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Open Innovation for sustainable transition: The case of Enel "Open Power"

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Abstract

Only in the last years, Sustainable Open Innovation has become a unique issue from the convergence between the concept of Open Innovation and sustainability as well as a challenge for the future business models of companies. Given that the aim to build a more sustainable world is one of the most relevant targets to reach over the world, the present work has focused on how Open Innovation is a catalyst for sustainability, by proposing a model for the case study in an underdeveloped sector, such as the energy one. Specifically, through the analysis of the ENEL case study, the relationship between Open Innovation (OI) and a strategic approach to CSR has emerged. The strategic approach to CSR, guided by open leadership aimed at involving stakeholders and creating shared value, creates an organizational culture and an environment favorable to the development of Open Innovation strategies; furthermore, the Open Innovation processes support the integration of the social, environmental, and economic objectives of companies. The findings show how Open Innovation can address sustainability practices and objectives. Through the application of the framework called SKiN, which provides a qualitative and replicable tool, the study allows to evaluate the *organizational permeability* as a critical success factor for both sustainability strategies and innovation.

KEYWORDS

Open Innovation, sustainability, sustainable development, sustainable open innovation, utilities

1 | INTRODUCTION

According to the Agenda 2030, building a more sustainable world is one of the most relevant targets to reach in the next years (UN General Assembly, 2015). In this sense, achieving sustainable development goals is required not only at a public level by the countries adherent to the United Nations but also at an individual level as well as at a company level. That is, companies are called to give an important contribution to this achievement.

In such background, the adoption of sustainable strategies as well as the adoption of a strategic approach to Corporate Social Responsibility, such as considering CSR practices as a strategy to achieve competitive advantage and a crucial factor in the creation of value in the long and medium term (Crane et al., 2014; Porter & Kramer, 2006; Porter & Kramer, 2011), are surely encouraged by regulations and mandatory provisions, above all for large companies. In this sense, the European Institutions, through the Non-Financial Reporting Directive (NFRD) (Directive 2014/95/EU) and the very recent Corporate

Sustainability Directive (CSRD), together with the Sustainable Finance Disclosure Regulation (SFDR) and the Taxonomy Regulation, are creating a robust legal framework to this end.

However, previous studies (Venturelli et al., 2022) confirmed that the role of Open Innovation to facilitate and accelerate the process toward sustainable strategies could be relevant (Bogers et al., 2020; Rupo et al., 2018). There are a few studies in this sense and the present work is contextualized in this stream of literature.

Concerning the issue of Open Innovation, since the seminal work of Chesbrough of 2003, which defined for the first time Open Innovation as "valuable ideas can come from inside or outside the company and can go to market from inside to outside the company as well" (Chesbrough, 2003, p. 43), the importance given by academics, practitioners and managers to the issue has grown over the world. Chesbrough has later given other and more complete definitions of Open Innovation (Chesbrough, 2006; Chesbrough et al., 2014), but the fundamental aspect enlightened is that the previous linear model of innovation (von Hippel, 1988) is no longer adapt to the actual world and changes. In this sense, the boundaries of a firm are more and more open, allowing external partners to develop innovation together with internal stakeholders.

Academics have developed the issue of Open Innovation in different disciplines, such as business, management and accounting, engineering, psychology, chemistry, medicine, and so on. Also, the studies about the adoption of Open Innovation in companies of different industries (Bianchi et al., 2011; Galati & Bigliardi, 2016), of different dimensions (del Vecchio et al., 2019; Dodgson et al., 2006) grow more and more. Furthermore, previous studies have carried out a systematic reorganization of previous research in order to identify the main thematic areas and the relative evolution over time as well as a line for future research on this topic (Bigliardi et al., 2021). The results show the scarcity of previous studies about the possible link between Open Innovation and sustainability.

Indeed, even if, on one hand, Open Innovation and sustainability have been studied as two independent issues, on the other hand, Sustainable Open Innovation has become a unique issue from the convergence between the concept of Open Innovation and sustainability as well as a challenge for the future business models of companies (Bogers et al., 2020). Exactly that work represents a starting point for the present paper. In fact, following those results, we consider the specific elements of Open Innovation that address sustainability, thus proposing a model of Open SOI.

