

The governance of the circular economy: insights from the Veneto Region

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Abstract

Over the last decade, the notion of circular economy progressively emerged all over Europe. It can be defined as “the reducing, reusing and recycling activities conducted in the process of production, circulation and consumption” (Ghisellini, Cialani, & Ulgiati, 2016), but also as “a system that is designed to be restorative and regenerative” (Charonis, 2012). It is a popular approach towards green economy and sustainability (Geissdoerfer, Savaget, Bocken, & Hultink, 2017). Circular economy systems are being developed in many countries and contexts, particularly China. There is a growing literature on the various dimensions of the circular economy from many disciplinary perspectives, including planning (Murray, Skene, & Haynes, 2017). However, little attention has been paid to its governance. What is the impact of some variables related to governance, such as actors, actor configurations, collective action, policy instruments, compliance processes, as well as institutional levels and policy sectors, on the development of the circular economy? Are some of these variables more important than others? Through which causal mechanisms do they intervene? To answer these questions, we analyze four cases from the Veneto Region in the materials, building, food and textile sectors. Unlike most of the literature, instead of focusing on the peculiarities of each case, we chose to focus on what they have in common and the interaction of these key variables with the planning and institutional system. The insights were collected through participant observation in the framework of a transdisciplinary collaborative research project.

Keywords

circular economy, governance, region, comparative, Veneto

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The challenge of the circular economy

Images of islands of plastic in the middle of the ocean or mountains of waste on the outskirts of many large cities remind us of the limits of today's production and consumption systems. Phenomena such as the so-called “triangle of death” in Campania, or debates such as those on the use of incinerators to dispose of waste, remind us that these problems are not confined to developing countries, but also concern the so-called developed countries. These problems also affect Italy and the Veneto (ENEA, 2019), whose production and consumption system, while possessing many specificities, is intrinsically connected with the rest of the world. The concept of “circular economy”, emerged in the 1990s as an operational version for companies of the broader concept of sustainable development (Carroll, 1999; Clark & Munn, 1986), aims at transforming production systems so as to tend towards waste reduction, recycling and reuse; the circular economy also intervenes on consumption in a way that moderates the generation of waste, as well as encourages recycling or recovery and reuse (Ghisellini et al., 2016). The circular economy is considered as a fundamental element of the green economy and a transformation necessary for greater sustainability (Geissdoerfer et al., 2017).

But the biggest challenge of the circular economy is not only the reduction, recycling and reuse of waste, but the tendency to minimize waste, which is often summarized in the probably utopian formula of “zero waste”. This requires not only technical innovations, as pointed out by Prieto-Sandoval et al. (2018), but also cultural changes. For example, the transformation of wastewater into a resource requires not only significant progress compared to current urban and industrial wastewater treatment plants, but also the overcoming of the wastewater taboo among the population and the increase in citizens' confidence in the drinking water distribution system (UN-Water, 2017). The need to combine the reduction, recycling and reuse of waste and systemic changes has clearly emerged from the analysis carried out by Kirchherr et al. (2017) of a hundred definitions of the circular economy found in the scientific literature.

The development of the circular economy often involves the reduction of distances to avoid the decoupling of production sites and places of consumption (Leduc & Van Kann, 2013; Liu et al., 2013) and therefore the excessive distancing of waste from production centers and its accumulation in landfills and in the environment, such as in the case of cattle-bred products, the fertilizers used in the production of feed and the ensuing perturbation of the nitrogen cycle (Brunner & Rechberger, 2017; Morsetto, 2019). This however is not systematic, as there are also more or less long value chains, such as the use of mineral resources, which can often be found only in remote areas, sometimes on the other side of the world, which should not be excluded from the logic of the circular economy and from the process of reduction, recycling and re-use of resources.

The concept of circular economy, if only in a general sense, is widely shared. An analysis of the positions of the five main candidates in the last French presidential elections on environmental and climate issues has shown how the development of the circular economy and short supply chains is with the promotion of renewable energies among the few issues that gather support across the political spectrum from the extreme right to the left passing through the center (Church, 2017). This phenomenon can be explained by the territorial dimension of the circular economy, especially where this coincides with short supply chains. The circular economy in fact transforms potential waste into resources and contributes to local development, also in terms of jobs, and in some cases to the re-industrialization of entire areas (Ratti, 2002).

The political dimension of the economy is therefore important. Korhonen et al (2018) note that research on the circular economy has mainly been focused on practical and technical questions concerning the flow of materials and energy in production and consumption systems. The values, the social structures, the cultures, the visions of the world and the paradigmatic potential of the circular economy remain largely unexplored. The phenomenon of governance, which will be

explored further, includes and goes beyond these concepts. This paper contributes to fill this gap by looking into the governance of the circular economy and particularly the role of some characteristics. The study of the governance of the circular economy is important because it is, for example, through governance systems that the knowledge needed to make the economy more circular is co-produced and circulated by and between various actors, including both experts and decisionmakers. For example, thanks to the results of scientific research and the pressures of a group of economic actors, a public body can realize that the rules in force hinder the re-use of certain resources in a production process.

This paper will therefore identify the actors that currently participate in the development of the circular economy, as well as the configurations of actors that facilitate this type of development. For two sectors of activity, the institutional and spatial levels on which the transformation process is structured will be explored. On this basis, the type of collective action will be characterized on a gradient ranging from cooperation to conflict. Finally, the tools used to promote the circular economy will be identified, as well as the eventual mechanisms for verifying the implementation of these policies. The methodological approach to explore these dimensions is presented first, followed by a conceptual framework that allows identifying the main features of a system of governance from the point of view of the circular economy. These characteristics will then be analyzed in four cases in two different business sectors. The characteristics that emerge from the analysis of these cases will finally be discussed to see how far they can be generalized (Gerring, 2004; Magliocca et al., 2018). The main objective of this text is indeed to identify the main features of a governance system that promote the development of the circular economy.

Pattern recognition of features

The four case studies presented and analyzed in this text have been identified as part of a research and training project that was funded by the European Union with the participation of the Veneto Region. This choice results from many factors including opportunity, proximity and, above all, interest on the part of the European Union, the Veneto Region, the universities and companies involved in the circular economy. These are therefore positive cases that allow us to identify the forces that drive companies to contribute to the development of a circular economy. The cases concern four of the main sectors of activity that are protagonists of the emergence of the circular economy, namely materials, building, food and textile. The four cases are not identical and are placed along a gradient that goes from the large to the small and medium-size enterprise.

