiency)
	REF2	Minimising lifecycle environmental impacts
Useful application of materials	REC1	Recyclability (e.g. dismantling, separation of components, information on chemical content)
	REC2	Increased content of reused parts or recycled materials
	REC3	Increased content of renewable materials

enablers—mobilisation of resources, collaboration among actors and supporting knowledge building—and the three desired impacts on strategies—product-life extension, resource efficiency and useful application of resources. Other information, such as business sector, country where the company is located, size of the company's or administrators' level of information about CE was also incorporated in the survey as control variables.

The items included in the questionnaire were measured by means of a five-point Likert scale, where 5 indicated 'strongly agree' or 'very important' and 1 indicated 'strongly disagree' or 'not at all important'. Variables and dimensions of the model can be found in Table 3.

By means of statistical processes, a model was built with six constructs and nineteen variables from the Public Consultation on the Circular Economy of European Commission database. Factor analyses of the dimensions of the model can be found in Table 3.

3.2. Methodology

The approach used to test the hypotheses of this study was separated into two different sections. First, an exploratory factor analysis (EFA) was carried out in order to pick up the items included in the model. In accordance with the literature, any item with a coefficient lower than 0.4 was not taken into account. The remaining items were identified and allocated to each dimension. These variables were confirmed afterwards by a confirmatory factor analysis (CFA) in order to certify consistency among the constructs. Any variable with a coefficient minor less than 0.6 was discarded at this stage. Internal consistency and reliability testing were carried out once the constructs were built and confirmed. At this stage, the Cronbach's alpha coefficient and the average variance extracted (AVE) corroborated the goodness of the dimensions. In this sense, for every dimension, the Cronbach's alpha was greater than 0.6 (Churchill, 1979), the composite reliability higher than 0.7 and the AVE was greater than 0.5 (Barclay et al., 1995).

Further, the discriminant validity of the model was analysed, and the results showed that all the correlations were less than the square root of the AVE. The discriminant validity of the model results can be found in Table 4. Second, after identifying and testing every dimension, the cause and effect relationships among constructs were studied.

The maximum-likelihood method was assessed and EQS 6.1 software was used to test the model. As is shown in Table 5, the statistics studied to assess the model were X²/degrees of freedom, the Jöreskog and Sörbom goodness of fit (GFI), the Jöreskog and Sörbom adjusted goodness of fit (AGFI), CFI (comparative fit index) and RMSEA (root mean square error of approximation). The results of these parameters are shown in depth in the next section.

4. Results

The first step of the present analysis was to define the variables included in each construct. In this way, EFA analysis was conducted to discriminate all noninformative variables, and then a CFA analysis corroborated the factors included in the six dimensions of the model (see Table 3). Once defined, the factors of each construct, AVE, Cronbach's alpha and composite reliability coefficients were calculated. As can be seen in Table 4, all the statistics exceeded the minimum required to confirm the internal consistency of the constructs.

After the constructs were defined, a discriminant analysis was conducted to confirm that the correlations between constructs were lower than the square root of the AVE. As Table 5 shows, this principle was met in all cases. The discriminant analysis also

Table 4
Factor analyses of the dimensions.

Dimension	Code	Load	Internal consistency and reliability statistics
Mobilisation of resources	MOB1	.785	Cronbach's alpha: .634
	MOB2	.734	Composite reliability: .768
	MOB3	.652	AVE: .527
Collaboration among actors	COL1	.787	Cronbach's alpha: .607
	COL2	.743	Composite reliability: .794
	COL3	.719	AVE: .563
Support knowledge building	SUP1	.647	Cronbach's alpha: .637
	SUP2	.662	Composite reliability: .789
	SUP3	.744	AVE: .511
	SUP4	.727	
Product-life extension	PLIFE1	.655	Cronbach's alpha: .817
	PLIFE2	.820	Composite reliability: .880
	PLIFE3	.874	AVE: .649
	PLIFE4	.854	
Resources efficiency	REFFI1	.846	Cronbach's alpha: .601
	REFFI2	.846	Composite reliability: .834
Useful application of materials	REC1	.757	AVE: .716
	REC2	.823	Cronbach's alpha: .663
	REC3	.752	Composite reliability: .821
			AVE: .605

proved that each dimension was only one.