In light of the above, this study intends to highlight, through the analysis of a case study, how Open Innovation (OI) and a strategic approach to CSR are mutually related. On the one hand, the strategic approach to CSR, guided by open leadership aimed at involving stakeholders and creating shared value, creates an organizational culture and an environment favorable to the development of Open Innovation strategies; on the other ones, the Open Innovation processes support the integration of the social, environmental, and economic objectives of companies. The exchange of knowledge with external stakeholders increases the possibilities of corporate social innovation, a circumstance that favors a widespread social impact (Roszkowska-Menkes, 2018).

The choice to focus our research on the case of Enel is because Enel is the largest utility in Italy, and the world leader in the power and gas market. Furthermore, it has received important global awards and is present in the most important ESG rating in the world, so it is considered a best practice and a virtuous company in the field of sustainability (enel.com/it/investitori/sostenibilita/rating-indici-esg).

This paper, thanks to the proposal of the model open SOI, shows how Open Innovation is a catalyst for sustainability. Furthermore, the representation of the strategic Open Innovation approach adopted by Enel helps to contribute to the literature about Sustainable Open Innovation as well as to policymakers in the identification of new strategies to encourage companies to adopt a SOI paradigm.

The remainder of the paper is the following: Section 2 provides the literature review; Section 3 presents the methodology used; Section 4 describes the case study; Section 5 presents the discussion of the case study and the framework elaborated; and finally, Section 6 provides the theoretical and practical implications of the paper.

2 | LITERATURE REVIEW

2.1 | Open Innovation

The continuous exposure of companies to environmental transformations and disturbances resulting from competitive contexts requires them to change the decision-making process and the way they approach both inside and outside the organization. There is therefore an urgent need to follow the trend toward the *open organization* (Whitehurst, 2015). It is an organizational model that considers the propensity for an openness to the outside, thanks to which companies of all sizes reach out to stronger relationships with other companies. This is made possible because outward opening can lead to greater agility, as the focus is on unitary and homogeneous goals with a shared vision. Moreover, the open organization can provide faster responses to innovation needs and increase the level of engagement of the organization members who draw new lymph from the comparison and sharing with external agents. The organization thus conceived turns out to be more fluid, and flexible, and enjoys greater transparency that allows a better form of communication outside as well as inside, thanks to the full involvement of all the stakeholders in defining the objectives and in their pursuit.

In the context outlined above, organizations face complex challenges in terms of changing business models and reconfiguring the value chain. New alternative paradigms emerge, different from the concept of innovation in its traditional sense, such as that of Open Innovation (Chesbrough, 2003, 2015, 2020; Chesbrough & Appleyard, 2007; Chesbrough et al., 2014; Elmquist et al., 2009). This concept was formalized by Chesbrough for the first time, but already before, companies have practiced forms of Open Innovation unconsciously and informally, within the supply chains of the

districts, thus anticipating the phenomenon then synthesized in literature.

Unlike traditional innovation, based on the vertical integration of the innovative process and on defense, Open Innovation is based on the idea that the company can create value through a strategic path to open up to the competitive environment (Teece, 2006). According to this approach, the innovative process does not have a defined origin in the context of business activities but is fed by flows and processes external to the organization.

The definition of Open Innovation makes clear the ambidextrous logic (Duncan, 1976; March, 1991; Raisch & Birkinshaw, 2008) that characterizes the three ways in which the paradigm manifests itself and is applied in inter-organizational research and development relationships (Enkel et al., 2009; Gassmann et al., 2010; Lichtenthaler, 2010). The first one is Inbound OI (or outside-in), an approach characterized by the exclusive presence of incoming flows, generated by the introduction of innovative ideas and knowledge from external sources (customers, business partners, universities, research institutions, etc.) (Chesbrough, 2015; Di Minin & Crupi, 2018). The second approach is that of Outbound OI (or inside-out), an approach characterized, instead, by the exclusive presence of outgoing flows, generated by the sharing of innovative ideas and knowledge in favor of subjects outside the organization (Burcharth et al., 2014; Burcharth & Fosfuri, 2015; Katz & Allen, 1982). The third one is the Coupled OI (or mixed), rather characterized by the coexistence of both types of flows, outgoing and incoming, respectively, to and from the organization.