Each company simultaneously received a trainee in the framework of the project for a duration of twelve months between May 2018 and April 2019. The trainees have a post-graduate level of education and, in the period considered, were trained on the topics of circular economy. The trainees were therefore able to make a participant observation of the processes of transformation of the respective companies towards the circular economy, including regarding the systems of governance. During four months between January and April 2019, the trainees participated in a special program on governance systems. This allowed them to acquire a common language and common conceptual frameworks regarding governance and therefore the ability to structure the observations that they had been able to carry out in the previous months in a relatively uniform manner. They then presented and discussed their observations on two occasions, individually and collectively. This process made it possible to build a relatively homogeneous and therefore comparable narrative corpus.

The corpus thus obtained was then analyzed in an iterative way to identify features common to the four case studies according to the recurrence method (Young et al., 2006). This approach has also allowed for the emergence of differences that are specific to each case. The following paragraphs present the conceptual framework that has been adopted, the case studies, the common features,

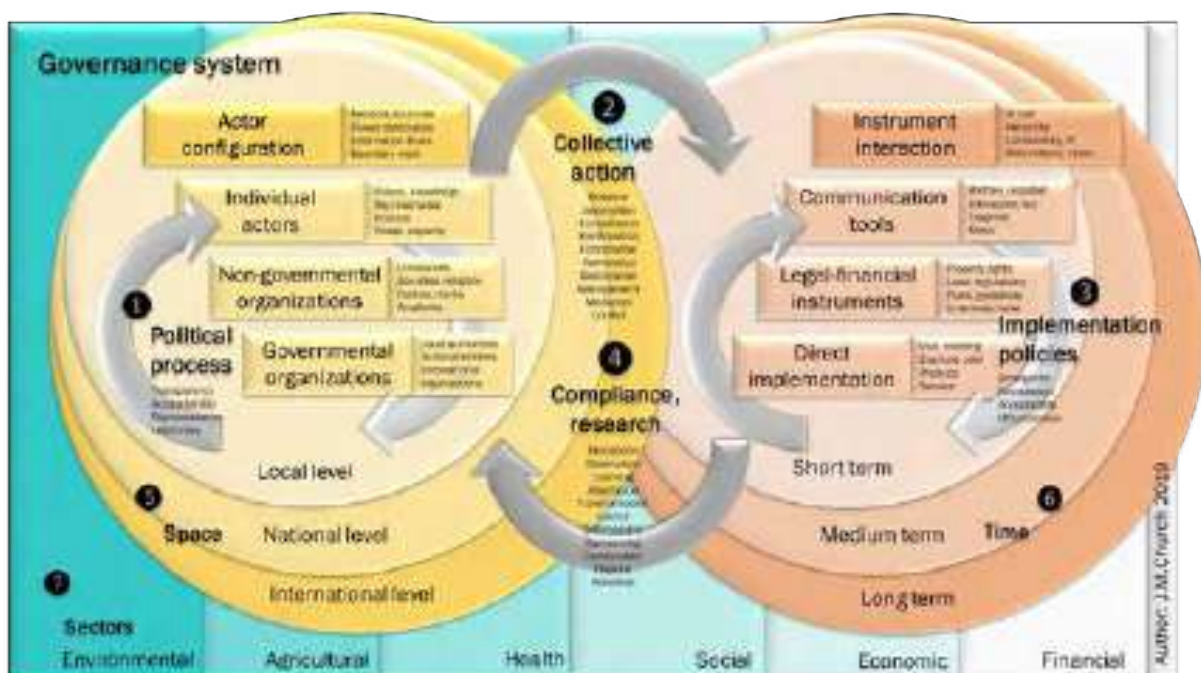
as well as the differences. A synoptic summary of the narratives is included among the supplementary materials.

Governance systems

“Governance” is a concept that emerged between the 1970s and 2000s in contrast with the concept of “government”. As early as the 1960s, authors such as Dahl (1961) showed that government action was complex and difficult to analyze. Even in the case of circumscribed examples like that of the small city of New Haven, Connecticut, it is difficult to understand who exactly is at the origin of a policy and how this policy was decided. If the concept of government refers to a sovereign entity in the sense of the decision-maker of last resort on a well-defined population and on a territory delimited by relatively clear boundaries, the concept of governance reflects the complexity of the act of governing that is exercised by different actors in a context complex characterized by a multitude of governmental, non-governmental actors, including companies and individuals, and by a territoriality with overlapping perimeters and that is articulated along several nested levels (Agnew, 1994; Ruggie, 1993).

We also propose a systemic and cyclical approach to governance, which is not limited to the analysis of the configurations of actors on different levels and spatiality, nor is it reduced to considering the collective action that is exercised by the various actors as a black box generating implementation policies, in this case in favor of the circular economy. The systemic approach used in the case in question is represented schematically in Figure 2. This framework is dynamic, articulated over time as well as in space, does not provide a teleological view of implementation policies, foreseeing their retroaction in the political process, thus leading to new cycles of collective action.

Figure 1: Conceptual scheme of a governance system



The systemic and cyclical approach adopted starts from the **1 political process** intended as an iterative interaction between different types of actors, particularly individuals, and governmental and non-governmental organizations. This political process has its own characteristics, such as transparency and accountability, but also the representativeness of the actors and their legitimacy, only to mention a few of the main features. At the same time, the interaction between the various actors is conditioned by their configuration in terms of network structure, power distribution, information flows and boundary work between one type of actor and another.

The political process allows the transition from the individual action of each actor to **② collective action** that can take different forms. Again, in the aforementioned hypothetical example, the public body can decide independently or in a coordinated manner with other bodies to change the rule in question. In this case, there are two actions: change (not the norm but the act of changing) and the eventual coordination with other actors. The most spontaneous type of action is behavior that can be influenced by the political process. Then, following the scale of Kerkhoff and Lebel (2006), it is possible to proceed to levels of increasing participation ranging from the lowest levels, i.e. information and consultation, to the highest ones, namely cooperation and partnership. If management refers to relatively de-politicized decision-making processes, deliberation is an important form of collective action as it allows choices to be stabilized in a way that will be perceived as more or less legitimate, depending on the type of interaction, and can therefore be disputed. In some cases, mediation can take place between opposing parties, but in others the collective action can lead to a more or less open conflict between parties disagreeing not only on what to do but also on the political process itself.