After the statistical analysis, it can be confirmed that the performed constructs were strong and consistent, and we can begin analysing causal relations.

In this sense, using EQS 6.1, the hypotheses proposed in this article were analysed. The model was performed using maximum likelihood methodology. Table 6 shows the main statistics and their recommended values according to the literature. In this sense, Wheaton et al. (1977) assumed that the chi-square divided by its degrees of freedom must be less than 5, and Tabachnick et al. (2007) recommended that this ratio should not be lower than 2. Regarding other statistics, Byrne (1994) suggested that AGFI should be higher than 0.9, the GFI value more than 0.8, CFI should be close to 0.9 (Hu and Bentler, 1999) and RMSEA should be lower than 0.08 (MacCallum, 1996). Finally, following Schermelleh-Engel et al. (2003), the goodness of fit of the model can be confirmed because more than three statistics fulfilled the recommended values.

Fig. 2 shows the standardised solution of the causal model. As can be seen, all hypotheses can be accepted except H1. Therefore, it can be said that collaboration among actors and supporting knowledge building are key enablers for the development of the CE at the EU level by improving CE strategies related to the durability of products, minimising the use of products that have a negative impact on the environment and improving recycling and reuse. All these results are explained in the next section.

5. Discussion of the results

Several authors have pointed out that mobilisation of resources is a key variable in IE in order to facilitate radical changes such as the transition to a more circular economy in Europe (Brown et al., 2019; de Jesus et al., 2019). Indeed, as previous researchers have stressed (Athens and Ferry, 2018; Covalski et al., 2013; George et al., 2015), the mobilisation of resources is a relevant enabler of CE practices with respect to increasing the efficiency of resources such as water efficiency and the minimisation of life-cycle impacts. It also facilitates the transition to more recycling and reuse strategies, such as the separation of components, dismantling, increasing the content of reused parts or increasing the

Table 5
Discriminant validity.

	MOB	COL	SUP	PLIFE	REFFI	REC
MOB	.726 ^a					
COL	.503 ^b	.750 ^a				
SUP	.273 ^b	.388 ^b	.715 ^a			
PLIFE	.089 ^b	.228 ^b	.375 ^b	.805 ^a		
REFFI	.251 ^b	.348 ^b	.314 ^b	.230 ^b	.846 ^a	
REC	.212 ^b	.310 ^b	.341 ^b	.336 ^b	.308 ^b	.778 ^a

**Correlation is significant at the 0.01 level (bilateral).

^a Square root of AVE in the diagonal.

^b Significant at .01

Table 6
Goodness of fit of the model.

Assessment item	Values	Recommended value
X2 (chi-squared) ^a	571.3981	The lower the better
X2/df (normed chi-squared)	3.996	2 < x < 5
GFI	0.901	> 0.9
AGFI	0.865	> 0.8
CFI (comparative fit index)	0.829	> 0.8
RMSEA (root mean square error of approx.)	0.077	< 0.08

^a Satorra-Bentler chi-squared.