In particular, the transition from a closed innovation system to an Open Innovation system came from Chesbrough represented through the figure of the funnel that highlights the difference between permeable (dashed lines) and impermeable (solid lines) organizational boundaries, respectively influenced (permeable) and indifferent (impermeable) to contributions coming from outside. Through a path of "inbound" Open Innovation in the broad part of this funnel to an internal technology base of the company, an external technology base is associated, intercepting the assets needed to innovate (Chesbrough, 2015; Di Minin & Crupi, 2018). Instead, through an opposite path of "outbound" Open Innovation, the funnel itself is designed as a permeable membrane that allows the company to enhance the internal development of technologies by placing assets in different contexts and markets.

This form of innovation, as conceived, considers that not all the most capable people work internally in the company, and the skills that lie outside of it are a potential source of competitive advantage, overcoming the "pathological" dynamics related to the *NIHS*, *Not-Invented-Here-Syndrome* (Burcharth et al., 2014; Burcharth & Fosfuri, 2015; Katz & Allen, 1982).

Normally, the phenomenon of Open Innovation requires a proactive relationship of collaboration between the parties involved, configuring among them a dense and extensive network of inter-organizational relationships that can represent the genesis of real organizational ecosystems: spaces for co-evolution and strategic cooperation between organizations, contexts in which the aim is to promote the exchange and circulation of knowledge and skills (Aarikka-Stenroos & Ritala, 2017; Adner, 2017; Granstand & Holgersson, 2016; Kapoor, 2018; Moore, 1993, 1996, 2006; Sherwani & Tee, 2018; von Krogh & Geilinger, 2014).

The concept of the ecosystem has evolved, enriching itself with the aspects linked to the use of technology and those connected with other aspects of sharing. Thus, "the digital business ecosystem" is used when the use of information and communication technologies representing a platform within which the various actors interact and share values and goals is emphasized (Mancini, 2018). On the contrary, the collaborative business ecosystem is used, when the emphasis is on collaboration, which develops between different partners within the ecosystem based on long-term alliances (Moore, 2013).

Opportunities are identified for the search for new ways of learning and managing knowledge flows within which new value can be generated precisely by the complexity of products, processes, and meanings. The cognitive surpluses created by innovation and multiplied by digitalization are "distributed" among the various actors involved in the supply chain—that can be defined as digital and global—according to a network logic, and no longer by the single company (Grimaldi et al., 2019).

In this context, it is appropriate to reconsider the business models of companies according to two dimensions. The one that allows creating a sort of "division of labor" in the use of knowledge, participating in the construction of an Open Innovation system in which each one brings its own knowledge and, at the same time, uses those of others. The other is that allows to initiate flows of communication and cooperation between "bearers of needs" and "possessors of skills," according to the perspective that—thanks to digitization—is transforming all companies into companies that put their skills at the service of potential customers, found in global and digital networks (Rullani, 2018).

Nowadays, as widely highlighted in the literature, it is possible to find above all cases of organizations in a hybrid position that alternate moment of closed innovation with moments of Open Innovation (Binci, 2016; Huizing, 2010).

2.2 | Open Innovation and strategic CSR

According to the perspective of creating shared value and propensity to adopt open and sustainable strategic innovation policies, the paths of building a common identity bond are vital to foster the development of a "contaminated" vision by the actors of an ecosystem that can represent an important success factor and the recreation of corporate value, also in terms of cost-effectiveness and efficiency. It is particularly important to note that, when the various stakeholders of the organizational ecosystem perceive engagement, through the presence of a widespread and consistent fabric of social relations, it is potentially plausible that a proactive attitude and predisposition to collaborative efforts are triggered between them exchanges and sharing of resources, information, skills, and knowledge.

It is possible to highlight how Open Innovation and CSR are mutually related. Both concepts, in fact, are built around notions such

as cooperation and dialog with stakeholders and are based on complex network relationships. While stakeholder theory has traditionally considered an organization's interactions with stakeholders in terms of dyadic relationships, recent scholarship has pointed to the fact that organizations exist within a complex network of relationships (Neville & Bulent, 2006), the so-called *stakeholder multiplicity* (Oliver, 1991).