Collective action can therefore lead to the consolidation of **③ implementation policies** that are essentially a form of crystallization of political processes and collective action, which are naturally fluid. Policies can take various forms ranging from communication tools to legal and financial tools, such as laws, regulations, plans, guidelines, but also subsidies and taxes, up to direct implementation by the actors who participate in the political process. These policies interact with each other depending on the perimeters of implementation and any hierarchy that may exist between them. It goes without saying that they can be more or less consistent and adequate and that it is therefore possible to observe a certain amount of redundancy and a certain level of disturbance between one policy and another. Of implementation policies, we normally go to study not only the emergence and formulation, but also the acceptability and effectiveness towards the specific objectives of the policy itself but also of general objectives such as sustainability (Church, 2015).

A systemic vision of governance allows us to conceive the processes of **④ verification** of the implementation of policies as a feedback that returns them to the political process. Research is a fundamental form of verification, especially vis-à-vis face of complex phenomena. The verification of implementation practices passes through various processes such as perception, which can be more or less distorted, and the observation of phenomena and situations. This process can lead to the learning of the limits of existing policies but also of previously unknown phenomena and concepts and this can lead to the emergence of the need to adapt and possibly transform not only the implementation policies but also the underlying processes. The perception and observation of the failure to implement policies can also lead to attempts to control and execute by certain actors such as law enforcement, which can lead not only to sanctioning deviant behavior but also to contesting policies and their implementation. In some cases, this dispute can lead to disputes between parties with contrasting visions of the policies and the stakes, but also in phenomena of rebellion against the policies and processes that have led to them.

Governance is articulated in **⑤ space** on various levels that may correspond to the main administrative structures and therefore may be distinguished between local, national and international, but which can also either overlap horizontally, for example in the case of economic and environmental regions, or nest vertically, like in the cases of multilevel governance (Hooghe & Marks, 2003), depending on the functional logic. Governance is then a dynamic process that is articulated across **⑥ time**. In the governance cycle, it is therefore possible to distinguish short, medium and long-term processes, but also observe accelerations and rhythms dictated for example by political processes such as the duration of electoral mandates, but also phenomena such as natural disasters. A third dimension or scale, using the terminology of Cash and colleagues (2006), of governance is constituted by the **⑦ sectors** of activity linked to the specialization of collective action and knowledge, which include, for example, the environment, agriculture, health, welfare, as well as the

economic-financial sector. Distinct spatial, temporal and sectorial logics often lead to the compartmentalization of political processes, collective action, implementation policies, as well as verification and research processes, compartmentalization which is however recomposed in various locations, above all in the processes of verification and by certain actors that are transversal to the sectors.

The “Opportunity” project

The “Opportunity” project (ID: 2122-1-1267-2017) is funded by the European Social Fund (ESF) of the Veneto Region. Through a dual approach integrated both vertically (research, training and action) and horizontally (inclusion, economy and environment), has established a network of companies and organizations that, based on their logic on the circular economy, are able to generate social, economic and labor innovation. The project, which ends in the coming months, lasts 18 months and involves numerous partners, including the Università IUAV di Venezia, the Municipality of Padua, the Chamber of Commerce of Padua, three high schools, five companies, the Ecosystems Foundation, the Fenice Foundation, SIVE Training and three partner universities (Université de Reims Champagne-Ardenne; Technische Universiteit Delft; Universitat Autònoma de Barcelona) that supported the project through the participation of some visiting professors. The project has spread the concepts of “reduction, reuse and recycling” among a wide and diverse public, starting from schools, demonstrating its potential both in terms of sustainability and job opportunities. The project has supported companies and institutions in recognizing potentials that are not yet manifest in the production and labor systems, in educating for sharing and collaboration, in training for the creation of value and new work spaces and in creating synergies and industrial symbioses that are relevant for strategic sectors at municipal, regional and national level. Furthermore, the project was able to count on a partnership formed by research, training and education entities, companies supplying products and services, public and coordination bodies that have been able to cover the needs and requirements of a vast project with ambitious objectives.

One of the objectives of the “Opportunity” project was to start a process that would allow the development of a network of public and private actors capable to innovate, through the logic of the circular economy, the labor market in the Veneto region to increase competitiveness and territorial cohesion, reviving the local economy, reducing unemployment and particularly youth unemployment, as well as improving waste prevention and management. To achieve this ambitious goal, the project stimulated the spread of the culture of “reduction, reuse and recycling” through the involvement of private companies, public entities, students, workers and consumers in seminars, network meetings and workshops; it identified the industrial synergies and symbioses that can be developed in the territory in the sectors of materials, building, food, textile and gardening; it supported the development of a network of companies able to work synergistically on the logic of “reduction, reuse and recycling”; it built a specific training course for companies on the circular economy and on possible productive and working innovations; it created a specific teaching package for middle schools and high schools, capable to prepare students for new jobs in the field of sustainable development and the circular economy; it provided a facilitation service to launch innovative start-ups that follow the principles and logic of the circular economy.

Five companies were directly involved in the interventions envisaged by the project. Five research grants of eighteen months were allocated to unemployed graduates, one for each company involved. These fellows, under the coordination of the Università IUAV di Venezia, were each assigned to a company, in which they carried out research on the production system of the company and on the concrete impact of products. This led to work on identifying potential cooperation and synergies with companies in the sector or related sectors with the aim of making the best use of the resources present in the area. The fellows were therefore able to suggest and support companies in the introduction of circular economy principles; they also carried out a careful search for good practices in the specific field of the company to which they were associated. As part of the research grant,

company visits and periods of study were provided, as well as training mobility both at regional, interregional and transnational level. The presence of the fellows at the companies engaged in circular economy processes allowed them to carry out the participant observation of the practices of the specific company and of their sector, as well as of the related governance processes.

Action-research interventions were then conducted in each company participating in the project. These interventions allowed us to discuss and introduce in the various companies, each according to its specific needs, the new logic of the circular economy both in terms of production and business management. Furthermore, this has made it possible to deal with complementary and broader topics such as sustainability, resilience and inclusion. The companies then took part in meetings, seminars and workshops to discuss their respective development plans and to contribute to the creation of a network among companies not only in each sector, but also in a regional circular economy network. The need for this network has been studied within the project. Its realization depends on the assessments that will be made and on the will stimulated by the project. It will in any case follow the project.

