Antonella Zucchella
Sabine Urban

Circular Entrepreneurship
Creating Responsible Enterprise

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Preface

Circular entrepreneurship suggests the idea of a new concept, leading to social *responsibility* among powerful actors: namely, "entrepreneurs" and enterprises (though possibly also in other kinds of organizations or institutions). This is a challenging topic for several reasons. First, currently enterprises' objectives seem to be mainly oriented towards economic and financial performances rather than towards social responsibility. Second, the world is entering the so-called "digital revolution" in an era of global and dense interconnections in all domains—the economy, science, art, politics and so on—opening huge opportunities for socioeconomic handling, with more or less relaxed controlling systems. Thus, the sense of responsibility may be tendentiously reduced (think for example of fiscal optimization decisions). Third, the open economy reinforces competition among worldwide actors. The voluntary acceptance of responsibility is not yet considered a decisive factor of competition, but mindsets are positively changing. Fourth, in recent years academic literature and firms' business reports have explored the fundamental change that is occurring in the ways of producing, working, consuming, thinking and living. Climate change, CO_2 emissions and the squandering of natural resources raise growing anxiety concerning the future. A paradigmatic change seems desirable because nature and the health of humankind are considered at risk. All the stakeholders of the global eco-system, each for its

part, are concerned. A collective sense of responsibility, which individual enterprises cannot ignore, is emerging.

The circular economy represents a credible answer to these problems. It appears to be at least part of a solution. But what is the circular economy? A definition is provided by the Ellen McArthur Foundation, a major think-tank in this field.

Circular Economy Definition

Looking beyond the current take-make-dispose extractive industrial model, a circular economy aims to redefine growth, focusing on positive society-wide benefits. It 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. It is based on three principles: Design out waste and pollution, Keep products and materials in use, Regenerate natural systems.

Source: The Ellen McArthur Foundation, https://www.ellenmacarthurfoundation.org/circular-economy/concept

This definition underlines the notion that natural and social systems are characterized by a dominance of circular movements, by interconnected ecological relationships and infinite interfering networks. The first wave of circular economy applications concerns essentially the visible part of these complex, natural or social systems, that is material elements. Later on, step by step, intangible assets like knowledge, capabilities, time and ethical values will have been integrated into circular management models. Now, circularity appears to be a key concept of modern management and a pathway to sustainable development. This evolution is analyzed in the first chapter of the book.

Circular principles need entrepreneurial innovative spirit to become reality. This transition process is covered in Chap. 2, in which we tackle the questions, Why and how do economic actors decide to adopt circular philosophy and concrete acting on the field? Which are the expected returns, and under which conditions do they occur? Circular entrepreneurship is not static but takes on various, changing features.

Circular entrepreneurship consists in processes of exploration and exploitation of opportunities in the circular economy domain. Which steps can entrepreneurs concretely follow? Two core elements are represented by the design of the value proposition and the development of the business model. Chapter 3 discusses how to develop a circular value proposition, and how to develop all the remaining building blocks of the business model, always in the light of circular economy principles.

Chapters 4 and 5 introduce a number of case studies and respectively illustrate cases of "born circular" firms, that is young ventures which have been designed for circular principles from their start up (Chap. 4) and cases of established larger organizations which are experimenting with a transition towards circularity (Chap. 5). The former are examples of classic entrepreneurship (i.e., creation of new ventures), while the latter are cases of corporate entrepreneurship. Following an inductive approach, based on the observation of cases, we derive lessons and infer concepts about what circular entrepreneurship means and entails.

The last chapter presents an integrative model of circular entrepreneurship. The enabling conditions for the rise and growth of circular enterprises are considered, from internal factors, like resources and capabilities, to external conditions. The model shows the entrepreneurial processes of exploration and exploitation of opportunities in the circular economy domain, in their specific context. The model considers the different levels of the individuals (entrepreneurs and leaders), the organization (circular enterprise), the inter-organizational ties (partnerships, networks and ecosystems) and the external context. The entrepreneurial processes generate different innovations, from technological to financial, corporate governance and business model innovations.

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Contents

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Antonella Zucchella is Professor of Marketing at the University of Pavia (Italy) and senior research scholar at Anglia Ruskin University, Cambridge (UK). She is the author of books on entrepreneurship and international entrepreneurship and of numerous articles in international journals on the growth of small and young ventures and on sustainable management.

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List of Figures

List of Tables

1

From Circular Principles to Circular Entrepreneurship

1.1 Introduction

The world is changing rapidly, with a lot of positive and negative aspects. Looking at both tendencies, growing imbalances do appear, whether in socioeconomic life or in the sphere of natural capital resources. "Something" looks wrong. We must learn again to live in tune with nature and with one another. This statement can be considered as a requisite condition for a *sustainable*, viable future, taking care of human needs and Planet Earth's possibilities to contribute to them. Earth Overshoot Day (EOD) is an initiative of an American NGO named "Global Footprint Network; Advancing the Science of Sustainability." Indicators relate dates when humanity has exhausted nature's budget for the year. For the rest of the year we are accelerating our ecological deficit by drawing down natural resources' stocks. Humanity is now operating in unsustainable "overshoot" on a global level. Here are some relevant indicator dates: 2018: August 1; 2000: October 1; 1975: December 1. Calculation of data is also available detailed for countries and cities (https://data.footprintnetwork.org).

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Nature is characterized by a dominance of circular movements, by interconnected ecological relationships and infinite interfering networks. Melting glaciers become water, rivers, lakes, evaporation, rain, viable climate. Dead leaves become humus in the forest. Specific seeds become wheat in the ear, food for wild animals. Sunshine delivers heat and light, and further, life. In social life, the rules are not the same. Use, reuse, creation of goods and services, transformation of resources all need work, energy, capital and innovation, that is management and entrepreneurship. Socioeconomic resources are not a *given* (as natural resources may be) but a *construct*, initiated by entrepreneurship.

Circular entrepreneurship is becoming a new reality, in the manner of a radical paradigmatic change, including the safeguarding of natural resources, social sharing and solidarity practices. The application of circular *principles* may be considered, if not a panacea, at least as part of a holistic solution to reach a global, viable, sustainable evolution for all. We intend to understand why and how this may happen. It is a huge challenge concerning the peaceful cohabitation of people, businesses and the planet. Circular entrepreneurship's initiatives and support do play a pivotal role on the road to a radical, needed paradigmatic change. Circular entrepreneurship gives a decisive impulse to transform *circular movements and principles* into a *circular economy* activated by responsible enterprises and other social organizations. Thus, circularity appears to be a key concept of modern management, operating in a rapidly changing international environment.

In this first chapter we describe some major aspects concerning that difficult cohabitation of people, business and the planet, and review adequate methods of understanding and acting. Three sections are dedicated to the following topics:

1.2. A short global overview of circularity and entrepreneurship

1.3. An analysis of a systems approach governing business dynamics and circular economy, that is a global systems-thinking, able to decipher and manage the prevailing relations and interactions between the various elements of the global macro-system, but also of those of numerous micro-systems (or subsystems), like enterprises. These web-like patterns of organizations are evolving towards a future that is not a given but is desirable.

We argue that in a systemic context, businesses are powerful players, having the means to influence other players of the "game," and also enjoy a certain degree of autonomy to become really pivotal strategic players without loosing too much time in adopting pertinent strategies. These considerations place on business leaders a huge responsibility we shall describe in the following section:

1.4. Circular entrepreneurship and entrepreneurial responsibility.

1.2 A Short Global Overview of Circularity and Entrepreneurship

1.2.1 Socioeconomic Evolution and Paradigmatic Change

Today it looks like a widely accepted fact: the world is changing rapidly. Population is growing, economy is developing and knowledge gains ground everywhere, with, however, widening inequalities. Technological revolutions do occur at a high pace; air, water and soil pollution is invasive; natural resources are over-exploited; common goods are under pressure of capitalistic commodification; Planet Earth is suffering; biodiversity is threatened; human life is full of unfair and growing imbalances. Philosophical conceptions of action, political thinking and its resulting social institutions' management, as well as current socioeconomic handling in public or private spheres seem no more able to shape the frame of life in its diversity and in a satisfactory manner for all. "Something" looks wrong. In the high interconnected and complex environment we are living in, this condition does not seem easy to change rapidly. But a paradigmatic change appears urgently needed. Comments about this are numerous, just to cite a few: "We need a holistic economic model" (Brown 2017); "The new source of competitive differentiation may lie in the internal capacity to reconfigure resources in real time; driving co-created value through global networks" (Prahalad and Krishnan 2008); "A new ecolegal order is urgently needed." "Sustainability is not an individual property but a property of an entire web of relationships, and it

always involves a whole community" (Capra and Mattei 2015); "The breakaway from linear models obviously applies to tangible resources, but it must also include intangible resources such as knowledge" (Radjou 2017); "We need better business principles" (Hamel 2012). With circular economy we are confronted with "a management revolution that requires a deep rethinking of our economic and managerial system, our lives, and what matters to us, what matters now" (Auerswald 2012).

It is becoming clear that we must learn to live in tune with nature and with one another, that we need a radical paradigmatic change, including sharing and solidarity practices. Application of circular principles may be considered as part of a holistic solution, of a global viable evolution; we try to understand why and how.

1.2.2 Circularity and Sustainability

The concept of circular economy is rooted in the observation of physical phenomena and natural cycles (Institut Montaigne 2016); it is an old story. As a famous saying attributed to the eighteenth-century French chemist Antoine Laurent de Lavoisier puts it, "Nothing is lost, nothing is created, everything is transformed." This expression was a reformulation of the idea expressed by the pre-Socratic Greek philosopher, Anaxagoras, who commented on nature (around 450 BC), "Nothing comes into existence nor perishes, but is rather compounded or dissolved from things that are."

However, later on, the concept of "circular" economy became grounded in more narrow terms: in its opposition to the "linear" economy. The latter, a product of the industrial revolution induced by the invention of the steam engine and its rapidly large utilization, relies on the following chain: extraction of raw materials—transformation into a product—consumption of the product—production of waste, or in other words "take–make–use–discard." The viability of such a model, linked to enormous squandering (and in a context of growing population and limited natural resources) is not "sustainable" in the long run. In some circumstances irreversible damage is done to the environment and its ecosystems. A famous alarm-whistle is the report published by the Club of Rome, 1972,

written by Meadows, Donella et al. (1972, MIT), and often called the *Meadows report*. This scientific large data analysis defends the idea that infinite growth cannot be envisaged in a world of finite resources. Over- and mis-use of natural resources lead to dramatic depletion. Long before, a German administrator at the court of Saxony in charge of the mining industry and forest management, Hans Carl von Carlowitz, wrote a treaty, *Sylvicultura oeconomica* (1713), (printed again with annotations in 2013) in which he developed the rule that exploitation of natural resources like timber cannot exceed the quantity that nature is able to reproduce, in a given space of time. He argues that this rule is valid even if "good" economic reasons, or even a decision to start a war, are alleged as dubious pretexts. Carlowitz is not well known outside of Germany, but he is considered the first to clearly formulate the concept of sustainability in forestry. Unfortunately, more than two centuries of carelessness followed.

Since the 1960s, in the field of environmental economics and management (Callan and Thomas 2015) both concepts of "sustainability" and "circular economy" are gathering momentum (see for instance Geissdoerfer et al. 2017). These authors do link the two concepts in their recent research question, *The Circular Economy—A New Sustainable Paradigm?* They state that for "academia, industry and policymakers, the similarities and differences between both concepts remain ambiguous." Geissdoerfer et al. make reference to several hundreds of definitions! Scott T. Young and K. Kathy Dhanda, in *Sustainability: Essentials for Business* (2013), a book offering immense understanding of the interaction between the needs of society versus the ecological limits on natural resources, listed more than 500 definitions of sustainability! Some of them are easy to remember, such as the term *3P*, which stands for people, planet, and profits; it states that companies need to measure their impacts not only on the bottom line (profits) but also on the community (people) and the environment (planet). In that view, businesses' responsibility extends to all stakeholders, in all domains of social life and in the long run. This global performance achievement is the core of sustainability, a very ambitious objective for entrepreneurship. Ambitious does not mean impossible. We do think that entrepreneurial initiatives are essential to tackle the huge problem of sustainability because enterprises have—more so than other organizations like international institutions or national states—the capacity to be reactive in a short time and the ability to

introduce, in an autonomous way, radical change (at least in a free market economy).

Circular economy, in its classical acceptance, is linked to the idea that waste, once adequately treated, can become a resource again, through the creation of closed circular loops in the production–consumption chain. The diverse schools of thought, in the frame of that thinking ("cradle to cradle," biomimicry, industrial ecology, blue economy, regenerative design, eco-design, and others) are identified in the well-known British Ellen MacArthur Foundation publications. This foundation goes further and lays out two essential elements of the circular economy: the regeneration and protection of natural capital on the one hand, and efficient use of natural resources on the other. Hence the challenge of the circular economy is to align our human production and consumption cycles with the natural regulatory functions that make up the rate of natural capital regeneration.

In Short

Following the trend of evolutionary development, we consider circularity principles' implementation into business practices as qualified means to reach the objective of sustainable development.

1.2.3 Evolution and Transitions: Entrepreneurial Responsibility

Our concern, in this book, is to try to understand what "circular entrepreneurship" is, and especially to decipher why and how the leading decision makers (a person, or a group of decision makers, or a new governance body) decide to get active in environmental management to support sustainability for the present and future generations (famously expressed in the so-called Brundtland Report, in fact a UN World Commission on Environment and Development (WCED) Report, 1987. Its message is *Sustainable Development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs*).

Since 1987 sustainable management has not only concerned materials and non-renewable natural resources but also knowledge, software, services and human resources (Fücks 2013; Capra and Mattei 2015). All kinds of resources have become the subject or object of circular handling.

In Short

Both concepts—sustainability, as an objective, and circularity, as a means to reach—are not static; they are evolving according to technological innovations, to changing mindsets, to institutional support, to legal systems, to scientific revolutions, to public policy incentives. Time is an actor of change. Territories and countries have diverse ideas of sustainability needs. Our intention is of course not to analyze all what happens in the world on our topic, but to make more understandable what kinds of transitions are on the way and—hopefully—to instill hope for better living in the future. The description of that needed transformation process will be developed, with different perspectives, in the following chapters.

In the present chapter, we discuss some fundamental characteristics and general problems to be solved to reach the era of circular entrepreneurship. A comprehensive method for understanding that manifold challenge of the twenty-first century is proposed notably by Fritj of Capra (2002), presenting the "hidden connexions" in a conceptual framework that integrates life's biological, cognitive and social dimensions. The subtitle of his book, *The Hidden Connections*, is *A Science for Sustainable Living*. Humankind and nature, trying to find a way forward for reciprocal survival, obviously need a reference to "science."

Nevertheless, academic "science" is not the only way to get wisdom. "People" (in all countries and in all centuries) have over time found a way of living in tune with nature. Local people's observations, listening, thinking, experiences did suggest good ways to live, to explore, to understand, to innovate, to change, to survive. A "people's science" does exist and is sometimes admitted as very clever and correct, even by multinational capitalistic enterprises; it is the root of many collaborative circular entrepreneurship practices. A story of chaotic evolution between nature, people, law, science and techniques has been explored in particularly by

Clifford D. Conner (2005) in a work of monumental erudition analyzing the history of humankind from prehistory to the twentieth century.

Both of the above-mentioned authors (Capra and Conner) make clear that the complexity of science and knowledge creation is extensive and needs collective effort. That means that many people (indeed with unequal decision powers) are able to participate in knowledge creation and its implementation in the real world. Especially in the age of unlimited digital interconnections worldwide, everybody will be concerned. Circular entrepreneurship brings an illustration of that new kind of web. Collaboration between all actors, producers and consumers, public authorities and non-governmental organizations (NGOs), doers and thinkers, is one of the keys to the success of the circular business model (European Commission 2018). The other most important keys are the personal motivations of the entrepreneurs, the overall business incentives and the institutional context of entrepreneurship (Lenox and York 2014).

In Short

"Circular entrepreneurship" appears to be an element of a complex socio-economic system that needs rethinking in terms of relationships, patterns (accumulated memories of events and structures) and context (technical, political, legal, cultural). Circular economy is inclusive; by its very essence, the circular economy is collaborative. Developing all kinds of relations inside and outside the firms' organization is a major responsibility of circular entrepreneurship. Circular entrepreneurship is "creating responsible enterprise," not only legal registered enterprises but even more: "responsible organizations" like NGOs, territorial institutions, communities focused on a sustainable topic, political associations.

The outcome of circular principles applied to organizations is possibly (i.e. under certain conditions) an efficient contribution to a sustainable and innovative future for human beings and for nature.

This is not a mirage. Today, one can observe that circular entrepreneurship is becoming an emerging reality, not just an "opportunity" for companies to exploit new businesses and create more value, but also a "must" to preserve the planet's health and survival of humankind, both presently at risk. This correlation, the link between *opportunity* and *a must*, may

support an optimistic view to a possible sustainable future. That is what we intend to clear up in this publication, without neglecting the fact that some circular entrepreneurial initiatives are taken without ethical considerations. For example, the delocalization of dirty recycling practices in poor, less developed countries does not solve the systemic resource problem: it is only delocalized. Circularity is not, per se, a magic concept in all circumstances. That's why a qualitative analysis of circular entrepreneurship is also important.

The transition to circular economy is denominated by some authors and managers as a "resource revolution" that is a disruptive change, that takes substantial time. The move from one paradigmatic system to another implies that a number of past systemic elements and relations are recast. Resistance to change may appear. Moreover, one can expect that a strong innovative entrepreneurial spirit is requested to take up the challenge of a desirable, radical, socioeconomic change. Personalities with a clear vision, empathy, multicultural knowledge, risk acceptance, courage and communication abilities are wanted, but are perhaps not so easy to find.

Diverse facets of circular-entrepreneurs' responsibility will be presented in Sect. 1.4 of this chapter. Before that (Sect. 1.3) we want to evoke some of the main features to keep in mind concerning the systems approach to business dynamics in a circular economy.

1.3 Systems Approach Governing Business Dynamics and Circular Economy

The search for sustainable development in a complex human and physical environment requires global systems-thinking, able to decipher the prevailing relations and interactions between the various components of that macro-system.

An enterprise is part of that macro-system (or global system) but it is also, per se, a specific living system that is a micro-system (or subsystem) "with networks which continually create, or recreate, themselves by transforming or replacing their components. In this way they undergo continual structural changes while preserving their web-like patterns of

organization" (Capra 2002, p. 10). So, entrepreneurship is needed: "Future is not a Given" (Prigogine 2003).

What are some of the main features of that transformation process? First, we focus our attention on the enterprise considered as a living part of a global socioeconomic system, constraining but with evolutionary perspectives. Second, we discuss circular entrepreneurship's mission inside a specific living system.

1.3.1 The Enterprise: A Living System Part of a Global Socioeconomic System, Constraining but with Evolutionary Perspectives

A system can be presented schematically, as in Fig. 1.1.

The horizontal line refers to the duality—*opportunity, must*—that conditions the strategy adopted as a policy objective for the enterprise. The vertical line shows the *evolution* of the enterprise's functional *activities* imposed by the transformation process needed to change the existing organizational system. In the center of the figure is the "enterprise," considered per se as a micro-system, not necessarily a unique legal entity but possibly a group of interconnected partners.

It is important to notice that all these rectangles, considered as parts or elements of the subsystem, are interrelated, interdependent, interacting

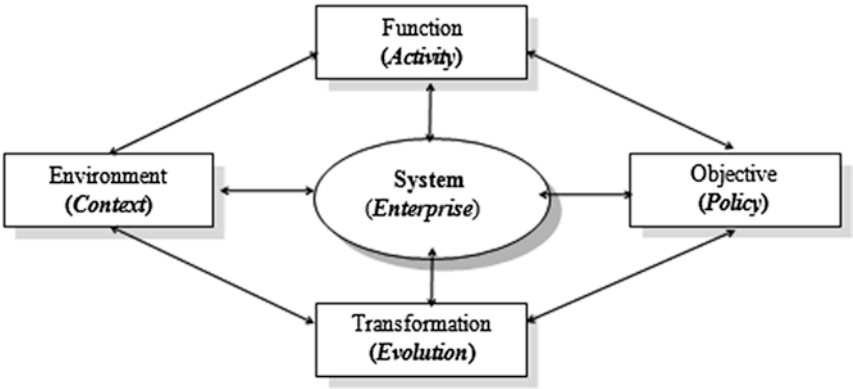

Fig. 1.1 A system's interrelations. *Source*: the author

in some way, as the sense and the number of the arrows suggest. But the straight line connecting the rectangles does not mean that the interrelations are simply linear. Systems do explore a complex reality, determined both by external decisions and forces (delivering opportunities and constraints) and internal initiatives, with possibly unexpected or changing feedback effects. Business context and a firm's strategy (policy) are evolving, changing the functional adopted activities of the enterprise (and connected partnership).

The "context" has a fundamental importance; it is a basic constraint or opportunity for entrepreneurship. The context has various components, all characterized by a certain power of influence: public institutions, cultural identities, philosophical vision, technological skills, scientific knowledge, law applied, including the conceptual relationship between "laws of nature" and human laws (Capra and Mattei 2015, pp. 4–6).

Until the end of the Middle Ages, cultures around the world observed nature very closely and adapted their way of life accordingly. Their observations were often couched in religious or mythological language, and, in general, nature and its laws where seen as emanating from God or some other divine power. These beliefs implied rules of human behavior that everyone was expected to follow; even law itself was a deeply spiritual concept, based on obligation and on the proper role of an individual within a community and in relation to the life-sustaining earth.

This early holistic, communal conception of the universe and the planet continued to be dominant until the scientific revolution of the sixteenth and seventeenth centuries which championed the study of matter and brought forth the mechanistic science of Galileo, Descartes and Newton. Nature was now seen as a machine made up of discrete, measurable parts.

As the holistic view of nature was replaced by the metaphor of the world as a machine, the goal of science became knowledge that could be used to dominate and control nature. A similar movement was afoot in legal thought. Ownership is considered as an individual right, guaranteed by the state, to develop nature, that is, to transform it into physical useful objects.

The human dominance of nature, advocated by lawyers and scientists, has produced an ongoing exploitation and destruction of nature with always more powerful technologies induced by the "industrial

revolution," begun in 1769 with the creation by James Watt of the first steam engine, and still in progress. This mechanistic vision of property and sovereignty is largely responsible for the dramatic state of affairs on our planet. Now we need a resource "revolution," which means also a paradigmatic change. Physical reality is a network of inseparable relationships; scientific knowledge should be used to learn from and cooperate with nature. On the other hand, social reality is also composed of social networks and communities; with adequate knowledge and education they are also able and willing to work on better relations between nature and economic activities (Brown 2017, pp. 155–161).

But the context is also a field of severe battles between more or less powerful actors in a market economy, supposed to be characterized by freedom of choice. Whereas an industrial strategy for change must be implemented in the long term, another part of the context, namely the financial markets, demands high short-term performances and low risk-taking (to reassure investors).

Aristotle's "chrematistic" economy has taken over from the social "*oeconomy*." In etymological terms, the word economy means "the rules of managing the shared home"; it comes from the Greek words *oikos* meaning household, the shared home, and *nomos* meaning the law. As Mikhail Gorbachev highlighted in his famous speech to the United Nations in 1988, our "shared home, our household, is now the planet." The challenge for the *oeconomy* is not to endlessly develop trade goods but to guarantee conditions of well-being for humanity as a whole, well-being that is not reduced to the quantity of goods and services consumed. It depends equally on the way which they have been produced and to what extend participation in the acts of producing, distributing and using integrates each individual into society. This process of production and use of goods and services must be achieved whilst protecting the biosphere. The wanted *oeconomy* is not based on arbitration between growth and environmental damage (Calame 2009). Unfortunately, up to now, this view, or this "must"-condition for survival, is not yet accepted as a rule in the financial sphere of handling. There, primacy is accorded to speculative gain without reference to the productivity of the real economy. Since 1971 (delinking of the US dollar from reserve assets), the deregulation of the monetary and financial systems spread to the world a situation that

had become aberrant in terms of sovereign debt and liquidity management. The international context of financial markets freely and instantaneously interconnected across the globe has imposed its own vision of global socioeconomic development. Hybrid countries, like China combining authoritarian state governance and capitalistic exploitation of global market opportunities, have learnt to take advantage of this situation. Competition is an expression of rivalry, an inescapable battle, not in favor of long-term challenges. The planet's environment is pleased to keep a stand-by position.

Financial markets are not alone in imposing their *diktat* on enterprises creating real and sustainable wealth. Political decisions, like those on taxation or money management, do affect the rules of the game, either from the production or the transactional point of view. The role of education and learning at all levels also appears essential. The quality of national educational and training systems has a large impact on workforce competences and employability, on talents support, and thus on socioeconomic development. The legal and regulatory landscape is able either to promote a social and environmental "desirable" context or to hamper the spirit of necessary change. The pricing of the CO_2 allowances, following the Kyoto Protocol, or the adoption (or not) of the agreement on climate change at the COP 21 (Paris, 2015) are eloquent examples.

But the context is not necessarily constraining in a compulsory mode. It may be helpful in a facultative mode. Context is also a space of cooperation, of collaborative supply. An illustration of that characteristic comes from the "World Resources Institute," WRI (Washington, DC).

WRI is a global research organization that spans more than 50 countries worldwide, including the USA, China, European countries, India, Brazil, Indonesia and others. More than 700 experts and staff work closely with leaders and entrepreneurs to turn big ideas into action to sustain the planet's natural resources. WRI focuses its activity on six critical issues at the intersection of the environment and development: climate (climate resilience, long-term climate strategies), energy (ensuring people everywhere have affordable, reliable, clean energy), food (supporting agriculture, the environment and sustainable development), forests (sustaining forests for people and the planet in the long run), water (mapping, measuring and mitigating global water challenges) and sustainable cities and transport.

The business element of WRI starts with data collection, research and draws on the latest technology to develop new insights and recommendations. The next step is dedicated to influencing government policies, business strategies and civil action. Third, WRI works with partners to deliver appropriate change on the ground and, once tested, supports this successful expertise regionally and even globally.

This WRI activity is much appreciated, even by successful and innovative large companies, like Saint-Gobain (179,149 employees, 1917, world leader in most of its business spheres—see case study Chap. 5). A long-term objective is to reduce the quantitative and qualitative impact of Saint-Gobain's activities with regard to water resources as much as possible, both on withdrawals and on discharges. Particular attention is paid to limiting the group's withdrawals in water stress areas and in not competing for access to drinking water with the local populations. In this regard, Saint-Gobain uses the WRI's "aqueduct" atlas of the world, which allows each of the sites to classify its water risk from "low" to "extremely high." This atlas is based not only on qualitative and quantitative physical risk (such as water stress or flood risk), but also on stakeholders' risk (like access to water). To support the application of its water policy on industrial sites, Saint-Gobain has defined a water standard that describes the minimum requirements that the sites must observe in future.

In Short

Circular entrepreneurship is promoted through the circularity of ideas, expertise and services. Circular management sustains responsible handling.

Another illustration of contextual entrepreneurship: new private and public organizations operating on a national, regional or professional level in order to develop a sharing economy.

In the main industrial countries, private or public organizations have been created in recent years to develop sustainable management of resources and transitioning towards a circular economy. Public organizations usually participate in the funding of valuable projects, support

research & development (R&D) projects, and have an active communication policy in the country; the private ones focus on cross-businesses or cross-activities exchange of experience and expertise, observe local regulations or habits and try to seize local partnership opportunities. The priorities generally declared concern the development of the circular economy: promoting industrial or user processes that incorporate a maximum of recycled content, generate a minimum amount of waste, recover the waste internally or externally, coordinate and expand R&D efforts devoted to reducing energy consumption and greenhouse gas emissions, conceive efficient ecosystems, and invest in technology to make value chains circular. It becomes a domain of a sharing economy. Nowadays we live in ecosystems where everything is connected, like in nature. Hence, we have to draw inspiration from the way nature works. A tree in a forest, for instance, delivers a lot of positive external products or services for use by the species that live around it; and that, completely for free (Wohlleben 2015; Helm 2016). It is a question of "natural" solidarity.

Human and technologic systems (like an enterprise) are "living systems" (Capra 2002, pp. 13–14), combining closed aspects of organizations and open characteristics (flows) of networks. They are not stable, rather *dissipative structures* (Prigogine) to mention the close interplay between structure on the one hand and forces of change on the other. Instability is connected to life, to development and evolution. *Creativity—the generation of new forms—is a key property of all living systems. Life constantly reaches out into novelty* (Capra). But life is not a machine (under control); life is delicate, ingenious and often unpredictable because of the occurrence of "points of 'bifurcation'" (described by Ilya Prigogine).

In Short

An enterprise, considered as a living system, is consequently able to learn and adapt to new circumstances, particularly to get "circular." But this target needs "circular entrepreneurship"!

1.3.2 Circular Entrepreneurship's Mission Inside a Specific Living System

From a systemic point of view, useful for understanding entrepreneurial phenomena, a firm can be considered (either or all together) as a mechanical system (reference to the work of F.W. Taylor), an organic system (with the characteristics and behavior of human beings), a cybernetic system (focused on communication processes, feedback and self-regulation able to compute and adapt automatically), and a cognitive system, focusing on knowledge (Golinelli 2010, pp. 21–50). The firm is considered *per se* an open system with numerous exchange flows with the environment (input–output analysis). Our purpose is not to deliver a Leontief model able to measure this complex reality, but to try to understand how some enterprises manage their development in such a context with regard to their social and environmental responsibility.

In a complex social and technological context it looks quite evident that no unique best practice or model exists. The globalization process can be apprehended as a "windy whirlpool" (Delmas-Marty 2016). There are dominant winds and contrary winds, blowing with changing forces, releasing energy, sources of ideas and actions. Each "entrepreneur" (a given person, or decision maker, board of directors, senior management committee) must evaluate these forces, taking into consideration their possible impact in relation to the characteristics of his or her enterprise, or *the* "boat" of which he or she is in charge, that needs a navigation plan in harmony with its own strengths and weaknesses. But circular movements of inputs and outputs are always important regulation factors to be activated. The entrepreneur is dedicated to be such an "activator." Nicholas Stern underlines in answer to his question *How We Can Save the World and Create Prosperity* (Stern 2010), the importance of "the power of example." Each example gives an illustration of what can really be done in its diversity (of features, countries, activities, organization) even when the collective aim is the same (protect Planet Earth and all the humans living there). Each story, each successful practice, is able to deliver a message to another actor, an idea to become also a good player in this dramatic game in which we are all involved. We need positive spillover effects.

Finally, what is important concerning circular entrepreneurship initiatives and handling? Many answers are feasible:

1. Create wealth, design goods and services that are really useful and needed by people (reliable markets for the future) and implementing sustainable methods to achieve this target.
2. Allocate investment resources to drive sustainable performance.
3. Use digital technology to serve customers or users and profit from their experience, analyzing their data and anticipating their needs.
4. Create sustainable competitive differentiation through innovation and R&D.
5. Adapt production processes promoting the incorporation of recycled materials, minimizing waste production, especially non-recoverable waste.
6. Work on reducing the CO_2 footprint, on policies reducing energy consumption for business activities, for infrastructures and transport.
7. Develop communication and training concerning circular solutions.
8. Work on efficient organizational activities (agile, flexible, partly decentralized, rapidly reactive, competent) suitable for change management.
9. Circular economy is inclusive: it stimulates a world of flows and work to connect value chains with each other. In recent years, two trends have emerged from companies embracing the circular approach: closed loops for optimal use of raw materials, and open-source sharing. Clients and customers are often involved in the development of new products and services, and also tend to be suppliers. Moreover, crowd funding enables neighbors, friends and individuals to be involved, for example in an architect business-ecosystem. Many mutually beneficial relationships are built through circular economy projects. Including intangible assets, the circular economy is based on a combination of closed loops and open networks.

Pragmatic and methodical implementation practices are essential to succeed on the way to circular entrepreneurship.

An illustration of pragmatic and methodical implementation of a firm's strategic vision concerning the transition to circular economy is given by SUEZ, one of the leading players in the resource revolution, and a global leader in the water and waste sector (see case study Chap. 5). An efficient program has been conceived from the beginning of the transition to circular management decisions, to be achieved step by step. The first detailed "road map" covers the period from 2008 to 2012.

Four *priorities* are mentioned: (1) Conserve resources and engage in the circular economy; (2) Innovate to respond to environmental challenges; (3) Empower employees as "actors" of sustainable development; (4) Build development with all stakeholders.

These "priorities" are divided into 12 *commitments* to environmental, social and societal performance. Examples: concerning the first priority: (1) "Optimize waste recycling and recovery rates"; (2) "Increase the yield of drinking water networks"; concerning the second priority: (3) "Reduce greenhouse gas emissions": (4) Improve energy efficiency; concerning the third priority: (7) "Foster professional knowledge"; (8) "Continuously strive to improve health and safety in the workplace"; concerning the fourth priority: (11) "Be a key actor of local sustainable development."

Each of the 12 commitments includes *goals* for 2012; almost all of them were achieved. Examples include: for commitment (1), "Raise the global recovery rate of household and non-hazardous industrial waste to 36%"; for commitment (3), "95% of the waste landfilled by SUEZ Environment is sent to sites equipped with biogas collection and treatment systems"; for commitment (7), "Maintain the efforts to provide an average of 15 hours of annual training per employee"; for commitment (11), "implement a dedicated reporting system for this commitment."

This *first* detailed road map was also a powerful tool for transforming SUEZ's business, allowing them to imagine and define *new modes of governance* to better engage its customers, regional authorities and other stakeholders in the solutions offered. These new approaches became *competitive assets* for the SUEZ Group.

The second road map covering the period from 2012 to 2016 was primarily focused on matching the solutions proposed to customers and their expectations in terms of water distribution and waste treatment. The concept of *co-production* became a key focus of the new road map. The solutions designed by SUEZ are the outcome of a *dialog* with its stakeholders, strengthened within the *consultative structures* in place.

Following on from the previous roadmaps, *the third roadmap* 2017–2021 has been conceived as a guidance tool for the group's transformation strategy (see SUEZ Reference Document 2017, pp. 99–127). It covers all the group's business activities throughout the world and supports the resource revolution through its two main functions:

- to act as a *lever of SUEZ's transformation* and as a tool for *management control*: comprised of 17 measurable commitments with specific deadlines and action plans to reach the objectives by 2021;
- to contribute to the Sustainable Development Goals, as defined by the United Nations in 2015.

The four priorities of this new roadmap are called:
Priority 1: Be a collaborative, open and responsible company,
Priority 2: Be a leader in the law-carbon circular economy,
Priority 3: Support, through practical solutions, our customers' environmental transition,
Priority 4: Contribute to the common good (act to protect the environment and the oceans, promote biodiversity and ecosystem services, contribute to the local development and attractiveness of territories).

In Short

Circular entrepreneurship is correlated with ethical strategic management. Management's philosophy and pragmatic handling must be in phase.

1.4 Circular Entrepreneurship and Entrepreneurial Responsibility

1.4.1 Circular Entrepreneurship: A Multifaceted Responsibility

As mentioned already, a paradigmatic change needs strong entrepreneurial leadership due to the large responsibility engaged. The leadership process involves (1) setting a direction for the organization, (2) aligning people with that direction through communication and argumentation, (3) motivating people to action and performance and (4) controlling complexity-management in the organization and its environment.

Entrepreneurial responsibility is linked to its legal or institutional and normative context. It is also a moral commitment generated by educational and cultural background, and by the philosophy of the enterprise's

governance. These three kinds of factors are not exclusive; they are also combined and all-binding, but to varying degrees.

To illustrate this assertion we seek to observe what really happens on the field. The influence of enterprises on humanity's socioeconomic life and in the equilibrium of the global ecosystem appears, in fact, to be ambiguous and constantly changing. In any case, the enterprises are pivotal players, capable of playing a leading role as responsible organizations and able to impose their logic, good or bad, on other actors of the system. Entrepreneurial responsibility, in different forms, is huge.

Industrial entrepreneurial decisions do have an impact on a company's activities, and thus on natural ecosystems and stakeholders. It is not simply a matter of knowing whether the goods and services are produced and consumed in a more or less resource-sober way; but social impact needs also to be taken into consideration. Entrepreneurs are transforming the global economy, each global project generating positive or negative interactions, inclusive or not (Alexander and Reno 2012). The breakaway from linear models applies not only to tangible resources, it also includes intangible resources and contextual assets like local territories and landscapes. The use and reuse of tangible *and* intangible assets are drivers of growth and progress. This evidence should be accepted on a worldwide scale, and in the near future. Peace on our planet depends on better living standards for all, according to more environmentally sober and more socially inclusive models (co-construction of circular programs). By its very essence, the circular economy is collaborative, built on partnerships. The circular economy introduces new players' relationships. Right from the design phase, products and services must be created with users in order to better meet their needs and to evolve towards the made-to-measure. Solutions to socioeconomic problems must be developed together: it is together a "must" and a hopeful "opportunity."

The way to that desirable future is not easy to design, even if entrepreneurial responsibility and good will can be considered as powerful. The support of other actors, like local administrations and authorities, financial institutions and NGOs, is important.

Let us sum up: one of the main aspects of entrepreneurial responsibility is wealth creation—that is the production of goods and services, innovations, contribution to the development of knowledge—and all that

means added value for humankind (Zucchella and Urban 2014). In the case of circular economy promotion this added value is the outcome of production processes aiming to do "better with less" or "more with else." That activity depends, in a market economy, on a firm's ability to stand up to competition, to innovate earlier and in a more efficient way than the competitors. The development expectations of an enterprise depend, as will be discussed, on many systemic elements, external and internal, that shape organizational change and innovation. Innovation requires not only good ideas and trust, but also financial resources, human talents, and above all a solid sense of creativity and acceptance of risk. The risk is usually borne by a team (or a board of directors, a management committee or a shareholders' decision), but it is ultimately borne by only one person, a *conductor* at the head of the organization (Urban and Zucchella 2011). The responsibility related to the risk involved is heavy because the market response may be such that the very existence of the enterprise is jeopardized or, on the contrary, that its growth and financial performance are boosted. Disruptive decisions with high stakes, which are essential in a rapidly changing world, are prompted either by the need to adapt the enterprise (an urgent "must") or by speculation based on a proactive view of the future (an opportunity). Such speculation presupposes on the part of the decision maker a sound ability to gauge technological, socioeconomic, cultural and political changes, but the key to that approach is the will to dare, a core characteristic of an "entrepreneur."

The second aspect of entrepreneurial responsibility is the allocation of resources. The wealth created is reflected in the distribution of resources throughout society (in its regional, national or international dimension). A famous French economist and physician, François Quesnay, who in 1759 made probably the first circular analysis of a socioeconomic "system" (which subsequently inspired K. Marx and J.-M. Keynes), compares the production/distribution process of new resources to the flow of blood in the human body. A society without sufficient wealth creation is anemic. Conversely, an adequate distribution of created resources stimulates social peace and happiness.

Enterprises participate intensively in the allocation of resources, either directly or indirectly: directly through job creation and the subsequent payment of salaries, through the distribution of dividends and other

forms of return on equity; indirectly via corporate income tax or other various taxation modalities. The application of circularity principles has an impact on that creation–distribution model. Some of these resource–distribution decisions are compulsory (through taxation for instance) and others are optional depending on entrepreneurs' decision-making and sense of responsibility.

The circular economy also creates new relations between enterprises and territories. Thanks to digital technology, new activity location policies are gaining momentum. All stages of the value chain are getting concerned, from design to manufacturing, to distribution, to use, to valorization of materials and substances, to the creation of new business models. The Internet of "Things" is pushing industry into a new digital age, the "4.0," where flows of goods are better connected and where the use of resources and finished products can be identified and optimized.

New management methods are invented, for example *reverse cycles management* (new supply chains where end-of-life resources are reintroduced at the start of the cycle) or *cross-cycle and cross-chain collaboration* between players in the same production cycle or the same value chain or the same country.

To explain in other words these entrepreneurial responsibilities in the circular economy venture, it is possible to call to mind an apparently very different, but familiar to all, domain: the world of music.