The use of this perspective, in addition to being fundamental in the development of CSR issues, is particularly suitable for analyzing OI processes, as it refers to relationships and knowledge flows between organizations and stakeholder groups within ecosystems (Chistov et al., 2021).

In this regard, the topics of sustainability-oriented innovation will be highlighted below, and the dimensions of mutual interaction between CSR and Open Innovation processes will be identified (Rauter et al., 2017). With reference to the relationship between innovation and CSR, it is possible to highlight how corporate social innovation can be defined as a process of development and implementation of products, services, processes, and business models, which simultaneously address social issues and generate value for the company (Kanter, 1999; Tukker et al., 2008; Schaltegger et al., 2012; Boons & Lüdeke-Freund, 2013; Yang et al., 2017). In this sense, previous literature confirmed the fundamental role covered by the process of stakeholder engagement in the path toward sustainable innovation (Achterkamp & Vos, 2006).

What emerges is that the challenges of sustainability offer significant potential for innovation and new business opportunities. This awareness is based on two considerations: First, following a "regulatory push" logic, it should be noted how the recent (national and international) socio-environmental regulatory frameworks are increasing the pressure on companies to invest in technological innovation; moreover, according to a "vision pull" approach, it should also be emphasized that sustainability is a vehicle for new business opportunities and a harbinger of innovations that are the result of increasingly open and shared research and development processes.

Broadening the gaze with respect to mere product innovation, it should be considered that the dynamics of Open Innovation can allow companies to find solutions and activities that are not only new but also responsible and sustainable. Furthermore, they help to act responsibly thanks to the expansion of the knowledge base and the opening of perspectives resulting from the continuous dialog and discussion with the various stakeholders.

Preview studies highlighted that *Sustainability-oriented innovation* (SI) (Adams et al., 2016; Afeltra et al., 2021; Klewitz & Hansen, 2013) implies the introduction of intentional changes to the philosophy and values of an organization, as well as to its products and processes, with the particular aim of creating social and environmental value in addition to the achievement of objectives linked solely to financial and profit logic. SI is, in fact, a dynamic and gradually expanding process, which begins with strategies for responding to regulatory impulses with only incremental change at the organizational level and culminates with a radical change at the systemic and inter-organizational level. Adams et al. (2016) highlight a conceptual framework for the study of SI, a model that analyzes three observation variables: the strategic orientation of the innovation objectives set by the company, with a dichotomy between a *technology-oriented* and a *people-oriented* approach; the range of action within which organizational relations develop, comparing logics focused on the individual company (*insular*), with a more ecosystemic and inter-organizational vision (*systematic*); and the degree of extension of innovation policies within the company, comparing initiatives that involve individual units or functions (*stand-alone*) with those that instead completely permeate the company organization (*integrated*).

The paradigm of change requires a transition from the shareholders-oriented model to a broader stakeholder-oriented (Maiolini, 2016) vision, in a synergic and engagement perspective, capable of *Creating Shared Value* (or CSV, Porter & Kramer, 2011), without neglecting strictly financial logic and performance (Rialti et al., 2022). Accordingly, the creation of shared value means, first, adequate remuneration for shareholders and shareholders, guaranteed by careful risk management, that is associated with corporate governance models that are able to combine efficiency with transparency, plurality, and protection of minorities; it means, also, better and satisfying working conditions for collaborators, which enhance their skills and ensure an organizational environment marked by the protection and promotion of the person and their integrity (Sciarelli, 2007), as well as innovative products and services able to fully satisfy the explicit or unexpressed needs of customers, conveying the message of sustainability (Pivato et al., 2008). Furthermore, creating shared value implicates sharing of knowledge and long-term collaboration with suppliers to ensure relationships based not on a logic of competition, but of co-evolution (Valdani, 1997), clear and transparent relationships with financial partners, correct and responsible relations with the governing bodies and collaboration in the governance dynamics of growth processes at local and national level (Tencati & Zsolnai, 2009), propulsive and innovative role, in the communities, by the company, as a real engine of development and place of innovation (Vurro et al., 2010), as well as attention to the environment (and to the rights of future generations) thanks to sustainable practices aimed at fully protecting natural resources (including some fundamental common goods, such as water, air, soil) and minimizing the impacts associated with cycles of transformation, production, and consumption.