Case studies from the Veneto Region

This analysis of the governance of the circular economy is based on the case studies of four companies, all based in Padua and involved in the “Opportunity” project and therefore in circular economy processes. These companies belong to the construction sector, particularly construction materials in one case and buildings in the other, while one is in the food sector and the other in the social sector with aspects related to both textiles and food.

Stiferite s.p.a.

The company operates in the construction sector and more specifically in the production of insulation material for construction and for the refrigeration industry. The insulating product is rigid polyurethane foam, a material deriving from the chemical industry, but capable of meeting energy and environmental requirements. Although the product already reduces the need for winter and summer air conditioning in buildings and despite the company's attention to energy efficiency, the future objectives are to develop an internal process linked to the circular economy, especially for the reuse of waste material in the production and recycling phase and re-use of the material at the end of its life. Currently there are already processes of chemical and mechanical reuse and recycling carried out by external bodies. The main objective of the company is the realization of an internal plant to produce panels from recycled material, also destined for other sectors.

The position of the fellow within the company was to carry out research activities related to the sustainability of the products, carrying out a life cycle assessment and subsequent publication of the environmental product declarations, from the extraction of raw materials, to the production and subsequent disposal of the product. This analysis made it possible to carry out some in-depth studies on the end-of-life scenarios of the product, assessing its impact on the surrounding environment.

Cazzaro Costruzioni s.r.l.

The company has been active in the building sector for over fifty years and is based in Trebaseleghe near Padua. It is a family business that, after the crisis of 2008, decided to specialize in the construction of high-value buildings, paying attention to the quality of living and comfort, devoting itself to fewer interventions in the surrounding area, but in a detail-oriented manner. The company has been collaborating for years with the Università IUAV di Venezia as part of research and development projects. The “Opportunity” project provided the starting point to apply the principles of circular economy in the production process, understood as the entire life cycle of a building, from construction to demolition. The goal of the company is to make the management of the materials used

in the construction more efficient, paying attention to the use of materials with recycled content and the management of any construction site waste. Furthermore, it becomes a prerequisite to digitize projects with the aim of creating a real database of materials, hypothesizing, already in the design phase, the possibilities of recovery, reuse or recycling. The continuous comparison with professionals, sector operators and building materials suppliers has favored the development of innovative strategies to optimize the design and construction processes.

The research fellow worked at the company's technical office where she was able to carry out research and analysis of a project under construction in Treviso. The latter was analyzed and digitized with BIM (Building Information Modeling) methodology to estimate the quantities of materials used in the construction. Strategies were first developed aimed at optimizing the construction process and then aimed at the recovery or recycling of materials used at the end of the building's life.

Ca' Sana (PI.TA.PU. s.a.s.)

The company Ca' Sana Food, Art, Culture, active in Padua since 2014, is a restaurant specialized in vegetarian and vegan cuisine that uses local and organic products from small businesses in the area, but also from fair trade, from lands confiscated from the mafia and from social cooperatives. The company is also active in the catering business and is an active player in the social and cultural life of the city, linking its main activity to the diffusion of a new development model and to the exchange of good practices in terms of sustainable development. Ca' Sana is also a reference point for the ability to develop projects related to agricultural production and the enhancement of the territory, creating new relationships between producers and consumers. The company is strongly interested in the development of circular processes: from the reduction of food surpluses, through careful planning linked to seasonality, to menu planning. The reuse of advanced raw materials after the food preparation phase could be further developed. The optimization of all the parts of the product would lead to minimizing material losses, taking maximum advantage in terms of environmental benefits and economic savings.

The researcher, starting from the actions developed by the company in relation to the circular economy, carried out a first survey to understand how catering in the city of Padua is approaching this theme, with particular attention to the reduction of food waste. Furthermore, it supported the creation of a local network of farms, providing a document that can strengthen local and suburban agriculture at the Veneto level.

Città So.La.Re soc.coop.soc.

Città So.La.Re Solidarity, Labor and Responsibility is a social services cooperative created in Padua in 1997 on the basis of a project by Caritas, ACLI (Associazioni Cristiane Lavoratori Italiani) and Nuovo Villaggio soc.coop.soc. for collecting used clothing, in partnership with APS (Azienda Padova Servizi). The company offers reception, environmental, mechanical and electromechanical assembly services for third parties, job placement and coworking. The company is therefore engaged among other things in the collection of used products, in their reconditioning, in the reuse by people in need and in the resale on the used market in collaboration with other similar entities. Regarding environmental services, collection functions for Caritas-branded containers, collection center management, city decoration, cardboard collection, special waste, exhausted food oil, door-to-door services are proposed to public bodies, commercial users and private individuals for plastic and metal packaging, paper and cardboard, greens and twigs, biodegradable damp, mowing, evacuation and removals, as well as transport for third parties at the national level. Città So.La.Re. intervenes above all in favor of disadvantaged people with problems of job and social insertion or with impairments and temporary difficulties, in conditions of socio-rehabilitative treatment, to have more job opportunities and to improve their quality of life. The company promotes the value of the human person, the protection of health and the social integration of local and foreign citizens.

The research fellow has produced in particular a technical report on the transformation of waste into a resource and on the supply chain and, in particular, on the potential of large-scale distribution for the collection and resale of used clothing, the role of social cooperatives in this sector and their relaunch and on a possible partnership with the large textile districts, such as around the city of Prato. The approach used was that of action-research about reporting, geo-referencing and communication of results and benefits.

Common features and divergences

To better understand the role of governance in the development of the circular economy in the case studies, seven themes were selected from those identified by the conceptual framework based on their relevance. The political process has been separated into analysis of actors and configurations of actors as the circular economy remains relatively confined to the technical sphere. In Italy, the political level has not yet fully adopted this concept, which is still emerging. Also, the time scale has not been the object of specific analysis as the phenomenon is relatively recent. For each of the case studies, the following topics were then analyzed, searching not only for common features of the governance system, but also for divergences:

- ① Governmental, non-governmental organizations and individuals
- ② Actor configurations
- ③ Collective action
- ④ Implementation policies
- ⑤ Verification, research
- ⑥ Levels
- ⑦ Sectors

The following paragraphs summarize the points in common and the differences observed in the four case studies. The selected themes, the analysis of each case study, as well as the synthesis of common characteristics and differences were discussed in internal and external seminars between February and April 2019. In the economy of this text, see Annex 1 for a synoptic table that presents more details.