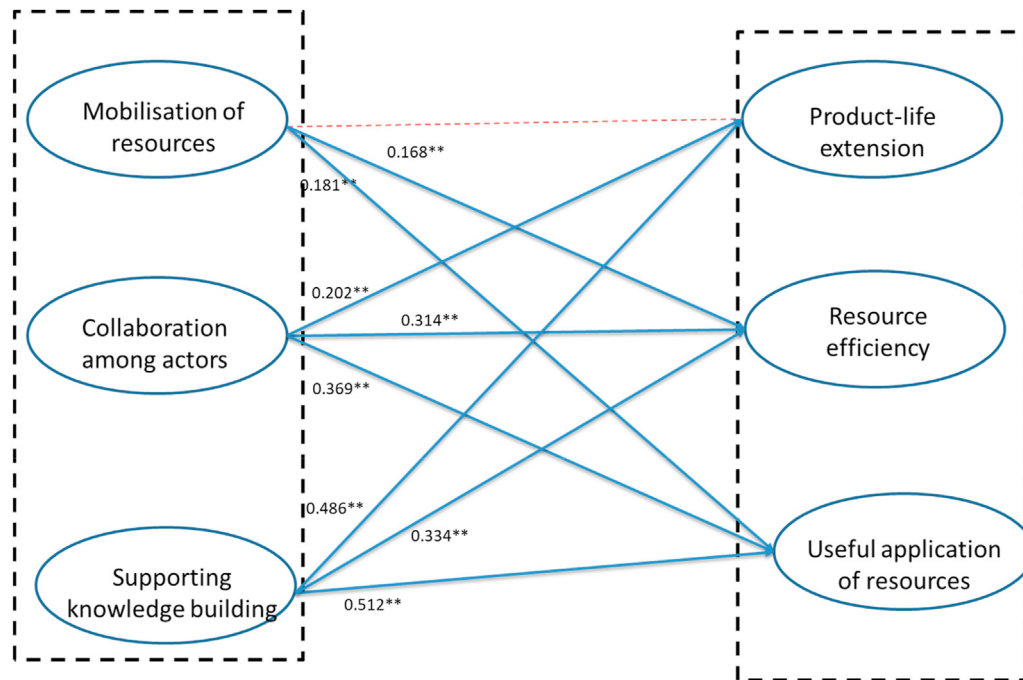


Fig. 2. Contrasted model. **Significant at 0.01.

content of renewable materials. The main reason seems to be that mobilisation of resources allows for improved innovation and new ways to do things outside of the box. Thus, the official discourse accompanied by the mobilisation of resources could convince different actors of the importance of being involved and promoting more CE development. The EU should stimulate mobilisation of resources by allocating part of its budget to promoting the use of circular economy among its state members. This will pay off in terms of increasing the efficiency of the resources and using them in a more ecologically friendly manner. This mobilisation of resources could be transferred to agents directly or using soft loans, grants or any other financial instrument. The EU should build an organisational and specialised structure to allocate these resources efficiently.

H2 and H3 are thus accepted. CE-oriented strategies for resource efficiency and the useful application of materials have been the first ones and have been more extensively adopted. Nevertheless, there is still some work to do on the relationship between this enabler and strategies oriented to product-life extension. Indeed, results show that mobilisation of resources seems not to have been as effective in facilitating products' durability, information on product repair or in facilitating maintenance and repair activities probably because environmentally friendly legislation has focused on the better use of natural resources and recycling. Therefore, the mobilisation of resources was pursued as the primary innovation among these types of strategies, leaving other CE strategies aside. Thus, it is necessary to make clearer the role that the mobilisation of resources plays in promoting a CE and how this mobilisation can be extended to other CE strategies, especially among businesses and citizens. Therefore, regrettably, H1 is not accepted.

With regard to the second enabler of IE and its impact on CE strategies, some authors have pointed out the importance of cross-sectoral collaboration, the cooperation with public authorities and other stakeholders to overcome potential legal obstacles, and the importance of collaboration to promote new ideas, solutions or innovative business models as key variables for the success of the CE mission (i.e. Adams et al., 2016; Bocken et al., 2018; Brown et al.,

2019; De Jesus and Mandoca, 2018; Domenech and Bahn-Walkowiak, 2019; Gasbarro et al., 2018). These factors could facilitate the transition to a more CE environment. Indeed, results show that this kind of collaboration facilitates the key factors of product-life extension such as maintenance of the product, improvement of the product's design to facilitate its maintenance or the availability of spare parts to facilitate the reparability of the product. IE is a collective process that only operates successfully with alliances, collaborations and the creation of networks (Hardy and Macguire, 2008) and CE development needs different agents to promote the change. So, just like an organisational structure is needed to allocate budget resources, it is also essential to build an organisation within the EU to facilitate collaboration among all agents, acting as a link between them. This could support a transition to a more CE environment.