From the combination of the principles of CSR (Carrol, 1979, 1991; Perrini & Tencati, 2008; Schwartz, 2011) and the perspectives of creating shared value, a model of sustainable strategic innovation inevitably arises, based on the ability of organizations to meet the needs and expectations of the various stakeholders, following a collaborative approach aimed at sustainable relationships (Freeman et al., 2007). Strategic CSR, based on stakeholder engagement, stimulates a company to access and use external knowledge, share its intellectual capital and engage in partnership. The integration of the shared value perspective in CSR activities, in fact, favors the creation of wide and deep stakeholder networks (Hauser et al., 2006; Luo & Du, 2015).

Thus, it can be argued that strategic CSR influences the creation of an open organizational culture based on trust and dialog. From this point of view, the intensification of the complexity and structural dynamism of the reference environments leads to a change in equilibrium and relationships, marked by the transition from competitive logic to increasingly collaborative approaches, from a more restricted intra-organizational perspective (which looks at organizations as "closed mechanical systems"; Morgan, 2002) to an inter-organizational one, according to what von Bertalanffy (1971) defined as an "open systems theory," borrowing from the study of living biological systems, also valid opening characteristics for organizational systems. This concept of CSR integrally assumes the principles underlying the paradigm of the open organization as even in the integral company there is a link of mutual exchange between the company and the environment. By this exchange, the organization draws cultural values and social norms from the reference context, and returns—with an identity imprint that becomes flexible (without being distorted)—as many values, knowledge, and skills, weaving a network of cooperative relationships from which all the stakeholders involved benefit. Therefore, the integral enterprise is characterized by its creative potential, its particular ability to produce utility and value both for itself and for the community, the environment (both physical and social), and the institutions present in the reference context.

Furthermore, the mutual and bidirectional link between strategic CSR and the Open Innovation approach is based on the considerations provided by Roszkowska-Menkes (2018), according to which strategic approach to CSR with its focus on stakeholder engagement favors open organizational culture and environment, conducive to developing OI strategies. Thus, it implicates employee engagement, increasing their awareness and sensitivity to social issues, as well as external stakeholder dialog and collaboration, fostering knowledge transfers and outside-in OI processes. It also provides rationales for knowledge sharing and nonpecuniary inside-out OI.

2.3 | Sustainable Open Innovation

The model of the open CSR concept described in Section 2.2 clearly highlights the bidirectional character that distinguishes the correlation between strategic CSR and Open Innovation approaches, a synallagm of mutual benefit in which the organizations involved prove to be more agile and capable of both creating and capture value thanks to the adoption of strategies for opening and sharing knowledge. In fact, the model provides two considerations: First, OI processes foster, support, and improve the achievement of corporate sustainability efforts goals. Knowledge sharing from external stakeholders increases the chances for corporate social innovation that would create widespread, meaningful, and sustained social impact; besides, CSR strategies and stakeholders-oriented initiatives generate open organizational culture and an environment favorable to OI approaches, by providing rationales for knowledge sharing and nonpecuniary inside-out OI and involving employee engagement, increasing their awareness and sensitivity to social issues, as well as external stakeholder dialog and collaboration, fostering knowledge transfers and outside-in OI processes.

Furthermore, on the basis of the existing literature, *Sustainable Open Innovation* (SOI) is considered to be an outside-in process, whereby external knowledge is gathered to support the internal development of sustainability-oriented innovations (Adams et al., 2016; Bogers et al., 2020; Costa & Matias, 2020; Gyamfi & Sein, 2021; Melane-Lavado & Álvarez-Herranz, 2020; Rauter et al., 2017; Rauter et al., 2018; Roszkowska-Menkes, 2018). Thus, it is possible to describe SOI as an approach by which Open Innovation practices merge with the sustainability concept (Arcese et al., 2015), particularly by contributing to the realization of the Agenda 2030 Sustainable development goals (Pizzi et al., 2020).