The fact of analyzing the characteristics of a multiplicity of case studies on the same territory, allows a better understanding of the local governance system thanks to the multiplication of perspectives (Young et al., 2006). However, the external validity of the conclusions outside the Veneto Region remains to be demonstrated. The use of the conceptual framework lends itself to the production of case studies from other areas and other contexts, articulated both in time and in the various sectors of interest for the circular economy, to be compared and analyzed together with the conclusions concerning the Veneto case.

① Organizations and individuals

The protagonists of the development of the circular economy are in the first place the companies interested in the transformation of waste into a production factor and a management level that is sensitive to these issues. In each case there are the producers of raw materials, the distributors and finally the users, which can be different in the different sectors, especially at this level of detail. All the actors observed tend towards the principles of the circular economy diffused by the European Union, thanks also to the use of certified products, special bodies and research activities carried out by universities and research centers, which are always among the actors included in the process. At the end of the life process of the single product, there are companies that deal with reusing waste materials to transform them into secondary raw materials, through different types of companies depending on the sector but with similar purposes. Both in the building sector and in the food and social sectors, there are national or international bodies, particularly the European

Union, which deal with the regulation and definition of the sector rules, providing funding for the sector development and publicizing the results thus obtained.

② Actor configurations

The circular economy develops above all from the bottom through the companies, but the institutions and the networks play an important role for the circulation of information. The relationships between the actors take place both vertically, especially between administrative-legislative-financial actors, and horizontally, mainly between actors who work on the same level and who collaborate with each other, especially companies. The dissemination of information is important for the creation of circular networks among companies that cooperate with each other, but often the circulation of knowledge is difficult, as there is competition and not all actors are ready to immediately accept the guidelines provided by the administrations, with consequent complications in reaching a large user base. In general, in the circular economy process, advantages can be created for some actors, who manage to enter the production process in a given sector for the first time but disadvantage other types of actors.

③ Collective action

Cooperation among companies is minimal, while partnerships are being established among companies, research institutions and public entities. The point in common among all companies can be considered an interest in issues concerning the circular economy. The collaboration between the different realities operating in the same sector is certainly indispensable, but when the economic and strategic factor comes into play the collaboration is interrupted. All companies ask for more effective actions by public entities to favor the application of circular economy principles, find a lack of incentives and ask for regulatory simplification. For some companies, at the economic level, it is not convenient to apply the principles of circular economy because of the time necessary for the return of the investment, which can often be very long.

④ Implementation policies

European objectives and national legislation are important for managers, but company initiatives fall within the scope of pilot actions. In the implementation of the circular economy, the importance of European legislation is noted in all the sectors studied (End-of-life Vehicles, Waste Batteries and Accumulators and Waste Electrical and Electronic Equipment Directive 2018/849; Landfill Directive 2018/850; Waste Framework Directive 2018/851; Packaging Directive 2018/852) which focuses on the prevention of waste production, introducing important objectives that can contribute to achieving objectives of sustainable development. Furthermore, the new legislation, requiring the member states to adopt specific measures, acts as a push for the concrete implementation of the principles of circularity. Italy, like other member states, has already embarked on a path that aims at the progressive improvement of waste management, in line with European standards. This has led to important results, such as the “anti-waste” law (Gadda Law) and the application of minimum environmental criteria (CAM), i.e. the environmental requirements defined for the various phases of the purchasing process, aimed at identifying the best product, service or design solution from an environmental point of view along the life cycle, also in the context of what is established by the plan for the sustainability of consumption in the public administration. The procurement code makes the application of CAM mandatory, while in the food sector the “anti-waste” law encourages actions developed by private individuals and simplifies the procedures for the donation of unsold products for the public and private sector but does not make it compulsory. In these instruments which, despite their specificity, are united by shared objectives, there is no assessment of their adequacy and a unified vision of the actions to be developed, especially in the food sector, where the municipal level, prompted on the basis of practices such as the strategic plans of some cities, can become decisive for giving substance to the regulatory system.

⑤ Compliance, research

Controls vary by sector, but they are rare, while it is the internal improvement of companies that supports the development of the circular economy, together with scientific research. In the building sector, sanctions can be multiple in the case of use of non-certified recycled materials or in the event of illegal disposal of construction and demolition waste, but their application has not been observed. The control bodies are public entities at municipal level (e.g. ETRA), regional level bodies (ARPAV) and ministerial bodies, dealing with environmental and sampling investigations and may issue sanctions in case of illegal disposal or use of non-certified material and material that is dangerous for the environment and for people. The food sector, on the other hand, is not currently subject to sanctions for the circular economy. The impact of local, national and European initiatives for the inclusion of circular processes within the sector cannot be observed at company level. Companies decide to lean towards sustainability based on internal motivations, rather than external factors. The processes are looked at by the actors involved and the role of research and development is fundamental because it allows the creation of the materials and techniques necessary for their implementation and to increase circularity. There is no network of research institutions working on the circular economy at the regional level.

⑥ Levels

The governance of the circular economy is multilevel but varies according to the sector. The levels involved, common for all companies, can be considered nested and each company must comply with the norms and indications of its sector provided by the state (e.g. “anti-waste” law), the region and the municipality (e.g. building regulations). Above all this is the European Union, which establishes guidelines and objectives to be respected and implemented. There are no substantial differences and every company must comply with the legislation that is specific for each sector.

⑦ Sectors

Although the case studies refer to specific sectors, the governance of the circular economy also involves other sectors, particularly the environment, health, social issues and the economy. Despite the difference between the issue area to which the four companies belong, it is clear that some sectors, including related policies, are involved in a transversal manner in the development of actions linked to the circular economy for those operating in the materials and building sector, as well for those in the food and textile sector. Out of all, the environmental sector comes out on top, indicated as being the most relevant in business activities and therefore the one towards which companies tend to operate to intervene in favor of the protection of resources, the reduction and recycling of waste materials, as well as energy consumption. Alongside this, the other transversal sector is that of health, paying attention to the final consumer. Finally, the sector linked to social issues, in which specific aspects related to the figure of the worker emerge, not only with regards to health and its protection, but also to combat exclusion, facilitating return to work and illegal employment.