1.4.2 Responsible Resource Management: The Challenge of a "Conductor"

One can consider that music is also a "resource," like natural resources are; it is a resource for our soul, to make it happy or to console it; it is partly renewable. It is a universal resource: for everybody, children and adults, females or males, young or aged, in all countries. It occurs in all circumstances of human life. It may be a very individual creative process or a collective one. Music is subject to "circular management." It is a resource, captured or created somewhere, used and reused possibly somewhere else.

Let us consider the case of a collective organization, a symphonic orchestra: it is in charge of giving life to music, to transform silent musical

notes, printed matter, into sounds made of "vibrations coming into resonance," able to produce emotions in the audience. The masters of this fantastic transformation process are the conductors; they create a circular event. They are not inventors of the melody but they, and the members of the orchestra, transform this silent "given" by a composer into audible reality, which can be registered, sold, or neglected and disappear. A second element of that melody creation is the "harmony," combination of sounds or coproduction of tunes. All the musicians must work together, observe the conductor, listen to the other "tune producers" of the orchestra. The third element of this audible creation is the "rhythm," the same for all the musicians, under the exclusive responsibility of the conductor. Finally, the quality and the fascination of the concert is a delicate result of "interaction" between the conductor, the musicians and the feeling of the audience.

The conductor is altogether the leader of the game, a decision maker, the coordinator of all the players, each of them having an individual role in producing marvelous sounds, even if the space for autonomy is narrow. The conductor is a core element of the concert's success, of its atmosphere, of the desirable empathy between all the members in the hall, musicians and audience. An emotional shock becomes an intangible, memorable capital. The result of this creative musical process differs from one conductor to another; each has its own interpretation of the existing written work of the composer. The outcome is a unique kind of alchemy, achieving transmutation of silence to sounds, individual and collective emotions through common vibrations at different frequencies.

Business alchemy is comparable with this musical phenomenon. "It offers a sense of purpose and meaning, collaboration and connection, fulfilment, success and recognition, a sense of authenticity, achieving career dreams and actualizing new levels of potential. Business alchemy explores the hidden internal dynamics. It is about taking responsibility for the environment that we create" (Wallas 2017, pp. 166–168). Like a music conductor, "a business leader creates our outer world from his inner world. The fundamental truth about the universe is that everything is connected. A business entrepreneur is a 'projector'" (Wallas 2017, p. 170)," who is partly responsible for the environmental and human future. Creating the future, especially in a disruptive context like resource revolution, calls for a responsible circular entrepreneur,

needing important attributes: the courage to choose; the clarity to focus; the curiosity to explore; the conviction to persevere (Anthony et al. 2017).

Entrepreneurship is confronted with a hard challenge in the long run. But attitudes and talents are quite similar for a leader creating a responsible enterprise through circular management and for an orchestra conductor giving life to music for a present moment. The business "melody" is displayed in the development road map; the "harmony" concerns the organizational management, the "rhythm" depends on the time needed to acquire the adequate means (including human and scientific resources) for the transformation process to circular economy. In both cases (conductor or entrepreneurship) methodical preparation-work and a good deal of communication-energy are essential.

1.4.3 Some Short Entrepreneurial Responsibility Stories: The Era of Circular Principles Stimulates Creativity in Various Socioeconomic Domains

SUEZ, as already mentioned, is a well-known industrial company, exclusively dedicated to water and waste activities on a world level. What is not so well known is that, at the initiative of its two main leaders of the board of directors, Gérard Mestrallet (Chairman) and Jean-Louis Chaussade (Chief Executive Officer) SUEZ became a kind of "think-tank" devoted to the "resource revolution" and the circular economy. Two publications, *Open_resource* magazine (2017) and a book entitled *21 voyages aux pays de la nouvelle ressource* written by Erik Orsenna (2017), are of special interest. Their aim: to "stimulate innovation and entrepreneurship, reconcile growth and environment, promote the great thoughts and solutions proposed by those who are imagining and conceiving the future of the resource, encourage collective intelligence and collaboration, promote local experiments to favour use rather than possession."

Below, we offer three examples, giving an idea of this new industrial revolution, changing our lifestyle, our behaviors as consumers, our modes of production and adopting a radically new approach to management (circular management of natural resources).

Illustration: A New Sector for Circular Entrepreneurship Responsibility—Building Design

Superuse Studios is an architecture office founded in Rotterdam, in 1977, by Césare Peeren and Jan Jongert. It has become a pioneer in the field of sustainable design: a design not considered as the beginning of a linear creation process, but as a phase in a *continuous* creation and recreation, use and reuse, circular approach.

"Waste is a source of inspiration" (Jan Jongert). "At Superuse Studios we have radically reversed design practice. We not only design a spatial form and find afterwards the most appropriate materials. We also study the project and its environment to find available resources nearby that we use as building materials. Then we propose to transport the minimum amount of them and to give them a new function. It is pretty much the same when you cook. You can either come up with a recipe and then buy all the ingredients needed or either be inspired in the kitchen by the leftovers from previous purchases to create a meal from these.

By working backwards we force ourselves to look at the entire construction chain from a different angle. As we like to tell ourselves we no longer do business with the sales department of a company, we do business with the production department and the waste processor (at a low price).

With the circular economy, we enter a world of flows. These flows go through a circuit and work to connect the value chains with each other. Each payment for a purchased product is an investment in a process that adds more or less value in the chain.

In recent years, two trends have emerged from companies embracing the circular approach; closed loops and open networks. Open-source sharing is becoming common. Clients or costumers are often personally involved in the development of new products, but also tend to be suppliers. Moreover, crowdfunding enables neighbours, friends and individuals to be involved in the business-ecosystem. In the past century, the tendency has been to reduce complexity and separate activities. But, like in nature, resilience and biodiversity can only thrive if many mutual beneficial relationships are built and maintained.

Existing materials have very specific technical and aesthetic properties. The design of an object or a building is strongly subject to these characteristics. As for us, we look at design and construction processes in a dynamic way, resulting from a combination of involved partners, the environment, available material and the program. To increase our positive impact, Superuse Studios opened a subsidiary in China to upcycle the vast and polluting flows of waste in this country.

As a consequence of our open-source approach, we developed tools and methods that are available to other entrepreneurs who want to create value waste streams. In 2012 Superuse Studios built an online platform

Harvestmap.org, which presents more than 250 common material flows. We created this platform for the need of our activities in identifying waste-flows but also to help other designers to find materials. Its goal is also to support new circular entrepreneurs to start their own mediation company. Harvestmap.org now has active communities in Detroit, Vienna and China."

Source: *Open_resource* magazine, 4, "The Inclusive Circular Economy," pp. 66–79, 2017

Illustration: New Builders of the Energy Revolution—Biogas Entrepreneurship

Biogas is emerging as a new source of renewable and local energy that contributes to the reduction of greenhouse gas emissions. Its production cycle is based on the methanation of the sludge produced by the wastewater treatment of municipal, industrial or agricultural waste and also of organic storage facilities. The produced biogas can be used to produce renewable energies: electricity, heat, fuel that does not emit any fine particles and hardly any nitrogen oxide. In France the government adopted in April 2016 a new regulation law supporting this biogas technology and its use, causing it to grow rapidly. Biogas development became also part of the European Union strategy on renewable energies. SUEZ is a pioneer partner of biogas coproduction and supports the development of new responsible innovators and start-ups in that methanation field. Local authorities were quick to show an interest in biogas because this new circular production cycle offers the means of developing locally sourced renewable energy and reducing pollution of cities and other local territories. A fossil product, which is often imported and emits greenhouse gases, is replaced by a neutral product in the network that is produced and consumed locally. Such short-circuit rules have been adopted in Strasbourg with the so-called "Biovalsan project," a joint venture between the City of Strasbourg, its GDS-mixed economy gas distribution company, and SUEZ. This pilot project was developed with the financial support of the European Commission LIFE program for the conservation of the environment. The goal for Strasbourg was to become the first city in France to inject biomethane from a wastewater treatment plant into the urban natural gas network. Moreover fuel made from biomethane addresses the issue of clean and sustainable mobility.

It's a matter of quality of life-well-being and health responsibility.

Source: *Open_resource* magazine, 4, "Biogas Expertise: The New Builders of the Energy Revolution," pp. 80–89, 2017

Illustration: Social Entrepreneurial Responsibility—Combatting Poor Housing Crisis with Bricks Made of Recycled Plastics—*Conceptos Plàsticos*

Conceptos Plàsticos, founded in 2010 by Oscar Méndez, an architect by training, from Colombia, is a company recycling plastic waste into plastic bricks. The material can be used to construct buildings, quickly and easily, in an effort to respond to the poor housing crisis in the country. This circular entrepreneurship initiative is also environmentally friendly.

Conceptos Plàsticos was founded using plastic waste rather than traditional materials, and the company has saved more than 8000 barrels of oil, 66,000 kilowatts of energy, 1650 tons of CO_2, and almost 100,000 liters of water. "Conceptual Plàsticos [CP] was born of the desire to address both social and environmental issues. For me and the other co-founder of CP, Fernando Llanos, building decent housing in the shanty towns, and especially in rural areas, was a way of engaging local communities. They are blighted with poor housing like everywhere in Colombia, mainly due to movements of population fleeing violence. And from an environmental point of view, plastic waste is a real scourge that must be addressed. One solution consists of recycling it. My doctorate in architecture looked into the use of plastics in the construction industry. Only a very small portion of waste, and of plastics in particular, is recycled in Colombia. So, in 2010, we started working on CP, and eventually launched the project three years later, so that we had enough time to develop the product.

We collect different types of raw materials thanks to the hard work done by NGOs and recycler associations (collecting and reselling waste). It includes packaging and products made up of different plastics that are difficult to recycle and often end up in landfill sites. We also work with the producers of packaging materials and companies that dismantle electronic appliances. Our production plant near Bogotà can recycle up to 250 tonnes of plastic per month. The plastic collected is washed, sorted by type and then mixed with additives to give it the physical behaviour we want. Then we extrude it in moulds so that it densifies. We produce different types of blocks that can be used to build 100% plastic houses, from the structure to the isolation, to thermal and acoustic capacities, and they are even more weatherproof [than other forms of housing materials].

The housing units made of our materials are very easy to build, especially in emergency situations. This solution is particularly well suited to the poorest populations for whom we have set up a partnership with the Inter-American Development Bank, which provides access to our solutions through saving schemes."

Source: *Open_resource* magazine, 4, "Combatting Poor Housing Crisis with Bricks Made of Recycled Plastic," pp. 55–59, 2017

In Short

Our world at risk needs altogether innovative ideas, a spirit of entrepreneurial responsibility, a sense of collaboration and systems analyses capabilities.

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2

Circular Entrepreneurship: Triggers and Backgrounds to Value Creation

2.1 Introduction

In Chap. 1 we presented an overview on the important challenge with which entrepreneurs are confronted, facing a disruptive socioeconomic reality. In this chapter, we intend to proceed with a more systematic investigation concerning entrepreneurial motivations to act in the present challenging context. What must or should be done, and why? What has already been done? Observations on the field and literature analysis on this topic deliver interesting answers.

Like in the world of music, one can discern a "theme with variations." The theme is "value creation," in the largest sense of the term; the variations illustrate the various features of that value created by enterprises implementing circularity principles (see Box 2.1). The understanding of that implementation (partial or extensive) differs according to enterprises, activities or countries. In a capitalistic system with a dominance of free market economy it is logical to expect that the value created deals first with the financial performance of a given enterprise; but things are changing rapidly towards a *socially responsible enterprise* (our title).

A. Zucchella, S. Urban, *Circular Entrepreneurship*,
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An entrepreneur is at once a representative of humankind (while also pursuing personal goals) and at the same time a functional person responsible for a firm's economic, social and financial performance (a firm thus supposed to be managed with a rational optimization vision) (Leoni and Usai 2005, pp. 83–97). But a firm's objectives are today only one facet of the decision-making process. Global, holistic, environmental considerations and cultural background of the decision makers appear as key factors of that rather recent evolution. In the following sections, we review some major features of that paradigmatic change in progress:

2.2. Circular entrepreneurship and natural capital preservation: a value becoming dramatic actuality;
2.3. Circular entrepreneurship, resource productivity, firm's profit enhancement: "values" becoming a growing factor of competition;
2.4. Circular entrepreneurship and ethical values promotion: the future of humankind and peace at stake.

Box 2.1 Some Major Features of Value Creation by Circularity Principles Implementation

A. Natural Capital Preservation

(a) Target-invention of new processes and products: *more and better with less*. Credo: don't be wasteful.
(b) Promotion of circular economy principles across the whole value chain; global spillover effects and individual competitive differentiations.
(c) Eco-innovative policies to take into account the environmental impact of created goods and services across their whole life cycle; production of more durable goods, waste decrease.

B. Resource Productivity Increase and Profit Stimulation

(d) Development of waste recycling; reuse techniques, remanufacturing; avoidance from possible raw materials shortages and disruptions due to increased political instability in key countries: risk reduction.
(e) Dialog concerning the circularity principle with all stakeholders: customers, users, suppliers, employees, shareholders, research centers, policymakers, financial markets; efficient target management

(meeting stakeholders' real expectations); marketing of circular economy principles, transparency, new investments attraction, social return, individual and collective values promotion.
(f) Frugal economy return for circular-minded enterprises: purchase cost reduction; positive image building: trust-push in enterprise's capabilities leading to business expansion in a new era.

C. Ethical Values Promotion

(g) New skills and abilities creation (long-term oriented), technological and organizational learning, useful knowledge transmission; promotion of collective creativity.
(h) Sense of responsibility and solidarity-oriented behaviors enhancement.
(i) Ecosystems health and bio-diversity restoration.

2.2 Circular Entrepreneurship and Natural Capital Preservation: A "Value" Becoming Dramatic Actuality

Let us remember that in open-living systems a modern socioeconomic society uses diverse types of capital: material, intangible, human and natural, interconnected through different kinds of flows: information, work, natural resources. The "resource revolution" initiated by circular entrepreneurship does concern both: natural capital, today at risk, and natural resources, often misused and over-exploited, by men or by economic activities.

Natural capital is a gift offered to all humans living on Planet Earth, in the past, the present and the future. From the beginning of history it is not a space or a matter dedicated to one or more specific categories of humans. It is a gift for every creature.

Natural resource flows illustrate the quantity and the quality of resources exchanged between all individuals or collective actors. But a core problem is, at what price? Or eventually at none (i.e. free). This central question has not been solved by economic "science" up to now. The answer is still open: open to all possibilities, to all excesses generated by power games, by corruption practices, by unfair handling, by lack of guidelines. Exchanges of natural resources do of course interfere with

natural capital preservation. The outcome is, inter alia, a big resource-allocation problem.

Without an adequate management and valuing of natural resources exchanges, the dramatic outcome, now visible, is the destruction of our natural environment (Helm 2016).

Pricing and Valuing Natural Capital Matters

"Absent a carbon price, carbon will be over-produced—as it has been with potentially catastrophic consequences. Absent prices for sulphur, for particulates in diesel, and for nitrates, and our air may choke us, our rivers and lakes become eutrophic, killing fish and invertebrates in the process. Without a price, fishing will be without limit. The eutrophication of the Great Lakes, between Canada and the US, the collapse of the cod stocks in Canada's Grand Banks, and the large numbers of premature deaths in China's cities are all examples of what happens when there is no price. Not even London and New York escape the consequences of air pollution [etc. …].

We continue to pollute our atmosphere, and our oceans, and to denude the planet of its global biodiversity.

It might be argued that the obvious solution to all these problems is prohibition and preservation. Nature should be left alone. Such naïve utopianism gets us nowhere." (Helm 2016, pp. 4–5)

However, from a methodological point of view, pricing and "valuing the planet" is a very difficult and controversial venture, requiring moreover a good deal of time and financial resources. Hopefully, complementary or alternative measures can be applied (Chalendar 2015). Facing this massive and complex problem of natural capital preservation, circular entrepreneurship appears to be part of the solution, for at least three reasons. First, circular entrepreneurship is pointing out the way for acting immediately in the wanted direction to save natural capital even if a precise price calculation of its economic or social value is not already available. Second, circular entrepreneurship gives a clear demonstration of the powerful force of the willingness of a few leaders, combined with new technologies' use. Third, numerous and outstanding global analyses on the "tragedy of the commons" (UNEP 2002, pp. 2 and ss) have been undertaken since the 1970s, but the corresponding "global responses"

(UNEP 2002, pp. 417–470) are not sufficient or adequate enough. Time of change in socioeconomic life is accelerating when natural capital is dangerously suffering.

In Short

Entrepreneurs and states are the main transformation actors of sociopolitical systems; they need, with other decision makers (territorial and financial institutions, research centers, consumer organizations, NGOs) to work hand in hand.

2.2.1 Natural Capital in the Centre of the Problem of Shaping a Sustainable Future

The first question to elucidate is, What does natural capital mean? and second, What are the ways to "preserve" natural capital?

2.2.1.1 In Search of a "Natural Capital" Concept

Natural capital is an asset that is of value to its possessor, like other assets. Some elements of natural capital can be bought by private actors, public institutions or businesses (for example a piece of land, a gold- or coal-mine), others not, because they are considered as "common goods" (a river, an ocean etc.). "Natural" capital is an asset that is not created by humankind; it is not a result of an investment decision; but the management of this natural asset may differ with the adopted political governance systems' rules: more freedom to buy, sell and exchange in a so-called liberal democratic regime, dominant bans inside a collective regime.

A second important characteristic of natural capital concept is its ambivalence: some sorts of "natural" capital are non-renewable (fossil energy resources like oil, coal, mineral resources disappear after a first use), others are renewable (solar energy, windmill energy, some water resources). A major question does arise: Is it possible to keep back at least part of the "non-renewable" resources for future generations, as suggested by the UN Brundtland Report 1987, and this at a worldwide scale? It is

hard to imagine that issue. What else? Transform present demand for non-renewable resources and offer renewable natural resources or innovate and create new industrial resources, new products and new services, new processes, without damaging—as far as possible—the stock of non-renewable natural resources. This trend is at work in the circular economy and in the so-called resource "revolution."

At any rate, use and management of natural capital should differ according to that essential duality: renewable or non-renewable. It is evident that such a fabulous task cannot be achieved from one day to another. A lot of goodwill initiatives or compulsory regulations have to be coordinated. Circular entrepreneurship is adapted to such a step-by-step efficient process.

Other evidence must be kept in mind: humankind is not able to survive in the long run without a sound environment; to be clear, this means available natural resources (needed in quantity and quality), a healthy climate, correct biodiversity, balanced global ecosystems. This can no longer be avoided. Circular entrepreneurship offers many useful possibilities.

In Short

Use and management of natural capital must differ according to its duality: renewable or not.

2.2.1.2 Various "Preservation" Forms

Natural capital-"preservation" may have diverse acceptations (UNEP 2002 and 2016), for example:

- keep at least a given measure of pollution or other deterioration considered in the past as acceptable;
- respect specific norms quoted for a given business activity, or for a territorial area, or in the mind of international organizations;
- promote the transition of industrial processes from non-renewable to renewable natural-capital resources' use;
- innovate to develop more frugal production processes and consumption practices;
- protect the commons (public goods) or specific areas like the Arctic zone or Amazonian forests, and other wild, large-scale territories so important for human health all around the world;

- promote atmosphere quality (UNEP 2012, pp. 33–67), river restoration, land restoration, marine restoration (Helm 2016, pp. 205–219);
- work on balanced ecosystems; reduce dramatic climate change tendencies. Concerning that topic, the recent IPCC "Special Report on 1,5°C," published Oct. 2018, delivers the alarming impacts of global warming in the fields of sustainable development and efforts to eradicate poverty;
- protect or restore a maximum of biodiversity;
- respect all the living components of the biosphere.

Biodiversity is a fundamental characteristic of natural ecosystems, that cannot be reproduced because it is the result of an infinite diversity of regulations that humankind is not capable of reproducing artificially (Calame 2009, pp. 261–264). Biodiversity is essential, both for the maintenance of sound common goods and the survival of humanity on Earth. Human well-being is correlated to biodiversity and ecosystem services (UNEP 2012, p. 146).

Concerning the survival of humanity, the impact of anthropogenic CO_2 emissions on global human nutrition is a growing subject of research (see for instance: special issue of the *Journal for Nature Climate Change*, 2018; *Nature*, 2014; *Harvard Geo Health*, 2017). Why? Atmospheric CO_2 is on pace to surpass 550 ppm in the next 30–80 years. Many food crops (including rice) grown under 550 ppm have protein, iron, zinc contents that are reduced by 3–17% compared with current conditions. That means that public health it at risk; illnesses, young children complaints and anemia will develop in the future, and immunity systems will become more frail.

However, in all these situations, circular economy appears as part of the global solution; but this consideration does not mean that circular economy plays an exclusive role to tackle the challenge. Other decisions may become helpful.

In Short

Circular entrepreneurship is very multifaceted and becoming a collective practice. Thinkers, doers and users are co-creating a new socioeconomic model. It is the beginning of a long process.

Table 2.1 Engie: Key figures 2017

Brand	"Engie," French multinational company (corporate headquarters in Paris)
Employees (world)	155,128
Activities (countries)	In about 70 countries
Activities (production)	• Power generation • Power distribution (power networks) • Integrated solutions for customers
Revenues	€ 65 billion
EBITDA (Earnings Before Interest, Depreciation and Amortization)	€ 9.3 billion

Source: Registration Document 2017

2.2.2 Illustration of an Entrepreneurial Responsible "Natural Capital Preservation" Policy: Engie, a World Leader in the Energy Transition

We address two major concerns here: (1) Limiting the use of natural capital resources, implementing producers' and consumers' strategies moving from non-renewable to renewable resources, and (2) limiting damage done to the *quality* of natural capital and resources (particularly through an uncontrolled climate change process), moving from high-polluting to cleaner energy production (Table 2.1).

In 2015, Engie launched an ambitious repositioning project (a three-year drastic action plan and a new organization profile, from 2016 to 2018) to make the brand "the champion of the new energy world" (Isabelle Kocher, CEO, Registration Document 2017, p. 3), inventing the sustainable energy world of tomorrow.

The "world of tomorrow" is characterized by a specific *context* (see Fig. 1.1) that can be developed as follows:

- a rising demand for energy (especially in high-growth countries);
- a new industrial and social revolution driven by digital technology and other scientific inventions. Firms must conceive new efficient software portfolios;
- people seeking more comfort, security and participation (decentralized units);
- contextual change at a high pace, generating new kinds of risk and tough competitive challenges.

Engie tries to be in the forefront of evolution, with clear management resolution, anticipating the future with strategies boosting renewable energies and energy efficiency, creating new business connected to stakeholders, rather than being an ordinary follower. To be a leader in energy transition in Europe, the group relies on innovation to meet customers' new requirements.

To get a better understanding of what such revolutionary strategy (rethinking the global energy landscape) means on the field, we propose to present some concrete emblematic examples.

The climate change challenge concerns the quantity and the quality of natural capital and natural resources available for present and future humankind; their "preservation" is a physical and moral "must." The problem is not easy to tackle because the causes are still considered controversial, is it in political, scientific or economic spheres.

But some evidence is quite generally accepted; this is the case with the negative role of carbon dioxide (CO_2) emissions, creating diverse and severe damage to natural capital (atmospheric pollution, climatic warming, impact on agricultural soils, forests, oceans, rivers etc.).

In a market economy the idea that the price of an exchange is an efficient indicator of handling is dominant. If the price of CO_2 emission is high, the propensity to emit will be low. That was one leading proposal of the Kyoto Protocol (adopted by the participating "Parties" [countries] in dec.1997). The second important agreement was the acceptance by each "Party" of a "quantified emission limitation in accordance with its national circumstances" (art. 2). In reality this signed compromise has proven not very efficient. The quantitative quotas accepted as rights to emit CO_2 and other greenhouse gases, their pricing, the non-participation to that consensus of high-polluting countries are all causes of poor global results. That underlines the importance of voluntary decisions taken by individual enterprises.

Some of Engie's strategic orientations are as follows:

- Adoption of low CO_2 power generation mix and development of strong positions in renewables (solar and wind energy); the energy created by sunshine has no cost in the beginning of its creation. Solar energy produces more than 20 times the total need of energy worldwide (I. Kocher, CEO, Meeting in Strasbourg on 08.01.2017). Engie is developing very quickly its photovoltaic business in Canada, Italy, Belgium, the Netherlands, Chili, Brazil, USA, Mexico, India, South-Africa and other countries. Its objective in that activity: world leader position.
- Gradual end of its coal activities. In 2016 Engie announced the sale or closing of more than 50% of its coal capacity (with high CO_2 emissions).

- Create a leading energy company supporting countries in their move towards the energy transition. Example 1: Construction in Indonesia of a geothermal power generation plant. Example 2: In China, ENGIE enters the solar market by acquiring a 30% equity investment in Unisun, a solar photovoltaic company. Example 3: ENGIE will build and operate the Sainshand wind farm in Mongolia. Example 4: ENGIE North America acquires Infinity Renewables and thus considerably expands its wind development portfolio.
- Developing the uses of natural gas to replace more carbon emitting energies and paving the way for green gas in the future. Biogases, such as methane, result from the fermentation of organic waste in a depleted air environment such as landfills and wastewater treatment plans. Such fermentation is the result of a natural or controlled bacterial activity. As such, biogas is classified as a renewable energy source.
- Investing in new renewable energy resources, like marine energies. Tidal power is a renewable marine energy produced by sea currents, which produce no pollution or waste. New technologies are launched. ENGIE'S Raz Blanchard pilot project is supported by ADEME, the French environment and energy management (public) agency.
- 100,000 people (enabling customers to achieve their own sustainability objectives) are dedicated to energy efficiency solutions.

Finally, CO_2-light activities will represent more than 90% of the group's EBITDA by 2018.

The preservation of natural capital depends clearly on clean production technologies, respecting the living ecosystems, but it is also a matter of optimized consumption. Engie takes part in that preoccupation, delivering know-how services to consumers, helping them to take responsibility for their consumption. The smart home (Beliv'Projet) is a project that encourages users to track their gas and electricity consumption, and remotely manage their heating, lighting and home appliances in an effort to cut energy costs while improving customers' day-to-day lives. Through its Think Energy program in the USA, Engie offers its residential customers an innovative mobile app to get information about their energy consumption, view their invoices and compare their average consumption with that of their neighbors based on statistics of averages among other Think Energy customers living in the same neighborhood. The goal is to instill good habits in its customers to inspire them to manage their energy consumption (through circular information communication). The app even sends weather notifications in order to help customers anticipate their consumption, in addition to tips and advice to reduce their consumption.

Engie is also improving consumers' energy efficiency through reducing energy consumption programs in housing and industrial buildings, or in developing interconnected urban heating and cooling network solutions to

be used in sustainable cities (Climespace is the Engie-dedicated subsidiary to that business). Another example of applied circular principles is the development of biomethane (green gas), a fuel produced from municipal waste and used to supply heat and electricity to inhabitants. "Green mobility" is another topic: Engie is developing Liquefied Natural Gas (LNG), a more competitive and environmentally friendly alternative to diesel. Near Boston (MA) Engie opened (2016) its first LNG station to fuel a fleet of trucks; it reduces emissions of sulfur dioxide (SO_2), a harmful greenhouse gas.

In Short

Convincing circular entrepreneurship is a powerful factor of desirable and innovative value creation for Earth and humankind.

However, this powerful factor of change can be disputed or misused.

2.2.3 Circular Entrepreneurships' Ambiguity: Power Possibly Stimulates Counterpower Contesting the "Resource Revolution" and Natural Capital Preservation

In the two preceding subsections (2.2.1 and 2.2.2) we presented "virtuous circular entrepreneurship" having in mind a sustainable future for all, in a healthy biosphere. This target has become a concern in academic literature (Alexander and Reno 2012; Anthony et al. 2017; Bansal and Hoffman 2013; McDonagh and Prothero 1997; Hamel 2012; Neumayer 2013; Prahalad and Krishnan 2008; Thomas and Callan 2007; Wallas 2017). However, this "virtuous" tendency is not yet a dominant part of the current socioeconomic reality. The concern expressed by the UN "World Commission on Environment and Development" in its famous 1987 report (also called the Brundtland report) about the accelerating deterioration of human environment and natural resources, and the tragic consequences of that deterioration for future economic and social development, still has momentum. The message was: use and misuse of natural capital must be limited.

The credo of circular entrepreneurship is different, more optimistic: change does not automatically need restrictions, fewer available resources or lower levels of well-being. Resources can be created or made available through new organizational, technological or biological arrangements, setting a collaborative state of mind and confidence between the connected actors. Circular economy is working on interconnectedness of quality: quality of production and services created in cooperation with consumers and users, strictly adapted to their real needs; collaborative consumption; sharing or pooling platforms; product lease; activity management sharing; circular supplies; technology exchange; open innovation; collective creativity looking to high value-added solutions; dialog with popular local know-how keepers; circular move of employees in different functional services inside the company (sharing knowledge and creating a sense of responsibility, of solidarity) and so on.

In fact, imagination works "top down" and "bottom up" in a social body, but it has to be caught effectively. That is why visionary leaders are so important. This consideration is at the heart of circular entrepreneurship's success. It is also a core element of circular entrepreneurship's possible misfit. Circular entrepreneurship needs not only a visionary leader, but also a strong personality capable to resist contrary forces trying to impose (or maintain) conflicting interests (by lobbying or corruption maneuvering).

Navigators long ago invented a "compass card" 'or "*rose des vents*" to overpower the eddies of contrary winds. In the modern era of socioeconomic globalization, humankind is also confronted by contrary winds and is in search of an efficient regulation principle. Circular principles, dominating the regulation of nature, should be considered as relevant (Delmas-Marty 2016, pp. 18–55). But, in fact, governance of large companies, or also entrepreneurs of smaller enterprises, are not all "virtuous circular minded." "Old" management practices are still applied, with powerful methods. Let us just mention two of them: financial markets' intimidations and political relations with lobbies. Economic decisions, definitions of norms, are not all based on objective reason. Chemical fertilizers continue to damage soils; toxic pesticides continue to be sold with financial profit but with disastrous effects on animal and human health; coal is still used to produce energy and massive CO_2 air pollution;

toxic waste localizations tend to be concentrated in poor countries; dirty recycling is often exported from industrial countries to countries with massive unemployment and low salaries and so on (Alexander and Reno 2012). To win the next election campaign politicians are willing to make bad decisions concerning a sustainable future. It looks quite paradoxical that in 1998, 38% of the world's electricity was produced with coal; twenty years later, it remains the same: 38% (BP 2018 report, Nabil Wakim, *Le Monde*, 29/09/2018, p. 19). USA, China, India, Germany and Poland are some of the main actors of that worrying game with growing injury.

In Short

Circularity is linked to movement, to transformation, in good and bad ways. It is important to choose the right sense.

A good way to believe in the development of efficient decisions is to study carefully the positive effects of circular economy choices on business performances. The own-performance perspectives of each firm are efficient triggers to value creation: individual value becomes, through ecosystems' interconnections, collective value.

2.3 Circular Entrepreneurship, Resource Productivity, Profit Enhancement: "Values" Becoming a Growing Factor of Global Competition

In Sect. 2.2. we sought to prove that circular entrepreneurship is able to manage efficiently desirable change, becoming a "must" at a global level, together for the planet's and humans' survival. Entrepreneurs' sense of responsibility creates innovative products, processes and services to save common goods. But this "new age" is not only a "collective must" to reach together, it is also an "individual opportunity" at the enterprise level, and thus a powerful trigger. That assertion is the topic of this sec-

tion. First, we review how the path to circular economy leads to resource productivity improvement (2.3.1), and second, we review how this policy induces profit stimulation (2.3.2).

2.3.1 Resource Productivity Improvement

"Resource productivity" measures the output per unit of a given resource input; "improvement" illustrates the "more with less" achievement.

Having in mind that one of the important targets of sustainable development is the preservation of non-renewable natural resources, we consider that "sustainable supply" aiming at reducing the impact of the raw materials supply or replacing non-renewable raw materials by renewable ones, contributes to the desired "improvement." The transition to a circular economy encompasses all the changes which allow different economic actors to continue creating value whilst preserving the non-renewable natural capital and using increasingly fewer limited resources. The point is also to ensure that economic activity consumes less renewable natural capital than it can regenerate, by mobilizing all levers from the most traditional, such as recycling, to the most innovative ones connected to digital technology (SUEZ 2018).

Several other efficient levers are to be mentioned:

- Recycling: reusing waste materials or recovering energy from them.
- Reuse: placing products that no longer correspond to the primary needs of the user or consumer back into the economy.
- Recovery: recovering certain waste products or parts of these products still in working order, to use in the development of new products.
- Repair: giving broken products a second life.
- Eco-design, aiming at taking environmental impacts into account throughout a product's life cycle and integrating them from the very first design stages (example: manufacturing of machines which are easily repairable and, at the end of their life cycle, recyclable or destroyed with a reduced environmental impact).
- Industrial and territorial ecology: establishing a method of industrial organization characterized by an improved management of stocks and flows of materials, energy and services within the same geographic area.

Illustration: Kymi, Kouvola, Finland

Kouvola's main industry is the UPM-Kymmene Corporation's paper and pulp mill. The Kymi mill was established in 1874 and over time has grown to be the center of the industrial ecosystem. The mill interacts with a power plant, three chemical plants, a water treatment plant and a sewage plant. The power plant utilizes wood and residual waste from the mill in order to provide the mill with electrical power. Moreover, the output from the power plant also provides the entire town of Kouvola with its electricity and heat. The three chemical plants providing resources to Kymi are powered by Kymi. The Kymi mill also provides the chemical plants with purified water and other resources for their processes. Specifically, the calcium carbonate plant takes in the carbon dioxide given off by Kymi for its own chemical processes. In another process within the ecosystem, a sewage plant provides sludge to a water treatment plant, which received wastewater from Kymi. The sludge acts as an expedient for purifying the wastewater. This ecosystem not only benefits the participating firms but also the local municipality's residents, as they receive electricity and heat due to the efficient operation of the industrial ecosystem. (Young and Dhanda 2013, pp. 150–151)

- Function oriented business models: focusing on usage rather than ownership; selling services rather than goods. For trucks, Michelin no longer sells tires but a mobility service that includes the rental and maintenance of tires, which are insured for a certain number of kilometers. Thanks to function-oriented business models manufacturers become interested in long-lifetime products (longer usage, less production resources needed).

Observation: while the twentieth century saw gains in labor productivity, the twenty-first century needs to produce gains in productivity in resources to achieve the needed "resource revolution." The transition to a circular economy does contribute to that imperious accomplishment. In many industrial countries, a good deal of companies are mobilized, partnering with regions, national or international organizations. Today the main challenge is mass mobilization (of businesses, citizens, communities, associations, government agencies, researchers) to meet this challenge. One efficient tool seems to be "roadmapping," shaking up habits, providing information by showing good practice, available collaboration, and convincing people.

Methodology for Developing a Roadmap: French Example

France is not yet the best pupil of the European classroom in the domain of resource productivity improvement but is on the way to successful transition towards a circular economy.

First, circular entrepreneurship is getting strong, influenced by an active Association of Private Enterprises, AFEP (Association des entreprises privées), which created in 2014 a working group dedicated to circular economy promotion. In 2017, 33 member-companies, all of them world-class, with a strong capacity to train their suppliers, partners and customers, presented 100 commitments to the circular economy. The companies concerned come from 18 different sectors: cement, automotive industry, materials, paper, building-construction, distribution, food industry, cosmetics, water, waste, telecommunications, real estate activities, financial services. Commitments correspond to three levels of maturity: resource flow assessment; identification of opportunities associated with the sector, actors and markets; formulation of targeted quantitative and qualitative objectives. The presentation of resource flow assessment is very didactic. In the dedicated report each company commits to the following areas: origin of the initiative, description of the circular economy solution adopted, implementation difficulties, benefits, perspectives. All these 100 examples, available on the web, stimulate fresh ideas, new expertise, innovation and cooperation possibilities for other actors.

Second, convinced enterprises are not acting alone. The French government is also promoting and supporting circular economy effective initiatives. The "Ministry for an Ecological and Solidarity Transition" began in 2017 to work on developing a Circular Economy Roadmap. Stakeholders worked for several months on the subject in diverse workshops. At the same time, an online platform was opened to collect citizens' opinions. In 2018 specific working groups were launched by the state to continue exchanges between different actors (businesses, communities, NGOs etc.) to identify the most relevant tools for meeting the objectives of the roadmap and the practical ways of implementing them. A pre-roadmap was put out in February 2018 for a second consultation. The latter confirmed citizens' strong interest in the circular economy. The outcome of that public roadmap is divided into four parts:

1. A roadmap for better production: use more secondary raw materials in products; support productive investment; support the mechanism of ADEME (French Environment and Energy Management Agency): "SMEs winning every time"; enable the EPR (Extended Producer Responsibility) schemes to secure investments from industrial recycling sectors; manage resources more sustainably; adapt professional skills; labelling.

2. A roadmap for better consumption, concerning especially: reuse, repair and the economy of functionality (product-service systems); effective implementation of the legal guarantee of conformity; implementation of eco-modulation (encouraging producers that put on the market eco-designed products through bonuses, which may exceed 10% of the sale price); improve consumer information; step up the fight against food waste.
3. A roadmap for better waste managing.
4. A roadmap for mobilizing all actors to enhance communication, education, training, dedicated funding, scientific and technical research with a multidisciplinary approach.

In Short

Reconciling the economy with the environment is a long road; but circular entrepreneurship contributes efficiently to various operational and political dynamics of progress.

2.3.2 "Revolutionary" Resource Management Induces Business and Profit Stimulation

Two levers appear to be dominant to profit enhancement through transition to resource revolution: the supply costs (2.3.2.1) and the markets' dynamics (2.3.2.2).

2.3.2.1 Impact of Supply Costs

The metaphor "more with less" used in the resource revolution process suggests an impact on costs. "Less" can mean both: either, through innovative arrangements in the production and distribution processes, the company needs a quantitative lower amount of resources to reach its given output objectives (resource productivity is moving into production productivity), or, through innovative arrangements the producer succeeds in substituting high-priced resources for lower-priced resources (recycled, reused, shared etc.), that is money-saving. Being ready for the "resource revolution" means

that all aspects of resource management are to be taken into consideration: market or regulated price, squandering, misuse, availability, product as service, product life extension, circular supplies, sharing platforms, territorial location, quality regulations, security, market orientation, currency risk. Thus, a firm's technical and organizational processes are changing.

Systems thinking makes clear that a resource revolution requires management of complex and numerous relationships. All the aspects are elements of the resource system, interfering with a company's performance. But the figures and the business model of each individual company do differ. Hence it is quite impossible to deliver an average value of the cost reduction resulting from circular entrepreneurships' implementation. It all depends on the business sector, product processes, new sets of technology, actors involved in patterns of production/consumption, on members of the supply chain, and on environmental regulations. However, the reading of numerous annual "Registration" or "Reference" documents, of press releases or letters to shareholders of various enterprises, including SMEs, of AFEP or similar organizations' publications as well as dialogs with entrepreneurs, allows us to state that a positive correlation circular management/cost reduction does really occur.

2.3.2.2 Circular Resource Management and Markets' Dynamics as Profit Drivers

Circular resource management, at one and the same time, induces and depends on numerous interdependences. Global resources management must be tackled with more possible actors. To take up that quite new challenge, efficient connections must be realized: information connections (databases, websites, enterprise portals), people connections (emails, social networks, community portals), knowledge connections (knowledge bases, semantic webs, taxonomies, knowledge networks, file sharing), intelligence connections (artificial intelligence, smart market places, semantic weblogs) and so on. All that new relationships construct, supported by digital technologies, represents an enormous innovative investment; but an investment with new businesses return, thanks to new business models (see Chap. 3), new value chains, new supply chains, new markets opportunities all around the globe. *The Circular Economy Advantage* (subtitle of the book of Peter Lacy and Jacob Rudqvist 2015)

does really exist. Circular entrepreneurship creates the future of value through competitive differentiation. Enterprises' created value has together a social and economic value, in shareholders' and stakeholders' interest (Young and Dhanda 2013, pp. 135–242) (Lowitt 2011). Growth and development in the future will be synergetic (Fücks 2013; Pauli 2010).