One of the first study about sustainable Open Innovation is the work of Bogers et al. (2020), who focus on how Open Innovation can effectively drive innovation activities to address a specific sustainability objective, as well as toward the 17 SDGs. In fact, based on the consolidated concept of sustainable development, in that paper the so-called Sustainable Open Innovation is defined as a "distributed innovation process which is based on purposively mechanism in line with the organization's business model, thereby contributing to development that meet their own needs" (Bogers et al., 2020, p. 1507).

After the recent work of Bogers, who focuses his research on a case study of the Food and beverage industry, some other studies have focused on SOI, always based on case studies aiming at showing how to achieve sustainable results through integrating the three dimensions of sustainability in a framework based on Open Innovation. Venturelli et al. (2022) focused on the food industry and found how Open Innovation can effectively drive strategic renewal and innovation activities to achieve sustainability results.

A recent bibliometric analysis on the field (Bigliardi & Filippelli, 2022) has revealed that, though using different denominations (open-eco innovation mode, Open Innovation for sustainable innovation or sustainable Open Innovation), a recent part of the literature focuses on the role of Open Innovation in supporting the transition toward a sustainable business (Venturelli et al., 2022). According to the analysis carried out, four clusters of research on the field have been identified: innovative performance in an open sustainable innovation context; the role of technological capability, the business model perspective, and, lastly, the collaboration between companies and universities to achieve sustainable innovation. Specifically, the future lines of research have been identified in the sustainable Open Innovation in the agri-food industry. Research on other sectors was underdeveloped.

In this sense, the present work aims to show how Open Innovation is a catalyst for sustainability, by proposing a model for the case study in an underdeveloped sector, such as the energy one, presenting the case study of a large utility.

Thus, in the section dedicated to the discussion of the case study, as a result of the analysis of various contributions offered by the existing literature, an experimental model has been developed.

TABLE 1 Semi-structured interview track

I. *Evolution and change (needs and stages of the opening process)*
   a. How did the need to adopt an Open Innovation model arise?
   b. In which sectors was this model necessary? Because?
   c. How has the change in leadership impacted on the adoption of this model?

II. *Innovation and sustainability (strategic objectives, perspectives, and limits)*
   a. Where does the need to give centrality to the "innovability" combination arise?
   b. In your opinion, was sustainability the goal that prompted the "open" change or the opposite? Or was there co-generation?
   c. What are the benefits for the company? And what are the limits?
   d. What are the benefits for stakeholders? And what are the limits?
   e. What is the time frame for the development of these strategies (objectives, perspectives …)?

III. *Ecosystem model (articulation of flows)*
   a. Which channels (enabling organizational structures) are involved?
   b. How do they work?
   c. What are the types of interactions (flows and relationships)?

Note: Our elaboration.

3 | METHOD

As evidenced in Section 1, we have chosen to focus our research on the case of Enel because it is the world leader in the power and gas market; it has received important awards at the global level, and it is present in the most important ESG rating in the world.

To highlight how the strategic approach of Open Innovation significantly reinvigorates the positioning of the company in terms of CSR and sustainable transition, through the experience of ENEL Open Power, the methodology adopted is the analysis of a single case (Grandori, 1996; Lucidi et al., 2008; Yin, 2018), through a longitudinal analysis of company documents (Bailey, 1982; Corbetta, 2015; De Lillo, 2010; Lucchini, 2018; Lucidi et al., 2008; Yin, 2018), supported by some semi-structured interviews (Corbetta, 2015; di Fraia & Risi, 2019; Granot et al., 2012; Lucidi et al., 2008; Yin, 2018) with managers and company representatives, as evidenced in Table 1.