It goes without saying that the food sector needs to be considered jointly with the agricultural sector, closely linked to objectives such as local production, through forms of suburban agriculture, quality and soil management. Linked more to textiles, the fashion sector must also be considered, once again for the possibility of developing new materials deriving from recycling and as a driver of potential change. A last sector that emerges from the analysis is that of economics and finance: although it is not highlighted in the construction sector, it is likely decisive for actions to be developed at company level. This sector, in fact, can make it possible to overcome the lack of stable incentives, relating to the circular economy, which producers complain about.

Discussion

The aim of this paper was the analysis of the governance of the circular economy. Our goal was to explore not only the values, social structures, cultures, visions of the world and the paradigmatic potential of the circular economy identified by Korhonen et al. (2018) as gaps in the scientific literature on the circular economy, but to do so in a systematic manner, placing these issues within a systemic approach to the governance of the circular economy. Following the reading of Elias (1969) and Tilly (1973), social structures are considered here through the concept of configuration of actors which includes that of the structure of the network of interdependencies between individual and collective actors and which also takes into consideration elements such as the distribution of power, information flows and boundary work.

The systemic approach adopted for this analysis of governance tends instead to link the values, cultures and visions of the world to individual actors, since within a collective actor these elements can vary, as we consider organizations as a common means to pursue different ends (Rawls, 1971). The commonality of values, cultures and visions of the world among individual actors within the same organization, as well as the role of so-called corporate and organizational values and cultures are elements that have been observed but mostly among company managers and not necessarily among the staff. This could be linked to external factors such as the sharing of values, cultures and visions of the world linked to belonging to structures outside our target companies, such as education background, belonging to political movements or other ties that however could not be detected through participant observation within the company.

The question of the paradigmatic and therefore ideological role of the circular economy can also be traced back to the individual actor and to collective actors such as political parties and certain associations. The circular economy as a paradigm is in fact a form of value and a vision of the world that can be more or less shared through information flows within different configurations of individual and collective actors. This can therefore be integrated directly into the communication tools and indirectly into the other types of implementation policies and influence, through the feedback process, on the transformation of production and consumption systems and the political process. The circular economy as a paradigm emerged only indirectly, having analyzed the governance system starting from the companies' point of view. This element would probably have emerged in a more pronounced way by including the point of view of other types of actors such as administrations and associations.

Furthermore, the circular economy is a phenomenon that has always existed, since economic actors and individuals have always tried to exploit all the factors of production. Traditional societies produce very limited waste. It is the collapse of the prices of raw materials and their transport plus the stigmatization of refusal with the spread of the hygienist movement and of the concept of public health that led to the exponential increase in waste from the end of the nineteenth century. The emergence of industrial approaches to waste disposal then allowed to keep costs relatively low. It is the awareness of the explosion of the amount of waste in landfills and oceans that has occurred in recent decades that has brought up the issue and led to the definition of the concept of circular economy, which is therefore itself a tool for implementing a transformation of the production and consumption system.

The selected cases are not representative of all circular economy cases in Veneto. They were identified based on the partnership established due to a commonality of interests within the “Opportunity” project. However, they are representative of the main sectors involved in the development of the circular economy: construction, materials, food and clothing. In this sense, they constitute a gradient that allows to go beyond the individual case study and to extract knowledge with greater external validity (Gerring, 2004). However, negative case studies are not included (Dimitrov, Sprinz, DiGiusto, & Kelle, 2007). This may limit the possibility of identifying the elements that prevent the

development of the circular economy at the company level. The inclusion of companies in the same geographical area involved in the same project also allows the control of the possible influence of external variables and therefore facilitates comparison and generalization. Furthermore, the use of a common conceptual framework and the multiplication of case studies makes it possible to compensate for the intrinsic subjectivity of the method of participant observation and, by objectifying the approach, to reinforce the general validity of the conclusions.

Conclusion

The analysis of the governance system of four case studies of the Veneto Region involved in the circular economy has revealed seven common characteristics:

- ① **Companies, managers** The protagonists of the development of the circular economy are first and foremost the companies interested in transforming waste in a production factor and the presence of a management level that is sensitive to these issues.

The four case studies that were observed are, however, examples in which it is precisely the companies and particularly their managers that autonomously adopt the concept of circular economy for reasons internal to the companies themselves or for the conviction of the managers. In fact, the four companies complain about the absence of more favorable legislation and stimuli, particularly in terms of tax incentives, while employees do not necessarily share the managers' point of view.

- ② **Development from below** The circular economy develops mostly in a bottom-up manner through companies, but institutions and networks play an important role for the circulation of information.

This does not mean that the role of other actors and particularly of local authorities, national entities, European structures, as well as of associations and research bodies, are irrelevant. On the contrary, they play an important role in spreading the concept of circular economy (Finnemore & Sikkink, 1998), encouraging companies to participate in its development.

- ③ **Minimum cooperation, partnerships** Cooperation among companies is minimal while partnerships are established among companies, research institutions and administrations.

In terms of collective action, the target companies have shown a propensity for internalizing production, which can limit the development of recycling and re-use value chains with the participation of other companies. At the same time, we observe the search for partnerships especially in the domain of research and administrations to assist companies in finding technical solutions and to support the development of the regulatory framework and obtain incentives.

- ④ **European targets, piloting** European targets and national legislation are important for managers but company initiatives fall within the scope of pilot actions.

With regards to policies and implementation tools, the European targets for waste reduction by 2025 have emerged as a common concern in all case studies. The national legislation was more present in the construction sector than in the food sector. In any case, the development of the circular economy in the companies studied is more linked to pilot actions conducted directly by the companies, regardless of the policies in place.

- ⑤ **Internal improvement, research** Controls vary according to the sector but are rare, while it is the internal improvement of companies that supports the development of the circular economy, together with research.

The verification of the implementation of policies related to the circular economy varies according to the sector. Certification bodies play an important role in the construction sector. Above all, it is the internal improvement of companies that supports the development of the circular economy.

The research and development processes, also in collaboration with research institutions such as universities and foundations, therefore, play a fundamental role.