A dynamic of sustainable growth aimed at achieving more harmonious development reconciling individual needs and public interest will succeed (with high probability rate). Paradigmatic change is on the way as a collective "must" and is becoming a strategic priority for many firms (see Chap. 6). With the support of people's changing mindset, these strategic priorities are becoming desirable "profit cans."

Illustration 1: Engie Energy transition

Illustration 1: Engie (world leader in the energy transition; 155,000 total workforce, 2017)

For Engie "The energy revolution has been ongoing for several years at three different levels:

- the technological revolution is accelerating, thanks to advances made in photovoltaic energy, battery storage, electric mobility and the use of hydrogen;
- added to this is the digital revolution: smart solutions have changed people's relationships with the city, home and car, and the Internet of Things is becoming standard in energy management;
- and, finally, a cultural and social transformation is playing out. Today consumers are looking to a more thoughtful use of energy and they want to use customized low-carbon solutions to manage their consumption and even produce their own green energy.

Engie has been anticipating this change of paradigm for several years and is now stepping up to its shift in strategy, aiming to position itself as a leader in this new world of energy."

Source: Engie Registration Document 2017, p. 9

Illustration 2: Saint-Gobain Eco-innovation

Illustration 2: Saint-Gobain, a world leader in the construction market and in innovative materials, developing the eco-innovation (see case study, Chap. 5), 179,000 employees worldwide, very good financial results (2017 Registration Document).

Saint-Gobain is developing an active policy incorporating the challenges of sustainable development. Its environmental approach is to ensure the sustainable development of its Activities, while controlling the environmental impact of its processes, products and services over their entire life cycle. But the Group thus wishes also to meet the expectations of the stakeholders involved throughout the entire value chain. Transitioning towards the circular economy involves partnership opportunities, new commitments, extended business, spill over effects. By the end of 2019 each Activity and each General Delegation (of decentralized organizational structure) have to draw up a roadmap to develop the circular economy and create synergies with external local partners.

Source: Saint-Gobain 2017 Registration Document, pp. 73–79

Illustration 3: Tryatec: a new circular business

Illustration 3: Tryatec, new circular business and "profit can."

Tryatec is an online marketplace for the renting or lending of high-tech items, a start-up founded in 2016 (London, UK). The idea of creating a platform where users can try out a technology before buying it spawned on listening to innovative manufacturers. A lot of the innovation in the technological sector reveals it to be incremental: it follows a process of continual and gradual product improvement, in which each new version undergoes a series of iterative tests. It looks difficult for many manufacturers to experiment and to test their new products; and this can become an obstacle to innovation. The initial idea of Tryatec's founders was to address this problem by offering a specific place (platform). This idea has been extended to make technology accessible to all, while promoting innovation at the same time. Tryatec decided to include in the initial concept a C2C dimension, which is part of the two-dimensional sharing economy of renting and lending. On the Tryatec platform these two management practices are combined. The renters, those who do not have access to up-to-date, often expensive, technology (except by renting) and the lenders, of which 80% only use their high-tech gadgets for about 10 days per year, are then playing a "win-win" game. Tryatec, adopting the same business model as Airbnb, but for the sharing of range-topping high-tech products, brings the user [and producer] together and guarantees the security of the exchanges, that creates new services, new businesses; it reduces waste which has an economic and environmental cost. The Tryatec business model is also closing the circle by encouraging innovation in business, while bringing companies closer to their potential users.

Source: Company's internet site, and *Open_resource* magazine, 5, pp. 26–29

In Short

Circular entrepreneurship is a resource solution driver, but to achieve this challenging objective, "resource revolution" and "digital revolution" must be bound together.

2.4 Circular Entrepreneurship and Ethical Values Promotion: The Future of Humankind and Peace at Stake

The resource and digital revolutions are changing the lives of everybody, in every domain. That fundamental change will also affect ethical values and enterprises' responsibility. We need more ethical handling and thinking, to preserve the environment and humans.

Circular entrepreneurship is indeed confronted with natural resource preservation and management. These "resources" are not only material, energetical or biological ones, but also "human" ones. In the course of globalization that latter component is becoming increasingly important: it is a matter of fundamental human rights' respect, and more generally speaking of justice. The preservation of human dignity and health protection must be defended as well as the quality and the quantity of other resources.

We saw that the resource revolution, linked to circular principles implementation, is a global, worldwide challenge. However, in a number of countries resources preservation issues are not sufficiently regulated by positive law or enforced by legal institutions; that situation underlines the need of self-voluntary ethical behavior of international operating firms. In fact, this virtuous trend of handling is moving off. Diverse entrepreneurial measures are applied to reach the aim of human resource preservation: either through a direct contribution (for example enterprise's ethical charts or "vigilance plans" enforcement), or an indirect one by playing a part in the development of global rules, and thus cooperating with national governments, NGOs (like Transparency International, World Material Forum) or other organizations such as the UN, with Global Compact Initiative or ILO (International Labour Organization).

The circular economy offers the opportunity to reconcile growth and environment, developing ethical values, including altogether economic, social and environmental values. In this section we intend to illustrate some important features of that virtuous entrepreneurship model.

First, we want to underline how the circular economy, beyond economic and environmental profits, is also an instrument for social progress and solidarity. The circular economy is inclusive (2.4.1).

Second, we remember that the challenge of future sustainability implies new modes of production, consumption, organization and innovation on a global scale, that assumes and develops new skills and abilities, learning, knowledge-transmission and the sharing of collective creativity (2.4.2).

Third, we present an illustration of handling in that direction thanks to enterprise foundations (2.4.3).

2.4.1 Circular Entrepreneurship, an Instrument for Social Progress and Solidarity

Always more and more international firms, since the beginning of the current century, develop "Principles of Conduct and Action," including compliance with existing rules and laws, respect for human rights, environmental policies, responsible purchasing policy, contributing to economic development and to local employment, contributing locally to the fight against climate change, or against corruption, lying practices and so on. These ethical-oriented policies are in harmony with circular entrepreneurship that imposes—to be efficient—confidence in others' honest handling. The transition to circular economy requires sharing methods, abilities to cooperate, to co-produce, to include diverse talents, diverse cultures, to co-create new knowledge, services, new connections. In a very hard economic and political competition context, trust in partners is essential, and this consideration is particularly true for circular principles implementation. Such a strategy is necessarily inclusive, through collaboration between all actors.

Ethical handling is, of course, also connected to ethical thinking and the ability to use it. An enterprise is not only an economic actor, connected to financial markets with specific performance rules; it is also a moral actor, connected to social responsibility. This kind of responsibility

has diverse acceptations in the global economy, even on the European level, where Scandinavian and German countries are considered as pioneers, thanks to a dominant "consensus culture" resulting from rational argumentation between the concerned actors.

Illustration PUMA: virtuous corporate strategy

Illustration: PUMA, a German multinational company founded in 1948, near Nürnberg (Bavaria), producing footwear, apparel, accessories, sportswear, sports equipment (2017 revenue: €4.1 billion; 11,800 employees).

In 2000, this company established an annual meeting with all stakeholders to discuss international sustainability standards, to promote fair trade practices, workers' rights, to respect social and environmental standards in all countries (about 40) where PUMA is active. The same year PUMA began an auditing policy of all suppliers and makes the results available in its sustainability reports. The whole value-chain is integrated in its "virtuous" corporate strategy. Since 2011, the company puts a value on its environmental impact, as a guideline for future practices.

Source: Website and personal discussion with partner Prof. Dr. Horst Steinmann

Thanks to the digital revolution, new business models are based on more direct relationships, able to develop the planet's resource solutions together. All that is not only a matter of industrial production or innovation. It is also a kind of organizational revolution. The growing multitude of circular loops demands cross-organization.

Consumers are also participating in the creation of a new economic model: from a dominant culture based on appropriation, they move towards a culture based on use.

In any case, enterprises have been, and still are, cornerstones of this global revolution.

In Short

Circular entrepreneurship is a major factor of a new emerging socioeconomic model, leading hopefully people to live together on a peaceful and healthy planet.

2.4.2 Circular Entrepreneurship, a Factor of Knowledge Creation and Transmission, Sharing Collective Creativity

Circular entrepreneurship is fundamentally linked to collective creativity that leads to the sharing of new knowledge to the benefit of others. Creativity is a key property of all living systems (Capra and Mattei 2015, pp. 94–98); thus, circular entrepreneurship is a key factor of successful social networking. Clever entrepreneurship is a driving force for a sustainable future. That driving force has different forms, based on a company's internal resources or on external ones.

On the internal level, one finds laboratories, R&D units, research centers, cross-disciplinary teams, or networked organizations dedicated to identify local innovation needs to be satisfied by central responses. Such organizational arrangements, bringing together for instance R&D, sales and manufacturing units, help to speed up the innovation (solution provider) processes, or to ensure that all the skills needed for a new project's success are available.

Illustration: Internal Collective Knowledge Creation (innov@ENGIE)

The innovation department of Engie [total average workforce (2017): 238,216; revenue (2017): €65,029 millions] is intended to support changes on mature energy markets and the convergence between energy services and information technologies. Its aim is to position the Group at the forefront of these changes by developing additional growth vectors and new ways of doing business within the Group.

A number of tools and processes have been deployed to foster entrepreneurial creativity and ensure that innovation promotes the Group's long-term commercial development. The "innov@ENGIE" collaborative platform, designed for Engie employees, aims to boost the innovation dynamic in the Group and promote innovation among employees. On December 31, 2017, innov@ENGIE had over 16,000 members. On average, 5 to 10 new product- or business-ideas are submitted each week. At the end of 2017, a total of 670 ideas had been proposed. To turn these ideas into products, an incubation process for employee projects was created.

Source: Engie 2017 Registration Document, p. 41

On the external level, attentiveness to real customer needs is getting more and more momentum; that means that an industrial or service-oriented company will be able to optimize its proposal, avoiding useless costs or material squandering.

Another interesting approach is "open innovation," implementing partnership with start-ups. This trend is developing very rapidly all around the world; it is boosting new ideas, offering new social or technological services, creating employment facilities especially for young talents, and giving life subsequently to successful enterprises, international and circular-minded. A win-win opportunity for the future's dynamics.

Knowledge creation and transmission through partnerships with universities, research labs, competitiveness-clusters (dedicated for example to sustainability of water resources, or renewable energy, or natural environments, or new materials), through cooperation agreements together with cities aiming to become "smart" or "greener," are also very active forms of open innovation, to be considered as Keynesian "multipliers."

In Short

An ecological vision of reality contributes to a dynamic system of knowledge creation.

2.4.3 Circular Entrepreneurship Supports Ethical Initiatives through Corporate Foundations

Circular economy, as related before in Chaps. 1 and 2, is inclusive, by its very essence collaborative, developing a sense of solidarity. This ethical aspect of circular principles implementation is also illustrated by the activities of corporate foundations. Large and middle-sized enterprises are concerned, more or less in harmony with their business activities or cultural identity, with initiatives not really connected to their marketing policies.

Illustration 1: SUEZ Foundation

Its aim is: (1) Development of access to essential services in developing countries. In 2017, 33 projects have been managed related to drinking water and water cleansing, in numerous countries: Tchad, Burkina Faso, Senegal, Cote d'Ivoire, Soudan, Niger, Malawi, Madagascar, Guinee, Cameroun, Bangladesh; to waste treatment, in Philippines, Madagascar, Senegal, Togo, Mozambique, Congo. Each project is managed with the participation of all stakeholders (local people, associations, public institutions, SUEZ employees working as "competence partners" ("mécénat de compétences"), building together a partnering ecosystem. A complementary objective is to share SUEZ know-how in order to accelerate access to services by supporting training and making its expertise available. (2) Support and assist with integrative projects for disadvantaged populations in France.

Source: Foundation SUEZ Bilan 2017, Meeting with Myriam Bincaille, SUEZ Foundation Representative

Illustration 2: The Saint-Gobain Initiatives International Corporate Foundation

This foundation relies on employee commitment. All Group employees—whether currently employed or retired—can sponsor solidarity actions in two fields:

- inclusion of young adults in professional life;
- construction, improvement or renovation for general interest purposes of the social habitat, contributing in particular towards reducing energy consumption and preserving the environment.

The projects must be borne by non-profit organizations and be situated close to a Group site.

The Foundation provides financial support for the projects it selects. In addition the Saint-Gobain subsidiaries may offer support in terms of technical skills or donate materials. Certain projects provide the opportunity to involve local employees who become involved in the association and participate on a voluntary basis.

In the period 2008–2017, 373 projects were submitted to the Foundation in 60 countries and 161 projects were approved.

In addition to that foundation, local foundations have been created in North America and India, completed by cultural, artistic, educational and general interest sponsorship.

Source: Registration Document 2017

Illustration 3: The ENGIE Corporate Foundation

ENGIE is one of the world's leading energy players. Its foundation's philosophy is: "providing the energy of possibility." The foundation focuses on two main areas of charitable activity: solidarity and the environment.

It aims to help the weakest and most vulnerable people. Focus has been set on children and young people in need, giving them the confidence to grow, by supporting projects that promote inclusion through culture, education, health or sport. ENGIE is also supporting projects led by women. Of the world's 800 million illiterate individuals, 75% are women. And yet women are often the linchpins of development. They are innovators who work hard to improve the day-to-day life of their families.

The Foundation is also concerned with crucial challenges like access to energy for all and preservation of the planet's biodiversity. Its grants program does, for instance, support energy access for disadvantaged communities, urban ecosystems, sustainable architecture and measures to combat climate change. The grant programs operate in every country where ENGIE is represented (about 70). Over the past 25 years, the ENGIE Foundation has supported some 1000 projects, charitable organizations and institutions.

Source: Engie Registration Document 2017

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3

Value Propositions and Business Models for Circular Entrepreneurship

3.1 Introduction

After discussing the principles of the circular economy and the key notion of value creation in this framework, this chapter analyzes in detail what it involves to put the circular economy into practice in business. Business firms are increasingly called to embrace the challenge of sustainability and—more specifically—of circular economy principles. Making profit compatible with the planet (and people) is possible and earns a payoff in terms of potential market success and stakeholders' engagement.

The circular economy represents a very promising creative endeavor for entrepreneurs to discover and create novel opportunities, to experiment with new models of doing business and new relationships with partners, customers and employees. This chapter focuses on the role of the business model and business model innovation in the practice of the circular economy. Innovating business models is an expression of entrepreneurship, designing and implementing business models that embrace the circular economy and make profit compatible with the environment.

A. Zucchella, S. Urban, *Circular Entrepreneurship*,
https://doi.org/10.1007/978-3-030-18999-0_3

The growth of the circular economy requires an increasing number of entrepreneurs, who can start new business or renovate the existing ones, building on these premises. Which steps concretely should they follow in this process? This chapter suggests that first they should develop a circular value proposition, and then they should conceive and develop all the remaining building blocks of the business model, always in the light of the circular economy principles. Finally, they have to give attention to all the factors that can enable or constrain the effective implementation and development of the circular business model.

Thus, this chapter is organized into three parts:

3.2. Business models: what are they?
3.3. Circular business models: definitions and components
3.4. The design and development of a circular business model

3.2 Business Models: What Are They?

The development of the circular economy is based on the capacity of economic actors to explore and exploit novel opportunities to do business profitably and pursue circularity principles. This challenge goes beyond the mere respect of sustainability goals: as mentioned before, radical innovations are required to realize a circular economy and to make it compatible with profit. Thus, firms pursuing these objectives have to embrace entrepreneurship fully, encompassing one or more of the expressions of entrepreneurship as defined by Schumpeter (1934), from product to process to market innovation up to new methods of organizing economic activities. According to Zott et al. (2011, p. 1032) business model innovation is a new source of innovation that "complements the traditional subjects of process, product, and organizational innovation." Innovation in business models is certainly one of the key elements through which circular entrepreneurship takes place.

3.2.1 Business Model Definitions and Components

The business model defines the activities and the resources which are at the foundation of the costs and revenues structure and create value for the diverse stakeholders. But what is a business model? "At a very general and intuitive level, a business model is a description of an organization and how that organization functions in achieving its goals (e.g., profitability, growth, social impact)" (Massa et al. 2017, p. 73). There is no generally accepted definition of a business model. The last twenty years have witnessed a blooming of contributions on this topic, which have produced a number of alternative definitions and conceptualizations. The following provides a concise summary of some of the most commonly cited ones:

Timmers (1998)	"an architecture of the product, service and information flows, including a description of the various business actors and their roles; a description of the potential benefits for the various business actors; a description of the sources of revenues" (p. 2)
Chesbrough and Rosenbloom (2002)	"the heuristic logic that connects technical potential with the realization of economic value" (p. 529)
Magretta (2002)	"stories that explain how enterprises work. A good business model answers Peter Drucker's age old questions: Who is the customer? And what does the customer value? It also answers the fundamental questions every manager must ask: How do we make money in this business? What is the underlying economic logic that explains how we can deliver value to customers at an appropriate cost?" (p. 4)
Morris et al. (2005)	"concise representation of how an interrelated set of decision variables in the areas of venture strategy, architecture, and economics are addressed to create sustainable competitive advantage in defined markets" (p. 727)
Zott and Amit (2010)	"a system of interdependent activities that transcends the focal firm and spans its boundaries" (p. 216)
Teece (2010)	"A business model articulates the logic, the data and other evidence that support a value proposition for the customer, and a viable structure of revenues and costs for the enterprise delivering that value" (p. 179)

Osterwalder and Pigneur (2010) have contributed to the debate by providing a frame, which illustrates the nine cornerstones on which a business model rests. At the heart of their model there is the value proposition targeted to a customer/group of customers. Beyond the value proposition, the customers and the relationships of the firm with the customers drive revenue streams, the remaining elements being the key resources needed, the key activities to be performed and the key partnerships with other organizations, which all affect the costs structure. Figure 3.1 portrays the nine cornerstones (based on the mentioned works by Osterwalder and Pigneur) of the business model canvas, a tool that has gained increasing popularity in the practice of management and entrepreneurship.

3.2.2 Business Model Innovation Is Key to Circular Entrepreneurship: The Four Ds

In circular entrepreneurship, reasoning in terms of business models is essential to the success of the venture and particularly in terms of business model innovation (Foss and Saebi 2017).

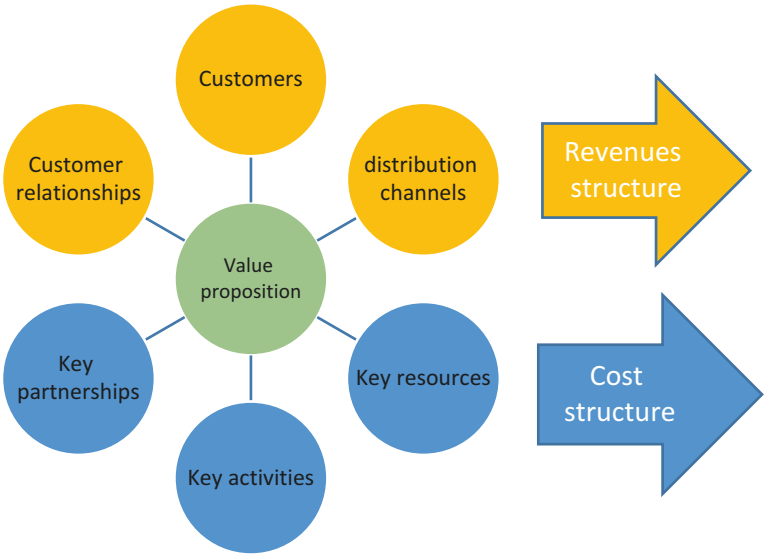

Fig. 3.1 The business model canvas cornerstones. *Source*: elaboration based on Osterwalder and Pigneur (2010)

Business model innovation is undoubtedly one of the most important implications of the circular economy within businesses. Circular principles need to be translated within businesses into new value propositions in order to gain profits and lead economic growth. New technologies and products by themselves don't guarantee business success: they need to be coupled with the development of a business model defining "go-to-market" and "value capturing" strategies (Teece 2010). In other words, circular products and services need brand new ways to create and capture value for being economically successful.

The remaining part of this chapter leads the reader to uncover circular business models (CBMs) starting from their definition, the description of their different typologies, the process of developing a CBM and key elements of CBM design. Figure 3.2 shows these four different issues (the four Ds of CBM innovation), which will be discussed in each of the following sections. We consider the definition of a CBM and the description of its taxonomies to be part of the general process of CBM innovation, since setting conceptual boundaries and understanding the field are prerequisites for an appropriate design and development process. Also from the development stage we hypothesize a loop back towards design and redesign, but also towards taxonomies and definitions, because the field of circular entrepreneurship is still in its infancy and will benefit hugely from field experimentation.

Consisting in a radical change and novel way to think and do business, the circular economy fosters the research and implementation of alternative and profitable models of business for both start-ups and well-established organizations. The adoption of circular principles can in fact promote the establishment of brand-new companies or start-ups putting into practice circular principles since their inception, as well as drive

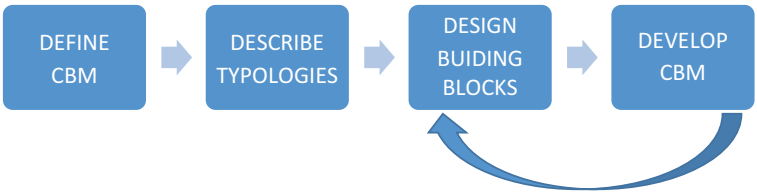

Fig. 3.2 Circular business model innovation: the 4Ds. *Source*: the author

changes in the business models of already-established firms of different sizes and sectors. For instance, access over ownership and sharing platforms stem from the circular attempt to optimize utilization and prolong the lifecycle of products instead of relying on planned obsolescence. As such, they represent significant innovations in business modelling. Firms with recycling as their core business need to be supported by innovative business models in order to be able to disrupt the current waste management industry, still based on waste disposal and incineration. New and profitable business models stemming from circular principles can ultimately incentivize other players towards the adoption of circular principles, thus contributing to the expansion of the circular economy.

The application of the business model concept and business model innovation to the circular economy has been very fruitful: the need to provide frames of reference, structures and "canvases" to shape a circular project has raised the attention both of academic and of the so-called "grey" literature. The latter has explored the idea of CBMs and business model innovation, as demonstrated by the works of McKinsey et al. (Hannon et al. 2016), Boston Consulting Group (BCG and WBCSD 2018) and the Ellen McArthur Foundation. BCG (2018) has found that while companies are more oriented and clear towards product and process innovation in their sustainability strategy, business model innovation is still lagging behind and firms do not know yet how to pursue it.

Example. Business Model Innovation in the Sharing Economy: BlaBlaCar

The company, founded in 2006 by three young French entrepreneurs, has the following mission: "We imagine a fairer, more open world of travel. Where people are better connected and independent."

Nowadays, according to their website, "BlaBlaCar is the world leading long-distance carpooling platform. It's a trusted community marketplace that connects car drivers with empty seats to passengers looking for a ride, over average distances of 300 km. With 60 million members in 22 countries and over 18 million travellers every quarter, BlaBlaCar is creating an entirely new, people powered, travel network. With a dedicated member relations service, a state of the art web and mobile platform, and a fast-growing

trusted community, BlaBlaCar is making travel social, money-saving and more efficient for millions of members."

BlaBlaCar has contributed to a revolutionary model of mobility, based on sharing vehicles through a platform, building a community of users and reducing the impact of cars. Many of us may own a car but use it only occasionally. Most people drive their cars alone. Both these factors contribute to making unsustainable the impact of cars on the environment. BlaBlaCar helps in addressing this issue, inviting people to share their cars with others (thus also making money) or to use other people's cars instead of owning one. In itself sharing is not an innovation, but the model developed by BlaBlaCar certainly is innovative. It has involved creating a community of users through a platform, using the digital economy as a supportive infrastructure of sharing and communicating (Casprini et al. 2015), but also through rating the drivers and creating trust. Their business model has a cost structure based on the management of the platform and the community of users, while revenues stem from a fee for every ride shared.

BlaBlaCar success has encouraged more entrepreneurs to develop sharing models. For example, Hello Tractor provides a similar service to farmers in developing countries. They explain: "Farmers throughout developing economies remain trapped in poverty despite $6BN in aid spent each year over the past five decades to improve agricultural production and raise standards of living. This is due, in large part, to the disorganized and often antiquated agricultural value chains that persist across emerging markets. As a result, the individual farmer is often left without access to the information and inputs that are critical to improving their livelihoods. Without the right knowledge, labor, and equipment, farmers struggle to properly cultivate their land and plant on time, leading to underproduction and lost income The Hello Tractor platform enables farmers to request affordable equipment inputs, while providing enhanced security to tractor owners through remote asset tracking and virtual monitoring. This value extends to all stakeholders in the mechanization ecosystem."

In Short

Companies show an increasing commitment to the sustainability agenda, but not many of them are aware that this involves renovation and innovation in their business models.

3.3 Circular Business Models: Definitions and Components

According to Mentink (2014), a circular business model (CBM) is "the rationale of how an organization creates, delivers and captures value with and within closed material loops," while for Linder and Williander (2017) a CBM is "a business model in which the conceptual logic of value creation is based on utilizing the economic value retained in products after use in the production of new offerings."

Starting from the application of circular principles, Van Renswoude et al. (2015) identify important methods of value creation in the case of CBM: value can be created by keeping products in short cycles through repair and maintenance services and product adjustments, and in longer cycles that extend the lifespan of goods and processes; these sources of value creation respectively correspond to the power of the inner circle and of circling longer, proposed by the Ellen MacArthur Foundation. In addition, according to Van Renswoude et al. (2015), other sources of value creation can be found in production on demand, in the supply of dematerialized services instead of physical goods, in cascading actions, based on the creation of new combinations of materials and components as well as on the purchase of upcycled waste streams, and in pure circles that fully reuse materials and resources. Cascading actions and pure circles can also be referred to as the power of cascaded use and of pure inputs as defined by the Ellen MacArthur Foundation. The latter identifies six business actions that can be derived from circular principles: these are Regenerate, Share, Optimize, Loop, Virtualize and Exchange, all framed in the so-called ReSOLVE framework. Regenerate means shifting to renewable materials and energy, so that biological resources can be recovered and returned to the ecosystem. Share actions focus on product-life extension through maintenance and repair, maximization of the utilization of products as well as reuse of goods still in good condition. Optimize signifies increasing the efficiency and performance of products as well as removing waste in the supply chain and production processes. Loop actions are focused on maintaining resources, materials, components and products in closed loops. Through Virtualize actions, firms deliver products virtually instead of physically, by means of digitization, for instance

as in the case of Netflix and other streaming platforms. Finally, Exchange means introducing new technologies and advanced non-renewable materials.

3.3.1 The Components of Circular Business Models

Typical components of CBMs have been outlined in literature. According to Mentink (2014), the value proposition of the CBM is typically related to fully reused or recycled products and to product-service systems, selling services and performance instead of physical products. In the first case, the establishment of a reverse logistic network is needed as well as particular activities, processes, capabilities, resources and partners for recycling and keeping products in closed loops; additionally, customers need to take responsibility for their consumption. The second case requires changes in customer habits, shifting from ownership to access, and a rethink of the revenue model, as the company will create value on the basis of the performance delivered by its products instead of the sale of physical goods. In particular, in order to be integrated into business models, the circular economy requires product-design and material composition changes, establishment of reversed supply-chain logistics, new sales models, trusted relationships with partners, enhancing programs in HR to foster both culture adaptation and development of circular capabilities, and IT and data management able to track materials, products and components (Laubscher and Marinelli 2014).

Many conceptual models concerning the different components of a CBM exist in literature. Mentink (2014) developed the Business Cycle Canvas (BCC), where the concept of the business cycle is applied to the CBM framework, in order to visually show the idea of circularity embedded in a business model better than what happens using the more static model. The "Play it Forward" tool (Dewulf 2010) adds the components of societal costs and benefits to the traditional CBM in order to describe sustainable business models and represent the triple bottom line: in this way, People and Planet are accounted for in the additional building blocks together with Profit, that is derived from the revenue stream and cost structure components.

Considering that a CE entails environmental and social aspects, peculiar evaluation models for assessing the feasibility, viability and profitability of CBM need to be considered. Laubscher and Marinelli (2014) stressed the importance of measuring reductions in an environmental footprint, growth through new BMs and value recovery of assets and materials. In addition, Mentink (2014) identified a list of circular KPIs for evaluating a CBM, such as revenues from repairs, refurbished products, recycled materials and second-hand products, time of resource reuse and products leased.

3.3.2 The Different Typologies of Circular Business Models

The adoption of circular principles is leading to the implementation of different kinds of CBMs that are being deeply analyzed in literature. Starting from the already-mentioned ReSOLVE framework of the Ellen MacArthur Foundation, Lewandowski (2016) proposed an overview of the different taxonomies of CBMs existing in literature (see Table 3.1 for a summary).

Bocken et al. (2016) resume different business model strategies aimed at closing or slowing resource loops, providing examples resulting from literature for each case. In order to slow resource loops through product-life extension and reuse, Bocken et al. (2016) identify three models: the "access and performance model," consisting in delivering services rather than ownership (e.g. car sharing and clothing hire models); "extending product value" through reuse and remanufacturing (e.g. the second-hand market on eBay and electronic waste remanufacturing); "classic long life model and encourage sufficiency," supported by design for durability and repair (e.g. Vitsoe and Patagonia, that both promote initiatives against obsolescence and consumerism to their customers). In the case of closing resource loops, the models identified by Bocken et al. (2016) are "extending resource value" through recycling and "industrial symbiosis," as in the case of InterFace NetworksTM and AB Sugar, respectively: the former company turns wasted fishing nets into recycled yarn for carpets, while the latter redefined its BM through innovative practices of industrial

Table 3.1 CBM types according to Lewandowski (2016)

Classification criteria	Model	Explanation
Regenerate	Energy recovery	Conversion of non-recyclable waste materials into usable heat, electricity or fuel
	Circular supplies	Using renewable energy
	Efficient buildings	Locating business activities in efficient buildings
	Sustainable product locations	Locating business in eco-industrial parks
	Chemical leasing	Producers mainly sell the functions performed by the chemical, so environmental impacts and use of hazardous chemicals are reduced
Share	Maintenance and repair	Product life cycle is extended through maintenance and repair
	Collaborative consumption, Sharing Platforms, PSS: product renting, sharing or pooling	Enable sharing use, access, ownership of product between members or businesses
	PSS: product lease	Exclusive use of a product without being the owner
	PSS: availability based	The product or service is available for the customer for a specific period of time
	PSS: performance based	Generating revenue according to delivered solution, effect or demand-fulfillment
	Incentivized return and reuse or Next Life Sales	Customers return used products for an agreed value. Collected products are resold or refurbished and sold
	Upgrading	Replacing modules or components with better-quality ones
	Product attachment and trust	Creating products that will be loved or trusted longer
	Bring your own device	Users bring their own devices to get access to services
	Hybrid model	Short-lived consumables in durable products
	Gap-exploiter model	Exploits “lifetime value gaps” or leftover value in product systems

(*continued*)

Table 3.1 (continued)

Classification criteria	Model	Explanation
Optimize	Asset management	Internal collection, reuse, refurbishing and resale of used products
	Produce on demand	Producing when demand is present and products are ordered
	Waste reduction, good housekeeping, lean thinking, Fit thinking	Waste reduction in the production process and before
	PSS: activity management/ outsourcing	More efficient use of capital goods, materials, human resources through outsourcing
Loop	Remanufacture, product transformation	Restoring a product or its components to "as new" quality
	Recycling, recycling 2.0, resource recovery	Recovering resources out of disposed products or by-products
	Upcycling	Materials are reused and their value is upgraded
	Circular supplies	Using supplies from material loops, bio-based or fully recyclable
Virtualize	Dematerialized services	Shifting physical products, services or processes to virtual
Exchange	New technology	New technology of production

Source: adapted from Lewandowski (2016)

symbiosis, in which waste, resources and by-products can be exchanged among cooperating firms (Short et al. 2014). Table 3.2 reports the overview of the BM strategies by Bocken et al. (2016).

One of the best-known categorizations has been provided by Lacy and Rutqvist (2015), who propose five archetypes of CBM: circular supply-chain, recovery and recycling, product-life extension, sharing platforms and product-as-a-service (Fig. 3.3). The circular supply-chain business model is based on the production of completely renewable, recyclable and/or biodegradable inputs, which a company can use for internal processes or supply to other firms: IKEA, for instance, aims at augmenting the production of renewable energy for its own operations by 2020, while CRAiLAR technologies produces circular garments that are then sold to

Table 3.2 CBM for slowing and closing resource loops

Circular approach	Model	Explanation
Slowing resource loops	Access and performance model	Providing the capability or services to satisfy user needs without needing physical products
	Extending product value	Exploiting residual value of products—from manufacture, to consumers and then back to manufacturing—or collection of products between distinct business entities
	Classic long-life model	Business models focused on delivering long-product life, supported by design for durability and repair
	Encourage sufficiency	Non-consumerist approach to marketing and sales, solutions to reduce end-user consumption through durability, upgradability and reparability
Closing resource loops	Extending resource value	Exploiting the residual value of resources: collection and sourcing of otherwise "wasted" materials or resources to turn these into new forms of value
	Industrial symbiosis	A process-orientated solution consisting in using residual outputs from one process as feedstock for another process, that benefits from geographical proximity of businesses

Source: adapted from Bocken et al. (2016)

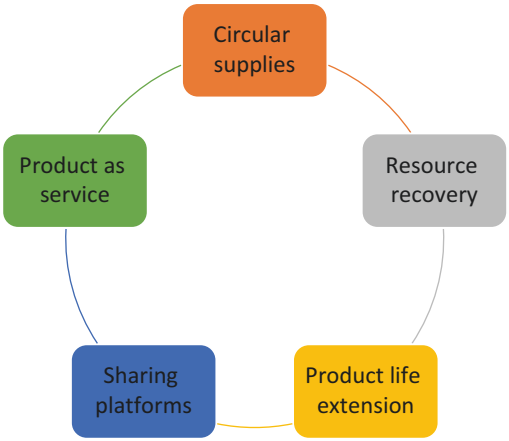

Fig. 3.3 The five circular business models according to Lacy and Rutqvist. *Source*: adapted from Lacy and Rutqvist (2015)

other companies. The recovery and recycling business model is focused on turning waste into recycled valuable materials, as Desso is doing by taking back wasted products from consumers either to turn them into new carpets or to use them for other recycling initiatives. The product-life extension model leads to built-to-last products and activities such as repair, upgrade and refurbishment in order to lengthen the lifespan of products and make profits from longevity instead of volume: remanufacturing has become a fundamental activity for Caterpillar, for instance. The sharing platform BM enhances the utilization rates of already existing products, decreasing the need for new manufacturing and augmenting the productivity of otherwise idle goods, by connecting supply and demand among users and companies. An example of sharing platform is 3D Hubs, which is a collaborative platform for those owning and demanding 3D printers. In the product-as-a-service model, companies retain the ownership of a product and offer it to users on the basis of its usage or performance. By maintaining the ownership over their products, firms are incentivized in prolonging their lifecycle, thus overcoming the concept of planned obsolescence. Daimler and Philips are strongly introducing product-as-a-service offerings within their business, as reported by Lacy and Rutqvist (2015).

In conclusion, the literature offers alternative taxonomies and systematizations about CBM, confirming the growing interest in the matter and the need to support entrepreneurs and managers to have a portfolio of options. The business models reported are the result of an "entrepreneurial turn" in the circular economy and are subject to continual change, as a consequence of entrepreneurial action. In a number of cases one may wonder about their innovative content: for example, are sharing or product-as-service really novel approaches? The innovation can also rest on the adoption of new technologies: sharing platforms rest on digitalization and the creation of digital communities of users, products can embed sensors for tracking their use and obsolescence (Internet of Things applications), in order to optimize pay per use and extend usable life, 3D printing can avoid goods transportation issues and so on.

The coupling of digital technologies and circular economy principles can unleash a wave of innovative business models: we are just starting to categorize some of them. The previously mentioned examples of BlaBlaCar, Hello Tractor and 3D Hubs provide an illustration of this phenomenon.

In Short

The marriage between digital technologies and circularity principles can unleash a wave of innovative business models, which go beyond existing taxonomies.

3.4 The Design and Development of a Circular Business Model

The taxonomies discussed in the previous section help in understanding that the design of a CBM starts from a clear view of its inner logics and the principles that are going to be applied. Is it about sharing? Or product-as service? Or again, is it about extending the life of a product? Closing a loop?

At the foundations of the design of the CBM there is an insight about the final user/customer and the main stakeholders. This is what we call the value proposition. Which problems are we aiming to solve? Who is the problem holder? Which benefits are we going to provide and to whom? Designing a convincing value proposition is key to the success of any business model and for this reason the topic will be treated in the next section, followed by a discussion of the remaining key components in designing a CBM.

3.4.1 At the Heart of Circular Business Model Design: The Value Proposition Design

The key foundation of every business model is the value proposition. The value proposition can be briefly explained as a "what for whom" statement incorporating customer insight and the benefit(s) to be delivered to the customer.

In a circular economy project, the value is understood as both economic and social/environmental, while the "customer" is a more multifaceted construct, spanning from users and buyers to communities and relevant stakeholders of the project. We refer to *personas*, instead of customer segments/groups, following an important trend in marketing approaches towards better understanding of buyers/users' behavior. We adopt this concept also in business-to-business settings, since buying/using decisions are ultimately made by people. In a traditional CSR approach, stakeholders (different from customers) are "outside" the value proposition and the business model, and they represent a system of actors external to the basic model of the business. Customers are the "target" of the firm's offer: the firm tries to develop an insight about their "pains and gains" and a corresponding convincing offer. In the circular economy, instead, stakeholders are part of the business model and of the value creation. Also, "customers" play a more complex role:

1. Regarding their relationship with the product/service, they are asked to use, reuse, recycle, buy, resell, extend the life and so on of the product/service.
2. Regarding the relationship with the circular project, they are asked to adhere to the ethical principles of the project, to engage as users and as citizens, to be an active part of the circular ecosystem.

How to design an effective value proposition for a CBM? We need to develop an insight about sustainability, putting ourselves in peoples' shoes. Which problem are we going to address? Which benefit are we ready to deliver? Is our value proposition capable not only of finding a "market," but—most importantly—of engaging customers and all the other relevant stakeholders? The box in Fig. 3.4 illustrates briefly how a circular value proposition is developed in practice. The firm develops an insight (also based on data from market research) about a very specific waste issue: having clothes in our wardrobes that we seldom use. From this insight they develop a concept (jeans rental and recycling) and a community of users, who are actively engaged by the brand in this sustainable/circular fashion project.

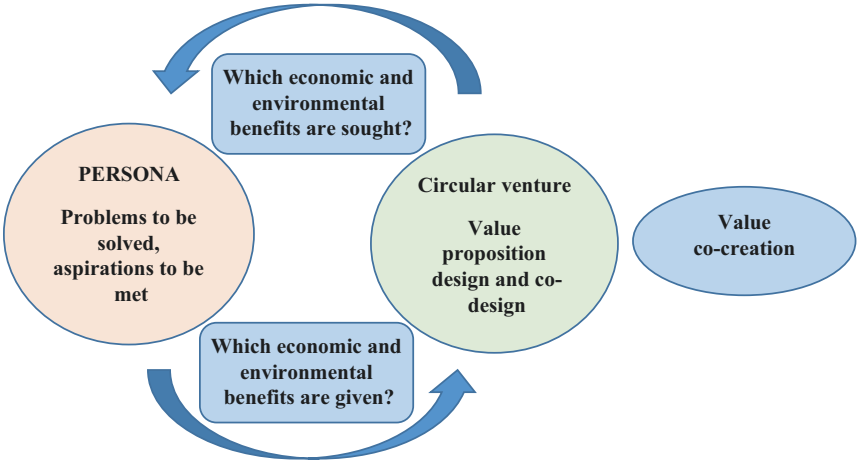

Fig. 3.4 The circular value proposition. *Source*: the author

An Example: Understanding the Value Proposition of Mud Jeans

Mud Jeans addresses its value proposition to environmentally conscious millennials, who are aware of the impact of their consumption decisions on the planet and want to contribute to a better world for future generations: "Be kind to the world. Recycle your jeans." The value they offer is co-created with users, since they are asked to adhere to the "buy and recycle" or to the "rent and recycle" model and are an active part of the business model. The value created is both economic and environmental.