The adoption of a case study method is particularly suitable for qualitative studies and to carry out research based on the questions of HOW and WHY (Yin, 2018). Data from different sources have been triangulated. Furthermore, to strengthen the validity of what emerged from the documentary analysis, a triangulation has been conducted between the analysis of ENEL sustainability reports from 2011 to 2021 semi-structured interviews with the Chief Innovability Officer of ENEL and four managers. From the documentary analysis carried out, the need to divide the reference period into two sub-periods has emerged: the first one from 2011 to 2014, and the second one from 2015 to 2021. The distinction has been made necessary for relevant facts that occurred in the 2-year period 2014–2015, which therefore plays the role of the watershed of the entire arch temporal observed. The methodology protocol followed is summarized in Table 2. The use of documents is instrumental for a longitudinal analysis of the case studied, aimed at highlighting the evidence and trends that have characterized (and still distinguish) over time the path of strategic renewal and organizational change undertaken by the ENEL group. In fact, if the possibility of diachronic analysis is one of the main advantages in the use of corporate documents, it is also true that the incompleteness

TABLE 2 Data analysis: The protocol followed

Research question	How does the strategic approach of Open Innovation significantly reinvigorate the positioning of the company in terms of CSR and sustainable transition?
Company	Enel
Managers involved	Five managers, as evidenced in Table 4 for the interview, are recorded and analyzed through manual content analysis.
Duration	No. 5 interviews carried out in the period from February 2021 to February 2022, each with an average duration of 1 h 30 min
Source of data	Triangulation of data from interviews, observation, and documentary analysis
Validity	Multiple sources
Internal and external validity	Systematization of data to evidence the relationship between Open Innovation and sustainability. The external validity is granted by the replicability of the methodology and model used.

TABLE 3 Sources of evidence: Strengths and weaknesses

Source of evidence	Strengths	Weaknesses
Documentation • Sustainability reports (2011–2021) Official company websites and channels	• **Stable** – can be reviewed repeatedly • **Unobtrusive** – not created as a result of the case study • **Specific** – can contain the exact names, references, and details of an event • **Broad** – may cover a long span of time, many events, and many settings	• **Retrievability** – can be difficult to find • **Biased selectivity**, if a collection is incomplete • **Reporting bias** – reflect (unknown) bias of any given document's author • **Access** – may be deliberately withheld
Interviews	• **Targeted** – can focus directly on case study topics • **Insightful** – provides explanations as well as personal views (e.g., perceptions, attitudes, and meanings)	• Bias due to poorly articulated questions • Response bias • Inaccuracies due to poor recall • **Reflexivity** – e.g., interviews say what the interviewer wants to hear

Source: Our elaboration, based on Yin (2018).

of the information and the non-objectivity of what they represent are disadvantages of this technique (Corbetta, 2015; Yin, 2018). The robustness and validity of the methodological structure adopted are granted by the triangulation (Yin, 2018) of all the information collected from the different types of sources interrogated in the research, to which the official web channels of the company and other documentation, both corporate and scientific ones, have been added.

In Table 3, the strengths and weaknesses of each source used in the analysis have been summed up, thus highlighting that the weakness of a source can be compensated by the strengths of the other source used.

Furthermore, in Table 4, major details about the source analyzed have been provided.

4 | THE CASE OF ENEL

4.1 | Enel case study

Enel (Table 5) is an Italian Group that operates as a utility multinational company in 32 different countries, generating energy, selling gas, and distributing electricity. It was created as a statutory corporation in 1962 and, after Italy's energy market liberalization, it was transformed into a private company and has become the worldwide leader in renewable energy and the Italian largest utility. It built the first solar energy generation plant in 1981 and the first wind farm in 1984. Furthermore, it has expanded its business in electronic mobility, energy storage and big data technologies, smart cities, and so