- ⑥ **Multilevel phenomenon** The governance of the circular economy is multilevel but varies according to the sector.

If the company level is predominant in this analysis, various levels of action appear clearly, from the most macro (global market, European Union, national government) to the most micro (municipalities, companies, individuals). The gradient tends to be more macro in the building sector with value chains that can be global and more micro in the food sector, with a “zero kilometer” trend.

- ⑦ **Multisectoral phenomenon** Although the case studies refer to specific sectors, the governance of the circular economy also involves other sectors, in particular the environment, health, the social sector, as well as the economy.

The main sectors of reference of the individual companies are obviously the most involved. However, the development of the circular economy requires the involvement of other sectors, particularly the environmental and health sectors for waste management, including pollution, and for limiting health and hygiene risks. The circular economy then intersects with the social economy especially in the food and textile sectors with important social implications. The financial aspects are never to be ignored because of the huge investments sometimes necessary for the development of the circular economy. If in some cases companies manage to finance these investments with their own resources or with the support of banks and investment funds, in other cases they depend on public funding, especially for interventions with a long return on investment.

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Supplementary materials

Annex 1: Comparative table (in Italian)

Caratteristiche	Settore edilizio	Settore alimentare-sociale
① Attori	<ul style="list-style-type: none"> Enti di normazione ed associazioni nazionali/internazionali che elaborano linee guida nel settore Ministeri per elaborazione di finanziamenti Fornitori di materie prime per la realizzazione del prodotto finito utilizzato in cantiere Aziende produttrici di materiale da costruzione finito: si occupano della scelta delle strategie più adatte a raggiungere gli obiettivi previsti dalle normative e linee guida, mediante la regolazione di aspetti tecnico-amministrativi-finanziari Enti di certificazione di prodotto di tipo obbligatorio o volontario Enti di ricerca e università che svolgono prove di laboratorio per analizzare la veridicità dei dati riportati dalle aziende e sviluppare nuove tecnologie costruttive Progettisti per l'elaborazione di edifici in linea con certificazioni ambientali, mediante la scelta delle tecnologie costruttive più adatte da applicare Imprese di costruzione: si occupano della scelta e dell'utilizzo dei materiali più adatti, secondo le linee guida dei progettisti, con una continua supervisione dei lavori in cantiere Aziende di demolizione/smaltimento: si occupano della gestione del materiale a fine della vita utile, in seguito alla demolizione di un artefatto 	<ul style="list-style-type: none"> Ministeri per l'elaborazione di linee guida nel settore e gestione di finanziamenti Amministrazioni regionali/comunali per la gestione delle risorse ambientali e la regolazione dei rifiuti Agricoltori che producono e distribuiscono la materia prima (ristoranti, mercati, supermercati) Aziende certificatrici del rispetto requisiti ambientali da parte degli agricoltori e dei prodotti da loro ottenuti Università/Scuole, per la ricerca di metodi innovativi e sicuri per il rispetto dell'ambiente Gruppi d'acquisto delle materie prime mediante organizzazioni in comunità (organizzazioni non governative, comunità locali e/o cooperative sociali) Ristoratori, che elaborano la materia prima per la distribuzione al cliente finale Clienti Aziende che riutilizzano le materie prime seconde, per la produzione di nuovi materiali (non necessariamente del settore agricolo)
② Configurazioni	<ul style="list-style-type: none"> Relazioni di tipo verticale tra attori che lavorano su diversi piani (ministeri, enti certificatori, aziende produttrici) e relazioni di tipo orizzontale, biunivoche, tra attori nel medesimo processo di costruzione (aziende produttrici dei materiali finiti, progettisti, imprese edili) 	<ul style="list-style-type: none"> Relazioni di tipo verticale tra attori di tipo amministrativo (ministero, regione, comune, aziende produttrici) e relazioni di tipo orizzontale tra aziende che detengono servizi di tipo ambientale

Caratteristiche	Settore edilizio	Settore alimentare-sociale
	<ul style="list-style-type: none"> • Circolazione delle informazioni difficoltosa in alcuni casi, per la grande competitività tra le aziende e la difficoltà di aderenza alle linee guida non obbligatorie, in altri casi facilitata per la libera circolazione dei prodotti grazie a enti certificatori (Green Building Council e Forest Stewardship Council) • Diffusione informazioni e obiettivi del settore mediante seminari e riunioni, a livello locale/nazionale/internazionale • Prezzi finali determinati dai produttori delle materie prime (a monte del processo di produzione/costruzione) • Utilizzo di materie riciclate e introduzione del recupero nel processo di costruzione, favorendo alcuni attori e svantaggiandone altri 	<ul style="list-style-type: none"> • Gli attori produttori di materie prime si impegnano per la diffusione delle informazioni relative allo sviluppo sostenibile e l'utilizzo corretto delle risorse locali, mediante la creazione di piccole catene di approvvigionamento; in altri casi la diffusione delle informazioni risulta difficoltosa (tra i clienti finali), con complicazioni nel raggiungimento di una base di utenti più ampia
<p>③ Azione collettiva</p>	<ul style="list-style-type: none"> • C'è interesse nei confronti dei principi di economia circolare nelle aziende operanti nello stesso settore ma la collaborazione tra le diverse realtà molto spesso si interrompe perché entra in gioco il fattore economico/strategico • L'applicazione dei principi di economia circolare può avvenire solo attraverso la cooperazione tra i vari attori coinvolti nel processo di costruzione dalla fornitura alla costruzione e demolizione. Per fare un esempio pratico, un produttore di serramenti, al termine della vita utile del prodotto, deve essere in grado di recuperarlo facilmente dal cantiere per poi riprocessarlo e reinserirlo nel ciclo di produzione o recuperarne i componenti (<i>upcycling</i>) • L'applicazione dei principi di economia circolare è facilitata in aziende di grandi dimensioni, che possono investire capitali e risolvere più facilmente problemi di organizzazione, di spazio e di logistica • Attualmente c'è tensione tra i vari attori e i livelli amministrativi e l'imprenditore non è incentivato 	<ul style="list-style-type: none"> • Non ci sono veri e propri conflitti tra le aziende che si occupano di trasformazione e distribuzione di cibo ma non c'è neanche collaborazione per favorire l'applicazione dei principi di economia circolare • C'è invece una concreta collaborazione tra aziende nel settore agricolo • Attualmente non ci sono conflitti con le amministrazioni locali ma le aziende chiedono azioni più efficaci per favorire l'economia circolare • Tra le varie aziende coinvolte nella gestione ambientale/urbana si può riscontrare sia un irragionevole conflitto sia un tentativo di collaborazione per favorire l'economia circolare