In 2013 the founder, Bert Van Son, "introduced Lease A Jeans, an innovative approach to offer guilt-free consumption. MUD Jeans allows customers to shop guilt free and do good for the environment, while looking fashionable and modern. Therefore, the company won several awards, such as the Sustainability Leadership Award and the Peta Vegan Awards."

They add that "it doesn't make sense to keep the jeans you no longer wear in your wardrobe. Nor does it make sense to throw them away. We all know that our resources aren't unlimited, that's why we most of all have to be smart. The circular economy comes with a solution. In the circular economy waste is seen as a source of growth to make something new. We like the idea. That's why we create new jeans from our old jeans. The best part is that we make an environmental impact by cutting back on resource consumption."

Source: Mud Jeans website

3.4.2 The Design of a Circular Business Model

Building on the already-mentioned works by Ostwalder and Pigneur, we propose a business model canvas for the circular economy (Fig. 3.5). Our model confirms that at the core of the model there is the value proposition, as discussed in the previous section. It is also possible to identify the other building blocks of the canvas as already presented in Sect. 3.2.1 and—more specifically—in Fig. 3.1. All these elements need to be designed in the light of circular economy principles. For example, distribution channels have to be thought of in terms of environmental impact and also eventually planned for reverse logistics. The partnerships with other organizations involve also sharing similar principles, to guarantee the final customer and broader public that the entire value chain is sustainable and applies circular economy principles. A number of partnerships can involve associations and other non-profit institutions as well as public institutions. The key resources must be conceived in the light of reuse, recycling, sharing and so on. Capabilities need to be developed accordingly.

The Business Model of Mud Jeans

Mud Jeans is a company based in Amsterdam, and founded in 2012, with the idea to develop a model of business based on the principles of the circular economy. They explain their mission as follows: "By taking the most popular fashion item in the world, a pair of jeans, MUD Jeans wants to show you how we can put the principles of the circular economy into practice. Our jeans are the perfect combination of organic and recycled denim and timeless design. When worn down, we will give them a second life, cutting down on water and waste."

Their business model rests on six components:

1. Product design: "In the circular economy products are designed to be reused easily. That's why we don't use leather labels, but printed ones instead."
2. Manufacture: "We don't use conventional cotton. Our mills are BCI and GOTS certified. Also, we are a member of the Young Designer Programme of Fair Wear Foundation."
3. Lease "jeans and become a member of the MUD community. Or just buy them directly online or in one of the stores."
4. Use and return: "our adventures shape the character of (y)our jeans. Take them wherever you go, but send them back at the end of use."

5. Upcycle: "Returned jeans are upcycled and sold as unique vintage pairs. The jeans are named after the former user."
6. Recycle: "Worn out jeans are shredded, cut into pieces and blended with virgin cotton. This is how a new denim yarn is born."

Source: Mud Jeans website

Fig. 3.5 A circular business model canvas. *Source*: the author, based on an adaptation of the canvas by Osterwalder and Pigneur (2010)

Observing the components of Mud Jeans' CBM, we can identify a combination of some of the previously mentioned typologies of business models: product-as-service (jeans can be rented instead of being purchased), upcycling and recycling, product-life extension and closing loops. Also the product design and the materials (cotton) used are compliant to circular economy principles.

Mud Jeans is a good example of how the development of a CBM does not necessarily fit the taxonomies previously listed. In this case the company mixes elements like recycling, upcycling and renting/leasing. The circular economy is a natural realm for entrepreneurial creativity and continual business model innovation.

For a start-up in the circular economy, there is ample range of possibilities to introduce novel business models. The problem is more complex for existing businesses, which have already established models and a number of resistances to change. We shall devote Chap. 4 to the first, which we label "born circular firms," while we deal with the circular transformation of established firms in Chap. 5.

3.4.3 Developing the Circular Business Model: Enabling and Constraining Factors

Circular entrepreneurship rests on business model innovation, as discussed previously. The circular venture requires both a frame of reference for the design of the model itself, which encompasses its cornerstones and building blocks, and a developmental path.

In order to structure process phases in business model innovation, Frankenberger et al. (2013) have developed the so-called 4I-framework: in the initiation phase, the company needs to understand the ecosystem by which it is surrounded, comprehending stakeholders and change drivers, such as technology or regulation that can initiate business model change; the ideation phase is based on the generation of ideas for new BMs; in the integration phase, the ideas that normally refer to the value proposition, need to be transformed into viable business models and thus, integrated with other components of the BM, such as revenue streams and channels; finally, the integration phase requires investments,

pilots, trial-and-error and experimentation for the practical development of the BM.

The introduction of sustainability and circularity within existing businesses can lead to business model transformations. In particular, typologies of BM transformations toward sustainability have been outlined by Gauthier and Gilomen (2016) and are: business-as-usual, when no transformation occurs; business model adjustment, when transformation regards a single BM element; business model innovation, when major BM changes are implemented; business model redesign, when new value propositions result from a radical rethink of a BM.

In the case of the Circular Economy, several design methods and tools for the development and implementation of CBMs exist in literature. Mentink (2014) developed a framework, outlining a process of five phases (preparation, initiation, ideation, integration and implementation). Scott (2015) provides the so-called 7P-model in order to understand and apply circularity within businesses: after a "prepare" phase in which companies establish the objective of sustainability and figure out both the CE basic principles and the scope of the change, firms then need to implement the circular economy in terms of processes, preservation, people, place, product and production and finally support the circular economy implementation mainly relying on team building and change management (Scott 2015). Additionally, the transition toward a CBM is supported also by the BM scan, that is a methodology consisting in a six-stage process related to value proposition, design, supply, manufacturing, use and next-life.

CBMs share some key elements. They can be highly innovative, divergent from current business practices and challenging for the customers/users. BlaBlaCar and Mud Jeans are very good examples from all these points of view. Implementing a business model is thus a matter of design, more than planning. The design approach means that firms need to understand the cornerstone of the model, but it also means being ready to adapt it to market conditions and stakeholders' expectations and behaviors. This experimental approach permits the CBM to gradually co-evolve with the practical conditions of the "field," in which it is being introduced.

The implementation and growth of circular practices require that firms pay attention to a number of factors that can inhibit or enable their adoption. They can be classified into internal and external factors, according to Fig. 3.6.

To start a CBM it is necessary to set up a network of players, a system of partnerships, and engage different stakeholders. In some cases, this requires developing an ecosystem. The literature on industrial symbiosis (Chertow 2007) for example discusses the sustainability agenda from the perspective of developing ecosystems of actors, thus mimicking natural systems. Ecosystems in the circular economy involve both formal partnerships and informal networks (Van Buren et al. 2016). The concept of the business ecosystem proposed by Moore (1996) builds on previous supply-chain network theories to include other organizations such as research institutions, associations and other stakeholders. Most business models in the circular economy go beyond the organization boundaries of one firm. They are frequently designed to encompass different players, including

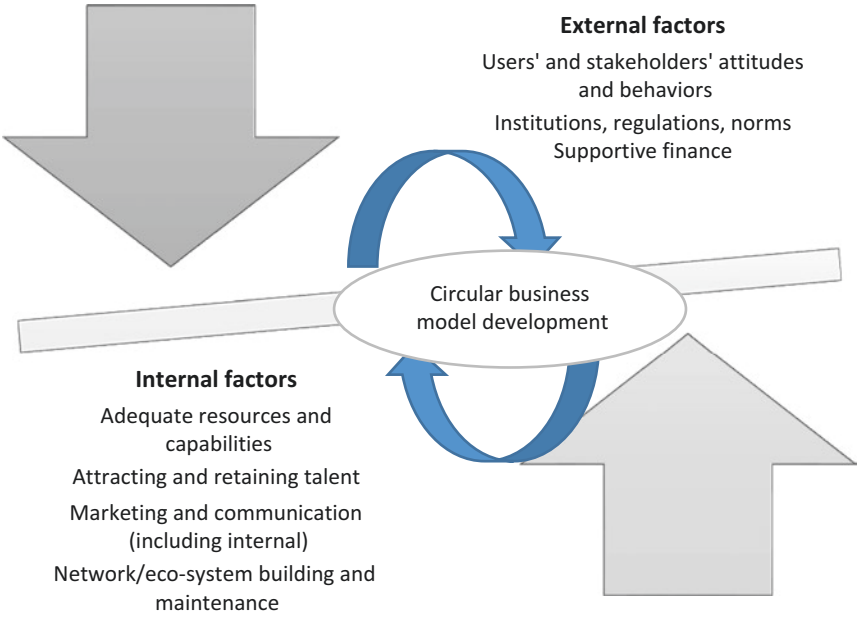

Fig. 3.6 Enabling and constraining factors to the adoption and development of circular business models. *Source*: the author

actively engaged users (as we discussed before), public institutions, research centers, suppliers and so on. Both BlaBlaCar and Mud Jeans had to establish a network of partnerships to implement their business model. For example, BlaBlaCar relies on a community of users, who provide/use the mobility service and rate the quality of drivers, on strategic partnerships with some large players, like for example with AXA for a competitively priced car insurance. Mud Jeans also has a community of users and established partnerships with key suppliers of fabric and jeans manufacturers, to ensure the needed quality and respect of environmental standards.

The implementation of the CBM requires an "eco-systemic" perspective (Zucchella and Previtali 2019) from its design phase, but then requires a continual adaptation of the entire system during the implementation phase. The functioning of these complex multi-actor models in fact needs to be constantly fine-tuned and co-evolves continually.

An additional element to be considered during the implementation phase is the development of capabilities. Both new and established firms, when facing the challenges posed by the circular economy, need to develop capabilities, which support the implementation of the business model.

According to Lacy and Rutqvist (2015), business strategy, innovation and product development, in-sourcing and manufacturing, sales and marketing, reverse logistics and return chains are fundamental capabilities for a successful adoption of CBM. This view reflects the idea that a CBM is mainly related to manufacturing processes, though this is not always the case, as some of our examples have demonstrated. More generally, a key capability to be developed refers to the capacity to understand, design and deliver a convincing and viable value proposition, a product-as-service solution, to develop and maintain a complex network and a business model that spans across organizational boundaries. Consequently, a key factor of success for any firm in the circular economy is represented by network/alliance capabilities.

Marketing and communication capabilities are also relevant, because it can be tricky to explain what a circular project is, its value proposition and how the business model is designed. "Selling" a circular value proposition may be a matter of educating consumers to new sustainable lifestyles. It can thus happen that communication and education go hand in hand. The mentioned cases of BlaBlaCar and Mud Jeans had to face the challenge of changing users' consolidated behaviors. They had to transform products into services (from the ownership of a car or a pair

of jeans to their sharing/rental/lease). They needed to engage people into a sustainable lifestyle and make them understand the benefits for the planet, while also achieving personal benefits.

Internal communication is equally relevant to the success and growth of the circular project: it is necessary to attract and to develop talent in order to implement effectively a CBM. Human resources are key to any project's success, and to attract motivated people and develop their skills further, aligning them to the circular project objectives, the firm has to communicate what its project is about, and why it matters, not only for the individual but for the planet. This can stimulate a strong sense of belonging in human resources and give a meaning to working for a venture, which aims to address some challenges for our future. Some authors emphasize the role of leadership and human resources as other important influencers in a successful transition toward a CBM (Scott 2015; Roos 2014). LifeGate (in the box) is a very good illustration of how to grow and retain talents, how to communicate internally and externally, and how to educate people to increasingly sustainable lifestyles. The case shows that the circular economy cannot neglect the "people" element in its implementation and development, in order to succeed.

LifeGate: Communicating and Educating for a 360° Commitment to People and Planet

LifeGate is a group of companies, all engaged in communicating, sharing and applying sustainable economy principles. The holding company was founded in 2000 by Marco Roveda, a visionary entrepreneur, formerly one of the pioneers of organic food (milk products) and bio-agriculture.

The LifeGate project was born with the core idea of "pursuing a 360 degrees vision of sustainability" (interview with Enea Roveda, LifeGate's CEO). It now counts around 50 staff, supported by a number of freelancers and a series of partnerships with other companies and associations.

LifeGate has two main business activities: the first refers to the importance of raising awareness about sustainable issues through the engagement of people with similar values that are constantly informed through the LifeGate media network. The second refers to supporting other companies and organizations in implementing sustainability into their core business, through a wide range of services and products. "We are the main—and probably the only—organization in Italy that addresses all the different needs of companies and organizations engaged in sustainability."

The first activity (communication) was established with the idea of aggregating people sharing similar values. It also serves the purpose of informing

about sustainable lifestyles, thus educating/inspiring consumers on the different aspects of sustainable living. Their community accounts for more than 5 million people, mostly concentrated in Italy, and relies on an extensive presence in different social media and the radio.

The second activity is represented by services and products provided to other organizations, both public and private. In particular, they provide (a) consultation for improving social, environmental and economic performance; (b) communication support for creating effective communication projects coherent with a People–Planet–Profit approach; (c) a series of projects addressing specific areas of interest (e.g.: PlasticLess, Mobility Revolution, Zero Impact®, Bee my Future, Ethical Debt Collection etc.); (d) energy from renewable sources and natural gas with "Zero Impact®"; and (e) LED lighting for energy saving.

The company adheres to the triple bottom-line principles and transmits them to its customers and to its community. When asked about the circular economy, Enea Roveda answers, "We have been discussing the circular economy for some time. It fits well with our triple bottom-line principles and our commitment to sustainable development. It also inspires concrete achievement of these goals. At the same time, the circular economy debate has a missing piece, that is the social one. I believe that a circular economy cannot neglect human resources and social matters. The circular economy is more than this. It is about returning to the planet whose resources we have used, natural and human."

He adds: "We must live a deep relationship with the planet, we need to establish a harmony, and this requires a long-term commitment from all the players. The planet is made of relationships and to me the circular economy must be based on this acknowledgement."

Source: Interview with Enea Roveda, CEO LifeGate

The company—as mentioned above—views social and environmental commitment as deeply intertwined. It develops and offers services, which also address social sustainability. As a key component of their social sustainability orientation, they give company shares to any employee with more than two years' length of service. At the moment 15% of their shares are thus in the hands of employees. This means that LifeGate carries interesting innovations also at the level of corporate governance, though they see this aspect as a "natural consequence of our principles."

Finally, there are adoption factors and barriers to the development of CBMs, which stem from the external context. Planing (2015) analyzed reasons for non-acceptance of CBM, pointing out that customer irrationality, conflict of interests between companies, geographic dispersion and

misalignment of profit-share across supply chains can lead firms to spurn CBM. Other researchers have focused on barriers and enablers to the implementation of CBMs, in particular within SMEs, such as lack of governmental support and capital (Rizos et al. 2016). Linder and Williander (2017) focused their research on uncertainties in CBM innovation related to reuse and remanufacturing. In the particular case of remanufacturing, factors hampering the adoption of CBM can be represented by fashion changes, lack of supporting law, policy and regulations (Linder and Williander 2017). Similar considerations and barriers to adoption can be found also in other types of business models in the circular economy. A role is certainly played also by the provision of financial resources. A number of promising business models cannot start or grow after start, because of capital requirements. This is a general problem for new ideas and start-ups, but in the circular economy the problem can be amplified by the difficulty in convincing investors about a business that tries to make profit compatible with non-profit objectives (Jeucken 2010).

Figure 3.6 summarizes the factors that can contribute or constrain the effective implementation and development of CBMs. The last chapter of this book is devoted to discuss in more depth under which conditions a circular business can grow and expand, also geographically. The scalability, replicability and transferability issues will be analyzed together with their enabling and constraining factors.

In Short

Beyond the design of a CBM, firms have to face the challenge of implementation and development of the model. It is a continual experimental process, which rests on multiple actors and on a number of enabling and constraining factors.

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4

Circular Entrepreneurship in Action: The Born Circular Firms

4.1 Introduction

In the previous chapters we have briefly introduced some examples of circular entrepreneurship. From those cases it is possible to outline two main types of circular ventures: the first describes firms which are "born circular" because they have been set up from scratch following an idea to create both economic and social/environmental value, applying the principles and the business models of the circular economy. These firms are frequently circular start-ups, founded in recent years and adhering to the increasing interest in circular economy principles both in the business world and among consumers. However, it is also possible to find more mature firms of the second type ("growing circular"), which have been founded years ago pioneering the idea to do business while doing good for the planet by closing the resources loops.

It seems plausible that born circular ventures are at an advantage compared to established players: the orientation towards a circular economy involves profound transformations in business activities and born circular players have the possibility to design from their foundation an innovative business model, without constraints from existing

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organizational routines, capabilities and cultures. At the same time, large players can deliver relevance and impact to a circular economy development and can also support the growth of smaller and resource-constrained realities. Also, in innovative and potentially disruptive contexts, large incumbents can benefit from learning through partnerships with new players. Finally, younger firms can be more financially constrained in realizing their project, especially when they involve relevant investments. Also from this viewpoint, partnerships can prove particularly useful.

We thus propose a distinction between born circular and growing circular firms, with the idea that they can cooperate and benefit from cooperation. The firms which are "growing circular" are in a transition towards less impactful activities and towards the adoption of circularity principles. Some of these firms are long-established and very large. This raises a double challenge for their management: first, they have consolidated routines and ways to run their business, which may be difficult to change, and second, they are large enough to make the transition process particularly complex, due to multiple businesses, multiple geographic locations and multiple functions. The transition process is a matter of corporate entrepreneurship and we devote Chap. 5 to these issues, illustrated through macro-cases, that is, a few cases of large corporations.

This chapter instead deals with born circular ventures, and specifically with circular entrepreneurship in small and young ventures, analyzed through a number of micro-cases, that is short stories of many born circular ventures. In both Chaps. 4 and 5, differently from the previous three chapters, the discussion follows the cases, thus adopting an inductive approach. The purpose is to let the stories and illustrative cases unveil opportunities and challenges for entrepreneurship in the circular economy.

Thus, this chapter is organized into three parts:

4.2. Born circular firms
4.3. The governance and the financing
4.4. The value proposition and the business model of born circular firms

4.2 Born Circular Firms

The circular economy, with its key principles and its various models of business, is a very promising creative endeavor for entrepreneurs willing to explore and exploit novel opportunities which make profit compatible with nature. In order to understand what is happening in this realm, we have analyzed a number of small ventures, all having in common the fact that they have been founded originally adhering to circular economy principles. We label these born circular firms and we shall try to identify and discuss their mission, the opportunities they are exploring and exploiting, and through which business model exploitation is occurring. Also, we want to uncover challenges and barriers to the diffusion of these types of firms.

In order to identify cases, we tried to map companies which have been reported as either involved in some circularity practice or referred to circular economy in their mission and vision statements. To do this we have combined different sources of data: companies cited in report and publications about the circular economy, companies which have been awarded/mentioned in some event about the circular economy, and companies which emerged from press releases through the Lexis Nexis data base, searching "circular economy" in relation to business activities. We could thus develop a list of firms, which have been screened in order to select cases of born circular firms, which fit the purpose of our research. This sampling does provide a representative sample of born circular firms, but it helps also in enabling us to discuss just what a born circular firm is—namely, the vision, the mission, the governance and business model adopted.

The firms have been first investigated through secondary sources (triangulating company reports, press releases, official documents, various internet sources) and are listed in Table 4.1. For some of them it has been also possible to conduct interviews with founders/managers. Some cases have been discussed in the previous chapter, like Mud Jeans, BlaBlaCar and LifeGate. Others have been briefly mentioned, like Hello Tractor, and will be analyzed in more depth in this chapter, together with some selected illustrative cases of the list in Table 4.1. In this section we

Table 4.1 Cases of born circular firms

Company	Size and typology of firm	Business	Nationality and year of establishment	"Circular mission"
Acqua&Sole	Small firm, part of a group	Upcycling organic waste	Italy, 2007	"From a necessity to a richness, applying the principles of a circular economy to agriculture," "we promote neo-rurality," a "novel circular approach to agriculture."
Femer	Small firm plus local association	Fish Leather fashion	France, 2013	"Femer is a leather firm (specialising in fish skin), which is based on a 100% eco-responsible approach. We valorise and transform, following the circular economy, fish skins in a noble resource: leather."
959	Small firm	Handbags and vats from seat belts	Italy, 2009	"959 has kept the idea of the seatbelt whilst transforming it into a collection of bags made entirely out of material recuperated from scrap yards." "[I]t is a creative and responsible philosophy, which respects people and the environment, through the re-use of materials."
Ecotech Recycling	Small firm	Rubber recycling	Israel, 2008	"A revolution in the rubber industry—from waste material to high-value commodity; closing the cyclical economy loop. With industry leadership in two major areas Ecotech is poised to launch a disruptive business that promises significant global growth; manufacturing and selling one of the world's most in-demand commodities, raw rubber."

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Table 4.1 (continued)

Company	Size and typology of firm	Business	Nationality and year of establishment	"Circular mission"
EcoAlf	Small firms, B-corp	Waste recycling to manufacture apparel	Spain, 2009	"EcoAlf arose in 2009 from my frustration with the excessive use of the world's natural resources and the amount of waste produced by industrialized countries. EcoAlf symbolizes what I believe the fabrics and products of the new generations should be, a new fashion/lifestyle brand that integrates breakthrough technology to create clothing and accessories made entirely from recycled materials with the same quality, design and technical properties as the best non-recycled products. That way we show that there is no need to use our world's natural resources in a careless way."
Kemit Ecology	Small firm	Waste recycling to produce ecological coal	Cameroon, 2014	"Kemit Ecology is contributing to fight against climate change by producing ecofriendly charcoal from urban food waste. 1 Kg of Megaecofire is helping to preserve 1665 kg of carbon dioxide in the atmosphere."
LanzaTech	Small–medium firm	CO_2 recycling through bio-based nanotechnology	New Zealand, 2008	"LanzaTech is focused not just on technology but on *what matters most*—the triple bottom line of social, economic and environmental growth. Today we live in a resource and clean carbon constrained world and alternative solutions hold the key to sustainable development. LanzaTech believes a transition to a 'Green Economy' is required."

(*continued*)

Table 4.1 (continued)

Company	Size and typology of firm	Business	Nationality and year of establishment	"Circular mission"
D3EPACA	Small firm, networked with alma mater association	Electric/electronic waste management	France, 2013	"[O]ur mission is to collect, re-use and re-cycle waste from electric and electronic equipment. Through our partnerships we engage for a sustainable, social and inclusive economy. We employ people with problems in entering the job market and people with handicaps."
Rethalar	Social enterprise	Textiles waste management and upcycling	Brasil, 2015	"Geramos soluções ambientais com valor compartilhado. Por meio de serviços inovadores, fazemos do descarte de uniformes profissionais da sua empresa um caso único de sucesso em economia circular!"
Actes	Small firm, part of the network Elise. Special statute firm (*entreprise adapté*)	Paper recycling	France, 2013	"[A]mong our objectives is the contribution to a sustainable economy through recycling paper, the support for a supply policy responding to circular economy principles and creating jobs for handicapped people (currently 80% of our staff)."
Codland	Network of small and large	Sustainable fishing and recycling/ upcycling	Iceland, 2012	"The Iceland Ocean Cluster brought together seven fishing- and ocean-related companies and set the course to create maximum value from every part of the fish." "New valuable products are created from underutilized raw materials using innovative biotechnical solutions. Codland seeks to collaborate within the industry and with research institutions and universities to create innovative solutions."

(*continued*)

Table 4.1 (continued)

Company	Size and typology of firm	Business	Nationality and year of establishment	"Circular mission"
Orange Fiber	Small firm	Fashion fabrics made of orange fiber waste	Italy, 2014	"Innovation, sustainability and quality to make the world a better place. A dream come true by pioneering an innovative process to extract cellulose from citrus juice by-product and transforming it into a refined and high-quality fabric for a totally new standard in fashion and luxury."
Rifò	Small firm	Upcycling of cashmere	Italy 2018	"Rifò symbolises the combination between the protection of the planet and the old tradition of a city known throughout the world for its textile innovation, which keeps up the know-how of a great treasure: manual art. It is a brand that arises from the need for sustainable development, from the urgency of a change towards the establishment of an ethical economic model, shifting from the economic need to the climatic and environmental needs of our generation and those to come."

(*continued*)

Table 4.1 (continued)

Company	Size and typology of firm	Business	Nationality and year of establishment	"Circular mission"
Mud Jeans	Small firm	Jeans and apparel renting/leasing	The Netherlands, 2013	Mud Jeans has a closed-loop circular business model, based on circular design, sustainable manufacturing through value-chain partners. The sale model is based on a lease or buy deal. "[W]e want to work towards a situation where we can guarantee above average living wages for the workers in the factories we work with."
Bundles	Small firm	Home appliances sharing	Netherlands, 2014	"We believe in a world without throw-away products and without waste. In a circular economy, only the best appliances will be used and reused."
BlaBlaCar	From small to large	Car sharing	France, 2008	"We imagine a fairer, more open world of travel. Where people are better connected and independent."
Hello Tractor	Small firm	Tractor sharing	USA, 2014	"Without the right knowledge, labor, and equipment, farmers struggle to properly cultivate their land and plant on time, leading to underproduction and lost income."
Floow2	Small firm	Assets sharing for B2B	Luxemburg, 2012	"Sharing assets is so much more than sharing equipment and services. It's a radically innovative new business model that asks for a mindshift in all layers of an organization."

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Table 4.1 (continued)

Company	Size and typology of firm	Business	Nationality and year of establishment	"Circular mission"
PooPooPaper Park	Networked organization	Theme park for sustainable tourism and education, production of paper from elephant dung	Thailand	"A commitment to both the planet and the people is at our core. We believe in pursuing the middle way—where we can balance care for the natural environment and the people and communities we work with, together, with our commercial pursuits."
LifeGate	Small group, networked with associations, 15% shares to employees	Energy, education/ communication and B2B services	Italy, 2000	LifeGate is today recognized as a leading organization for sustainability, with fifteen years' experience and a prime role in media devoted to ecological themes, innovative environmental projects, energy and sustainability consulting. "To promote a lifestyle and economic model where people, the planet and profit coexist in harmony."
Clean Earth and Sky	Network of small firms	Consulting and materials from bio sources, especially algae	France, 2013	"We adhere to the circular economy principles, contributing from the side of development and use of bio resources."
Degraf	Medium-sized, B-corp	electrical and electronic waste hazardous waste	Chile, 1982	"At Degraf we are aware that our responsibility as a company goes beyond the direct scope of our business."

(*continued*)

Table 4.1 (continued)

Company	Size and typology of firm	Business	Nationality and year of establishment	"Circular mission"
IDROwash	Small firm	Ecological cleaning of buildings	Italy, 2013	"Our technology allows amazing results without the use of hazardous chemicals affecting the environment and people. We take care of the outside of the buildings, and also, the squares and streets."
DesArch Lab.	Small firm (association of freelancers)	Design and architecture	Italy, 2010	"Our mission is offering a second life to objects, giving them a new function, according to the philosophy of creative recycling, from a simple chair up to large-scale architectural projects."

Source: Companies' websites

introduce some main considerations arising from a first look at all 20 firms. In the following sections, we shall consider in more detail the key issues arising (governance, business model, network, financing), building on some case firms.

4.2.1 The Contexts of Born Circular Firms

At a first glance, it seems that cases of born circular firms are spread in different parts of the world. We could find more easily cases in Western Europe, due to a better access to the mentioned information sources. However, circular economy initiatives are reported, for example, in Africa, which hosts an African Circular Economy Network (ACEN) and an African Circular Economy Alliance sponsored by United Nations Climate Change. We analyzed a case in Cameroon, Kemit Ecology, which addresses a particularly relevant issue in developing countries: urban waste is out of control, and quality of life in the cities is increasingly worsening. They have introduced a technology which converts urban food waste into ecological coal, thus providing sustainable energy to cities and villages. Thus, they also contribute to fighting pollution, deforestation and the destruction of mangroves caused by the production of firewood.

Also, some born circular projects like Hello Tractor specifically target African users (farmers in this case), though being incorporated in the USA. The same happens in Asia and in the Americas. China has been pioneering interest in the circular economy, since the first introduction of the concept, being challenged by large population, pollution and increasing scarcity of natural resources (Geng and Doberstein 2008).

In Asia we found a number of sharing platforms, both for cars and other vehicles, and for a number of goods and assets, like Rent Tycoons, based in Singapore. We focused our attention on a case in recycling, which nicely addresses problems and opportunities in Asia. The recycling of elephant dung to produce paper has been introduced in Africa and Asia, thus providing an answer to a circular economy that limits deforestation and gives value to a very humble material. It thus also helps in preserving the elephants. The case PooPooPaper Park in Thailand is interesting because it goes beyond recycling and upcycling, and transforms

this experience into a theme park, to attract sustainable tourism and provide information and education on sustainable lifestyles. The case is also relevant because they establish a network of people working at this project, providing a job to many women, who can also work from home, and to immigrants.

In developing countries, the circular economy can provide opportunities for women to make a living, but also empower them towards entrepreneurship. According to the community Lionesses of Africa, "The good news is that a new generation of innovative women ecopreneurs in Africa are playing their part in finding solutions to dealing with the impact of waste on our environment. They are successfully linking sustainable business to environmental consciousness and concern for societal well-being. This is the basis for a new wave of women-led *ecopreneurship* taking root in Africa, resulting in a new generation of women-led start-ups with environmental consciousness at their core" (website).

The start-up and growth of circular ventures are highly context-specific. First, they tend to respond to local problems and opportunities, but at the same time they also refer to global issues, like pollution, climate change and the scarcity of natural resources. Second, they seem to diffuse more in places in which there is a more widespread culture for sustainable behavior in citizens and customers, a policy and regulatory frame for supporting sustainable ventures and sustainable behavior from all the actors. At the same time, circular projects and ventures improve the sensitivity of policymakers towards these issues and can support a novel policy and regulatory agenda. They can become institutional entrepreneurs, contributing to forge new rules of the game.

A supportive institutional context is particularly relevant for new and small firms, which are challenged by the liability of newness and of smallness. A supportive institutional context is key to their establishment and to their following growth. But it also matters a great deal to support the transition of established and larger firms towards circular principles. The notion of supportive context encompasses policymaking and regulations, users' consciousness and culture and so on. These issues will be dealt with in more detail in the last chapter of this book.

In Short

Circular ventures tend to respond to both global and local problems and opportunities. They benefit from a favorable institutional frame. Their geographic distribution is linked to the presence of a supportive context.

4.2.2 Leaders and Founders

The foundation of new ventures rests on entrepreneurs who can envisage novel opportunities and take the risk of their exploitation, by setting up a business organization and designing a business model. The circular economy in particular requires leaders who can develop a clear and convincing vision for the future. Their leadership supports the pooling of human and financial resources, motivates employees and convinces potential partners and customers to adhere to the project. The circular economy provides opportunities but also a highly uncertain and novel context to do business. The entrepreneurs who aim at starting a business in this field are typically driven by a strong will to provide a contribution to environmental threats and to secure a living planet to future generations. At the same time, they can also aim at making profit if they start a business firm. They have it clear in their mind the triple bottom line (people, planet and profit) as a guiding objective of their entrepreneurial action. They also have personal objectives in terms of social recognition, passion for change and leaving a positive footprint in the planet. Their stories can motivate other potential entrepreneurs, who can benefit from learning from the successes and failures of others. For example, Patagonia is a recognized case of championing sustainability since the 1970s. Its founder, Yvon Chouinard, wrote a book about his story ten years ago. The book, titled *Let My People Go Surfing*, soon became very successful, a must read for many people interested in sustainability but especially for aspiring entrepreneurs following the triple bottom line principles. Chouinard is an example of transformational leadership, which is required to reinvent a company and its business. This topic will be particularly relevant also for the following chapter, discussing the transition of established firms to the circular economy. Under Chouinard's leadership Patagonia evolved into a champion of sustainability, including their

network of suppliers. The firm has been among the first to adopt the statute of benefit corporation, under the California regulation, as we'll discuss later on in more detail. Patagonia is also championing brand activism: this means that the brand assumes characteristics of its founder and engages in battles to save the planet. In December 2017 Patagonia filed a lawsuit in the Federal District Court in Washington, after it was announced that the US president took the decision to reduce the extension of natural monument parks in Utah. The lawsuit named as defendants Mr. Trump, Interior Secretary Ryan Zinke, the secretary of agriculture, the director of the Bureau of Land Management and the chief of the Forest Service. And the argument was simple: according to Patagonia, the Antiquities Act of 1906 gave presidents the power to create national monuments, but it did not grant the power to reduce them.

A number of born circular firms tell the story of their founders and their beginnings to provide invaluable insights about how to embrace circularity for new business firms, how to overcome obstacles and develop trust in the future. A good example is BlaBlaCar. According to their website, "On the occasion of BlaBlaCar's 10 years' anniversary, invaluable insights from BlaBlaCar's founders, employees, investors, sharing economy specialists and members of the community were gathered to take you behind the scenes and shed some light into how BlaBlaCar was built over the years. In a series of 10 articles, each linked to one of BlaBlaCar's 10 core values, you will discover a decade full of dreams, hard work, passion and fun."

BlaBla Car: How Frédéric Mazzella Developed His Project

"Since pioneering the idea for BlaBlaCar in 2004, Frédéric has led the company to become the world's largest long-distance carpooling community. As a branding and communications enthusiast, Fred has built a global brand whilst relentlessly spreading the word about the virtues of carpooling. Frédéric carries BlaBlaCar's vision of a people-powered travel network enabled by trust and technology, and is passionate about high social impact solutions. Frédéric is a regular speaker at leading international conferences and in the media, where he comments on the fast-changing mobility landscape, entrepreneurship, global marketplaces and building trust in online communities.

At 27 years old, he had never missed a Christmas at home and was determined that 2003 wouldn't be that year. At 500 km away from Paris in the Vendee region of western France, his hometown wasn't the easiest place to get to without a car. With no seats available on the train until after Christmas, Fred ended up calling his younger sister and convinced her to make a lengthy detour to pick him up in Paris.

Soon after, the siblings were on the road in the old family Honda Civic. It must have been a few hours into the journey when Fred who had been staring out of the window noticed something.

He could see the train from the A10 highway. The train that he should have been on. The train that was overbooked and had no seats left. And whizzing by him were hundreds of cars. Cars that were mostly empty, except for the driver. Suddenly he realized what he was actually seeing. 'Oh my god,' he thought, 'there ARE seats going to Vendee but they're not on trains, they're in CARS!'

For the next 72 hours, Fred couldn't sleep. Surely a database of empty seats in cars must exist? After searching online, he discovered a handful of listings on various forums with people offering to share a ride. It was at a very low scale and so unorganized that finding someone who was doing the same trip at the same time was next to impossible."

Source: company website

The story of BlaBla Car beginnings is a nice lesson in how entrepreneurs shape opportunities. Particularly it shows how motivated and open-minded people can turn a problem into an opportunity. The story of BlaBla Car also illustrates how the foundation of a born circular firm rests frequently on an entrepreneurial team: it is necessary to combine different skills and backgrounds and different points of view, to ensure a better design and evaluation of the new business and to run it successfully.

A third and very relevant case is represented by transformational leaders who do not run a circular business, but actively work for the growth of a circular economy, through non-profit organizations. A particularly important figure is Dame Ellen McArthur. In the previous chapters we already mentioned repeatedly materials and works provided by her Foundation, to support knowledge about the circular economy and share best practices. Around her Foundation a network of partnerships with companies, universities and other institutions has bloomed and a number of projects are underway. An example of her Foundation's recent action is the global commitment to eradicate plastic waste and pollution at the

source. It has been signed by 250 organizations including many of the world's largest packaging producers, brands, retailers and recyclers, as well as governments and NGOs. The New Plastics Economy Global Commitment is led by the Ellen MacArthur Foundation, in collaboration with UN Environment. "The commitment involves companies representing 20% of all plastic packaging produced globally. They include well-known consumer businesses such as Danone; H&M group; L'Oréal; Mars, Incorporated; PepsiCo; The Coca-Cola Company; and Unilever; major packaging producers such as Amcor, plastics producers including Novamont, and resource management specialist Veolia. The Global Commitment and its vision for a circular economy for plastic are supported by the World Wide Fund for Nature (WWF), and have been endorsed by the World Economic Forum, The Consumer Goods Forum (a CEO-led organisation representing some 400 retailers and manufacturers from 70 countries), and 40 universities, institutions and academics. More than fifteen financial institutions with in excess of $2.5 trillion in assets under management have also endorsed the Global Commitment and over $200 million has been pledged by five venture capital funds to create a circular economy for plastic" (UN Environment website). Ellen McArthur is a demonstration that being circular entrepreneurs can go beyond running a company: setting up a dedicated think-tank to support the growth of the circular economy and coordinating a big network to save the ocean from plastic are examples of entrepreneurship as well.

Ellen MacArthur DBE

"Dame Ellen MacArthur first hit the headlines in 2001 when she raced single-handedly non-stop around the world in the *Vendée Globe* when only 24 years old. After 94 days at sea, Ellen returned to a different life, she had come second in one of the hardest races in offshore sailing and the response was massive. Prior to her *Vendée* success, she won the solo transatlantic race from the UK to the USA and went on to win the Route du Rhum from France to the Caribbean in 2002.

After this successful run in the monohull Open 60 class, Ellen turned her attention to the multihull circuit leading to her departure from Falmouth, UK in 2004 on board the 75 ft trimaran B&Q … She returned 71 days, 14 hours, 18 minutes, 33 seconds later, having sailed over 26,000 miles to

become the *fastest person to circumnavigate the globe single-handed*. She was knighted by the Queen in 2005 and has received the Legion d'Honneur from French President, Nicolas Sarkozy. She is a founder of the Ellen MacArthur Cancer Trust, a charity, set up in 2003, which works with hospitals across the UK to take young people aged between 8–24 sailing, helping them regain their confidence after treatment for cancer & leukemia.

Ellen's current and unexpected direction was a result of her competitions at sea, which gave her a very real understanding of what it means to rely on a finite supply of resources, as on the boat food, water and fuel were inescapably linked to success or failure. Five years ago this inspired a new journey, spending time with local and national governments, scientists and working across key industry sectors to understand how on land too we rely on finite resources in the form of materials, energy and water. It was through this realisation that Ellen made the difficult decision to end her professional racing career and focus on a still greater challenge. Ellen's search for solutions to these challenges led her to discover a framework for re-design and the idea of shifting from our ultimately limited linear to economy to one that is re-generative by nature. In September 2010 she launched the Ellen MacArthur Foundation with the goal of 'accelerating the transition to a regenerative, circular economy.' The Foundation works in the three areas of business, education and communication. Not surprisingly—this is the most exciting project that Ellen has worked on to date, and, like with her sailing she is totally immersed in it!"

Source: EllenMacArthur.com

In Short

Founding a circular venture requires committed and visionary entrepreneurs with leadership attitude who are ready to network with complementary talents.

4.2.3 The Mission, the Objectives and the Role of People

All the born circular ventures point out their commitment to the planet as a key component of their mission and vision (Table 4.1). Most of these ventures are for-profit organizations, so they also need to make profitability compatible with circularity principles. This does not seem to be an

issue, because born circular firms have been established by entrepreneurs who have identified profitable opportunities in the circular economy domain.

It is important to notice that many of these firms refer implicitly or explicitly to the triple bottom line as their system of corporate objectives. The latter means that a firm prioritizes contemporarily people, planet and profit (Elkington 1997). The born circular ventures share the aim to be accountable to the triple bottom line. This is an important point because it seems to support two main considerations: first, in the circular economy the boundaries between profit and non-profit organizations are more blurred and second—though the circular economy discourse is about the "planet"—circular ventures feel the need to be sustainable also from the social and human resources point of view. The "circular ethics" encompasses a planet made of natural and human resources at the same time.