H4 is similarly accepted. Collaboration among actors is also shown to be a key enabler for the efficiency of resources, such as water efficiency or the minimisation of products' life-cycle impact. Thus, H5 is also accepted. Finally, our findings also support collaboration among actors as a facilitator for the useful application of materials, such as the separation of components or increasing the product's contents which are renewable or can be reused. Therefore, H6 is accepted. In summary, the collaboration among different types of stakeholders is an enhancer of possible strategies aimed at achieving a CE model based on product-life extension, on resource efficiency and on the useful application of resources. Furthermore, IE enables actors to collaborate with each other. For instance, collaboration between individual persons—customers—and private enterprises—hotels—in reducing the number of towels to be washed can have an impact on the product-life extension of the towels and on the consumption of water, energy and detergents, which thus improves resource efficiency. In the same way, the collaboration between professional organisations, public authorities and academic organisations for the elaboration of quality standards in specific sectors can influence improvements in resource efficiency and increases in the useful application of resources employed in the processes developed in

those sectors.

Finally, previous research has found that CE strategies oriented towards supporting knowledge building and its impacts are a key enabler to achieve success when radical changes are sought (Almeida et al., 2014; Gasbarro et al., 2018). The EU is acting as an institutional entrepreneur by making efforts to promote CE by supporting building capacity activities at all levels. IE favours change by transferring practices from nearby fields and sharing or learning from one's own and from others' institutional repertoires. Overall, the findings in this paper show that supporting knowledge building is the strongest enabler for the implementation of CE policies. Indeed, supporting knowledge building can use tools such as certifications and the setting of public standards or of public procurement, all of which have been shown to be strong enablers of CE projects that offer public incentives to private investors or support the development of circular economy projects. Therefore, H7 is accepted. Furthermore, results show that public policies have become a key variable in improving resource efficiency, such as reducing the resource waste and reducing the environmental impact of production; so, H8 is accepted. Finally, supporting knowledge building facilitates the implementation of recycling both in terms of the availability of information and the facilitation of recycling materials or other activities related to recycling and reuse. Thus, H9 is accepted.

Therefore, our findings show that the proposed enablers are key factors to promote the implementation of the main CE strategies across the EU, although the most powerful is supporting knowledge building.

6. Conclusions

In this section, some conclusions derived from the findings are presented. Additionally, some recommendations related to both academia and practitioners have been highlighted, and limitations have been noted. First of all, the mobilisation of resources in IE is key to promoting radical changes. In the specific case of CE, the mobilisation of resources directed towards different activities is confirmed as an enabler to promote strategies for better efficiency in the use of resources and as a catalyst for good useful application of materials practices. Thus, mobilisation of resources allows for the development of experiments and for recombining old and new practices to familiarise the new methods and processes. As can be seen, these strategies can positively accelerate the transition to a more CE at all levels and with different approaches. However, the impact of the mobilisation of resources on CE strategies is different depending on the strategy that being promoted. Findings reveal that some strategies are easier to promote than others, independently of the resources mobilised. Thus, prioritisation of strategies is needed when looking to mobilise resources for those CE strategies with higher acceptance or easy implementation in order to cover goals in the transition to a more CE, such as improving the results of a company through cost reductions and a change in routines. However, other CE strategies oriented to product-life extension require in-depth changes in consumption habits and a break with current production practices.

This fact seems to indicate that companies are not interested in increasing the number of years that a product can be used, as this can cause a significant drop in their sales in the short or medium term, depending on the type of product. Companies are prioritising their income statements and the short term over their general well-being and the long term. In this sense, and in order to resolve this situation, policies should be defined that encourage companies to opt for products with a longer life in order to optimise the planet's resources. Economic, advertising or more qualitative incentives, such as quality labels or badges that help people differentiate eco-

friendly products with a long lifespan from short-lived ones, could be helpful for companies. Surely, society is increasingly aware of sustainability and would be willing to pay more for these labelled products. This fact would increase companies' margins and counteract a drop in sales. It is true that not all strategies can be pursued at the same time (Morseletto, 2020). Today, there are a number of different labels and sometimes their meanings are vague to consumers. In this sense, promotional activity could have an educative and positive impact on consumers in order to differentiate CE products from other products. This is true in particular with respect to some aspects, such as durability, concerning which consumers used to fail to see the connection between the durability of the product, health and environmental issues (Echegaray, 2016).