Caratteristiche	Settore edilizio	Settore alimentare-sociale
<p>④ Strumenti</p>	<p>nell'applicare principi di economia circolare e spesso "il gioco non vale la candela"</p> <ul style="list-style-type: none"> • L'Unione Europea ha emanato leggi e norme per lo sviluppo dell'economia circolare • La Regione del Veneto dal 2014 sta recependo tali norme, applicandole ai settori di riferimento con progetti specifici (fondi FSE) e con la collaborazione del mondo universitario • Il Ministero dell'Ambiente ha adottato i Criteri Minimi Ambientali, imponendo l'utilizzo di materiali con una parte di riciclato • Le aziende che producono materiale da costruzione inseriscono all'interno dei materiali una percentuale di riciclato • Non esistono incentivi e strumenti finanziari per l'edilizia privata che influiscano nella scelta di utilizzare materiali riciclati • L'economia circolare è un tema che necessita una maggiore diffusione e comprensione da parte dei soggetti coinvolti, che potrebbero portare all'attuazione di nuovi strumenti di sviluppo 	<ul style="list-style-type: none"> • L'Unione Europea ha adottato un Pacchetto sull'Economia Circolare che sottolinea l'importanza della prevenzione nella produzione di rifiuti, con l'obbligo a partire dal 2025 della raccolta differenziata di rifiuti da materiali organici • Il pacchetto interviene inoltre contro gli sprechi alimentari • Il governo Italiano ha approvato una legge sullo spreco alimentare • Alcune pubbliche amministrazioni hanno attivato politiche alimentari e previsto strumenti finanziari, come premialità per quanti riducono lo spreco alimentare (diminuzione della TARI) ma lo scenario è diversificato, pertanto la scelta di introdurre determinate azioni nella propria attività è ancora spesso legata a motivazioni personali • La comunicazione potrebbe giocare un ruolo fondamentale per la richiesta e l'attuazione di nuovi strumenti di sviluppo
<p>⑤ Verifica</p>	<ul style="list-style-type: none"> • Le sanzioni possono essere molteplici in caso di utilizzo di materiali riciclati non certificati o in caso di smaltimento illegale di rifiuti da costruzione e demolizione, ma la loro applicazione non è stata osservata • Gli organismi di controllo sono organismi pubblici a livello comunale (ad es. ETRA), organismi di livello regionale (ARPAV) e organismi ministeriali, si occupano di indagini ambientali, campionamento e possono sanzionare in caso di smaltimento illegale o uso di materiale non certificato e pericoloso per l'ambiente e le persone • Ogni azienda promuove un'economia circolare al suo interno o con una società affiliata 	<ul style="list-style-type: none"> • Il settore dei servizi alimentari non è attualmente sottoposto a sanzioni in merito all'economia circolare e le regole sono quelle della legislazione vigente • I programmi ufficiali per l'inclusione di processi circolari all'interno del settore non sono osservabili a livello aziendale • Le aziende decidono di essere caratterizzate dalla sostenibilità sulla base di motivazioni personali, piuttosto che influenze esterne • Funziona per il continuo miglioramento interno sui temi della circolarità • I processi sono osservati soprattutto dal punto di vista della produzione, dell'appalto pubblico e del marketing

Caratteristiche	Settore edilizio	Settore alimentare-sociale
	<ul style="list-style-type: none"> • La ricerca sta facendo passi da gigante nello studio dell'economia circolare, ma a livello regionale non esiste una vera rete • I processi sono guardati dagli attori interessati e il ruolo della ricerca e dello sviluppo è fondamentale perché permette di creare i materiali e le tecniche necessarie per la loro applicazione per aumentare la circolarità di un settore responsabile per 1/3 dei rifiuti mondiali 	
⑥ Livelli	<ul style="list-style-type: none"> • I livelli coinvolti, molto spesso sono annidati e sono il Comune e la provincia di Padova e, più in generale la Regione Veneto • L'unione Europea detta le linee guida, stabilisce alcuni parametri da rispettare e fissa alcuni obiettivi da raggiungere, si veda ad esempio l'agenda globale 2030 per lo sviluppo sostenibile • Ogni regione ha propri regolamenti che fanno comunque riferimento alla legislazione statale e ha numerosi organismi di controllo e verifica • Ogni comune ha il proprio regolamento edilizio e la propria pianificazione, che però fa sempre riferimento alla legislazione statale, anche se in alcuni casi è possibile derogare alla normativa statale/regionale • Le attività delle aziende si rivolgono a livelli nazionali e internazionali 	<ul style="list-style-type: none"> • I livelli istituzionali coinvolti nella gestione ambientale/urbana sono il Ministero, le Regioni e i Comuni • Il governo nazionale stabilisce politiche, obiettivi da raggiungere e fornisce strumenti per attuarli • La regione si occupa di pianificazione e coordinazione degli interventi • Le autorità e le associazioni locali si occupano della pianificazione del sistema di gestione alimentare, ma anche di rendere partecipe la comunità locale e di mettere in relazione i vari soggetti privati
⑦ Settori	<ul style="list-style-type: none"> • Ambiente: tutela risorse, riduzione/eliminazione di emissioni volatili, riuso/riciclo dei materiali di scarto, limitato consumo di energia • Salute: comfort all'interno delle abitazioni • Etica: tutela e salute dei lavoratori all'interno dell'azienda. 	<ul style="list-style-type: none"> • Ambiente: difesa del suolo e del paesaggio, tutela delle risorse, riuso/riciclo dei materiali di scarto • Agricoltura: valorizzazione produzione locale, biologica, urbana • Solidarietà/ etica: contrasto a emarginazione e a lavoro irregolare • Salute: impatti produzione industriale cibo • Moda: individuazione risorse e riconoscimento componenti dei materiali per utilizzarle al meglio delle possibilità

Caratteristiche	Settore edilizio	Settore alimentare-sociale
		<ul style="list-style-type: none">• Economia: sostegno del sistema bancario• Politiche trasversali ai vari settori