But what makes the "people" bottom line aligned not only to a generic "social impact," but more precisely tuned with circularity principles? This orientation involves for example considering the issue of waste also when looking at human resources. The latter can remain underutilized or idle, instead of being actively engaged in activities, which—while doing good for the planet—can also do good for the firm. The creation of green jobs is part of the high potential of the circular economy. One of the most important studies on the social impact of the circular economy confirms that "existing studies point to the positive employment effects occurring in the case that a circular economy is implemented" (Skånberg and Wijkman 2015). McKinsey (2015) acknowledges that "This impact on employment is largely attributable to increased spending fueled by the lower prices expected across sectors and to the labor intensity of recycling activities and higher-skilled jobs in remanufacturing" (*Source*: https://www.mckinsey.it/idee/europes-circular-economy-opportunity). We certainly need more studies on the job creation potential of the circular economy and we must be aware that these effects may have significant differences across industries and contexts. Beyond the issue of green jobs creation, the circularity principles also invite entrepreneurs to target pockets of potential talents that would not normally be considered. For

example, people with disabilities and people marginalized from the job market for various reasons.

Our Asian case, PooPooPark, declares, "We operate a flex-work, cottage-based, production framework in Thailand where many of the artisans (mostly female) have the opportunity to work at home with the flexibility to also attend to their traditional farming, household or family responsibilities. Incomes generated often enhance a traditionally agriculture-based family income. We arrange and provide employment to many ethnic minorities from rural, mountain villages whose families often originate from nearby Burma and had moved to Thailand to seek better economic opportunities or in some cases to avoid political strife" (company website).

Femer is a French circular venture, established in the south-west of France on the coast of Arcachon. From fish skin they obtain a type of leather (through a tanning process fully sustainable and free from unhealthy metals). In their activity they involve local communities of fishermen and their families. Some stages of the tanning process are based on a partnership with a local association employing disabled people.

The French network Elise, founded in 1997 and now comprising a system of firms, among which is Actes (see Table 4.1), is committed to office paper recycling. The network members are under the charter of either *Entreprise adaptée*, which—according to the French regulation—means a firm is committed to hire at least 80% of their staff from disabled people, or *Entreprises d'insertion*, which commits a firm to the integration/reintegration into the labor market of people who are excluded from it. In both cases the firms have a special statute and a commitment to a social cause, notably the valorization of otherwise marginalized human resources.

We can also imagine that engaging people in circular projects and social ventures may appeal to an ageing population in Western societies, with a long life expectancy and willingness to spend part of their time keeping active and contributing to society. Also from this point of view, the principle of using resources otherwise neglected or inactive correlates well with circular economy objectives. To some extent the recent debate on the fourth pillar in social security addresses this issue: the Geneva Association identified a fourth pillar for pensioners' welfare, that is the

future need for a flexible extension of work-life, mainly on a part-time basis, in order to supplement income, but also in order to prevent exclusion from active life, if people wish to (Kessler 1988; Giarini 2012).

Caring for human resources means attracting, nurturing and retaining talents. This is pursued in different ways: for example providing better salaries, or giving other forms of compensation, like a company's shares (LifeGate case study, Chap. 3) and other benefits (Patagonia). Patagonia aligns its corporate goals (profitability and sustainability) with the individual preferences of its workers. The benefits include things like on-site childcare, time off when the conditions are prime for outdoor activities like surfing or skiing, and leaves of absence to volunteer for environmental causes. The title of a book by Chouinard (2016), *Let My People Go Surfing*, clearly illustrates the Patagonia attitude towards its employees. The results of this human resources policy are clear: Patagonia is a highly attractive workplace for talents, and has a very low turnover of employees. Also, it has a labor productivity above the average of the industry. Though Patagonia is not strictly a born circular firm, its pivotal policies are inspiring a number of new ventures in sustainable businesses.

It is increasingly acknowledged that sustainable businesses attract talent more easily, especially young, educated and motivated young people (Davis-Peccoud 2013). And the recent French initiative demonstrates that young people are moving towards a more active and collective behavior toward their future employment (see box about the French Students' Manifesto).

The French Students Manifesto

On September 25, 2018, students from five top French schools unveiled a manifesto titled "Wake up call on the environment." The manifesto calls for students to capitalize on their collective power as citizens and—as future employees—to compel French companies to embed sustainability deeply in all their activities.

By the end of November 2018, more than 23,000 students from over 300 French higher education institutions had already signed this manifesto, which calls for an active engagement towards sustainability.

In the Manifesto website we read, "We, students in 2018, make the following observation: despite the many calls from the scientific community,

despite the irreversible changes already observed around the world, our societies keep moving towards an environmental and human disaster." Also they write, "We, future workers, are ready to question our comfort zone in order to achieve a deep social change." The students' engagement request has many facets, including the decisions about future employers: "Given the scale of this challenge, we know that individual commitments, while laudable, won't be enough. Indeed, does it mean anything to ride a bike when you work for a company whose activities contribute to increasing climate change or draining natural resources? As we get closer to our first job we realize that the system we are part of steers us towards positions that are often incompatible with the result of our reflections."

Source: https://pour-un-reveil-ecologique.fr/index.php?lang=EN

To sum up, in our cases it emerges clearly that the circular economy needs to consider the planet's resources as well as human ones. Our cases permit us to address a gap in the circular economy discourse, due to its predominant "ecological stance" determined by the primary concern for the planet's natural resources, which leaves aside the perspective of human resources.

In Short

Many born circular firms show an engagement both with the planet and people, that is to environmental and to social objectives. This engagement supports the attraction and retention of talent. Moreover, social objectives include applying circularity to human resources: creating value from waste also applies to job markets in which many people are left behind.

4.3 The Governance and the Financing

4.3.1 Innovation in Legal Forms and Governance

A significant number of born circular ventures have some kind of "special" or alternative legal form. Some firms choose governance models they think more coherent with their mission. It seems that being a circular

enterprise, particularly for the younger born circular cases, is a matter also of innovation and experimentation in legal forms and governance mechanisms. This is somehow a natural consequence of what was discussed in the previous section.

We mentioned above the French cases, which adopt special legal forms like *l'Entreprise adpatée* or *l'Entreprise d'insertion*, in line with their social objectives. Some circular firms adopt the legal form of benefit corporation. A benefit corporation is a recent type of legal entity, designed to produce a public benefit, in addition to driving shareholder value. By their own nature they have to make profit compatible with also creating a social/environmental value. They have to be highly accountable to their shareholders about effectively pursuing these objectives. Transparency and accountability to all relevant stakeholders are key to their functioning. They have been introduced in corporate regulations in some US states from 2011 and since then they have quickly expanded. As of December 2018 there are 34 US states which recognize and define this special type of corporation. Patagonia has been among the first companies to embrace this legal form. "Patagonia is trying to build a company that could last 100 years," said founder Yvon Chouinard on the day Patagonia signed up. "Benefit corporation legislation creates the legal framework to enable mission-driven companies like Patagonia to stay mission-driven through succession, capital raises, and even changes in ownership, by institutionalizing the values, culture, processes, and high standards put in place by founding entrepreneurs" (Patagonia website). In recent years other countries have also adopted similar new legal entities, sometimes with differentiated denominations and with different rules. Italy has pioneered this process with a benefit company regulation in 2016.

In order to assure stakeholders about the respect of common rules, a certification for benefit companies and similar models have been introduced. They refer to B-corp to identify these entities, which in different countries and under different regulatory frames adhere voluntarily to additional requests of accountability, transparency and commitment to their mission. Also, a firm can apply for B-corp certification even in countries who do not yet regulate the matter. The B-corp certification entity declares, "Certifying as a B Corporation goes beyond product—or

service-level certification. B Corp Certification is the only certification that measures a company's entire social and environmental performance. The B Impact Assessment evaluates how your company's operations and business model impact your workers, community, environment, and customers. From your supply chain and input materials to your charitable giving and employee benefits, B Corp Certification proves your business is meeting the highest standards of verified performance." There are currently over 2500 Certified B Corporations in more than 50 countries. The benefit corporation and the B-corp movement does not necessarily involve only firms applying the circular economy principles. However, this legal form is interesting for circular ventures.

An example is Degraf, a Chilean company which provides services of e-waste recycling, certified destruction of data and assets, and the safe disposal/recovery of IT assets (ITAD) and management of hazardous and non-hazardous industrial waste for companies, corporations, governmental and municipal agencies and both profit and non-profit institutions. "At DEGRAF we are aware that our responsibility as a company goes beyond the direct scope of our business. DEGRAF is a certified B Corporation committed to its employees and constituents, the community and the environment by meeting rigorous standards of social and environmental performance, accountability, and transparency" (company website).

Another case firm, EcoAlf, based in Madrid, obtained a B-Corp certification in April 2018. The circular economy, beyond traditional for-profit firms and their recent evolutions like benefit companies, can host organizational hybrids (Battilana and Dorado 2010), like social enterprises. These are "organizations whose purpose is to achieve a social mission through the use of market mechanisms. … Social enterprises are neither typical charities nor typical businesses; rather they combine aspects of both. Their primary objective is to deliver social value to the beneficiaries of their social mission, and their primary revenue source is commercial, relying on markets instead of donations or grants to sustain themselves and to scale their operations. For these organizations, commercial activities are a means toward social ends. As such, social enterprises are hybrid organizations that combine aspects of both charity and business at their core" (Ebrahim et al. 2014, p. 83). The mentioned cases

like Femer and the Evise network are to some extent hybrid organizations. What is interesting to notice is that it is not always easy to distinguish for-profit from non-profit organizations. This is due to different regulations which complicate the field, but also to the fact that by their intrinsic nature circular firms make different objectives coexist, and they make compatible different institutional logics.

Social enterprises can complement fruitfully the circular economy perspective: some authors have called for a "social circular economy," with the aim to outline the benefits of social enterprises to fully realize circular principles (Soufani et al. 2018). According to a report (Social Circular Economy 2017, p. 6) "the negative social externalities created by a capitalistic model are not (necessarily) internalized by moving to the circular economy." At the same time, they acknowledge that social enterprises alone may not necessarily do good for the planet while pursuing social goals. "The social circular economy unites the circular economy and social enterprise concepts to draw on their individual strengths while counteracting their potential weaknesses when viewed independently, in

Rethalar: A Social Enterprise in the Circular Economy

"The textile industry is one of the most significant and important sectors of the Brazilian economy. Every year, the industry produces 175,000 tons of textile waste, which has a negative impact on the environment. Retalhar is a social enterprise that specializes in recycling used textiles to make corporate gifts and blankets. The firm offers corporations an easy way to dispose of their used uniforms and other textiles, helping them to meet environmental regulations. At the same time, Retalhar trains and contracts women from low-income communities to produce the upcycled corporate gifts and blankets, increasing their household income and livelihoods" (NESsT website). The results of their activity are significant: as of 2018, they recycled 63.8 tons of textile waste, dozens of women in local communities had an income, and thousands of unserved individuals have been reached.

They network with for-profit companies and large firms, like for example Leroy Merlin and FedEx, who supply the used uniforms and other textiles and offer them corporate gifts. In helping for-profit firms achieve a sustainable and circular way to manage textiles waste, they create both environmental and social value. They also rely on networking with associations like YunusYoung; providing professional mentorship to social enterprises, Rede

Papel Solidario, a network for shared professional services to social enterprises, and accelerators like WorthAMillion. They could rely for their start-up on financing from NESsT, which leverages donations and patient capital from supporters into investments in social enterprises that generate dignified jobs for people most in need.
Source: NESsT website

order to deliver benefits for people, planet and profit" (Social Circular Economy 2017, p. 12).

Apart from the choice of a certain legal form, circular ventures innovate also in terms of governance mechanisms. As mentioned before, they seem more prone to engage human resources in the company mission and strategy. Some firms, like LifeGate, have distributed part of their shares to employees.

Finally, many of our case firms are not stand-alone ones: they instead rely on being part of a network, encompassing other firms, associations and NGOs and so on. This confirms what we already argued in Chap. 3 about CBMs: networking seems to be vital for the circular economy players. We devote further attention to this issue in the last section of this chapter.

In Short

The circular economy nurtures innovation in legal forms and governance mechanisms. Born circular firms tend to have differentiated legal forms, from traditional corporations to benefit companies and social enterprises.

4.3.2 Financing of the Born Circular Start-up

Financial constraints may present obstacles to the innovations that circular enterprises can bring forward. Every start-up experiences problems in raising capital. However, born circular entrepreneurs can experience particularly severe resources constraints, due to the combined effects of the liability of newness to the world and the liability of business model innovativeness. Explaining to potential investors what a circular project is,

and how the value proposition and the business model are designed, can be difficult. Investors are not always prepared and ready to understand these business models and may be reluctant to finance ventures, which do not (only) target profit maximization.

Born circular start-ups and smaller firms must be ready to speak a language that investors can understand and provide figures they can evaluate. Developing a solid business plan under a different scenario is an important common ground for discussion. A key point is represented by the revenues forecasts: this is the guiding forecast in a business plan and a key element for evaluating the economic and financial viability of value proposition. A good estimate of potential customers/users and their willingness to pay is very important. The willingness to pay issue is receiving increasing attention, and also some positive evolution. People are increasingly more disposed to pay for sustainable goods and services. According to Nielsen (2015), 66% of people in their survey are willing to pay more for sustainable goods, up from 55% in 2014, and 50% in 2013, The sales of consumer goods from brands with a demonstrated commitment to sustainability have grown more than 4% globally, while those without grew less than 1%. Millennials are the most willing to pay extra for sustainable offerings—almost three-out-of-four respondents (73%), up from approximately half in 2014.

Some business models, like the sharing and the pay-per-performance models, seem to receive increasing favor from potential users and their proponents are able to find venture capitalists ready to finance them, as we will observe later in relation to BlaBlaCar.

Thus while circular and eco-entrepreneurs can develop better arguments to convince investors, the latter are improving their willingness and capacity to serve them. We can observe an increasing commitment of financial institutions to devote attention and resources to sustainable businesses (Jeucken and Bouma 2017). Private investors have come to realize that firms which pursue sustainability effectively have lower risk and better perspectives for long-term growth.

In 2005 the PRI initiative was launched (see box), setting principles for investors targeting sustainable business all over the world. The initiative has grown dramatically over the years now. In 2017 200 large inves-

tors that collectively manage $15tn in assets have sent a letter to the G7 group of influential countries calling on their governments to uphold their promises to tackle climate change (*Financial Times*, May 8, 2017).

Also the "green loans" market seems ready to take off. In March 2018, the Green Loan Principles were issued. They are designed for lending with a dedicated green use of proceeds, and they recommend transparency about how the projects were selected, the funds allocated and the impacts reported. Different green lending strategies are growing in the banking industry and they may be particularly relevant in contexts in which bank lending is by far the main way to finance a business. Also green bonds are taking off, though they mainly are tailored to larger and established firms and not born circular young ventures. The last chapter further discusses the issue of finance for circular ventures.

ING, a Dutch bank and one of the main banks in Europe, acknowledges the problems in financing circular ventures: "While some circular economy activity is comparable to what happens now—waste treatment and recycling, for example—in other areas there are still few practical examples that demonstrate that a circular business model can be successful." And because circular economy ideas are so wide-ranging, there is still confusion about what exactly it is. "There is a pressing need to define what circularity is, to understand its impact on business," says Gerald Naber, vice-president of sustainable finance at ING. As a result of so many changes businesses have to implement, "we are at a very early stage, still," says Naber. "There are currently few examples where we can see the shift. … Once banks understand how a business model works, they may be able to offer better terms of finance the more 'circular' a company becomes" (https://www.ingwb.com/themes/circular-economy-articles/jeans-phones-engines-circular-business-models-are-growing). This approach has been pioneered with a 1 bn euro loan extended by ING to Philips, with an interest rate dependent on the year-on-year advance of the global lighting firm's sustainability performance. This example, like the previous one about PRI, demonstrates how crucial financial institutions can be for the growth of the circular economy and for supporting the transition of existing businesses to sustainability.

Sustainable Finance: Principles for Responsible Investment (PRI)

The PRI are the world's leading proponent of responsible investment.

These work by seeking to understand the investment implications of environmental, social and governance (ESG) factors and to support its international network of investor signatories in incorporating these factors into their investment and ownership decisions. The PRI act in the long-term interests of their signatories, of the financial markets and economies in which they operate and ultimately of the environment and society as a whole.

The PRI are truly independent. They encourage investors to use responsible investment to enhance returns and better manage risks, but do not operate for their own profit; they engage with global policymakers but are not associated with any government; they are supported by, but not part of, the United Nations.

"As institutional investors, we have a duty to act in the best long-term interests of our beneficiaries. In this fiduciary role, we believe that environmental, social, and corporate governance (ESG) issues can affect the performance of investment portfolios (to varying degrees across companies, sectors, regions, asset classes and through time).

We also recognise that applying these Principles may better align investors with broader objectives of society. Therefore, where consistent with our fiduciary responsibilities, we commit to the following:

Principle 1: We will incorporate ESG issues into investment analysis and decision-making processes.
Principle 2: We will be active owners and incorporate ESG issues into our ownership policies and practices.
Principle 3: We will seek appropriate disclosure on ESG issues by the entities in which we invest.
Principle 4: We will promote acceptance and implementation of the Principles within the investment industry.
Principle 5: We will work together to enhance our effectiveness in implementing the Principles.
Principle 6: We will each report on our activities and progress towards implementing the Principles.

The Principles for Responsible Investment were developed by an international group of institutional investors reflecting the increasing relevance of environmental, social and corporate governance issues to investment practices. The process was convened by the United Nations Secretary-General.

In signing the Principles, we as investors publicly commit to adopt and implement them, where consistent with our fiduciary responsibilities. We also commit to evaluate the effectiveness and improve the content of the

Principles over time. We believe this will improve our ability to meet commitments to beneficiaries as well as better align our investment activities with the broader interests of society.

We encourage other investors to adopt the Principles."

At the end of 2018 the number of signatories reached 1449, with a 16% increase from 2017.

Source: PRI website https://www.unpri.org/pri/what-are-the-principles-for-responsible-investment

Small and new firms in the circular economy find even more problems in obtaining the needed resources, because they are not usually targeted by the mentioned investors. The born circular start-ups require dedicated attention. First, they need patient capital, that is resources that can finance long-term projects and do not pressure entrepreneurs about delivering short-term results. Second, they also may need advice and mentorship, together with financial resources, as was the case for Rethalar.

A question thus arises: Does the circular economy require special financial circuits, like crowdfunding, dedicated lending platforms and private equity systems? We believe this may be the case. Also this type of financing can develop and pool expertise on the side of the financial industry about these types of businesses, their often distinctive business models, legal forms and governance mechanisms. This will permit born circular ventures to find counterparts who can understand well their value proposition and their business plan, and who are ready to provide mentoring and advice for their growth.

For example, in 2018 the Dutch Bank ING launched a 100 million euros fund to finance start-up projects in water, energy and the circular economy.

BlaBlaCar relied on venture capital financing. They could appeal to investors thanks to their business model and its scalability. BlaBlaCar has raised a total of $448.5M in funding over six rounds.

Orange Fiber is a portfolio company of Fashion Tech Lab. Fashion Tech Lab is a global structure, financed by an angel investor, that combines an investment company, a multinational accelerator, and an experimental laboratory, all aimed at helping new technologies and sustainable

innovations connect, collaborate and create products and brands that evolve the industry and improve its social and environmental footprints.

These are not common stories in start-ups and even less in the born circular cases. The latter, as mentioned before, find difficulties in obtaining finance and may turn more frequently to alternative sources of funds. For example, peer-to-peer lending platforms (or crowdlending) can appeal to small firms and start-ups. An example is Funding Circle, a leading small business loans platform in the United Kingdom, United States, Germany and the Netherlands, connecting supply directly with demand. Thus, a wide range of investors are able to lend directly to small businesses. For start-ups crowdfunding platforms are an important source of initial funding. They may prove particularly appropriate for the circular economy, because a sustainable model of business is attractive for investors and citizens willing to commit even small sums to support an idea in the field of the circular economy. Crowdfunding normally targets relatively small amounts of funds, which makes it useful for born circular ventures with limited start-up financial needs. Crowdfunding is also important to test a value proposition and the appeal of a business idea. It may be important to gain the first customers.

Rifò, one of our case firms, used crowdfunding. They successfully closed their campaign in December 2017 on Ulule. This platform enables two types of campaigns: for raising financial resources or for collecting orders of products. Rifò had a target of 200 people ordering their products and they achieved 290. "Ulule is the first platform to offer two fundraising types: the project manager can set a financial target, or a number of objects/items to pre-sell. In the case of a subscription (or pre-sale), the project owner will have to set a price and the minimum number of pre-orders necessary to produce his product/idea" (Ulule website). The platform is available in different countries, in eight languages, and in 2018 achieved 8000 projects presented (40,000 in in the last 5 years), 63% of which have been successful. Only a small percentage of these projects refer to the circular economy, but there is potential for growth.

The born-circular project may require attention from public funds and grant-givers: for the previously mentioned reasons, there is a possible market failure in the financing of these ventures. As the above ING document confirms, the evaluation of the financial viability of CBMs is

difficult. Crowdfunding cannot usually convey large sums of money, leveraging mainly on the sympathy generated by enthusiast circular projects more than on financial assessment. Its key role seems to lie in testing the value proposition and finding customers.

Capital-intensive projects, innovative business models, differentiated legal forms, uncertain growth perspectives are all factors that still constrain much of the finance of many born circular enterprises.

The European Commission, which has adopted an ambitious circular economy package (see Chap. 1), finances the LIFE Programme to support circular economy projects. LIFE has financed projects demonstrating the viability of the circular economy since 1992, including over 700 waste-reduction, recycling and reuse projects that equate to an overall investment of more than €1 billion. This positive trend of supporting the circular economy continues under the new LIFE Programme 2014–2020 with some €100 million invested in more than 80 projects in the first two years. The commission will further boost the transition through funding from the LIFE Programme, COSME and €5.5 billion under structural funds for waste management. Horizon 2020, the EU's research and innovation program, includes a specific call with a budget of €650 million for projects supporting the transition to a circular economy.

Business Finland: Public Finance for Circular Firms

Business Finland was created on January 1, 2018 by the merger of two organizations: Finpro, which offered services for internationalization, investments and tourism promotion, and Tekes, which offered funding for innovation activities. In November 2018 Business Finland launched the Bio and Circular Finland program which aims to make Finland a forerunner in the circular economy.

"The circular economy is an opportunity for the industries traditionally important to Finland, but also opens incredible opportunities for a new kind of business. The expected volume of the four-year program is EUR 300 million, of which the share of Business Finland's innovation funding is EUR 150 million. In addition, the program will offer internationalisation services and renewing ecosystems that will also attract foreign experts, companies and investors to Finland. The program seeks internationally scalable solutions to the global challenges of sustainable development, such as climate change and waste issues. The consumers' ecological values will also change the features of the new solutions.

The program challenges industry to extend product life cycles through product design and new service businesses. The program seeks to strengthen industry's ability to introduce digital technologies for improving logistics and product life cycles, among other things, and for sharing materials, information and services.

In the consumer business, the program supports the development of digital platforms and the transition from ownership to services and sharing. In addition, leading cities and municipalities can be forerunners of sustainable development with innovative solutions compatible with the circular economy.

The content of the program is still being refined. Initially, the focus is on the following themes, among others:

- Cellulose-based textiles and the collection and recycling of used textile fibers;
- Circular economy solutions addressing the plastics challenge.

Also, together with Business Finland's Smart Mobility program, we aim to establish a world-class test environment under the theme 'From the forest to the sea' in order to develop automated logistics for the export of heavy industry goods, which is important to Finland."

Source: Business Finland, https://www.businessfinland.fi/en/whats-new/news/2018/bioeconomy-and-circular-economy-offer-huge-business-opportunities-for-finnish-companies/

In Short

Financing born circular firms represents a challenge, which requires a joint effort of financial institutions, public institutions and citizens. The growth of the circular economy requires innovations also in financial solutions.

4.4 The Value Proposition and the Business Model of Born Circular Firms

Born circular firms develop innovative value propositions and models of business. As the circular economy grows, the successful innovations gain followers. These processes enable the consolidation of best practices and their continual refinement, while leaving the door open to novel models. For example, successful case histories like BlaBlaCar have increased trust

from users and investors in the sharing platforms and favored the diffusion and improvement of the sharing business model.

We can observe form our list of born circular cases that they are grouped around some main general families of business models: the sharing/renting/reusing, the recycling/upcycling and the services to the circular economy, like information, education, design and consulting.

4.4.1 Value Proposition

The value propositions of our born circular firms clearly show a commitment to circularity principles, while considering needs, problems, aspirations and frustrations of common people and business firms. We already commented in Chap. 3 on the value proposition of Mud Jeans, as a good example of targeting the issue of waste (in this case clothes remaining underutilized in our wardrobes). The waste problem is common to many value propositions, because nowadays responsible citizens of the world increasingly feel frustrated about how many resources are wasted in the planet, from underutilized cars and clothes, to all the waste we generate in our consumption habits.

Orange Fiber: Addressing Frustrations and Aspirations of Fashionistas

When oranges are used, the production of citrus juice generates a lot of waste: most of the fruit is destroyed. How to address the frustration arising from this type of waste? How to make it compatible with the aspiration to have high-quality fashion fabrics? What is the link between a frustration and an Italian style aspiration? This is what Orange Fiber has addressed.

"In Italy every year, more than 700,000 tons of citrus waste are produced and, until now, no one has developed a viable alternative to disposal. This waste even prompted the closing of some citrus juice companies, due to illegal disposal or correct yet prohibitively expensive disposal practices. On the other hand, we face an ever-increasing number of consumers demanding sustainable materials and fashion brands seeking green innovation.

It is for these reasons that we have worked to unite oranges, which are typical of Sicily, and world-renown Italian excellence in textiles, developing a disruptive technology that creates an innovative material out of industrial byproducts. Existing textiles are unable to satisfy the increasing demand in quantity and quality, even before issues of sustainability are considered.

That's why we are passionate about reusing citrus juice byproducts that do not rival food consumption but are able to provide sustainable resources.

We are the world's first and only brand to produce a patented material from citrus juice byproducts, repurposing them to create beautiful, sensorial materials that reshape your sartorial experience.

Our fabrics are formed from a silk-like cellulose yarn that can blend with other materials. When used in its purest form, the resulting 100% citrus textile features a soft and silky hand-feel, lightweight, and can be opaque or shiny according to production needs.

Thanks to the process of industrial production that we developed and patented in Italy, then extended internationally, we can produce a high-quality fabric capable of bringing together two pillars from our Italian heritage—textiles and food—and respond to the demands of both innovation and sustainability in the fashion industry. Our exclusive fabric is produced from hundreds of thousands of tons of citrus juice byproduct, the so-called 'pastazzo,' that otherwise would be wasted.

A marked increase in food processing over the past 50 years has gradually generated an enormous amount of non-edible byproducts and the potential for the senseless discarding and waste of our natural resources. However, we're proud to have identified and developed a tremendous opportunity for the application of industrial ecology, allowing us to reduce waste as well as pollution by transforming citrus juice byproducts into a new and sustainable product.

Our efforts are inspired by beauty, quality and the opportunity to provide an innovative and sustainable textile to Italian production practices and the entire fashion industry. Straight from Mother Nature, we offer a fabric that's as fabulous to wear as it is to design with.

We believe that luxury has risen to new standards. Modernity no longer resides in the digitalization of exclusivity alone; modernity must look further than status and consider the future—the future of taste, the future of wearable design, but most importantly, the future of our world.

We are committed to bringing sustainable design values to the fashion industry, helping those who wear our products to become not just consumers, but contributors to the Luxury 3.0 movement."

Salvatore Ferragamo was the first famous fashion brand to use Orange Fiber fabrics for a collection.

The firm's fabrics have been shown during the exhibition 2018–2019 "Fashioned from Nature" at the Victoria and Albert Museum in London among 300 hundred pieces of art.

Source: Company website (http://orangefiber.it/en/fabrics/)

Examples like Orange Fiber suggest that the circular economy can inspire potential entrepreneurs to an infinite number of creative value propositions. The most innovative stem from the identification of unmet problems (BlaBlaCar, Mud Jeans) and from combinations of different frustrations and aspirations, as Orange Fiber suggests. They also confirm that successful value propositions start from the user/customer, from his or her needs and desires and then match them with a circular offer, which creates value for the user, the firm, nature and society.

For born circular firms it is very important to engage potential customers in developing their value proposition. We mentioned the opportunities arising from co-creation in the previous chapter. Rifò used a crowdfunding platform to test its value proposition and gain its first 290 customers. The main asset of BlaBlaCar and Mud Jeans is a community of loyal and frequent users. Nowadays, as our cases demonstrate, having a community of users/customers is vital for the success and growth of the circular project: their sense of belonging to a sustainable project drives loyalty and advocacy, thus providing a free and trustworthy advertising means for born circular enterprises.

In Short

The design of a successful circular proposition requires a creative effort, combining the frustrations and aspirations of people with the planet's preservation.

4.4.2 Business Models

The business models of born circular firms are different, but—as mentioned before—can be substantially grouped into three major families: the sharing/renting platforms, the recycling/upcycling/extended product life and the services to the circular economy. The services are not a business model per se, but they rather can be considered as a group of activities which deliver the needed services to the circular economy and complement the offer of circular value propositions. Among these services we can find for example design, which is key to developing products

and services fully compliant with circular principles, as the box below about DesArchLab suggests. LifeGate (see Chap. 3) is an example of a network and a multiservice platform, with a primary aim in spreading information and advancing education about sustainability. These services are particularly crucial for the development of the circular economy, as the success story of the Ellen McArthur Foundation demonstrates. According to the LifeGate website, they aim to create "the vastest international network for the dissemination of information and services for people, businesses, NGOs and institutions involved in building a sustainable future. LifeGate wants to be the hub of sustainable innovation, incubating ideas based on new paradigms, connecting minds, projects and businesses. It wants to be involved in all of the world's most promising emerging fields with investments targeting tools, media and advanced technology and an approach directed at the identification of the most diverse interests of people and businesses that share a commitment to a better world."

DesArchLab: Design Services to the Circular Economy

"[The name of the company comes] from our 3 fundamental rules: DESign, ARCHitecture and LABoratory. DesArch Lab. is a multidisciplinary interior & exterior architecture firm situated in Granarolo dell' Emilia (Italy). The staff is made up of qualified, dynamic and young people. Our customers are very special with precise demands: they look for creativity, quality and contemporary high-level design with particular attention to aesthetics and functionally. The project development is always supported by 3D modelling and display so that it will be possible to place it in photoprinting. In this way the project will be completely personalized. Next to the firm there is the laboratory where design items are directly manufactured, a new method to make them exclusive and reasonable. Our mission is to offer a '2nd life' to objects, giving them a new function, winking at environmental sustainability according to the philosophy of creative recycling. DesArch Lab. sweeps through the whole projects area: from the simple chair to the architectural project on a large scale (residential, private, public and urban development plan)."

Source: Website, http://www.desarchlab.it/

Bundles is an interesting case of sharing platform, working on a pay-per-performance business model. The starting point is again the awareness of a

problem for customers, the frustration of having to trade-off cheap and frequently dismissed home appliances for higher-quality but expensive ones. Also, frustrations arise from maintenance and having to deal with disposing of them at the end of their life. By partnering with a major brand the founder of Bundles could develop a business model capable of responding to these frustrations and make people feel they are embracing a more sustainable lifestyle. The partnership delivers to the appliances brand a lot of user data to constantly improve the performance of their goods.

The CBMs can also have an "upstream" challenge, that is, the capacity to develop technological innovations in order to provide new solutions and open new market spaces. Acqua&Sole achieves an innovation through new disruptive technologies in organic waste treatment. Waste coming from expired goods in supermarkets and from the organic waste of municipalities is transformed into a resource, as fertilizer for agriculture. Even though this may look simple and not particularly innovative, the firm developed and patented worldwide a new technology for obtaining fertilizers with excellent properties that did not impact the environment. "Acqua&Sole is responsible for: (1) Using nutrient elements from livestock farms, agro-food industries, wastewater treatment plants of urban sewage, and separated waste, (2) Analysis and control of the evolution of soil fertility, (3) Monitoring the improvement of fertility and the biological quality of soils, (4) Recovery and reuse of nutrients derivable from organic matter, (5) Electricity generation from biogas" (Acqua&Sole website).

Their model of business is shown in Fig. 4.1. It is based on recycling and upcycling: from waste an innovative fertilizer is obtained, which is given for free to local farmers. The company obtains revenues from the collection and treatment of waste, thanks to its innovative new plant, based on their innovative technology. The Acqua&Sole business model is based on a network with the local community of farmers, with partnerships with research institutions and universities—for the technology development—and with supermarkets, utilities and municipalities—for the collection of waste.

These models of business, like Bundles and many others mentioned before, suggest that business models in the circular economy are based on networks and partnerships and on communities of users. Value co-creation is the norm and spans from users and customers to other value

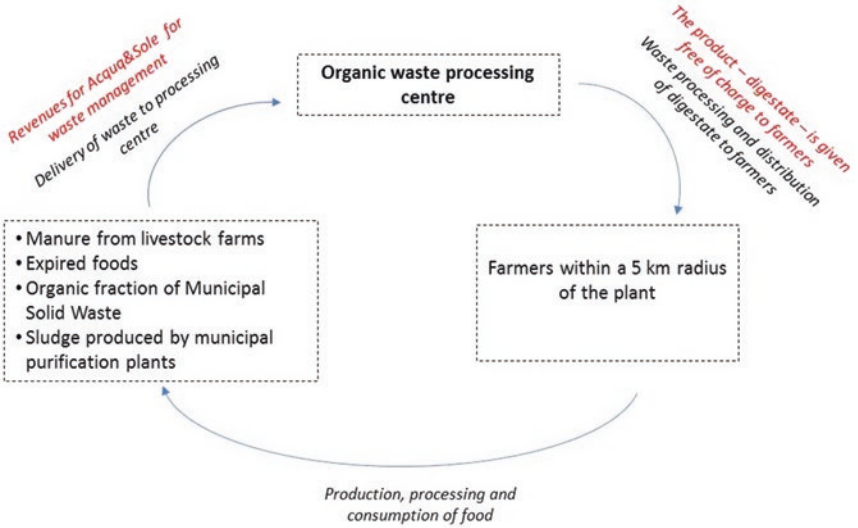

Fig. 4.1 The circular business model of Acqua&Sole. *Source*: adapted from Zucchella and Previtali (2019)

Bundles: A Sharing Business Model

In 2013, Marcel Peters found out that laundry creates a lot of waste. He claimed that the use of sustainable appliances can be cheaper than the ownership of low-quality disposable appliances (throw-away appliances) if we start using it in a smarter way. This would increase the fun and reduce the waste. "We aim to make sustainable and efficient appliances that last accessible to everyone. We help our customers to lower their energy, water and detergent use.

We take responsibility for maintenance in order to increase the lifetime of the appliances. Moreover, we take care of upcycling and repairs of broken appliances aiming to capture the value of the applied materials.

Pay for performance instead of ownership. That is one of the most important principles in the circular economy. This will stimulate manufacturers to make appliances that last longer and can be repaired. That's what we believe.

Bundles takes responsibility for the performance of the washing machines, tumble dryers and dishwashers. Since we connect the appliances to the internet, we collect data that enables us to learn how we can use the appliances in a smarter way aiming to increase the lifetime and reduce consumption of energy, water and detergent. Besides, this data can be used by Miele for product development in order to improve their appliances."

Source: Bundles website

partners, suppliers of goods, services and knowledge. This key issue will be further discussed in the next section.

4.4.3 Partnerships, Networks and Ecosystems

Born circular firms tend to operate in networks, to compensate for their smaller scale and lack of resources. But also because they believe that the circular economy is about networks. Our most interesting cases are embedded in circular ecosystems, which involve not only partners of the value chain, like users and other complementary firms, but also associations, research institutions and sometimes local authorities.

These ecosystems can be geographically spread, as in the case of LifeGate, or more geographically focused, as in Acqua&Sole.

At a first glance of our cases, it thus seems that the circular economy favors a networked model of business. Other examples are 959 recycling seatbelts and Femer, recycling fish skin. Femer is a stand-alone firm, but they could not operate without being embedded in a local territory where the sustainable fishing industry is important. It connects local fishermen to national and international fashion buyers, all sharing the common value of a sustainable and circular economy. Codland operates in a similar value chain (fishing), aiming at a 100% utilization of the byproducts of codfish processing. It utilizes biotechnical solutions to create valuable, new products from underutilized raw material from the fishing industry. The company was founded in 2012 in Iceland when the Iceland Ocean Cluster brought together seven fishing and ocean-related companies and set the course to create maximum value from every part of the fish. Codland thus works with established companies as well as innovators in the marine industry (Codland website).

Similar networked models of business are D3PACA, Clean Earth and Sky, Actes/Evise and LifeGate. These networks—as mentioned—involve not only other firms providing complementary activities, but also associations and sometimes public institutions (see Fig. 4.2).

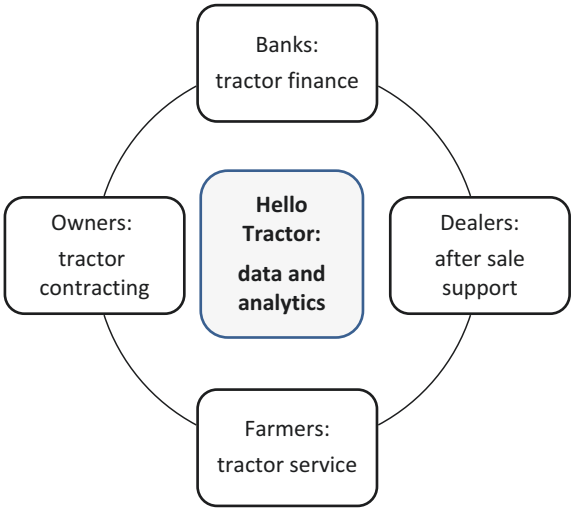

Fig. 4.2 The business model of the ecosystem perspective at Hello Tractor. *Source*: the author, based on Hello Tractor website

Networked Business Models: Developing an Ecosystem at Hello Tractor

Hello Tractor's rationale is captured in the following: "Farmers throughout developing economies remain trapped in poverty despite $6BN in aid spent each year over the past five decades to improve agricultural production and raise standards of living. This is due, in large part, to the disorganized and often antiquated agricultural value chains that persist across emerging markets. As a result, the individual farmer is often left without access to the information and inputs that are critical to improving their livelihoods."

Hello Tractor is an ag-tech social enterprise that connects tractor owners and smallholder farmers in Sub-Saharan Africa through a digital tractor sharing application. "We are the first technology offering designed specifically for the compact tractor (sub-100hp) segment, a market that is growing at close to two million new tractors a year. Our fleet management solutions provide insights to derisk and improve service delivery, ensuring tractor owner success while delivering market-led, sustainable impact to smallholder farmers."

The Hello Tractor platform enables farmers to request affordable equipment inputs, while providing enhanced security to tractor owners through remote asset tracking and virtual monitoring. This value extends to all

stakeholders in the mechanization ecosystem. Hello Tractor is an Internet of Things solution that supports improved efficiencies, profitability and transparency in the tractor contracting market.

"Our solution begins with a tractor monitoring device that can be installed on any tractor, connecting it to the Hello Tractor cloud. Once connected the device transmits relevant data across our ecosystem."

They now serve more than 250,000 farmers in Africa.

"Since our pivot in 2015, Hello Tractor has emerged as the leading provider of technology solutions designed for the tractor services market. Hello Tractor has captured 75% of private commercial tractor inflows to Nigeria and through strategic partnerships been able to expand to a total of 5 markets across Africa. We have developed technologies that add considerable value in the marketplace by helping to address the critical needs of tractor owners, agents, and the farmers that need tractor services."

Source: Hello Tractor website

In Short

The CBM requires the development of an ecosystem.