Therefore, more research is needed to know exactly why the mobilisation of resources by an institutional entrepreneur seems to have little impact on product-life extension strategies. One reason is that previous research has stressed the negative economic effects of fast product replacement for society (Echegaray, 2016). Another reason is that these types of strategies seem to have no attraction for consumers when they have little information about their benefits and the existence of spare parts for replacement, and the reparation is very long (Wieser and Troge, 2018). In addition to these initiatives, the EU can dedicate specific budgetary resources to help companies in less circular sectors to modify their production structure and work procedures so that they comply with the principles of the circular economy. Given that resources are limited, multistakeholders perceptions and change resistance should be taken into account to optimise the resources mobilisation to push new initiatives. Therefore, a communication plan to make clear and visible the advantages to achieve in economic, social, health and environmental among others is crucial. Moreover, a follow-up of results for each action is needed to make effective the pursued goal and a contingency plan to re-conduct a fail action or with poor results.

Secondly, and related to the importance of cross-sectorial collaboration in order to achieve circular economy goals, it has to be highlighted that collaboration among different actors plays a key role. Cross-sectorial collaborations with the support of the public sector are one of the keys to evolving from present business models to other more sustainable ones. Cross-collaborations help to see the same problem from different points of view. Thus, a collaborative multistakeholder approach can promote CE strategies in order to improve recycling and efficiency or to extend the product life. These kinds of collaborations are crucial to increasing the speed of some changes that must be implemented as soon as possible due to the climate change emergency. Furthermore, collaboration among actors helps to spread CE innovations and share them with other collaborative actions. Even diffusion of CE practices between and through networks could make it easy to replicate and imitate CE strategies. Collaboration usually takes place among actors at intra-level or a top-down approach. Therefore, to enhance collaboration among actors, the EU, through the European Commission, could create or enhance the creation of sectorial roundtables that allow different stakeholders to collaborate in order to guide each sector towards more circular models. Moreover, focus on high-impact sectors and/or regions and develop specific plans involving key actors could be the key to accelerate the transition towards CE. Some initiatives (as example consumer protection regulation) has been led since the consumers' organisations with a bottom-up approach. Nevertheless, according our best knowledge no research has been developed in a bottom-up approach to push CE. Thus, any research in this topic will be welcome.

In addition, it is recommended that the European Parliament approve a resolution such as the one recently adopted, calling on the European Commission to provide strong support to the tourism

sector and, especially, to the countries most affected by the health crisis.

Thirdly, in relation to strategies oriented to supporting knowledge building, previous academic studies have shown that IE was important in achieving relevant results. This article not only supports previous studies but also shows that knowledge building is the main enabler for the achievement of CE strategies and goals. Promoting policies such as certifications, standards and public procurement of innovation are crucial if the European Commission wants to implement effective CE strategies among their members. Practitioners should see these public policies not as a legal obstacle but as an opportunity to achieve a faster transition from a linear to a circular economic system. In addition, this type of support is not intrusive for businesses if it is voluntary. Therefore, supporting knowledge building seems to be the most powerful enabler of CE strategies. Thus, additional efforts will be needed to promote a stronger CE throughout EU countries. It is also important to take into account that knowledge building can lead to synergies among different CE strategies and goals and that capacity building in CE strategies could be complementary or act as a facilitator for other CE strategies and accelerate the transition to a CE. Thus, CE in Europe is being introduced slowly, more as an incremental than a radical change. It is beginning to make advances over the existing rationales and well-founded knowledge. In addition, CE is penetrating the macro level (Alonso-Almeida and Rodríguez-Anton, 2020; Domenech and Bahn-Walkowiak, 2019) but, in general, it is not pervasive among companies and citizens. This does not mean that some industries—for example, the automotive, apparel or information technology industries, among others—are trying to move little by little towards a circular model. Nevertheless, the permeation is not enough fast. In addition, as Stal and Corvellec (2018, p. 638) asserted, companies are making CE compatible with other own interests: “When the demands for circularity are vague enough, ...adoption can both be a way to respond to external demands and to mitigate them. Thus firms can collectively choose a form of implementation that does not cost too much and allows them to continue to operate in a linear fashion”. Consequently, consumers’ knowledge about what CE is and its advantages and impacts are little known yet (Hazen et al., 2017; Kuzmina et al., 2019).