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5

The Transition of Existing Businesses Towards the Circular Economy: Circular Corporate Entrepreneurship

5.1 Introduction

In preceding chapters we saw that entrepreneurs have a lot of *good reasons* to implement circular economy principles in their management decisions, whether to launch new socioeconomic entities, like born circular firms, or to organize the transition of existing businesses towards the circular enterprise. The latter is a more complex venture, because it faces an existing reality including organizational practices, human behaviors with resistance to change, given talents not easy to transfer, technological assets no more suitable, norms and rules becoming obsolete, or diverse institutional prescriptions not "flexible minded." The cost of leaving the existing given, combined with the cost of new investments due to organizational or technological innovation, may be high, and not so well appreciated by financial markets, which are mostly short-term oriented and which avoid highly unknown risks.

The transition of existing businesses towards circular economy is not easy to characterize in a few synthetic words, not only because there is an amazing diversity of ideas, of organizational change and innovation patterns, of ways to manage and control change that can be observed on the

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https://doi.org/10.1007/978-3-030-18999-0_5

field, but because in fact, circular economy implementation is not an episodic "change": it is a process of continuous "changing" (Poole and Van de Ven 2004, p. 4). Circular entrepreneurship is collaborative, open to partnerships, to co-production practices, to knowledge sharing; it is a web of relationships that involves diverse communities and diverse expectations; it is a world of flows and work to connect value chains with each other (see Chap. 1). All that is moving rapidly is it through political decisions on a national or international level or through technological evolutions. Transition is a collective venture, especially in the age of unlimited digital interconnections, transforming continuously the systems' dynamics. It requests a strong innovative entrepreneurial spirit, able—altogether—to detect new business opportunities for the individual firm, and to respect nature's sustainability through responsible handling of natural resources considered as a common good of humankind.

In this chapter we describe how some emblematic enterprises, circular minded, do manage their transition/transformation decisions to be in tune, both with nature and with social community, and with a firm's development. These examples illustrate the fact that paths to achieve this dual objective are different. Nicholas Stern underlines in his book *A Blueprint for a Safer Planet* (2010) the importance of the "power of example." Each example gives an illustration of what can really be done in its diversity of features, countries, activities, organization, environment, even when the collective aim (save the planet and create prosperity for humankind) is the same. Real economy, in its variety, is interesting to discover; it is a kind of think-tank delivering promising solutions models. Economically sustainable growth is correlated to enterprises' invention capabilities; circular entrepreneurship is transforming inventions into innovations and value creation.

The information we collect concerning circular corporate entrepreneurship, and especially following cases, has different sources, including dedicated interviews, dialogs, conferences, shareholders' or other communities' meetings, conducted business tours, registration documents, reports, publications and press releases.

The first section (5.2) is dedicated to large multinational companies, SUEZ and Saint-Gobain, both global successful players, forerunners in circular economy, but acting in different domains of activity and following

different evolutionary paths. SUEZ, a young brand, promotes a resource "revolution"; the second, Saint-Gobain, one of the oldest industrial companies in the world (founded in 1665), is opting for a continuous evolutionary innovation process (for years one of the 100 "most innovative global organizations," according to Thomson Reuters).

In the second section (5.3) the focus is put on the great family-owned businesses, Hager Group and Soprema, their sense of environmental and social responsibility, and their transitions towards circular economy strategies.

The third section (5.4) looks at organizational problems inherent in business transition processes, illustrated by two very different cases: Engie and EIM.

5.2 Large Multinational Companies, Forerunners in Circular Economy

In this section we present two cases that illustrate diverse transition models: SUEZ and Saint-Gobain.

5.2.1 SUEZ: Avant-Garde Resource "Revolution" Entrepreneurship

In September 2018, Jean-Louis Chaussade, CEO of SUEZ, was honored at the United Nations Global Compact Leaders' Summit with the title of "Pioneer of Sustainable Goals." Also in September 2018, SUEZ and UNESCO strengthened their partnership agreement for the protection of the ocean. In April 2018, SUEZ and the WWF (World Wide Fund for nature), France, signed a partnership encouraging the development of sustainable cities, aiming for the reduction of their footprints through sustainable resource management and circular economy solutions. We mention these recent events just to indicate that the "resource revolution" (so-named by SUEZ several years ago) is not just an entrepreneurship decision concerning the egoist performance of the group. It is much more societal performance-minded, as the following paragraphs will

demonstrate. These events also prove that SUEZ is recognized on an international level as a "responsible enterprise."

5.2.1.1 Brand

As of April 28, 2016, the legal name of the Company is "SUEZ." Before that time it was "SUEZ ENVIRONNEMENT COMPANY," a group with multiple trademarks. In 2015, all the group's trademarks were federated under a single brand, SUEZ, positioned on the sustainable management of resources. This change has three goals: to simplify a multi-brand architecture to improve performance and commercial efficiency, to meet the new needs of customers, and to reinforce the convergence between the group's activities in order to address the challenges of a circular economy. This "brand-decision" can be considered as a very "strategic decision," an illustration of "circular entrepreneurship."

Today, SUEZ is a French *société anonyme* (public limited company); its registered address is Paris-La Défense (France). It operates both on behalf of public authorities and of private sector players.

Another factor to keep in mind: the story of SUEZ begins in 1880 with the operating company Lyonnaise des Eaux et de l'Eclairage. The company operated in the public services of water, electricity and gas distribution in that time's rapidly growing cities and suburbs in Europe. From the very beginning Lyonnaise des Eaux was also developing its activities abroad. This reminds us that SUEZ has in fact a long and successful industrial and commercial expertise.

5.2.1.2 Activities

The group is now organized around four main activities:

1. management of the extended water cycle;
2. recycling and reuse of waste;
3. water treatment solutions;
4. consulting services for sustainable urban and regional development.

More precisely, these business activities consist of:
(1) the group's management of the *water cycle*-related activities:

- catchment, treatment and distribution of drinking water,
- maintenance of networks and operation of plants,
- customer management,
- collection and treatment of municipal and industrial wastewater,
- design, building, occasional financing and operation of drinking water production and wastewater treatment plants, as well as desalination and water treatment plants, for reuse purposes,
- studies, master plans, modeling of underground water tables and hydraulic flows and general contracting for water management infrastructure projects,
- biological and energy recovery of treated sewage sludge;

(2) the group's activities in the *waste* sector:

- waste collection and urban cleaning services,
- sorting, recycling, and material, biological and energy recovery of recoverable fractions,
- disposal by incineration and landfilling of residual fractions,
- integrated management of industrial sites,
- sludge treatment and recovery.

(3) For the group's *water treatment solutions*, SUEZ finalized on September 29, 2017, the acquisition of GE Water and Process Technologies. At the same time, SUEZ created a Water Technologies & Solutions (WTS) business unit that includes former GE Water entities and SUEZ entities specializing in industrial water. The strategic objective of this important SUEZ US acquisition is to be a major player in industrial water services that covers the entire value chain; it enables the group to increase its international presence and innovation capacities. The industrial water market is booming; it is an expected good profit center. The WTS platform is also an interesting response to the worldwide challenge of growing water resources scarcity. In other words the circular economy contributes to a sustainable future.

(4) The *consulting services* are delivered through Safège (wholly owned consulting subsidiary of SUEZ, 765 staff). It provides engineering services to municipal customers, public authorities, international financial institutions, public service agents, and private and industrial customers (see examples *infra* in §5.3).

5.2.1.3 Key Figures (2017, Reference Document)

Revenue	€15.9 billion
EBITDA	€2.67 billion
Employees	89,000; 28% of women in management
Business, as an operator	in over 70 countries
Training	67.2% of employees trained

5.2.1.4 The Group's Strengths

- SUEZ is a global major player in environmental activities (leading positions in water and waste);
- SUEZ is operating on a strong, expanding, environmental market. The group's strategy is based on solid long-term growth factors: the strengthening of health and environmental regulations, population growth, growing urbanization and increasing infrastructure needs.
- SUEZ is an integrated player throughout the entire water and waste value chains. The group has completely mastered each step of the water and waste cycles, allowing it to implement commercial and technological synergies within and between each activity. Circularity is a concept implemented amongst the group's value chains (see Fig. 5.1).
- An emphasis on research and development at the core of the group's culture. The group's research is based on a global scientific and technical network consisting of experts grouped within expertise and research centers (close collaboration and knowledge-sharing between internal experts, as well as with the group's university and industrial partners) [circularity of knowledge].

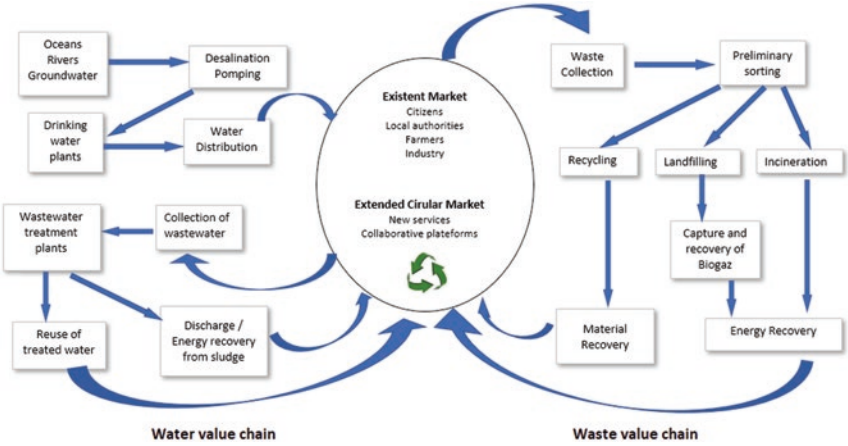

Fig. 5.1 Synergies throughout circular management of value chains. *Source*: the author; data: Reference Document, 2017, pp. 45–85

- Diversity and balance of the businesses and geographical exposure: balance between its water and waste activities; variety of the exposure: service contracts, short-, medium- or long-term contacts, local authorities or industrial customers and regulated/non-regulated markets. The group is pursuing a selective international growth strategy outside Europe based on identifying the fastest growing markets with controlled risk profiles [circularity of ideas].
- Training, a fundamental concern. Developing people is key to the group's transformation, as well to its social and societal responsibilities. SUEZ's ambition for 2021 is to train more than 80% of its employees ("apprenticeship for all"). In 2017, the creation of the "SUEZ Academy" marked a turning point in the group's learning ambition. Seven academies offer innovative programs tailored to SUEZ's business: the Leadership academy, the Digital and Innovation academy, the Technical academy, the Sales and Marketing academy, the Health and Safety academy, the Operational Excellence academy, the Cross-disciplinary Functions academy.

These short comments give evidence that circular entrepreneurship is based on an ecosystem. The implementation of circular socioeconomic principles implies that all stakeholders of the system must be involved because all elements of the game are interconnected. An efficient manager is one who is *learning with stakeholders, learning from differences, learning from others*.

The SUEZ business model underlines the relevance of a systems approach to boost business dynamics. Yet, this progressive paradigmatic change needs some time. SUEZ is fully aware of that difficult challenge; the direction of the firm's engagement in the way of paradigmatic change is clear and strong from the beginning of that fantastic venture. The quality of the organizational transformation process is primordial. Quality, in all domains of an enterprise's life, is also a strong vector of trust.

5.2.1.5 SUEZ Core Ideas Linked to the Concept of Circular Entrepreneurship and Their Organizational Implementation

Recent Historical Reminder

SUEZ committed quite early to an ambitious sustainable development policy, presented in a strategic "Action Plan 2008–2012" with Priority 1: *Conserve resources and engage in the circular economy*. It was the first step to a new model of prosperity, detailed into commitments to economic, environmental, social and societal performance, including precise goals and controlling procedures (almost all of them were achieved).

A second road map was launched for the period 2012–2016 focused on *co-production with customers and dialog with all stakeholders*. A culture of sharing and cooperation with all is promoted.

An ambitious third road map (period 2017–2021) is in progress. "We are all mobilised in the transition towards the circular economy that will also engage future generations. New technologies and the digital age are transforming our way of life in society, our customers' expectations and the very activity of SUEZ. The new page that is now turning is very exciting. The time has come for SUEZ to federate all of its know-how and

expertise and to build an organization around a common mission: proposing tangible solutions to optimise the management of resources that are essential to the development of human activity" (Gérard Mestrallet, Chairman of the Board of Directors, Report "Ready for the resource revolution," SUEZ 360° + 5 Report).

Strategic Vision

"Our vision of the resource revolution: *circular*, because it aims to generate resources that are essential to life and the future according to the principles of the circular economy; *concrete*, because it involves tangible and innovative actions to secure resources; *collaborative*, because it engages everyone who contributes, each at their own level, to better manage and secure resources for the future. Our group has been in the forefront of the great revolutions in modern society: the hygiene revolution in the 19th century, and the urban comfort revolution in the 20th. In the 21st century, we will be one of the driving forces behind the resource revolution. We must preserve the deeply human and local character of our activities with the spirit of a unified and global enterprise" (Jean-Louis Chaussade, Chief Executive Officer, SUEZ 360° + 5 Report).

That latter characteristic of circular entrepreneurship is probably the more delicate to achieve because still in today's world the socioeconomic system privileges the individual as supreme agent despite the harm to the collective good and ecological stability. Now, as demonstrated in Chap. 1, humankind must admit that collaboration between all actors (humans, legal institutions, research centers or political networks) is a major challenge of the resource revolution and that "nature" is becoming a global and powerful "actor" for resources' delivery or for natural capital destruction in the case of resource misuse. J.-L. Chaussade (CEO) is fully aware of that systemic modern reality.

Circular economy, where we all have a role to play, rethinks the complete value chain and generates sustainable economic growth. This radically new economic model (that takes a multitude of forms) opens up a way out of the obsolete linear logic symbolized by the produce–consume–discard triptych.

By its very essence, the circular economy is collaborative. Companies are one of the cornerstones of the resource revolution. They are an incomparable driving force, thanks to their investments and their capacity to innovate and build partnerships. They are now aware of their responsibilities to society and they must be encouraged to pursue this dynamic.

Let us remember that this "radically new economic model" mentioned by J.-L. Chaussade is quite different from the earlier sustainable development model promoted by MIT, "The limits to growth" (1972), that calls for a limitation of production of material goods. On the contrary, the circular economy proposes another balance between supply and demand of material goods due to the possible creation of new resources without depletion of non-renewable resources by the natural ecosystem.

Organizational Challenge

Circular entrepreneurship means for SUEZ: getting a strategic partner for leading manufacturers and local players, for consumers and cities. The objective of the company is to build business models based on more direct relationships with its customers, right from the design phase, in order to meet their needs and to evolve towards the made-to-measure. The objectives must be set at the earliest possible stage and the solutions must be developed together.

This multitude of circular loops demands cross-organization; it includes the notions of sharing and reusing (Chaussade, in *Open_resource* magazine, published by SUEZ, 4, 2017, p. 63).

However, the governance of a successful "revolutionary" process implicates a huge amount of energy (transformation power) and knowledge. Change also gives rise to resistance, inside and outside the organization. That's why ability and soundness of the top management are determinant factors of the outcome; organizational learning needs not only time as already mentioned but also perseverance and courage. Top management has to be convinced it is right in launching that "revolution," and of course it is not exempt from risk and cost, especially in the transition period. To consolidate such an important decision (with new forms of innovation that will change economic and societal models) the company

tried to reduce uncertainty by holding dialogues with diverse scientists and philosophers—for example Navi Radjou, a theoretician of "frugal innovation."

Navi Radjou (born in India and now with French-American dual citizenship, living in Palo Alto, California) explains that his concept of frugal innovation, which also creates value, is inspired by the Indian "Jugaad" movement, which literally means "do it yourself" in Hindi, and consists, in simple terms, of *doing better with less.* "This approach fits in perfectly with the circular economy. So the question remains, How can we produce better with less? One of the answers consists of placing eco-design at the heart of innovation in business and transforming our waste in new resources. We live in ecosystems where everything is connected exactly like in nature. So we simply have to draw inspiration from the way nature works to understand the extend to which our old and self-centred economic model has become inoperative. Every day, the tree makes more than 20 positive external products for use by the species that live around it, completely for free! Let us apply this reasoning to the business world. Factories are able to operate like natural ecosystems, even it seems utopian. We need to think about a 'spiral' economy where every project aims to be inclusive and to generate positive interactions.

The breakaway from linear models applies to tangible resources, but it must also include intangible resources such as knowledge" (*Open_resource* magazine, 4, *The Circular Economy Era*, pp. 27–31).

On the road of that transition towards the "resource revolution," SUEZ has been very active. They have sought:

- to *explain* the concept of resource revolution and the correlated developments in resource management; that is the way to:
  - favor access to resources for all,
  - optimize their management,
  - produce new alternative resources,
  - promote sustainable development in diverse countries, in collaboration with actors in the field, or research organizations, or other stakeholders;

- *to communicate*:
  - on the internet,
  - launching numerous publications (newsletters to shareholders, *The SUEZ Times*, press releases, special reports like "360° + 5" on contributions to the resource revolution, *Commitments & Performance*: annual report on sustainable development, Reference document (about 450 pages), various brochures in the series "Resources for all, Resources for ever"),
  - Shareholders' Club meetings on diverse topics and in numerous cities; visits of plants in a large range of localizations; participating at national shareholders' conferences including open debate with the top management (like *Actionaria* in Paris);

- to *support*, through the *Fondation SUEZ Initiatives*, decisive actions to develop access to essential services (water, sanitation, waste treatment) for underprivileged populations in developing countries, and supporting the integration of vulnerable populations in France through education and employment (more than 600 projects in emerging countries and in France) (see Chap. 2).

5.2.1.6 SUEZ Circular Entrepreneurship Illustrations

The following paragraphs should not, of course, be considered as a kind of catalogue of SUEZ's activities in this domain; they only aim to mention some applications, showing the large spectrum of rapidly growing business possibilities and their connected value creation, both today and tomorrow.

Biogas: From Dirty City Sludge to Clean Energy

SUEZ engineers made possible the production of a fuel that does not emit any fine particles, and hardly any nitrogen oxide. How? By recovering the biogas produced by the sludge from wastewater treatment plants.

The advantage is evident: a fossil product (like petroleum), that is often imported and emits greenhouse gases, is replaced by a neutral product in the energy network that is produced and consumed locally. The City of Strasbourg (and the *Réseau GDS SEM* that it controls) decided to work with SUEZ on the "Biogénère" joint venture. The goal for Strasbourg was to become the first city in France to inject biomethane captured from a waste treatment plant into the urban natural gas network. Fuel made from biomethane cuts greenhouse gas emissions by 90% in comparison with fossil fuels and does not emit any fine particles that are harmful to health.

This pilot project was developed with the financial support of the European Commission's LIFE Programme for the conservation of the environment. Advanced studies, managed by all the public and private energy players involved in the project, were necessary before biomethane could be injected, in complete safety, into the natural gas network. At the beginning, biogas was used only in sustainable urban eco-districts and clean mobility vehicles, and later on to fuel vehicles running on natural gas.

SUEZ plans to develop biomethane activity in France but also worldwide. Some 170 methanation units are already projected (in 2016): these include self-supply with biogas of the largest wastewater treatment plant in Jordan; maximizing the energy potential of a brewery in the UK; extending the largest composting site in North America, in Edmonton, to produce green energy from waste, among other examples.

Recovery of end-of-cycle material waste, through innovative and collaborative entrepreneurship, shifts into a virtuous circle of new resources creation.

Water Activities

Innovating in water to help nations, cities and industry to better preserve water resources by harnessing the full potential of new technologies is a strategic priority for SUEZ.

SUEZ built the first desalination site using a reverse osmosis technique in Saudi Arabia; won the contract for the largest wastewater purification plant in Qatar, intended for the reuse of treated water; and opened the

largest purification station in the Middle East with the AS Samra plant in Jordan.

SUEZ works with major industrial groups all over the world, to safeguard regional water resources, for example in the mining, oil and gas industries (in Chengdu, China, a plant recycles 70% of the wastewater from the Petrochina refinery), and in chemicals (SUEZ supplied a mobile osmosis water unit to Dow Chemicals).

"Smart water": To avoid waste and improve the management of water in the cities of the future and in agriculture (consuming currently 70% of total water resources), SUEZ is developing innovative solutions based on information technology. The "smart water" market is growing strongly. Upstream of these "advanced solutions" SUEZ has also designed complex systems that prevent the depletion of water tables by monitoring their levels.

As mentioned before, circular economy became the top strategic pillar of SUEZ. It implies a change in the group's value creation and a transformation of its core activities, adding new recycling and new recovery businesses: energy recovery, but also material recovery (secondary raw materials like paper, cardboard, glass, metals, plastics and wood, returned to the market), more service-oriented activities, new modes of partner-

In Short

What can we learn?

Two strong industrial leaders, Gérard Mestrallet (SUEZ Chairman of the Board of Directors) and Jean-Louis Chaussade (SUEZ Director and Chief Executive Officer) with multicultural education and diverse professional experiences in public and private domains, delivered the message, years ago, that modern economic society was taking an orientation not in harmony with the laws of nature: natural resources became at risk. Facing that dangerous reality for the planet and humankind they decided to launch a resource "revolution," shortly described in this SUEZ case—a paradigmatic change. Their decision is an homage to circular entrepreneurship.

Managing such a *revolution* supposes first a fantastic will to act for a changing sustainable future. That will must be implemented methodically in real socioeconomic terms. That crucial step is linked to the ability to con-

vince and to organize new partnering or collaborative structures, to develop new ideas including system analysis (see Chap. 1) and cross-organizational loops, to communicate, to create internal and external trust about technological talent and human resource quality, and to find financial support. "Resource revolution," based on circularity of materials, means and knowledge, is a collective, interconnected, fascinating venture in the digital age.

Case sources: Annual "Reference Document" since 2014. Press releases. Letter to stakeholders. Integrated report: 2014 (*Social and Environmental Report*); 2015 (*Our Economic, Environmental and Social Contribution*); 2016 (*Acting for Resource Revolution*); 2017 (*Resources for Everybody and for Tomorrow*). Annual brochure "SUEZ Commitments & Performance, Sustainable Development," since 2010. The book *21 voyages aux pays de la nouvelle resource*, 2017, written by Erik Orsenna, published by SUEZ. SUEZ *Open_resource* magazine, 3, 4, 5, 2016–2017.

ing, and of handling. This all presents a big challenge and a fantastic opportunity to participate in the coproduction of a sustainable future.

5.2.2 Saint-Gobain: Circular Entrepreneurship, a Continuous Evolutionary Innovation Process

In 2015 Saint-Gobain celebrated its 350th anniversary. What does that mean? Here is the response of Pierre-André de Chalendar, chairman and chief executive officer: "Saint-Gobain is 350 years old and I am very proud to be at the head of the company with such a heritage. I am one of the links in a chain of leaders who, like me, were committed to developing the Group in accordance with its strong values: attention to our employees and partners, a spirit of innovation and a passion for entrepreneurship, while at the same time working in solidarity with one another" (2014 Registration Document, p. 3).

These two sentences may summarize what the title of this book suggests concerning "circular entrepreneurship, creating responsible enterprise". The reference of Saint-Gobain is not a "resource revolution"

(SUEZ case), but rather a "continuous" innovation process: but in both cases entrepreneurial spirit is linked to values, to innovation, to passion, to solidarity. All that makes sense.

Some of the company's distinctive features are outlined in the following sections.

5.2.2.1 Brand

Saint-Gobain is a very old industrial actor and still an active juvenile innovator.

In 1665, King Louis XIV of France, encouraged by his famous minister Colbert, created the Manufacture Royale des Glaces (glass manufacturing plant, the first name of Saint-Gobain) to challenge Venetian supremacy in mirror manufacturing (mirrors were very much appreciated in the royal castles). From the beginning of its history the Manufacture was active in a domain of technological expertise. A strong spirit of innovation and a passion for entrepreneurship are considered by the successive leaders of the group as an inherited guideline. From the nineteenth century onwards Saint-Gobain diversified its activities, moving into chemicals and all types of glass products, and began its international expansion. The number of countries where Saint-Gobain has a presence passed from 18 in 1986 to 67 in 2017.

In recent years Saint-Gobain has continuously ranked among the top 100 most innovative global organizations (Thomson Reuters).

5.2.2.2 Activities

Saint-Gobain today has three sectors of activity:

Innovative Materials (25% of Net Sales, in 2017)

Combining flat glass and high-performance materials, the Innovative Materials Sector has a unique portfolio of materials and processes in the construction, mobility, healthcare and industry markets.

For high-performance materials Saint-Gobain is ranked no. 1 in the world, with more than 28,000 employees, present in 36 countries.

Some examples of Saint-Gobain's activities in that sector:

- products for the automotive market: lightweight glass, anti-heat glass, glass in complex shapes, solutions with increased safety and comfort for drivers and passengers;
- solutions for the aerospace market: cockpit glass, high-performance plastics and ceramics used in aircraft engines, low-pressure conduits, ceramic powders and ingots used as thermal barriers and corrosion resistance in engines;
- innovations for the healthcare market: tailor-made, single-use plastic solutions (tubes, connectors, pockets, filters used in handling fluids), crystals and scintillators, used in medical scanners;
- solutions for the energy markets: ceramic pellets to increase the conductivity—and therefore yield—of gas and oil wells, seals for marine-based wind farms, high-tech products used in waste recycling and so on.

In the area of flat glass, Saint-Gobain is ranked no. 2 in the world and no. 1 in Europe, with more than 34,000 employees, present in 34 countries.

Construction Products (29% of Net Sales, in 2017)

The Construction Products Sector offers interior and exterior solutions to enhance comfort in living places: plaster, acoustic and thermal insulation, façade rendering, roofing and pipe systems.

In this sector Saint-Gobain is ranked no. 1 in the world for plasterboard and plaster, mortar and floor coatings, and ductile cast iron pipes; no. 2 in the world for insulation (all insulating materials combined) and tile adhesives; and no. 1 in Europe for façade rendering, with more than 47,000 employees, present in 62 countries.

Building Distribution (46% of Net Sales, in 2017)

This sector brings the group a thorough understanding of customers' needs, be they building professionals, private project owners or large

companies. It serves over seven million customers each year, on the new building, renovation and home improvement markets.

In this sector Saint-Gobain is no. 1 in Europe, with more than 63,000 employees, present in 23 countries.

5.2.2.3 Key Figures (2017, Registration Document)

Net sales	€40.8 billion
Operating income	€3.02 billion
Net income	€1.63 billion
Employees	179,000 (over 100 nationalities represented);women: 42% of directors
R&D	3700 employees;8 cross-functional research centers;400 patents filed in 2017

5.2.2.4 The Group's Strengths

- Saint-Gobain is an outstanding global player.
- Strong values: Saint-Gobain's development is founded on nine Principles of Conduct and Action which form the basis of its code of ethical conduct. These principles were formalized in 2003 and have been translated in 33 languages and rolled out to all employees. Application of the Principles is a condition of being a part of the group. These principles are following ones:

  – [*Principles of conduct*] (1) Professional commitment, (2) Respect for others, (3) Integrity, (4) Loyalty, (5) Solidarity;
  – [*Principles of action*] (6) Respect for the law, (7) Caring for the environment, (8) Worker health and safety, (9) Employee rights.

The five "Principles of Conduct" are the fundamental values uniting management and employees. Saint-Gobain is effectively engaged in CSR (Corporate Social Responsibility) that includes Natural Capital preservation.The four "Principles of Action" guide the actions of all management and employees in the performance of their duties. These principles of action are applicable to all Saint-Gobain units and employees as well as to

the subcontractors, in their work for the group and suppliers, under the Responsible Purchasing policy. Saint-Gobain is training all managers in the principles in their first year with the group. Furthermore, the nine principles are included in the welcome booklets of all Saint-Gobain employees and in the majority of employment contracts.

- Saint-Gobain developed priority commitments linked to the challenges of sustainable development: inside the group (climate commitment and *developing the circular economy*) and outside: contributing to the public debate on sustainable development. Since 2016 Saint-Gobain has played an active role in the World Business Council for Sustainable Development *with responsibility for the circular economy*. It is also an active member of the International Energy Agency and partner of the "World Material Forum" held in Nancy (France) each year that aims to reduce the resource intensity of the economy.
- Proximity to customers. In the construction markets, worldwide Saint-Gobain aims to be the partner of choice for every player, from initial design to worksite implementation and project completion. That means, inter alia, a strong regional organizational structure, efficient coordination of various companies' actions, and extensive use of digital technology.

5.2.2.5 Saint-Gobain Strategic Vision Correlated to Circular Entrepreneurship

The Credo of Pierre-André de Chalendar (Chairman and Chief Executive Officer)

"We see our Group's growth within the context of strong and acknowledged responsibility.

Design, produce and distribute materials that help to create great living places and improve daily life: that is Saint-Gobain strategic ambition. The living places that we contribute to creating have a positive impact on their occupants' well-being and quality of life. Because they are designed sustainably and reduce energy consumption and greenhouse gas emissions, they help build the future of all. In our industrial markets, we aim

to provide increasingly reliable and efficient solutions, in the forefront of technology, working hand-in-hand with our customers through co-developments and partnerships.

Our teams are committed to creating the solutions for tomorrow in order to remain one step ahead. Innovation in products, processes and services is crucial. Digital technology is enabling us to evolve with our customers and our environment. Our businesses are rolling out 'industry 4.0' programs. Given the changing distribution models, Saint-Gobain is ideally placed to deliver value to its customers at each step of the way. The boundary between professionals and consumers is tending to fade, and the end-user has become a specifier of our solutions, and at times even the decision maker. Energy efficiency, zero carbon buildings, *circular economy*, etc.: this industry partially holds the answer to solving the major challenges facing us today.

Saint-Gobain develops skills and an entrepreneurial spirit. We are proud to rank amongst the 13 organizations worldwide awarded the Top Employer Global label." (Registration Document 2017, pp. 2–3, and presentation of the roadmap, Shareholders General Assembly, Paris, 07/06/2018).

Practices Inside the Ecosystem: Global Circular Management

The group's organization size, international dimension and diverse business portfolio imply decentralized management of the dialogue with multiple stakeholders. Priority stakeholders have been grouped according to challenge: (1) Marketing, (2) Sustainable Development, (3) Financial Communications, (4) Human Resources, (5) Delegations, (6) Corporate Social Responsibility (CSR). This provides a formal structure for feedback on internal and external stakeholder's expectations: *a circular organization of information*.

Group 1: *Marketing*. Information concerning the market: customers, users, purchasing advisers, suppliers;
Group 2: *Sustainable Development*. Stakeholders concerned: regulatory authorities and lobbying partners; governments, regulators, inter-

governmental entities, international organizations, inter-professional associations, Green Building Councils;
Group 3: *Financial Communications*. Stakeholders concerned: investors/shareholders, of which: employees, Social Responsibility Investment, institutions, individuals, rating and ranking agencies;
Group 4: *Human Resources*. Stakeholders concerned: employees, temporary workers, employee representatives, work/study students, interns;
Group 5: *Delegations*. Stakeholders concerned: local communities, governments (elected representatives, administrations), opinion leaders, neighborhood sites (private or public companies, individuals), traditional media;
Group 6: *CSR*. Stakeholders concerned: NGOs, foundations, associations, universities, secondary and professional education, online media (social networks, blogs etc.).

In this circular information organization nobody is excluded. The circular economy model is inclusive and collaborative.

Some Aspects of Operational Strategy Circular Minded

Target A: Sustainable Construction and Energy Efficiency

In the Construction activity Saint-Gobain aims to improve the well-being of all, promoting sustainable construction (that means changing the whole of the construction market value chain), and energy efficiency (both for existing buildings and for all new buildings). Specific R&D Saint-Gobain's centers are created in India, Brazil and the Middle East, developing energy efficiency solutions for hot countries. The European Commission, in conjunction with the industry (including Saint-Gobain) and the public sector, launched, 2017, a pilot program (LEVEL-S) in order to reduce the carbon content and the environmental impact of the materials and solutions used in construction. This involves increasing the recycled content of materials via the *circular economy*.

However, the efforts to promote sustainable construction can only be effective in the long term if they reflect users' needs and expectations. The

fulfilment of individual user expectations is considered by Saint-Gobain as part of its strategy. The perception of individual comfort is what is needed to convince users. Today, the group places well-being and user comfort (thermal, acoustic and visual comfort, and air quality) at the heart of its strategy, offering responses to the long-term collective challenges. In an increasingly urbanized world, where nearly 90% of the time is spent indoors or in a vehicle, there is a need to design and build living spaces that are both more comfortable and more sustainable. Comfort answers today's individual needs (performance, safety, adaptability, accessibility, beauty). Sustainability addresses tomorrow's collective challenges (sustainable building, better mobility, resource efficiency, demographic growth, climate change).

A novel approach of these mentioned aspects (Comfort and Sustainability) has been developed by Saint-Gobain with the "Multi-Comfort" concept, illustration of a circular information organization, connected to a new, emerging Building Science. Users' experience is at the heart of the Multi-Comfort approach.

In any physical location (a room, a vehicle, a workroom etc.) the well-being of the occupant depends on a certain number of factors: temperature, humidity, sound level, air-quality and so on. When developing solutions and the products that comprise or delimit the location (ceilings, floors, walls, windows) the first step is to understand the required comfort levels, in terms of temperature ranges, noise levels in decibels, or percentage of humidity. The novel approach to the industrial design process, underpinned by intensive needs analysis, makes the user the central focus of the entire innovation process. In a digital era, "comfort" becomes no more an intuitive concept, but part of a new "Building Science." Building on digital techniques, Saint-Gobain has developed a measurement tool, the Comfort-meter, which can immediately characterize a situation by measuring the parameters that describe the different types of sensory comfort. The tool is a portable, pocket-sized box fitted with sensors and connected to a smartphone via an app. A measurement of the parameters is taken on demand. It can be processed locally to provide information to the user (the app gives indications on the recommended levels). It can also be sent to a cloud service by aggregating all the data. Saint-Gobain's scientists can derive lessons learned that help the R&D

teams to find targeted solutions, and the sales teams to hone their arguments.

For example, based on thousands of measurements sent to the cloud service by Comfort-meter users, it has been possible to prove that average noise levels in open-plan office space, which play a decisive role in employee productivity and health, vary considerably between countries: the measurements give an average of 46 decibels in the USA, and 63 in Brazil.

More than the tool, Saint-Gobain's teams have integrated experts in physiology, psychology and sociology to better understand the individual, cultural and subjective dimension of comfort perception.

The various skills developed in the area of building science, especially via cross-functional programs, are key for the success of the group's construction strategy.

Circular big data management becomes smart data management for the industrial company and for the user. Circular handling means efficiency and performance.

Target B: Circular Management—Mirror and Trigger of Entrepreneurial Societal Responsibility

Saint-Gobain's environmental approach is to ensure the sustainable development of its activities, while controlling the impact of its processes, products and services over their entire life cycle. That means a responsible development policy at each step of the value chain (Design, Manufacturing, Distribution, Use of Materials and Valorization of materials and substances).

- At the *Design* step, the objectives are: design innovative processes, eco-innovation, and contribute to the circular economy;
- at the *Manufacturing* step, the objectives are: improve energy efficiency, reduce the carbon footprint;
- at the *Distribution* step, the objectives are: contribute to preserving biodiversity, preserve resources, reduce the environmental impact;

- at the *Use* of renovation and innovative materials step, the objectives are: demonstrate the efficiency of the multi-comfort program, promote sustainable construction, use the implemented solutions;
- at the *Valorization* step, the objectives are: reduce and recycle production wastes, promote closed-loop recycling, recycle materials from deconstruction as a priority in the group manufacturing processes, increase participation in the circular economy.

The group thus wishes to ensure the preservation of the environment, to meet the expectations of the stakeholders involved and to offer its customers the greatest value added for a minimum of environmental impact. The transition to a circular economy is for Saint-Gobain a compelling roadmap. Through cross-business actions and synergies between industry and distribution, the group undertakes to provide innovating solutions for the sustainable management of resources during the life cycle of its products and services, throughout the entire value-chain.

5.2.2.6 Saint-Gobain Circular Entrepreneurship Illustrations

Circular Entrepreneurship and Control of Risk: The Purchasing Challenge

Purchasing is not only a key factor in the group's competitiveness; it is also an activity related to the efficiency and the risks related to the supply chain that contributes to the effectiveness of Saint-Gobain's strategy. The challenge is big with a global annual purchasing amount of €29 billion (vs. €41 billion net sales in 2017).

The purpose of the group's Responsible Purchasing policy is to control and reduce the environmental, social and societal risks to its supply chain. It is built on two pillars: the Purchasers Charters and the Suppliers Charter. It comprises three stages:

- mapping the CSR risks, including human rights, anti-corruption and environment, health and safety risks;
- evaluating the CSR performance of suppliers to classify the risks;
- building progress plans in conjunction with suppliers.

This general framework is adapted by the operational teams based on the specific features of the trade and incorporates the strategy for the development of medium- to long-term partnerships with suppliers. The risks of purchasing categories integrate environmental performance, in particular water and carbon footprints, and safety. The mapping evaluation is based on international and recognized sources. It allows for the identification and evaluation of risks connected to suppliers and thus determines priorities for action and engages a constructive dialogue for improvement.

Circular economy implementation needs a rigorous organization.

Circular Entrepreneurship Facilitates a Business Culture of Change

More than three-quarters of the group's total energy consumption is today directly linked to fossil energies. The ability of industrial processes to move from using fossil fuels to low-carbon energy solutions—electricity (where this is low-carbon), biogas, hydrogen—is therefore crucial.

The transition is not so easy because Saint-Gobain's industrial processes can be grouped into two categories:

- Processes that are technically suited to the use of electrical power alone. For these processes, the transition is facilitated by the development of local renewable electricity networks and the growing share of low-carbon electricity in national grids. This is the case for glass wool, for example.
- Processes for which the adaptation to the use of electrical energy is technically more complex. This involves a dual approach to innovation, focusing on the expansion of low-carbon forms of energy and the development of processes for easier use of electricity. On its sites, Saint-Gobain is developing projects using new energies like wind power, biomass, biogas and solar power. These developments may be made in association with external partners.

The transition to circular economy takes time and needs substantial investment. But it cannot be eluded.

Circular Economy and Biodiversity Recovery

Saint-Gobain is committed in particular to those sites with a market impact or to areas with remarkable biodiversity. Based on its experience in quarries, the group today has significant internal expertise on the subject. It is now a question of grasping every aspect of the subject. Saint-Gobain has set the ambition of preserving, restoring, increasing and enhancing biodiversity, ensuring the sustainable and fair use thereof and managing to involve all parties concerned. A mapping study of all the sites was conducted in 2016 to evaluate their sensitivity to the ecosystems based on their proximity to areas of high biodiversity value.

Out of the 160 underground or open quarries operated by Saint-Gobain throughout the world, the vast majority belong to Gypsum Activity, which has drawn up a charter for biodiversity in its quarries. The group's quarries are operated and then restored with the aim of preserving the environment in accordance with local rules. During the operating and restoration period, the effects on residents and on the environment are reduced as far as possible concerning: visual impact, dust, noise and vibration, repercussions on the local natural environments.

In 2016, the Saint-Gobain Placoplatre quarry in Cormeilles (France) was awarded as an exemplary project. The actions taken since 1990 have made it possible to restore 60 hectares previously dedicated to gypsum mining, in order to create various ecosystems, including a forest of 70,000 trees.

Circular entrepreneurship is able to deliver positive, healthy, solutions for the long term.

In Short

What can we learn?

Saint-Gobain has a long, glorious industrial history beginning in 1665, and today is a successful testimony to circular entrepreneurship. What can we learn about this exceptional socioeconomic experience?

First, "heritage" is not just a gift from the past to be maintained, it is rather a multifaceted capital to develop adaptability to continuous social and technological environmental change (towards modernity). Heritage

can be considered as a useful *boîte à idées* (ideas' box), delivering reflections on methods, aims and means.

Second, circular entrepreneurship is a long-term-oriented venture aiming at the fulfilment of users' needs and expectations in changing ecosystems (key to economic performance). But this objective must be reached under sustainable conditions, that is preservation of natural capital (common goods) and responsible handling of human capital (ethical considerations).