The present study has among its limitations that the data used is somewhat old. Although we believe that this does not reduce the validity of the results achieved, it would be advisable, in the face of

further research, to be able to dispose of a database as powerful as that used but one that is carried out in more recent times.

Finally, this paper opens up new questions for future studies. On the one hand related to the impacts of IE, measurement of the specific impacts of IE on every CE strategy, differences between countries and the identification of other enablers are crucial topics that must be studied. Also, ways to incentivise cross-sectorial cooperation or create more effective public policies in the private sector should be studied in order to abandon linear business models and adopt circular ones. Another relevant issue involves analysing enablers and impacts among EU countries or other geographical areas. On the other hand, it is crucial and urgent to deepen in the IE processes, specially the central role that governments are acquiring to face the actual challenges.

CRediT authorship contribution statement

María del Mar Alonso-Almeida: Supervision, Conceptualization, Methodology, Supervision, Funding acquisition. **José Miguel Rodríguez-Anton:** Supervision, Funding acquisition. **Llorenç Bagur-Femenías:** Formal analysis, All researches, Investigation, Writing - original draft, Writing - review & editing. **Jordi Perramon:** Formal analysis, All researches, Investigation, Writing - original draft, Writing - review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgement

This study is part of a larger research project entitled “ECO-INNOVATION AND CIRCULAR ECONOMY Y SECTOR INDUSTRIES” (ECO2016-79659-R), which is financed by the Ministry of Science and Innovation within its aid programme for research & development projects inside Societal Challenges Program.

APPENDIX 1

QUESTION	ANSWERS
1 In what capacity are you completing this questionnaire?	1.As an individual/private person; 2. Private enterprise; 3. Civil society organisation; 4. Public authority; 5. Professional organisation; 6. Academic/research institution; 7.International organisation; 8.Other
2 Please give your country of residence/establishment	1. EU MS; 2. EEA; Non-EU MS/EEA
3 Please indicate your preference for the publication of your response on the Commission's website:	1. Anonymously: I consent to publication of all information in my contribution and I declare that none of it is subject to copyright restrictions that prevent publication; 2. Under the name given: I consent to publication of all information in my contribution and I declare that none of it is subject to copyright restrictions that prevent publication
4 How well informed are you about the circular economy initiative?	4. Very well informed; 3. Fairly well informed; 2. Not very well informed; 1. Not informed at all
5 Please give your name if replying as an individual/private person, otherwise give the name of your organisation	Company name
6 If your organisation is registered in the Transparency Register, please give your Register ID number.	Number
7 In order to facilitate the transition to a more circular economy, how would you assess the importance of the following product features? Durability	very important; important; not important; not very important; no opinion
8 In order to facilitate the transition to a more circular economy, how would you assess the importance of the following product features? Reparability: Availability of information on product repair (e.g. repair manuals)	very important; important; not important; not very important; no opinion

(continued)