Circular economy is a world of change, of sharing, of partnering and networking, of coproduction, co-development and solidarity: all these tendencies make sense in a chaotic world, with so many challenges to overcome, with possible difficulties (let us just mention cyber-security or the important issue of corruption). Circular economy induces organizational change (structures and behavior), more regional proximity, shorter decision-making channels and more agility. Saint-Gobain is aware of that evolution and is programming important changes in that direction (implementation having begun in 2019).

Change is also linked to innovation in all domains: science, technology, production processes, organization' governance, integrated services, learning, training, communication. On a world level Saint-Gobain figures in the TOP 100 innovating companies. Circular entrepreneurship is altogether a trigger and a result of that passion for innovation that characterizes this "distinguished old lady" as always youthful.

Case sources: Annual Registration Document, since 2014. "Building our Environment Together": annual Sustainable Development Report, 2011 and following years. Letter to shareholders, since 2012. "Changer le regard sur le confort," Annual brochure. "Pensés pour vous, conçus par nous; des matériaux et solutions qui changent la vie"; brochure 2018. Fondation Saint-Gobain, Rapport annuel. Pierre-André de Chalendar, "Notre combat pour le climat: Un monde décarbonné et en croissance, c'est possible," ed. Le Passeur, Paris, 2015. Annual "Actionaria" meeting in Paris. General annual shareholders assembly participation: 2017, 2018. Saint-Gobain website.

5.3 Great Family Businesses: Their Sense of Responsibility and Transition Towards Circular Economy Strategies

Two cases will illustrate different pathways to circular entrepreneurship decisions: the first, Hager Group, a German company, illustrates the

important role of national social culture; the second, Soprema, a French company located in the Alsatian bi-cultured Rhine river area, demonstrates the decisive relations between entrepreneurial spirit and knowledge co-creation with scientific organizations.

5.3.1 Hager Group: The Influence of National Social Culture on a Firm's Sense of Responsibility and Circular Entrepreneurial Vision

Hager, a German 100% family owned company, does not have, as Saint-Gobain, a "royal heritage" but a "people science" one, neglected in academic spheres, although this "cultural knowledge" appears often at the origin of core competences for strategic advantages (Conner 2005). Yet, both companies (Hager and Saint-Gobain) are convinced that natural capital—whether material or human—must be preserved, and that nature can be saved, at least partially, through circular economy implementation. Both think that such a long-term-oriented venture must be supported by a collective, universal program, like that described by United Nations Global Compact, but also by enterprises' individual initiatives. Focus is placed in this section on specific aspects of Hager initiatives. Some are unique and deeply connected to the philosophy of Hager Group's governance, others concern most "great family businesses" (Miller and Le Breton-Miller 2004, pp. 209–232).

5.3.1.1 Some Company Features

History

Hager was created in 1955 in the small city of Saarland (Germany), Blieskastel, by two brothers, Herrman and Oswald (one an engineer, one a manager), and their father Peter. Its legal seat (today a SE, *Societas Europea*) is still there.

Today (2017) Hager Group is a successful enterprise, 100% family owned.

Key Figures 2017

Turnover	€1.9 billion
Employees	11,400
Industrial property	3000 active patents worldwide
Production sites	23, in 10 different countries
Countries in which Hager products and services are available	120

Source: Hager Group website

Hager Group Brands

- *:hager*: electrical installation systems in residential, commercial and industrial buildings;
- *B. Berker*: multifaceted switch designs combined with smart building automation;
- *Daitem*: wireless security systems and services distributed via trade installers in the security business;
- *diagral*: alarm systems available in DIY stores as well as solutions and applications serving the "security in home comfort" markets;
- *EFEN*: safety devices and safety-related current distribution components;
- *ELCOM*: modern door communication systems and individual high-quality door station solutions.

Activities

Hager Group is a leading provider of solutions and services for electrical installations in residential, commercial and industrial buildings; cable management and wiring accessories to building automation and security

systems (burglar alarms, smoke alarms, motion detectors); communication systems (protection and control devices).

Innovation fields include: networked home, intelligent building technology, energy efficiency, renewable energies, ambient assistant living, electric mobility (fill-up with electricity and save fuel to protect the climate).

These fields are linked to the "digital revolution" that makes the "resource revolution" possible; both are inextricably bound together to make substantial resource savings, optimizing circular use and reuse. Hager Group is at the heart of that transformation process contributing, in collaboration with other socioeconomic actors, to sustainable access to resources that are essential to life and development (energy, communication, security; see Chap. 6, §6.2).

This presentation of present and future activities does concern essentially physical resources, a domain of management that is becoming, hopefully, quite common. But a competitive strength of Hager Group is mainly elsewhere, as shown in the following section.

5.3.1.2 Adopted Management Principles

(1) Hager Group's governance does think that *human capital* is the company's most precious capital, that must be at the heart of the organization. "You cannot buy a man/woman like you purchase a machine. Human competence/ability is created step by step; humans do reflect culture; tacit knowledge is important" (Denis Munch, Sustainable Development Department, Hager Group at Obernai). Thus, Hager pays great attention to education and training, especially to young employees: they are successively catered to with diverse missions. Young staff members may change their affectation inside the company every two or three years. Denis Munch related how he began his Hager career as an engineer in the Production factory. Later on he was active in the Quality Control Service, later in the Compliance Service, and after in Human Resource (HR) Management.

This kind of HR management is an important aspect of Hager's circular economy implementation: circularity of ideas, of industrial practices,

of employees, of knowledge, of cooperation. This circularity application has diverse advantages: each employee has the opportunity to learn what happens in another field of activity inside the business, to discover who is responsible for what, which person can be called for help in case of difficulty, or advice needed. The direct horizontal business relations make research for complex solutions easier and faster: no time is wasted (waiting for a possible ad hoc commission meeting, or for a hierarchy agreement that is possibly not the best-informed). Friendly inter-colleague relations create a serene job atmosphere and stimulate a sense of solidarity. Each staff member knows that he or she is not obliged to stay in present business activity: he or she may change, move to another service; it is the spirit of the company. Internal mobility on a local and global scale is an important factor in career development in Hager Group. International mobility is part of a wider business strategy developing business in new countries (India, China, the USA, Australia, the Middle East) as well as developing international careers. The Hager family created a Foundation that aims to develop the spirit of sustainability and circularity in the countries where the Group is operating.

Each employee, part of the firm's human capital, is as such worthy of consideration, even for details: for instance, a pregnant employee will get a parking position near the entrance-door of her activity building to avoid tiredness. The new headquarters building is called the Forum; it is a large, elegant open-space modern building, with plenty of sunlight and glass partition (transparency), optimal insulation, located in the middle of the business campus, including machine shops, controlling services, R&D departments, management offices, visitors' reception, coffee shop and restaurant. Everybody has access to the Forum; it is a space to meet, to discuss, to exchange serious ideas or jokes, to create links and solidarity, a sense of membership.

"All employees are part of our sustainably shaped future" (Daniel Hager, CEO).

(2) Natural resources are part of *natural capital*, a common good to be preserved. This statement is evidence of Hager's governance. The ancestors of the Hager industrial enterprise-creators were peasants, managing an agricultural firm. They know what nature can offer and how this gift of resources, of environment, of incredible beauty must be protected.

5.3.1.3 Circularity and Sustainable Development Practices

The firm's credo is: "As a family-owned company it is in our nature to be sustainable. We invest in our employees and their training, in energy efficiency and future technologies, in fair trade relations and we work actively to continuously improve our eco-balance sheet" (Daniel Hager, CEO Hager Group, June 2018).

The company has translated this vision of *responsibility* and sustainable development into a structured approach, called E3:

(1) The "Three E" chart: Ethics, Environment, Energy (first part)

- E for Ethics: we strive to offer our employees a safe and secure working environment, equal opportunities for professional development and to promote ethical behavior with all our stakeholders.

  – Example 1: 95% of people undertake a Personal Development Interview and have one validated individual appraisal review per year (2017).
  – Example 2: Gender diversity: 15% increase of women in management positions (2017/18).
  – Example 3: Ethical behaviors: 80% of managers qualified (trained and skills validated) in ethical management.

- E for Environment: we aim to make our environmental footprint as neutral as possible for the planet, optimizing the use of energy and resources, avoiding hazardous substances, and limiting emissions and waste.

  – Example 1: Energy consumption: decrease on-site energy consumption: 10% in 2017.
  – Example 2: CO_2 emissions related to inter-sites freight sales: 10% in 2017.
  – Example 3: strengthen eco-design of products: 80% eco-designed products amongst the innovative projects 2017.
  – Example 4: 100% of metallic waste and 90% of plastic waste are recycled (in the Hager/Obernai factory).

- E for Energy: we offer value to people and their assets through safe, smart, eco-friendly and energy-efficient products, solutions and services for both their living and working environments.

(2) The "three E chart" has been complemented by a second chart of three Es: "Everyone, Everywhere, Everytime":

Circular economy is interdependent and inclusive. Everyone is concerned, is it at home, in the city, in the factory or the office. The quality of earth, air and water is interconnected. Natural resources need constant attention; resources must be managed intelligently and sustainably, and efficiently to make substantial savings. Industrial products and services, circular-minded, deliver part of the challenging solution. With the help of public authorities, civic associations, NGOs and implementation of digital technologies, all actors, producers and consumers will demand new growth models that consume fewer resources. The innovation fields adopted and promoted by Hager Group are working towards that target.

In Short

What can we learn?

The long-term approach has many facets (Ethics, Environment, Energy) and the success will come only by fighting on many fronts (Everyone, Everywhere, Everytime) with determination and rigorous methods of evaluation criteria and monitoring, top down and bottom up, also on a horizontal level.

The long-term interests of the company include all its stakeholders, not just shareholders but employees, clients, partners and society at large (Everyone).

Family proprietorship induces a sense of responsibility, and even pride.

The CEO's abilities, intelligence and courage are essential aspects of winning circular entrepreneurship. The best leaders rally their firm's members and partners around a mission like sustainable development, the planet's natural resources protection, the respect for human dignity. Such a mission is possibly easier to fulfil in a family-owned enterprise. Nevertheless, in family-owned companies, as in larger capitalistic quoted firms, long-term development depends first on focused capability building. Efficient organizational flexibility, including staff members' circularity, supposes that the business is

constantly growing. This is the case for Hager. The group has an ambitious development plan in fast-growing countries like India, China and Australia for the coming years.

Case sources: visit to the Hager factory and Forum in Obernai; personal meeting with Jean Lasserre, Head of Corporate Strategy department, and Denis Munch, Sustainable Development Policy; website; "Building Bridges": Hager Group Annual Report 2017/18

5.3.2 Soprema/Sopraloop: Radical Innovation in Recycling—Entrepreneurship and Scientific Research

Soprema is an independent, 100% family-owned company (headquartered in Strasbourg), created in 1908 by Charles Geisen. Successively, his son, grandaughter and great-grandson inherited his entrepreneurial and innovative spirit. Soprema became one of the world-leading players in the fields of waterproofing, insulation and building protection. Today the objectives of the company are as follows:

- strengthen the energy performance of buildings (this sector is responsible for 40% of France's energy consumption, and nearly 25% of greenhouse gas emissions);
- improve the comfort and quality of life of the occupants;
- fight against future fuel poverty,

according to national energy transition laws (for example the transition law adopted by the French Parliament in August 2015).

5.3.2.1 Some Company Features

History

Soprema began under the brand "Alsation Emulsion Factory" (created in 1908). At that time, natural asphalt or coal tar was being used as roofing materials (mainly for terraces and balconies). These products were very expensive and not very reliable. Charles Geisen explored a fantastic idea:

dipping jute cloth into hot bitumen. The result was a lightweight, strong sheeting which came to be known as *Mammouth*. This name of a gigantic mysterious prehistoric animal became the origin of a big business success, of course not only because of the name. Soprema's "Mammouth" is an innovative product, not created or prepared with a consistent R&D program, but as the result of just a kind of "stroke of genius" born in the brain of a literature professor, in touch with friends/entrepreneurs. Since then, and up to now, research, inventiveness and innovation have been core activities of the business.

Present Activities

- Roofing (durable protection);
- Waterproofing systems;
- High-performance insulation systems;
- Wall systems (building envelopes);
- Sound proofing (floors, walls, ceilings and drainage pipes);
- Protection systems for more secure buildings;
- Civil engineering (waterproofing and protection of bridges, dams, canals, tunnels).

Key Figures, 2017

Consolidated turnover	2.63 billion €.
Employees	7187 (all over the world)
Manufacturing plants	63 (including 25 waterproofing factories, 20 insulation factories, 1 geotextile factory, 1 mastic and adhesive factory, 9 smoke-extractor factories, 1 recycling factory)
Operating subsidiaries	presence in 90 countries
Research and development centers	13, with a strong focus on Sustainable Development
Training centers	22, in 8 countries
Leader at the global level	Top 3

Source: Soprema website

5.3.2.2 New Circular Management Practice: Sopraloop Plastic Recycling

The activities of Soprema are intimately linked to sustainable development and circular economy. Both concepts have for years been considered strategic guidelines for the company.

The first strategic policy consideration is: the production process of the roofing and insulation products as well as other water- or sound-proofing applications have used, up to now, mainly petroleum-sourced raw materials. That means for Soprema a total dependence on strong petroleum-price variations and on imports at political risk. Thus, the company decided to move progressively from petroleum-sourced raw materials to eco-sourced raw materials, that is biological supplies or recycled materials.

Second, Soprema's activities are oriented towards limitation of clients' natural resources squandering (notably energy). This target should also be valid for the company itself (its production processes). Soprema decided to use recycling techniques to become a materials producer to preserve non-renewable natural resources like petroleum. The idea was to recycle plastic waste that is widely available and polluting oceans and so many other places. But this logical idea appears to be difficult to transform into a consistent useful reality. Why? The answer is simple: for PET (polyethylene terephalate) plastic items, no technological recycling process exists! Soprema launched an R&D program to discover a solution. It succeeded, creating a fantastic "première" in the world of plastic recycling, presented at the June 2018 World Materials Forum.

The problem and solution are summarized as follows, by François China, in charge of that project, led by the Soprema Strategy and Environmental Performance Unit and managed by "Sopraloop," the name of the legal Soprema entity in charge of that new technology management.

Sopraloop

Sopraloop represents a true premiere in the world of plastic recycling.

PET (polyethylene terephthalate) is one of the most common plastic resins, used in a lot of applications. The packaging segment represents 60% of those applications. Nearly 3.5 MT of PET are consumed every year as household packaging, mainly as plastic bottles.

But whereas PET is currently one of the plastics experiencing the highest recycling rate (nearly 60%), new PET packaging with a very strong growing curve is springing up without any recycling solution available. This packaging is called complex PET, due to the fact that, most of the time, they combine PET with other resins or pigments, not compatible with the existing recycling technology.

The most famous examples are the bottle of milk made of opaque PET, and the multilayers PET trays used for fresh food, which are directly sent to landfill or energy recovery. There is now a real emergency to find a solution for such wastes, which become a real societal problem.

The Soprema group is one of the world leaders in building materials, more especially in roofing and insulation applications. Even if the product portfolio of Soprema is large, most of its products share the same feature. They are all made of petroleum-sourced materials, which represents a real threat for the future of the company.

To protect itself against all the risks linked to oil rarefaction, Soprema decided several years ago to implement a strategy aiming for the substitution of all its petroleum-sourced raw materials by "eco-sourced" raw materials (meaning bio-sourced or recycled materials).

This research led the Soprema group to develop a very innovative process, being able to treat all kinds of complex PET waste.

This process belongs to the upcycling family. Thanks to this process, Soprema is now able to transform those PET wastes into a brand new product, called polyol. This polyol is a chemical material widely used in the production of polyurethanes, and more especially in the insulation polyurethanes foams (material produced by Soprema), where it is one of the two key components.

This gives Soprema first the opportunity to substitute the major part of its petroleum-sourced polyol needs (called phthalic polyol) by a PET-based polyol, and as well to become its own raw material producer.

Such an innovation was made possible because of Soprema's strong engineering culture and previous experience in other plastic wastes treatment.

Indeed this process is the combination of two kinds of processes:

- a mechanical one, specially designed to grind the wastes and achieve a fine sorting of the PET particles;
- and a chemical one, based on a glycolysis technology, specially designed to transform those PET particles into a virgin polyol.

A first industrial unit, located in Strasbourg, is about to be launched in early 2019, with a yearly capacity of treatment of around 7000 T of PET waste.

This first unit will supply the two Soprema polyurethane foam-panel production plants, one located in the south of Paris and the other near Frankfurt.

Source: François CHINA. Direction Stratégie et Performance environnementale. Soprema

In Short

What can we learn?

Anticipating the future while preserving environmental capital and natural resources is a good market opportunity and a possible performing competitive strategy. It is a corroboration of the analysis we developed in Chap. 2.

This happy Soprema/Sopraloop story underlines also the importance of strong and methodical entrepreneurship, combining three elements: (1) a relevant diagnosis concerning present position and long-term perspectives, (2) the ability to adapt to change in a global environment and to develop appropriate means and dynamic capabilities, and (3) faith in successful new transition processes.

A specific innovation venture also introduces possible management difficulties in an interconnected context with multiple actors; one of those refers to patents and more generally to industrial property creation, use or misuse. Open innovation and shared economy with growing circular relations obviously need fresh rules.

Industrial entrepreneurship, compared to public decisions, appears to be more efficient. One can observe that in the long story of climate change handling, in the frame of the UN's "COP" (Conferences of the Parties), from the beginning (first session in Berlin 1995) to COP 24 in Polen (2018), governments of the majority of the signatory countries revealed they were unable to observe their engagements; promises are diluted in political considerations, and are not really ethically minded.

Case sources: Soprema website, press release, meeting with Soprema Executive François China

5.4 Organizational Shift and Leadership Capabilities

The very fast changes, in all domains (technology, knowledge, politics, climate change, natural capital and resources' destruction, peoples' survival difficulties etc.), induce substantial corporate organizational changes,

also linked to circular economy implementation. We illustrate this assertion with two examples concerning some aspects of that transformation.

5.4.1 Engie: Organizational Problems Inherent in Business Transition Processes

In Chap. 2 we mentioned some substantial characteristics of Engie's business and objectives: natural capital preservation, clean energy production technologies development, new markets and new services valuation, strategic shifts worldwide. In this chapter we intend to focus on some organizational problems inherent in transition towards circular economy, especially in very large companies like Engie (about 155,128 employees in activity in 70 countries, contributing to €65 billion in revenue, in 2017). What can we learn of the organizational problems to be resolved in this delicate transition period?

5.4.1.1 First Consideration: Time Management

In a "born circular firm" (Chap. 4) this topic is of course not really a concern. In mid-sized enterprises we may observe, time management of that transition process is rather progressive, prepared and decided in a long-term perspective analysis, and implemented step by step. In very large enterprises like Saint-Gobain or SUEZ (both deeply concerned with circular economy and sustainable development), the policy decisions made are quite different: a resource "revolution" implementation is an immediate target for SUEZ, but its governance is convinced that the transition process will take time to be fulfilled; a continuous transformation policy has been adopted by Saint-Gobain for many years, but a "quiet" process is perhaps no longer feasible.

Modern socioeconomic life is presently evolving at a very high rate, for two dominant reasons: the invasion in all domains of digital technologies, and the relative (correlated to world population growth) shortage of natural resources, in huge uncontrolled progress. There are new rules to the global game coming in, and fast (Brafman and

Beckstrom 2007, pp. 197–215). In the "new world" large companies, as well as smaller ones, are connected to large networks of users, giving to the players both flexibility and power. The value of networks is growing. They become incubators for creative, or even destructive, ideas. Everyone seems able to contribute to knowledge spreading. In the digital world, decentralization will continue to change the face of industry and society. In response to that challenge, in January 2016, Engie put in place a simplified structure based on a territorial and decentralized approach.

How much time is needed for organizational renewal? The answer differs based on rational estimates and on entrepreneurial decision-making. Managing change is multifaceted, including organizations' architecture, technology and business strategy, managing functional competences, functional linkages, operational leadership, roadmap milestones, visions and values.

To be more explicit, we mention some of Engine's decisions linked to its transition measures towards circular economy implementation, with the option of a fast transformation process (three years, carried out).

5.4.1.2 Organizational Renewing: An Organization Close to Customers and Territories

The announced "simplified structure" does—of course—not look so "simple" in a very large company, with 155,000 employees and 24 million clients worldwide.

The group now comprises 24 operating entities (Business Units), five "Métiers" and a range of support functions and operational functions:

- Business Units: most of these are constituted on a scale of a country or group of countries, according to the density of the activities carried out in the geographical areas concerned. Each of these BUs are represented in the Group Executive Committee (COMEX) by an executive vice-president, who oversees it.

- Five "Métiers" have been created in addition to this geographical structure: gas value chain; centralized generation; decentralized solutions for cities and territories; solutions for businesses; solutions for residentials and professionals.
- The support functions (General Secretariat, Finance, Human Resources, Brand and Communications, Digital and Information Systems, Innovation, Corporate Social Responsibility, Real Estate, Risk Management, Reporting and Audit).
- The operational functions (Strategic Sourcing & Supply, Research and Technology, Business Development Oversight, Industrial Projects, Nuclear Development) complete the organization; they aim to reinforce the actions of the Métiers to develop synergies within the group and support the BUs.

Engie's renewed organization is induced both by internal competitive management considerations (growth and performance program) and external diverse opportunities. The first to mention is the increase in energy demand in fast-growing economies, and the energy transition becoming a global reality, accelerated by technological progress (advances made in photovoltaic energy, battery storage, electric mobility, use of hydrogen etc.). Second, the digital revolution is changing people's behavior, their relationships with the city, with their home and car. Third, a cultural and societal transformation is playing out. Consumers are looking for a more thoughtful use of energy, for low-carbon solutions to manage their energy consumption, and even for ways of producing their own green energy.

Finally, the transition towards circular economy needs a huge transformation process in various fields of innovation, tangible and intangible investments, a firm's organization, portfolio of activities, training, human relations, internationalization procedures, relations with public authorities or local partners. The implementation of all these changes is a source of risk occurrence and of internal human resistance. In fact, profound organizational change (induced by circular economy) creates new win-

ners and new losers; it is difficult to satisfy everyone. Entrepreneurship's responsibility is large.

5.4.1.3 Circular Entrepreneurship and Top Manager Leadership

The task of a top manager in charge of changing the business towards a successful resource-management model is not easy. This statement is especially true for very large organizations, confronted with overall complexity. Technical, human, financial and political aspects are all decisive and interconnected. That means that the top management decision leader should be sensitive to these various elements and able to appreciate the diverse components of the problem to be solved efficiently. Such ability depends on educational background, on experience acquired in the field, on personal talents, on will and on character.

Since May 2016, Isabelle Kocher (born 1966) has been Engie's CEO. It is a very unusual position for a woman in France for quoted companies. In 2018, *Fortune* ranked Isabelle Kocher as one of the Most Powerful Women (MPW) in business outside the USA. So, she is recognized, on an international level, as an outstanding leader, full of energy and authority. She graduated as an engineer and acquired a Masters degree in quantum optics. This theoretical knowledge was filled out later on with industrial expertise in several firms (Safran, Lyonnaise des Eaux, GDF SUEZ) and political responsibilities (Ministry of Economy, and Prime Minister Jospin's adviser for industrial policy). She is also mother of five children. All that shows proof of her organizational capabilities.

Case sources: Reference documents; shareholders general assembly; press release; documents delivered to stakeholders club; website; diverse meetings with Isabelle Kocher, Strasbourg, 2018

5.4.2 Organizations' Rethinking Through Circular Practices Implementation: Executive Interim Management

Concerning human resource management, the current business environment calls for ever-greater flexibility and rapid deployment of skilled individuals who can manage business transformation effectively. To cope with the challenges (for instance to digest an acquisition, to face a sudden crisis, to conduct reorganization) or benefit from opportunities that arise today (see Chaps. 1 and 2), companies must be prepared to adapt, and adapt quickly. Often, the management in place does not have the flexibility or experience to implement the necessary organizational changes in the necessary time frame. The way forward is to look outwards for fresh inspiration or new resources; this evidence leads to the emergence of a new type of business called "executive interim management."

Interim management has been in place for some time in the domain of craftsmen working forces. What is new is the idea of applying this circular practice to executive leaders. The novelty of that concept was introduced in 1989 by two founders: the leading international executive search firm Egon Zehnder and the Dutch Consulting Groupe Boer&Croon. They aimed to deliver quick solutions to their clients, combining "the quality of executive search firms and the speed of consultants." The brand of their created company is "EIM," Executive Interim Management.

EIM

"*EIM* can provide vital know-how and fast support. We provide rapid access to expertise or change management skills not immediately available in your company. These can be provided either on a temporary basis, or for permanent placements as appropriate.

EIM managers are seasoned senior-level professionals with proven track records in handling complex business situations that require rapid transformation. They are selected only after extensive interviews, in-depth testing and intensive evaluation. These experienced, results-oriented individuals quickly grasp the challenge at hand and make an immediate impact, often solving urgent issues in weeks, rather than in months and achieving specific goals in months rather than years.

We have established long-term relationships with some 30,000 such professionals across a broad spectrum of businesses. Many have worked with *EIM* for years, giving us unparalleled access to first-class change management skills. We can therefore quickly identify the right person for any assignment.

We believe in people. We believe that—in a business that is changing rapidly—people make the difference. They are the ones who find the opportunities to adapt to the changing environment. They are the ones who drive innovation. They are the ones who realize the transition.

We deliver value through people."

Source: EIM website

The business model of an EIM business competitor, Morgan Philips, looks very similar; the same concept of interim management, same strategy, and same methods of handling.

Morgan Philips Interim Management: New Challenges for Executive Leaders

"Interim management consists of the highly strategic assignments assigned to executive leaders for a set period of time. Offering more commitment than a simple external service provider and not as binding as a permanent contract, interim management draws on a pool of highly experienced candidates with managerial experience in key positions at large international groups.

Widely recognized in northern European countries, interim management is gaining popularity throughout France, as much among companies as candidates, especially managers who are nearing the end of their careers but remain eager to share their experience and take on new challenges.

Nowadays, interim managers are employed in all sectors, with a market tendency emerging in industry. Regarding salary, in 9 months an interim manager earns what he or she would have otherwise earned in a year. Furthermore, interim managers allow themselves a few weeks before taking on new assignments."

Source: Morgan Philips website

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6

The Growth of Circular Entrepreneurship: An Integrative Model

6.1 Introduction

Under which conditions can circular entrepreneurship grow and expand in different contexts? This is addressed in this final chapter. In the previous parts of this book we outlined the meaning and characteristics of circular entrepreneurship, as well as its different expressions. We have particularly explored how circular entrepreneurship can take place in new ventures (born circular firms) and in established and larger firms (circular corporate entrepreneurship).

An increasing adoption of circularity principles in business and the growth of circular enterprises are key to the survival of the planet. We need to understand under which conditions this growth can be achieved. These conditions can be classified into internal and external. The growth of the circular economy also requires us to pay attention at a different level of analysis: from enterprising individuals and transformative leaders to their organizations (circular enterprises, both new and established), the networks of actors and ecosystems around them, and finally the external context in which they are embedded, which affects their success but is also conditioned by their actions.

A. Zucchella, S. Urban, *Circular Entrepreneurship*,
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This chapter aims at introducing an integrative model for circular entrepreneurship, and consequently will leverage and discuss further the findings and issues of the previous chapters.

The first section (6.2) discusses the key role of internal resources and capabilities, but also enabling environments and institutions, for the growth of circular enterprises.

The second section (6.3) is devoted to presenting an integrative model for circular entrepreneurship, as applicable to both the main cases identified in this book, that is born circular firms and established organizations in transition towards circularity.

The final section (6.4) provides some conclusions about this chapter and the overall book.

6.2 Growth Conditions for Circular Entrepreneurship

The growth of circular entrepreneurship faces a number of challenges. These challenges—as well as growth opportunities—arise from both internal and external conditions. The former refer to the development of adequate resources and capabilities that can support growth, beyond the enthusiasm of founders. The latter refer to a supportive institutional context, the presence of a system of stakeholders that enables the development of circular ecosystems and ecosystemic business models, and the development of financial solutions to fuel the growth of circular ventures.

6.2.1 Internal Conditions for Growth

The main internal conditions—emerging from our cases—which enable the growth of circular enterprises are leadership and resources and capabilities.

Our cases demonstrate that transformational leadership is important for realizing a circular project. In the cases of large and established firms, which want to pursue a transition to circularity, transformative leadership can motivate people and drive an otherwise difficult process of change. In new and born circular ventures, transformative leadership attracts talent

and resources around the idea of innovating models of business for the future of the planet.

Transformational leadership is characterized by elements like individual influence, spiritual encouragement and intellectual stimulation. Transformational leaders take individuals into consideration, establish a vision, create an open culture, trust the staff to reach their goals and empower them (Bass and Avolio 1994).

There are four key components of transformational leadership (the 4 Is; Bass and Riggio 2006): Idealized Influence (the leader serves as an ideal role model for followers); Inspirational Motivation (the leaders inspire and motivate followers through having a vision and presenting that vision); Individualized Consideration (transformational leaders demonstrate genuine concern for the needs and feelings of followers and empower them); and Intellectual Stimulation (the leaders challenge followers to be innovative and creative, encouraging their followers to challenge the status quo).

A transformational leadership capable of developing and communicating effectively a convincing vision helps also in attracting new talent. We discussed in Chap. 4 how the attraction of talent, which is fundamental for the success of any organization, may find circular projects at an advantage, particularly when targeting younger generations. The latter show an increasing commitment to sustainability and workplace ethics.

A number of circular projects rest also on the development of new technology. The previous chapters highlighted a number of cases which demonstrate it, both in born circular firms (like for example Acqua&Sole) and in established firms in their transition towards circularity. Many of our cases in fact had to develop novel technologies to realize their circular project. Developing a technology may involve a novel product/service, a novel process, a digital platform or combinations of these. This may represent a challenge for firms, since it requires not only talent but also a resources and capabilities. It also increases the business risk. This is an issue which often requires the circular project to operate in an ecosystem, in which different partners can bring in resources and capabilities, reduce time to market and share the risk of the new technology development. The development of new technologies can be promoted and facilitated by public institutions, as the Hager Group case shows (in the box) and as we'll discuss further in a next section.

Hager Group: Creating Intelligent Energy Networks of the Future to Balance Energy Demand and Electricity Production

Hager Group is a leading provider of solutions and services for electrical installations in residential, commercial and industrial buildings. The company was founded in 1955 by Hermann Hager and Dr. Oswald Hager together with their father Peter, and today remains an independent business, owned and run by members of the Hager family, with its head office in Blieskastel, Germany. Hager Group is a worldwide business: 11,400 employees generated a turnover of around 1.9 billion euros (in 2017). They produce components and solutions in 23 production sites around the globe and customers in more than 120 countries all over the world trust in them.

They are partners of the Designetz Project, launched by the German government.

By 2050 Germany aims to cut greenhouse gas emissions by 95% and raise its share of renewable energy in gross electricity consumption to 80%. These aims need big data collection and analyses. The efficiency of wind turbines and rooftop photovoltaic systems depends on meteorological variations. The management of electricity generation systems needs insights into how much electricity these clean sources produce right now and how much they will generate in the near future, and under which conditions. Only then will it be possible to prevent energy networks from being overloaded as a result of highly fluctuating energy production and consumption. Intelligent networking is dependent on available data concerning wind and solar power systems, with global consumption fluctuation dependent on digital expertise in building automation and smart systems.

Once-wasted energy will be put to use all over the world, thanks to modern systemic management procedures and circular economy.

The energy supply of tomorrow is under increasing strain; it also creates urgent demand for new solutions for the energy network. As well as the natural fluctuation in energy production from solar and wind power, growing numbers of energy storage systems and electric cars are putting unprecedented strain on the electricity network.

For these reasons in January 2017 the *Designetz Project* was initiated by the German Federal Ministry for Economic Affairs and Energy: the project was launched with 46 experienced partners from the energy sector, industry, research and development.

As a member of the German Designetz Project, Hager Group and its partners are developing intelligent algorithms that could lead to significant reduction in network load, improve predictability and ensure stable security of supply. To do so, they are linking millions of data points, both past and present, from which they can derive predictions about the future of energy usage and production, both for the short and the long term. Data are collected using state-of-the-art sensors installed in electricity networks.

The ingenious thing about it is a self-learning system (developed in cooperation with the German Research Centre for Artificial Intelligence). The energy management system developed by Hager will develop automatically on a continuous basis. It "learns" from the experience it has gathered so that, going forward, it is able to "know" with more accuracy the levels of consumption and production that can be expected at a given time in a building. All of the production/consumption variables are continuously calculated and recalculated by the system's artificial intelligence, allowing the energy supplier to take the necessary measures to balance the load.

In the case of production surpluses, households could automatically activate high energy-consuming devices to take up the additional electricity. The excess energy (due to strong winds or long sunny days) could be used to charge electric cars, switch on heat pumps and load up batteries for neighborhood or household storage devices.

Source: Hager Group, *Building Bridges* Report, 2017/18

The circular enterprise thus requires resources and capabilities, including network capabilities, because it seldom can operate as a stand-alone entity: circular entrepreneurship leverages partnerships and collaborations, as we illustrate in the next section. Marketing capabilities are also critical, because they can determine success in terms of sales and revenues. They prove particularly useful in the development of good customer insight and of a convincing value proposition: these business processes are rarely a pure outcome of the mind of individual leaders and founders but arise from a continual confrontation inside the organization, with external partners and potential users. This is how the circular economy opportunity is created, as Sect. 6.3 discusses.

A circular enterprise bears a substantial market risk, bringing to the market novel value propositions, which may not be desirable for the customers. Moreover, the market may not be ready to understand or appreciate them. A circular value proposition requires an effort in customer insight and in communication to customers with convincing storytelling. The readiness conditions of markets are vital for the success of circular projects, together with the capabilities to understand customers and effectively market products and services.

While a number of business firms are accused of short-sightedness, marketing myopia and—generally—lack of capacity to develop a vision

for the future of their markets, circular ventures may suffer from the opposite problem: their market vision may be too "futuristic," their innovative value proposition and business model may find resistances to adoption. In 1994 Whirlpool launched the "Energy Wise" refrigerator, the first CFC-free cooler and with standards of energy efficiency, also in response to the 1987 Montreal Protocol, in which signatory countries agreed to phase out ozone depleting chlorofluorocarbons (CFCs) by 2000. But sales of the new refrigerator were disappointing, because the CFC-free benefit and energy-savings did not offset its $100 to $150 price premium and the refrigerators did not offer additional features or new styles that consumers desired. Ottman et al. (2006, p. 24) suggest that firms have to develop a green value proposition that appeals to customers: "Green marketing must satisfy two objectives: improved environmental quality and customer satisfaction."

However, customer needs represent a shifting frontier: they evolve and co-evolve with context, education, institutions and exposure to good practices and positive role models. Market readiness regarding sustainable consumption is certainly improving, but a number of resistances still persist. For example, a recent study on car sharing reveals the presence of forms of cognitive dissonance in the attitude of millennials regarding car sharing (Magnani et al. 2018).

The evolution of customers (both consumers and business customers) towards more sustainable purchase/use behaviors is favored by regulations (see next section on external factors), but also by the diffusion of a culture about sustainability and circular principles. From this point of view, the storytelling about sustainability champions (as reported in Chaps. 4 and 5) the activity carried out by organizations like the Ellen McArthur Foundation and LifeGate, which are all key elements driving behavioral change. Moreover, a sustainable consumption education is needed, starting from children, in order to grow future responsible citizens of the world. The difficulties in which many bike-sharing business models run into are also due to vandalism and theft. For example Ofo, a Chinese bike-sharing pioneer, experienced increasing difficulties, partly due to competition and over-investment but also related to widespread bad behavior from users (*The Economist*, January 24, 2019). Similarly recycling also depends on responsible behavior by consumers and businesses regarding waste.

6.2.2 At the Interface Between Internal and External Conditions: The Development of a Circular Ecosystem

The organizational boundaries of a circular firm are permeable and the organization needs collaboration with other organizations, leaders and think-tanks. Thus, at the interface between internal (entrepreneurial and organizational) resources/capabilities and the external environment there is a system of relationships which are vital for the establishment and growth of the circular project.

Circular ventures cannot operate effectively as stand-alone organizations. It is widely recognized that collaborations and partnerships are vital for any firm (Dyer and Singh 1998), and this proves particularly true for firms pursuing circular economy principles.

The literature on sustainable firms and green management provides ample evidence of the role of networks and collaborations (Rizzi et al. 2013). The role of networks can be particularly vital when firms introduce sustainability-oriented innovations. In these cases, firms tend to form coalitions with stakeholders such as NGOs, lobby groups and governments (Pereira and Vence 2012; Adams et al. 2016). A review of studies in this field confirms that innovation for sustainability requires the active involvement of a broader and more diverse network of actors—including those with more local knowledge of the implications of innovations—than is the case with more conventional forms of innovation (Van Kleef and Roome 2007).

The cases mentioned in our book in the previous chapters highlight that the circular economy is a context particularly favorable for a network approach to innovation and to business modelling. A circular model of business requires the design of a value network, as it happens in born circular firms, as well as the redesign of existing collaborations, in the case of firms in transition towards sustainability. According to Lahti et al. (2018, p. 8), "Creating a circular business model may be a first step to dissolving previous alliances. In some cases, this transformation requires companies to improve material selection and switch their current supply of inputs to nontoxic, pure, raw materials." Closing material loops

involves strong partnerships, as in the case of recycling, extending life and giving a second life to products. A number of business models involve partnerships not only with suppliers and other organizations along the value chain but also with end-users and customers, which are usually an active part in circular value creation.

Establishing a Link Between Industrial Symbiosis and Circular Business Models

The element of inter-organizational collaborations and the development of ecosystems around CBMs establish a link with the industrial symbiosis literature. As Zucchella and Previtali (2019) argue, "The issue of collaborations among different actors, which we deem fundamental in circular business models, is at the heart of the industrial ecology literature, which supports the creation of industrial ecosystems, in which local organizations form industrial symbioses (Lowe and Evans 1995; Korhonen 2001). The industrial symbiosis approach engages traditionally separate industries and actors in a collective approach, involving physical exchange of resources and/or by-products, also leveraging the synergistic possibilities offered by geographic proximity (Chertow 2000; Wolf et al. 2007). A concrete realization of this concept is the so-called eco-industrial parks. A CBM can assume traits similar to those of an eco-industrial park, involving both firms co-located in a defined area and partners that are not contiguous.

The industrial ecology and the related industrial symbiosis conceptualizations are certainly coherent with the circular economy principles. At the same time, these approaches do not investigate in depth the business implications (Etzion 2007; Wassmer et al. 2014). Walls and Paquin (2015, p. 33) observe about industrial symbiosis (IS) that 'The IS literature is still fragmented theoretically and has developed separately from corporate environmental strategy where the focus is mostly on intra- rather than interfirm action … Given its potential to inform environmental strategy and organizational theory, it is a good time to consider the IS literature from an organizational angle and set an agenda for future research.' … We can thus conclude that while the previously mentioned literature on CBMs does not fully consider the fact they are fundamentally "collaborative" models, encompassing different actors, the industrial ecology and IS literature focus on the collaborative dimension, but neglect the strategic and organizational dimension, as well as the role of the focal firm. The relationship between industrial ecosystems and CBMs requires a deeper understanding: while the ecosystem provides a 'stakeholders' architecture,' a system of actors and their relationships, the CBM (which has mostly been conceived at the single firm level), can encompass this system of actors and provide the 'operational and economic architecture' to make the ecosystem viable and sustainable also from the financial point of view."

Source: Zucchella and Previtali (2019)

A clear conceptualization of ecosystem is necessary, because this term is increasingly adopted in literature and sometimes treated as a synonym for forms of inter-organizational collaboration and networks. We prefer to disentangle this concept from the latter and embrace the definition provided by Jacobides et al. (2018, p. 2264): "An ecosystem is a set of actors with varying degrees of multilateral, nongeneric complementarities that are not fully hierarchically controlled." The circular economy provides a number of example of ecosystems and ecosystemic business models, like BlaBlaCar, Hello Tractor, Acqua&Sole. MudJeans needed to establish not only a users' platform, but also strong relationships with suppliers for the co-development of advanced solutions for jeans recycling.