QUESTION	ANSWERS
9 In order to facilitate the transition to a more circular economy, how would you assess the importance of the following product features? Reparability: Product design facilitating maintenance and repair activities	very important; important; not important; not very important; no opinion
10 In order to facilitate the transition to a more circular economy, how would you assess the importance of the following product features? Reparability: Availability of spare parts	very important; important; not important; not very important; no opinion
11 In order to facilitate the transition to a more circular economy, how would you assess the importance of the following product features? Upgradability and modularity	very important; important; not important; not very important; no opinion
12 In order to facilitate the transition to a more circular economy, how would you assess the importance of the following product features? Reusability	very important; important; not important; not very important; no opinion
13 In order to facilitate the transition to a more circular economy, how would you assess the importance of the following product features? Biodegradability and compostability	very important; important; not important; not very important; no opinion
14 In order to facilitate the transition to a more circular economy, how would you assess the importance of the following product features? Resource use in the use phase (e.g. water efficiency)	very important; important; not important; not very important; no opinion
15 In order to facilitate the transition to a more circular economy, how would you assess the importance of the following product features? Recyclability (e.g. dismantling, separation of components, information on chemical content)	very important; important; not important; not very important; no opinion
16 In order to facilitate the transition to a more circular economy, how would you assess the importance of the following product features? Increased content of reused parts or recycled materials	very important; important; not important; not very important; no opinion
17 In order to facilitate the transition to a more circular economy, how would you assess the importance of the following product features? Increased content of renewable materials	very important; important; not important; not very important; no opinion
18 In order to facilitate the transition to a more circular economy, how would you assess the importance of the following product features? Minimising lifecycle environmental impacts	very important; important; not important; not very important; no opinion
19 In order to facilitate the transition to a more circular economy, how would you assess the importance of the following product features? Other- please specify below	very important; important; not important; not very important; no opinion
20 If you think that additional options not listed above should be considered, please specify:	Not Used
21 How important are the following enabling factors in promoting the circular economy at EU level? Financing innovative projects or technologies relevant to the circular economy (from EU funds, e.g. Horizon, 2020)	very important; important; not important; not very important; no opinion
22 How important are the following enabling factors in promoting the circular economy at EU level? Public incentives (e.g. financial guarantees) for private investors to finance projects conducive to the circular economy	very important; important; not important; not very important; no opinion
23 How important are the following enabling factors in promoting the circular economy at EU level? Support for the development of circular economy projects (e.g. technical assistance)	very important; important; not important; not very important; no opinion
24 How important are the following enabling factors in promoting the circular economy at EU level? Support for innovative systemic approaches and cross-sectoral cooperation (e.g. industrial symbiosis and cascading use of resources)	very important; important; not important; not very important; no opinion
25 How important are the following enabling factors in promoting the circular economy at EU level? Partnerships with public authorities to help innovative businesses overcome potential legal obstacles to innovation	very important; important; not important; not very important; no opinion
26 How important are the following enabling factors in promoting the circular economy at EU level? Promotion of innovative business models for the circular economy (e.g. leasing and sharing)	very important; important; not important; not very important; no opinion
27 How important are the following enabling factors in promoting the circular economy at EU level? Specific measures to encourage the uptake of the circular economy among SMEs	very important; important; not important; not very important; no opinion
28 How important are the following enabling factors in promoting the circular economy at EU level? Exchange and promotion of best practice	very important; important; not important; not very important; no opinion
29 How important are the following enabling factors in promoting the circular economy at EU level? Promoting the development of skills/qualifications relevant to the circular economy	very important; important; not important; not very important; no opinion
30 How important are the following enabling factors in promoting the circular economy at EU level? Support for capacity-building in public administrations	very important; important; not important; not very important; no opinion
31 How important are the following enabling factors in promoting the circular economy at EU level? Support for market penetration of innovative projects through labelling, certification and standards, public procurement for innovation, etc.	very important; important; not important; not very important; no opinion
32 How important are the following enabling factors in promoting the circular economy at EU level? Better monitoring the implementation and impact of policies contributing towards the circular economy agenda	very important; important; not important; not very important; no opinion
33 How important are the following enabling factors in promoting the circular economy at EU level? Increasing the knowledge base by collecting and providing information and data e.g. on material flows, technologies and consumption patterns	very important; important; not important; not very important; no opinion
34 How important are the following enabling factors in promoting the circular economy at EU level? Other- please specify below	very important; important; not important; not very important; no opinion

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