In general closing the loop can require not only some collaborations and partnerships, but the design of an ecosystem for circularity. In ecosystems also customers/users have to affiliate (Hagiu and Wright 2015) and thus become part of the system itself.

In Short

Circular ventures require an understanding at different levels of analysis: the individuals (founders, entrepreneurs and internal entrepreneurs, transformational leaders), the firm level (resources and capabilities) with its governance architecture, its operational and economic architecture (value proposition and business model), and the stakeholders' architecture (network of actors/ecosystem).

6.2.3 External Conditions for Growth: An Institutional Frame for the Circular Economy

The external context is the third key issue and perspective of analysis of the circular enterprise. Entrepreneurship is increasingly acknowledged as a context-specific process: "There is growing recognition in entrepreneurship research that economic behavior can be better understood within its historical, temporal, institutional, spatial, and social contexts, as these contexts provide individuals with opportunities and set boundaries for their actions. Context can be an asset and a liability for the nature and extent of entrepreneurship, but entrepreneurship can also impact contexts" (Welter 2011, p. 165). As the author suggests, the relationship

between entrepreneurship and its context is a two-way (circular) one: entrepreneurial action can affect context. We discussed before the circular economy as a creative endeavor for the growth of entrepreneurship, the rise of new initiatives embracing these principles and of innovative business models that exploit the opportunities envisaged. These initiatives need to find a supportive institutional environment, starting from institutions and regulations. For example, a favorable and supportive set of rules can reduce barriers to entry and costs for the start of circular ventures, as well as barriers to adoption of circular innovations for customers.

As mentioned above, there is mutual relationship and co-evolution between circular principles and ventures and the outer context in which they operate (Liu and Yan 2018). So institutions can evolve according to the action of circular enterprises, as we'll discuss further later on.

Circular firms—as we repeatedly argued in the previous pages—benefit from an enabling context. This context is shaped by market characteristics, like market readiness, by the presence of adequate technologies supporting the model of business (for example, a sharing platform requires high internet penetration and reliable connection), an R&D effort in research centers in the direction of innovations for the circular economy and the working of appropriate technology transfer systems. The radical innovations required by the circular economy need much basic research, which rests primarily on public funding. For example, the Ecowama project has been funded by the UE from 2012 to 2016 for approx. 5 million euro, under the 7th Frame Programme. Coordinated by the Fraunhofer IGB, the ECOWAMA project ("ECO-efficient management of WAter in the MAnufacturing industry") seeks to develop an efficient and cost-effective method for electrochemical treatment of the effluents of the project partners from France, Spain, the Netherlands and Germany. The goal is to recover valuable materials and reuse them in the production process. In times of rising prices on the global market, metals are particularly valuable. At the same time the hydrogen arising from the electrolytic treatment of water is to be recovered as electrical energy to improve energy efficiency.

We can thus claim that the growth of the circular economy and of circular entrepreneurship also rests on an "entrepreneurial state" (Mazzucato 2015a). The author shows that the private sector only finds

the courage to invest after an entrepreneurial state has made high-risk investments. She also writes about a "green entrepreneurial state" (Mazzucato 2015b). The already-mentioned case of the Hager Group's participation in the Designetz Project of the German government provides an illustration of this.

A key element in an enabling context for circular entrepreneurship is thus represented by the existence of policies, R&D programs and rules which support it.

Regulations can impose limits to non-sustainable production and consumption of goods and services, and policies can encourage the transition towards sustainability and the adoption of circularity principles, setting an agenda and a path for transition towards sustainable goals. From the latter point of view, the United Nations provide a shared system of goals to address the different facets of a sustainable world (see box). It is key that all countries harmonize their policies and efforts towards sustainability, to avoid environmental and social dumping. Each of the 17 goals is then articulated in types of action required, targets and indicators.

The United Nations, Agenda 2030 with Sustainable Development Goals

"The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries—developed and developing—in a global partnership. They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth—all while tackling climate change and working to preserve our oceans and forests.

… Today, the Division for Sustainable Development Goals (DSDG) in the United Nations Department of Economic and Social Affairs (UNDESA) provides substantive support and capacity-building for the SDGs and their related thematic issues, including water, energy, climate, oceans, urbanization, transport, science and technology, the Global Sustainable Development Report (GSDR), partnerships and Small Island Developing States. DSDG plays a key role in the evaluation of UN systemwide implementation of the 2030 Agenda and on advocacy and outreach activities relating to the SDGs. In order to make the 2030 Agenda a reality, broad ownership of the SDGs must translate into a strong commitment by all stakeholders to implement the global goals. DSDG aims to help facilitate this engagement" (United Nations website).

The 17 goals refer to different issues in the sustainability agenda, from poverty reduction, to gender equality, education, well-being and so on. At least seven of the 17 goals refer specifically to environmental sustainability, as it is possible to read from the list below.

Sustainable Development Goals

1. End poverty in all its forms everywhere
2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture
3. Ensure healthy lives and promote well-being for all at all ages
4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
5. Achieve gender equality and empower all women and girls
6. Ensure availability and sustainable management of water and sanitation for all
7. Ensure access to affordable, reliable, sustainable and modern energy for all
8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
10. Reduce inequality within and among countries
11. Make cities and human settlements inclusive, safe, resilient and sustainable
12. Ensure sustainable consumption and production patterns
13. Take urgent action to combat climate change and its impacts
14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development
15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
17. Strengthen the means of implementation and revitalize the global partnership for sustainable development

Source: United Nations website, https://www.un.org/sustainabledevelopment/development-agenda/

The European Union is promoting a pervasive effort to support the circular economy in European countries: "The European Commission adopted an ambitious Circular Economy Package, which includes mea-

sures that will help stimulate Europe's transition towards a circular economy, boost global competitiveness, foster sustainable economic growth and generate new jobs. The Circular Economy Package consists of an EU Action Plan for the Circular Economy that establishes a concrete and ambitious program of action, with measures covering the whole cycle: from production and consumption to waste management and the market for secondary raw materials and a revised legislative proposal on waste. The proposed actions will contribute to 'closing the loop' of product lifecycles through greater recycling and re-use, and bring benefits for both the environment and the economy" (European Commission 2019). Some member states of the EU have been particularly active in embracing the principles of the circular economy, and promoting advanced policy approaches, for example the Netherlands (see box on the Dutch Government program). We thus have policies operating at the global level (the UN Agenda 2030), at the regional level (for example, the European Union), and at the national level. In a number of cases it is also possible to identify policies at a subnational scale (provinces, cities). These policies have different degrees of coerciveness: the UN shares recommendations and objectives among different countries, but it is then a country's task to implement the guidelines in its territory.

The Dutch Government Program

The Dutch Government-wide program for a circular economy is aimed at developing a circular economy in the Netherlands by 2050. The entire system needs to be reformed in depth. "The current regulations still insufficiently target the transition. This is because the focus is still too much aimed at countering the damaging effects of waste and emissions, and too little at utilising the value of the raw materials." The very comprehensive program acknowledges that regulations are not the only answer: "The Cabinet has designated five interventions in which the government, in its role or authority, influences the transition: • Fostering legislation and regulations; • Intelligent market incentives; • Financing; • Knowledge and innovation; • International cooperation." "In addition to a generic approach, the transition to a circular economy calls for a change of strategy specifically geared to each sector or raw materials value chain, that is, to each priority. The programme is focused on five priorities that are important for the Dutch economy, that have a large impact on the environment, in which there is already considerable social energy for the transition to a circular economy,

and that fit in with the priorities of the European Commission. The five priorities are: • Biomass and food; • Plastics; • Manufacturing industry; • Construction sector; • Consumer goods."

Source: Circular Economy, the Ministry of Infrastructure and the Environment and the Ministry of Economic Affairs, also on behalf of the Ministry of Foreign Affairs and the Ministry of the Interior and Kingdom Relations, the Netherlands, 2016

At the moment national policy institutions have adopted highly different approaches to the matter. The geography of circular initiatives is highly influenced by differentiated institutional contexts and policy actions. Regulations which effectively discourage non-sustainable habits and activities and—on the other hand—support the sustainable ones, is one of the piece of the puzzle of circular economy growth and of the rise of born circular firms.

The Chinese Government and the Circular Economy

The Chinese government has pioneered policies for the transition to the circular economy. According to Ghisellini et al. (2016, p. 11), "In China CE (circular economy) is promoted as a top-down national political objective while in other areas and countries such as the European Union, Japan and USA it is a tool to design bottom-up environmental and waste management policies. The ultimate goal of promoting CE is the decoupling of environmental pressure from economic growth. The implementation of CE worldwide still seems to be in the early stages, mainly focused on recycling rather than reuse. Important results have been achieved in some activity sectors (e.g. in waste management, where large waste-recycling rates are achieved in selected developed countries). CE implies the adoption of cleaner production patterns at company level, an increase of producers and consumers' responsibility and awareness, the use of renewable technologies and materials (wherever possible) as well as the adoption of suitable, clear and stable policies and tools. The lesson learned from successful experiences is that the transition towards CE comes from the involvement of all actors of the society and their capacity to link and create suitable collaboration and exchange patterns. Success stories also point out the need for an economic return on investment, in order to provide suitable motivation to companies and investors. In summary, the CE transition has just started. Moreover, the interdisciplinary framework underpinning CE offers good prospects for gradual improvement of the present production and consumption models, no longer adequate because of their environmental load and social inequity, a clear indicator of resource use inefficiency."

A recent review of Chinese policy measures in this field discusses how "A comprehensive review of 280 related policies shows that China has a long history of resource-oriented policies and implemented production-oriented policies very soon after the year 2000. China's policies toward the circular economy became more comprehensive through time, with a broad engagement of government agencies, an extensive and progressive coverage of recycling opportunities, production initiatives across multiple scales, and use of different policy instruments" (Zhu et al. 2018).

As mentioned above the institutional context is:

- A multifaceted construct, made up of culture, norms, and policies and regulations affecting the rise and growth of circular ventures;
- At the same time, context and institutions co-evolve with the key economic actors, like circular enterprises, which can contribute to forging them (institutional entrepreneurship).

For example, Thompson et al. (2015) discuss a case of institutional entrepreneurship in torrefied biomass in the Netherlands. They write, "Sustainable entrepreneurship often requires a purposeful change to the existing business environment, market regulations, and societal norms and values (institutions) to ensure sustainable products and services become legitimate and competitive. Yet, how sustainable entrepreneurs alter or create institutions remains unclear. We employ a two-year comparative case study with four entrepreneurs commercializing torrefied biomass in the Netherlands. Consistent with insights from institutional entrepreneurship research, findings show that sustainable entrepreneurs create new symbols, theorize, construct new measures, build consensus, and forge new relations to alter or create new institutions. Moreover, we find that entrepreneurial collaboration, in the form of a trade association, has three feedback effects: it creates accessible modes; diversity of scope; and an increased scale of institutional change strategies" (Thompson et al. 2015, p. 608). This case confirms that circular entrepreneurship not only involves introducing new value propositions and business models, or new technologies—it can also find expression as institutional entrepreneurship.

According to Pacheco et al. (2010, p. 470), "While entrepreneurial activity has been an important force for social and ecological sustainability, its efficacy is dependent upon the nature of market incentives. This limitation is sometimes explained by the metaphor of the prisoner's dilemma, which we term the green prison. In this prison, entrepreneurs are compelled to environmentally degrading behavior due to the divergence between individual rewards and collective goals for sustainable development. Entrepreneurs, however, can escape from the green prison by altering or creating the institutions—norms, property rights, and legislation—that establish the incentives of competitive games."

In Short

The external context and institutions co-evolve with circular enterprises, which can contribute to forging the former, through institutional entrepreneurship.

6.3 Circular Entrepreneurship and Its Concept, Context and Processes: An Integrative Model

Figure 6.1 provides an integrative representation of the different issues discussed in this chapter and in the book. It illustrates the various factors affecting the rise and growth of circular enterprises, moving from the individual level (entrepreneurs, transformational leaders), to the organizational level (resources, capabilities), to the inter-organizational level (collaborations, networks and ecosystems) to the external context. On the right side of the figure we outline the entrepreneurial processes: they consist of opportunities exploration and exploitation in the circular economy domain.

Entrepreneurship involves innovation at different levels, from technological innovations to value proposition, governance, finance and institutions. This seems particularly true for circular entrepreneurship, which has to face huge challenges. Circular entrepreneurship is not just about

surviving market challenges and reaching market success, it is about addressing the big environmental challenges of the planet at the same time.

Before discussing the nature of entrepreneurial processes in circular enterprises we need to take a step back and discuss what entrepreneurship means.

We follow Shane and Venkataraman's (2000, p. 218) conceptualization: "we define the field of entrepreneurship as the scholarly examination of how, by whom, and with what effects opportunities to create future goods and services are discovered, evaluated, and exploited." This definition has a number of merits: first it involves the key entrepreneurial processes (exploration and exploitation of opportunities), second, it encompasses different typologies of organizations, including existing firms, and not only new ventures, coherently with the contents of this book. "[E]ntrepreneurship can also occur within an existing organization" (Shane and Venkataraman 2000, p. 219). However, we partially depart from Shane and Venkataraman, in the idea that opportunities are not necessarily objectively existing and ready to be discovered by entrepreneurs. In our opinion they may instead be created by entrepreneurs themselves.

This book is framed into a specific form of entrepreneurship, that is environmental entrepreneurship. According to Dean and McMullen (2007, p. 50), "Environmental economics concludes that environmental degradation results from the failure of markets, whereas the entrepreneurship literature argues that opportunities are inherent in market failure. A synthesis of these literatures suggests that environmentally relevant market failures represent opportunities for achieving profitability while simultaneously reducing environmentally degrading economic behaviors." The Authors also write (Dean and McMullen 2007, p. 52), "Synthesizing theory from the entrepreneurship, environmental and welfare economics literatures, we develop a conception of environmental entrepreneurship as a subset of the broader concept of sustainable entrepreneurship and outline the means by which entrepreneurial action can resolve environmental challenges by overcoming barriers to the efficient functioning of markets for environmental resources. We argue that the growing desire of many individuals in the marketplace for the cessation of environmentally degrading activities, combined with a willingness to

pay for the reduction of these activities, represents opportunity for entrepreneurial action that can lead to the enhancement of ecological sustainability."

Building on Shane and Venkataraman's (2000, p. 58) definition of entrepreneurship Dean and McMullen provide the following definitions:

Definition 1A. Environmental entrepreneurship is defined to be: the process of discovering, evaluating and exploiting economic opportunities that are present in environmentally relevant market failures.

Definition 1B. Sustainable entrepreneurship is defined to be: the process of discovering, evaluating and exploiting economic opportunities that are present in market failures which detract from sustainability, including those that are environmentally relevant.

According to York et al. (2016) environmental entrepreneurship can be defined as "the use of both commercial and ecological logics to address environmental degradation through the creation of financially profitable organizations, products, services, and markets." York et al.'s definition seems closer to the processes of exploitation of opportunities, while Dean and McMullen comprehend the entire entrepreneurial process, from exploration to exploitation.

Sometimes it is also possible to find labels like green entrepreneurship and ecopreneurship: this variety reflects an increasing attention to the subject. We use the term environmental entrepreneurship and refer to circular entrepreneurship as a specific category in this field, as discussed in Chap. 1. At the same time, through our case studies we understood that the application of circular economy principles leads organizations to embrace a vision of creating value by closing loops for different resources, not only physical flows of materials, but also including human resources and intangible ones.

We believe that the circular economy belongs to the sustainability agenda, with the specific aim to find solutions to the different environmental challenges for the planet by closing, narrowing and slowing the loops of resources. Zucchella and Previtali (2019) discuss how "Different conceptualisations have accompanied the growth of the circular economy concept and have provided tools and approaches from different perspec-

tives: the circular economy has thus evolved progressively into 'a social construct which grew out of the sediment layered by many different concepts'" (Ciraig 2015). This recent and tumultuous evolution has made the distinction between circularity and sustainability increasingly unclear: "While the terms Circular Economy and sustainability are increasingly gaining traction with academia, industry, and policymakers, the similarities and differences between both concepts remain ambiguous" (Geissdoerfer et al. 2017, p. 756). As a result of their literature analysis, the authors point out similarities and differences and provide a definition of circular economy "as a regenerative system in which resource input and waste, emission, and energy leakage are minimised by slowing, closing, and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling" (Geissdoerfer et al. 2017, p. 777).

In this vein, we conceptualize circular entrepreneurship as the processes of formation and exploitation of opportunities, using both commercial and ecological logics to address environmental challenges with the aim of closing, slowing and narrowing the loop of resources and regenerating/reconstituting natural capital. However, in our conception the circularity principles apply not only to tangible flows of resources and materials but also to human capital and intangibles.

The definition proposed encompasses different expressions of entrepreneurship, including social and institutional entrepreneurship. It also encompasses different organizations, from new ventures to established firms aiming at a circular transformation. It considers the role of individuals and the role of the organizations they set up or transform. Finally, it encompasses the different entrepreneurial processes, from exploration to exploitation of opportunities in the circular economy domain.

In Short

Circular entrepreneurship consists in the processes of formation and exploitation of opportunities, using both commercial and ecological logics to address environmental challenges with the aim of closing, narrowing and slowing the loop of resources and of regenerating/reconstituting natural capital. Circularity principles apply also to human resources and intangible resources.

6.3.1 The Exploration of Opportunities in Circular Entrepreneurship

The formation of opportunities is key to the start of an entrepreneurial venture or to the renovation of an existing one. The circular economy represents a realm in which opportunities can be formed by entrepreneurs. As such, the circular economy represents a "creative endeavor" (Zucchella and Magnani 2016) in which environmental challenges can find innovative answers. In our opinion opportunities are these answers, arising from entrepreneurial creativity.

Entrepreneurs can identify explicit or latent needs and problems, which objectively exist, but the opportunity explored and embedded in the value proposition is the result of interpretation and creative construction. Discussing this issue, Shane (2012) invites scholars to distinguish (objectively existing) opportunities from (subjectively created) business ideas.

According to Davidsson (2015, p. 674), it is necessary to re-conceptualize opportunity in view of decomposing different elements: "in order to facilitate future theorizing and empirical testing we suggest three carefully defined and elaborated constructs be used. The first is External Enablers for the aggregate-level circumstances—such as regulatory changes, technological breakthroughs, and demographic shifts—which may affect a variety of new venture creation attempts by several, different actors. External Enablers are assumed to create room for new economic activities but cannot ensure success for particular ventures that are initiated in response to their occurrence. Neither need they be positive overall for the economy. The second construct is New Venture Ideas. This denotes 'imagined future ventures'; that is, imaginary combinations of product/service offerings, markets, and means of bringing these offerings into existence. These can be of any quality and may be evaluated differently by different individuals. New Venture Idea is our main alternative to accompany the actor under the nexus view. Third, we suggest that Opportunity Confidence has the important, supplementary role of eliminating perceived favorability from the other two constructs. Hence, Opportunity Confidence refers strictly to a particular actor's subjective evaluation of the attractiveness—or lack thereof—of a stimulus (External Enabler or New Venture Idea) as the basis for entrepreneurial activity."

We do not discuss further these key issues in the entrepreneurship field: we aim at providing some conceptual foundations to our book, and to briefly summarize the debate going on around them. We intend to maintain the term opportunity and to understand its formation as the outcome of creative entrepreneurial processes.

In Chap. 4 we adopted the term value proposition to label the innovative combination of benefits the circular enterprise addresses to its customers, based on market insights. Designing a value proposition links individuals and the opportunities they create to subsequent exploitation through an entrepreneurial organization and a business model (see the next section and Fig. 6.1).

The case of Acqua&Sole illustrates how—in a context in which the environmental impact of fertilizers in agriculture is high and there is a growing need for innovative and sustainable solutions—the company combines the issues of food waste in supermarkets, organic waste in municipalities and local communities' worries about the quality of their environment with the farmers' need for effective and efficient fertilizers. These elements, all part of the general creative endeavor of the circular economy, matched an experienced entrepreneur who had both knowledge about waste recycling technologies and transformational leadership. The opportunity took shape through entrepreneurial creation and was embedded in the value propositions design. The latter were addressed to multiple "customers": the farmers who received for free an effective and zero-impact fertilizer, the supermarkets and waste management utilities who were offered a cheaper solution to manage waste, thanks to an innovative technology, and the local communities, who benefited from a regenerated natural capital and the provision of energy from renewable sources.

6.3.2 The Exploitation of Opportunities

The following step in entrepreneurial processes is represented by the exploitation of the opportunity. It is here that usually individuals (entrepreneurs) need to set up an organization (the entrepreneurial venture) or renew the existing one.

Exploitation rests on pooling the necessary resources and capabilities and developing a system of partnerships/an ecosystem and an effective business model. In the exploitation phase, innovation can take different forms: from technologies to services and products, from business models to governance characteristics. We devoted particular attention to the latter issues in Chaps. 4 and 5, providing a number of examples.

The effort of pooling resources rests on how attractive the venture is for financial capital and talent as well as for partners. As we discussed before, circular entrepreneurship, and particularly its processes of opportunity exploitation, often implies collaborations with other organizations, including public and non-profit ones. Most CBMs involve developing an ecosystem of actors around the venture. Thus the entrepreneurs can access not only internal resources but also complementary ones from partners and actors of the ecosystem. In Chap. 4 we argue that sustainable companies can prove increasingly attractive for young talent, seeking responsible employers, and for capital, also seeking responsible borrowers and equity issuers.

The exploitation of opportunities in the circular economy can benefit from these more favorable conditions but at the same time still requires overcoming a number of barriers, particularly in raising funds. More generally, it is necessary to have a flexible entrepreneurial attitude towards resources, finding innovative solutions to resource paucity.

According to Stevenson and Jarillo (2007, p. 23), "An entrepreneurial organization is that which pursues opportunity, regardless of resources currently controlled." This proposition highlights the fact that being entrepreneurial means also pooling the needed resources and capabilities and exercising creativity and innovation.

The Rifò case is an interesting example of how a new venture can find innovative solutions to both raising funds and testing its value proposition at the same time, thanks to the use of a crowdfunding platform. Other business models may require a larger amount of financial resources. Some firms may be at an advantage from the funding point of view. Large established players may have their own resources to finance the transformation and the new circular projects. Moreover, larger firms can issue bonds or shares and leverage their status as a "sustainable company" to appeal to increasingly responsible investors. The latter have included

ESG (environmental, social and governance) criteria to their traditional profit-based logics in the selection of securities and the management of financial assets.

An example of changing investors' criteria and financial innovation for sustainable business is represented by the growth of green bonds (see box). Bonds, as mentioned above, are an instrument that typically suits larger companies as well as municipalities and multilateral institutions. One of our case companies, Engie, issued green bonds in 2017 (two issues) and 2018: "As a player in the development of the Green Bonds market, ENGIE has decided to launch a green bond hybrid issuance in January 2018 after that of September 2017 and March 2017. This new Green Bond reinforces the financing of our energy transition projects" (Engie website).

Green Bonds: Financial Innovation for Sustainability

"The green bond market has seen strong growth, with the market really starting to take off in 2014, when USD37bn was issued. In 2017 issuance reached USD162.5bn, setting yet another record.

The green bond market kicked off in 2007 with the AAA-rated issuance from multilateral institutions European Investment Bank (EIB) and World Bank. The wider bond market started to react after the first USD1bn green bond sold within an hour of issue by IFC in March 2013.The following November there was a turning point in the market when the first corporate green bond was issued by Vasakronan, a Swedish property company. Large corporate issuers include SNCF, Berlin Hyp, Apple, Engie, ICBC, and Credit Agricole.

The first green muni bond was issued by Massachusetts in June 2013. Gothenburg issued the first Green City bond in October 2013. US states are major green bond issuers, but issuers also include the Province of Ontario, City of Johannesburg, and Province of la Rioja (Argentina). Local government green bonds continue to grow. …

This momentum has continued, with over USD419bn in green bonds currently outstanding. There are projections for issuance to reach USD200–225bn in 2018.

Green bonds were created to fund projects that have positive environmental and/or climate benefits. The majority of the green bonds issued are green 'use of proceeds' or asset-linked bonds. Proceeds from these bonds are *earmarked* for green projects but are backed by the issuer's entire balance sheet. There have also been green 'use of proceeds' revenue bonds, green project bonds and green securitised bonds.

The key difference between conventional and green bonds is the specified use of proceeds. Investors are increasingly focused on integrating Environment, Social and Governance (ESG) factors into their investment processes. Green bonds meet these Environmental objects. Investors in green bonds benefit from: Funding green projects without taking any additional risk or cost, Greater transparency into a bond's use of proceeds, Meeting commitments as signatories of PRI and IIGCC, Reporting on climate impact of fixed income investments to their end asset owner.

The huge demand for these bonds is coming from a range of investors. Some examples include: Mainstream Institutional investors, Specialist ESG (Environmental, Social, Governance) and Responsible Investors, Corporate Treasury, Sovereign and municipal governments, retail investors."

Source: Initiative Climate Bonds, https://www.climatebonds.net/market/explaining-green-bonds

Some firms can find the access to financial resources particularly challenging: in Chap. 4 we reported the cases of born circular firms, but the same holds for small companies with limited resources. To address these situations of resources paucity, Intesa Sanpaolo, Italy's major Italian bank and sole Financial Services Global Partner of the Ellen MacArthur Foundation, set up the Intesa Sanpaolo Innovation Center, a new company born to explore and foster new business models, assets and the skills necessary to underpin the long-term competitiveness of the bank and its clients. The vision of Intesa Sanpaolo Innovation Center is centered on the idea of "innovation as a force for good" and driven by the circular economy paradigm.

To provide pragmatic support to the most innovative circular economy businesses, the bank has allocated a 5 billion euro credit facility and launched the first Italian Circular Economy Lab (see box).

The Intesa San Paolo example confirms that promoting circular economy growth requires the development of ecosystems, in which financial institutions have a key role. Shifting substantial financial resources from non-sustainable to sustainable and circular businesses is the actual challenge for both financial and non-financial companies. At the same time, these resources have to flow to circular ventures together with some kind of support and counseling, in order to make them grow in the long run.

Finance and Ecosystems for Circular Opportunities Exploitation: Intesa Sanpaolo Innovation Center

Intesa Sanpaolo's journey towards circular economy started in 2014 and the first key milestone was reached in December 2015, when the bank, the first player at an international level in this field, became Financial Services Global Partner of the Ellen MacArthur Foundation. Circular economy has been then included in the 2018–2021 Intesa Sanpaolo Group Business Plan as one of the key pillars to generate a significant positive impact on the Italian ecosystem, through different initiatives.

Intesa Sanpaolo supports the Ellen MacArthur Foundation's systemic initiatives: the bank is Lead Partner for Cities and the Circular Economy for Food, as disclosed during the 2018 edition of Seeds and Chips (the leading food innovation summit in the world), and collaborates also on the Make Fashion Circular and New Plastic Economy projects.

In September 2018, Intesa Sanpaolo and Fondazione Cariplo, one of the most relevant European grant-making foundations, launched the first Italian Circular Economy Lab, an Intesa Sanpaolo Innovation Center and Cariplo Factory (Fondazione Cariplo's pole of open innovation) joint initiative. Located in Milan, the lab's activities are focused on open innovation, helping to develop business opportunities as well as the scouting and promotion of young talent.

The three pillars underlying the CE Lab are:

- Positioning the lab as the systemic major player in the circular economy, spreading and supporting the principles of this new economic model;
- Facilitating the generation of new business opportunities;
- Creating value and growth by open innovation initiatives between start-ups, SMEs and large corporates, and with universities and institutions.

During the opening of the CE Lab, Intesa Sanpaolo also announced the launch of a €5 billion *redit plafond* with the commitment to offer its clients debt financing at the best market conditions to support transformative and innovative initiatives inspired by CE principles.

Intesa Sanpaolo Innovation Center, as a competence center for circular economy, assesses the eligibility of the financing requests to the plafond based on the adherence to specific criteria developed together with the Ellen MacArthur Foundation. Speaking at the launch event, Ellen MacArthur commented, "Supporting new and evolving businesses to adopt circular economy models is key to accelerating the transition to a regenerative and restorative economy. Intesa Sanpaolo's commitment to developing a circular economy ecosystem in Italy, through setting up the CE Lab and investing in organisations that are implementing circular approaches, is an important contribution towards creating an economy that can work in the long term."

Source: Intesa San Paolo and the Ellen MacArthur Foundation website, https://www.ellenmacarthurfoundation.org/our-story/partners/global/intesa-san-paolo

The recent case of Ofo, the Chinese bike-sharing platform, shows how the growth of a firm can be easily turned into a non-sustainable one from the economic and financial points of view. Ofo, started by students at Peking University in 2014, raised seven rounds of funding in the space of 18 months, receiving $2.2bn in total. The company found a number of problems, from vandalism—as mentioned before—to theft and competition. But also, as *The Economist* wrote, "Hubris and overreach were evident, especially at Ofo" (January 24, 2019). This story seems to go against the common idea that financial resources are always particularly scarce for new ventures and highlights two main considerations:

- A circular venture needs inventiveness and competences to find resources but also to manage them properly when they have been found. Thus, finance needs to be complemented with expert advice aimed at (financially) sustainable growth.
- Some business models find resources more easily than others. For example we can observe that sharing platforms and pay-per-performance business models experienced better access to finance when compared to other business models. The reason may depend on a simpler and more easily "marketable" value proposition, on the cost–revenues structure and on the scalability of these platforms. At the same time, they raise some issues. These concepts are also easy to imitate from potential competitors, they may find hostile regulatory environments and so on. The many bike-sharing platforms competing in China seem to suggest that opportunities exploration is not necessarily a creative process, but may also depend on the imitation of existing models. We still believe that the exploration is a creative process, which may be inspired by observation but cannot consist in the mere replication of existing formulas. It requires some adaptation, change and innovation to become distinctive and successful.

Among the innovations that the exploitation of a circular economy opportunity may involve, in Chap. 4 we also commented on the role of corporate governance mechanisms. Benn and Dunphy (2013) discuss the various facets of this key issue. Kock et al. (2012) discuss empirical evidence that several important corporate governance mechanisms, such as

the board of directors, managerial incentives, the market for corporate control, and the legal and regulatory system, determine firms' environmental performance levels. These results suggest that these different governance mechanisms resolve, to some extent, the existing divergence of interests between stakeholders and managers with respect to environmental activities. Amore and Bennedsen (2016) highlighted the relationship between green innovation and governance through an empirical study. This issue links back to the institutional framework discussed before, and also to the capacity of companies to influence it.

In Short

An innovative business model is at the heart of the exploitation of a circular economy opportunity, but its success depends on its sustainability from a financial point of view and from an accompanying set of innovations, from financial to technological, organizational to governmental.

6.3.3 An Integrative Model for Circular Entrepreneurship

The previous sections discuss the different components—and their interrelationships—of an integrative model for circular entrepreneurship (see Fig. 6.1). Its cornerstones are as follows:

- The attention to both enterprising individuals and transformative leaders, to organizations, inter-organizational collaborations and ecosystems, and finally to the broader context enabling and constraining circular entrepreneurship, according to a multilevel approach to understand complex phenomena like entrepreneurship (Shepherd 2011);
- A contextualized view of entrepreneurship, which accounts for the relevant role of the external context and its institutions, following a recently growing field in entrepreneurship research (Welter 2011; Bruton et al. 2010) and a co-evolutionary perspective of firms and institutions (Ahlstrom and Bruton 2010);

- A process view of entrepreneurship, as involving exploration and exploitation of opportunities (entrepreneurial processes). Bygrave defined entrepreneurial process as involving "all the functions, activities, and actions associated with perceiving opportunities and creating organizations to pursue them" (Bygrave 2004, p. 7). The debate on the nature and characteristics of these processes is lively (Moroz and Hindle 2012) and we adhere to the idea that these processes involve the creation of novel opportunities, in a creative endeavor represented by the circular economy. These opportunities require exploitation through pooling the needed resources, capabilities and partnerships and developing a financially sustainable CBM. The exploitation of opportunities can require innovations in different aspects, including financial solutions, technologies and governance mechanisms;
- Entrepreneurial processes link the exploration and exploitation of opportunities with the elements discussed in Chap. 3, that is the design of the value proposition, the development of the business model and implementation of the different innovations required. The design of the value proposition links the exploration of opportunities in the circular economy to their subsequent exploitation. Business modeling and implementing the related necessary innovations refer to the exploitation of the opportunity;

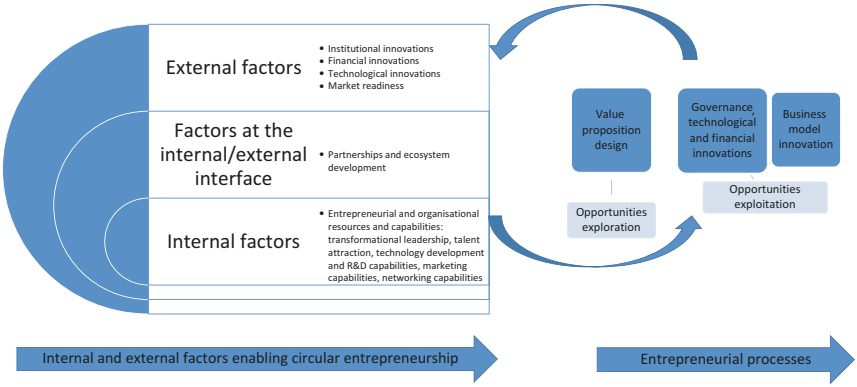

Fig. 6.1 An integrative framework for circular entrepreneurship. *Source*: the author

- Entrepreneurial processes are not merely deterministic: during the exploitation there are feedback effects to exploring novel opportunities or to refining the original one. Also the innovations introduced in the business model and, in other aspects, the outcomes of exploitation in terms of success or failure, can influence the external context.

6.4 Conclusions

The growth of the circular economy depends upon the widespread adoption of an entrepreneurial posture and entrepreneurial behavior by all the actors and stakeholders involved: for profit, non-profit and hybrid organizations, citizens, public institutions and multilateral organizations, and financial intermediaries.

The circular economy requires new ways of thinking and of acting, new value propositions and business models, and novel ecosystems. The degree of novelty is often very high, leading to disruptive innovations at the level of products/services, processes and technologies, legal entities and business models, and institutions. Thus, the circular economy context is a realm to be approached from the entrepreneurship perspective.

The planet and its natural capital are increasingly exploited at an unsustainable rhythm. A future for the next generations has become a guess and the "no future" (quoting a no longer existing work attributed to Banksy) option is gaining momentum.

Earth Overshoot Day "marks the date when we (all of humanity) have used more from nature than our planet can renew in the entire year. In 2018, it fell on August 1. We are using 1.7 Earths. We use more ecological resources and services than nature can regenerate through overfishing, overharvesting forests, and emitting more carbon dioxide into the atmosphere than ecosystems can absorb" (*source*: https://www.overshootday.org/).

Delivering the promise of a possible future for the planet requires a collective capacity to face huge challenges and embrace innovation in all the fields and among all the actors we have discussed. These challenges are environmental, economic and social at the same time. For example, the exploitation of natural resources and climate change have huge social

and economic consequences. They are driving migrations from one country to another, from continent to continent: it has already occurred in human history but now, with a population of billions, its impact is much higher. The drought and the low level of rivers in summer 2018 in Germany had relevant consequences on transportation systems and the overall economic growth of the country. No region is safe from these phenomena. Microplastics have been found in the human body, due to their presence in water and food chains. Waste can be found both in the oceans and in the highest mountains. These are just a few examples, as reported by newspapers and journals, about the current environmental crisis with its social and economic consequences.

The circular economy and circular entrepreneurship represent a credible answer to these problems. Terms like environmental, green and eco-entrepreneurship are already discussed in the literature and in the practice of management. Is entrepreneurship in the circular economy something else? Is it a new kid in town or old wine into new bottles? As discussed in the previous sections, circular entrepreneurship belongs to the field of sustainable entrepreneurship, providing concrete answers to the need to close, narrow and slow the loops of resources with business models capable of addressing these issues. A review of 565 articles reveals how much the circular economy field is thriving and also uncovers the need to understand better this evolving concept, its boundaries and practices (Merli et al. 2018). This book addresses this gap in knowledge. We also advance the idea that the principles of the circular economy apply not only to materials flows and to industrial systems, but can refer to services, intangibles and human resources.

We find it very intriguing that two recent literature reviews on the subject (Geissdoerfer et al. 2017; Merli et al. 2018) highlight that the circular economy concept is mainly a European and Chinese one. In our opinion, this may find its possible roots in a harmonic view of nature, society and the economy, that has been neglected in the last decades of impetuous industrial development, but still represents a cultural anchorage for both the European and Asian cultures. A Chinese expression is *tian-ren-he-yi*, which means "nature and humankind combined as one" or "nature–human harmony," which can inform also business behavior and strategy (Peng et al. 2016). According the Ellen MacArthur

Foundation, "The notion of circularity has deep historical and philosophical origins. The idea of feedback, of cycles in real-world systems, is ancient and has echoes in various schools of philosophy" (Ellen MacArthur Foundation website).

The examples we have offered about the current state of the planet's natural capital demonstrate the dimension of the actual problems and the need for radical innovation (Zucchella and Urban 2014). It is here that entrepreneurship can help, providing an actionable perspective to address major challenges. Through the entrepreneurship lenses, we particularly address the case of firms, as key players for both economic and environmental value creation.

What, then, is circular entrepreneurship as it emerges from our case studies? Circular entrepreneurship is an evolving field and a clear-cut definition is hard to find. From our empirical evidence it emerges as an entrepreneurship that commits to the creation of environmental value, through the exploration and exploitation of opportunities in the circular economy, and it is thus aimed at closing, narrowing and slowing the loops of resources and improving the natural capital of the planet. As mentioned, our book highlights that these principles can be applied to a wider concept of resources, not only to materials and industrial goods, but also to services, intangibles and human resources. The creation of environmental value interweaves with the creation of economic and social value. It focuses on the creation of environmental value, which also leads to creating—directly or indirectly—social value. At the same time, the creation of economic value is a necessary condition for the survival and growth of circular ventures. Moreover, the objective of economic value creation assumes different degrees of "intensity," depending on the nature of the entity (a "for profit" firm, benefit company, social venture, non-profit organization etc.). Our book, though, mainly focused on business firms, pursuing a framework that can apply to any other type of organization. The typology of firm we have found as representative of circular entrepreneurship is usually a pro-profit organization, meaning that profit (in the long run) is a necessary but not a sufficient condition for its existence, since they embrace multiple objectives, like the triple bottom line literature suggests (people, planet and profit; Elkington 2013).

What are the actors and the building blocks of circular entrepreneurship? This book explores the field with an inductive approach, uncovering cases of firms and institutions which provide examples of circular entrepreneurship. In our research two main typologies of circular entrepreneurship emerge:

- the "born circular" firms, that is, young ventures, which have been created to deliver circular value propositions and exploit circular economy opportunities;
- the "growing circular" firms, established organizations which pursue a transformation towards the circular economy in their business.

While the former represent examples of the classic entrepreneurship concept (the start of new ventures; Gartner 1990), the latter are cases of corporate entrepreneurship, a term used to describe entrepreneurial behavior inside established mid-sized and large organizations (Stopford and Baden-Fuller 1994; Kuratko and Morris 2018).

This last chapter provides an integrative framework for circular entrepreneurship, building on the literature and on our cases' evidence. The framework considers circular entrepreneurship as a context-specific set of processes, from the exploration of opportunities to their exploitation, through activities of value proposition design, business model development, partnering with other organizations and ecosystems' development. Different innovations tend to accompany these processes: innovations in products and processes; business models; technological, financial, governance and organizational innovations. The relationship between circular enterprises and their context is co-evolutionary. These firms need an enabling context and institutions, and the latter are also forged by circular entrepreneurship.

The framework also acknowledges different levels of analysis: from the context and the institutions to the ecosystems and networks, to circular enterprises, to enterprising individuals, transformative leaders and talents seeking an ethical workplace.

Human beings have put the planet's survival at risk, and they are now called to find the solution.

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Index

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