TABLE 4 Methodological framework for triangulation of sources

Source	Type	Use/collection
Semi-structured and unstructured interviews	Semi-structured interview to: • Chief Innovability Officer • Hub Manager in Silicon Valley Enel Innovation Hub • Open Innovation Culture and Project Portfolio manager • Innovation Governance, Intelligence and Partnerships manager • Head of CSV (Creating Shared Value), Sustainability Projects and Partnerships in Enel Innovability	• Information about the organizational-strategic transition of the group, with reference to the decade 2011–2021 • Information about the transition from an "ego-system" to an innovative ecosystem oriented toward sustainability, of the main stakeholders involved, as well as of the tools and operating methods adopted for their involvement • Information about the limits (external and internal) encountered in the Open Innovation approach • Testimonials about the policies and the vision of sustainability (based on ESG factors) for which the Open Innovation approach is instrumental: "sustainability is the goal, innovation is the tool"
	Unstructured interview to: • Innovation Governance, Intelligence and Partnerships manager • Open Innovation Culture and Project Portfolio manager	• Information about innovation projects • Information about the IPM (Innovation Projects Management) structured repository which highlights the flows of innovation projects • Information about the stages of the innovation process envisaged by the IPM • Information about the scouting sources
Diachronic analysis of sustainability reports (reference period: decade 2011–2021)	Sustainability reports referring to the first sub-period of analysis (2011–2014)	• Data and information relating to the organizational structure prior to the radical change in 2014 • Information about the approach to creating shared value (CSV) and materiality analysis relating to the individual years of the four-year period • Information relating to the objectives related to the use of renewable and sustainable energy
	Sustainability reports referring to the second sub-period of analysis (2015–2021)	• Data and information about the organizational innovation adopted with the introduction of the new matrix structure and specific function "Innovation and Sustainability" (later "Innovability") • Information on the new "Open Power" vision and the related mission 2025 • Information relating to the strategic pillars of the sustainability plans for the period analyzed • Information on the sustainable "low carbon" and circular business model and on the repercussions on the supply chain • Information relating to the project path of Open Innovation for sustainability, "Open Innovability" • More detailed information on the shared value creation model (see policy no. 211 of 2016 "CSV Process definition and management") • Information about Enel's commitment to the UN 2030 SDGs, as well as the compliance and progress of the new strategies adopted with respect to them

Note: Our elaboration.

TABLE 5 Enel company profile

Company age	Sector of activity	Geographical location/degree of internationalization	Stakeholders (internal and external)
60 years old, since 1962 (since 2014 under the guidance of Ing. Francesco Starace)	Utilities and energy (hydroelectric, thermoelectric, geothermal, wind, photovoltaic)	Argentina, Australia, Brazil, Canada, Chile, Colombia, Costa Rica, France, Germany, Japan, Greece, Guatemala, India, Ireland, Italy, Morocco, Mexico, New Zealand, Netherlands, Panama, Peru, Poland, South Korea, Portugal, United Kingdom, Romania, Spain, South Africa, USA, Zambia	Customers, communities (local and national), public bodies (local and national), universities, research bodies, schools, companies and startups, employees.

Note: Our elaboration.

on. However, up to the formation of Enel Green Power, innovations and development of the company have come, exclusively, from internal innovation activities. Enel Green Power is a spin-off of Enel born in 2008, grouping the renewable energy of the group in a unique company (enel.com/investors/sustainability; enelgreenpower.com/it).

First of all, 2014 in ENEL is marked by the concomitance of two significant organizational changes. The first concerns a change in leadership, as the roles of Chief Executive Officer and General Manager of the entire group pass to Francesco Starace, who joined the Enel Group in 2000, and was Chief Executive Officer and General Manager from 2008 to 2014, of Enel Green Power, an Enel company dedicated to the generation of energy from renewable sources and recognized globally. The second change concerns a radical transformation of the Group's organizational structure with the transition from a divisional to a matrix model, strongly business-oriented and preparatory to the achievement of five objectives: reduction of complexity, allocation of capital assessed and decided centrally, improvement of efficiency in operating costs and investments, dissemination and application of best practices in the various countries, clear and shared responsibilities between global business lines and regions. Starting from these disruptive changes, the entire activity of the Group is marked by the integration at all levels between innovation and business, introducing the figure of an innovation manager within each business line, and adopting integrated sustainability policies in the business itself. Second, it was in 2015 that ENEL decided to adopt a new strategic line called "Open Power." It is an approach that develops around a vision that is to help solve some of the biggest challenges in the world and a ten-year mission (with objectives to be achieved by 2025), based on five pillars of "openness," such as openness to energy to more people, to new technologies, to new ways of managing energy for people, to new uses of energy, to new partnerships.

4.2 | Enel change management and Open Innovability

It is clear that the contents of the 2030 Agenda have radically marked and revolutionized the way of pursuing sustainability policies in companies, these changes can be clearly seen in the ENEL case from 2015 onwards. Furthermore, in 2016 the Company Policy No. 211 "CSV Process definition and management," how sustainability must transversely permeate company processes and be a shared responsibility has been defined, as evidenced in Figure 1.

The change in leadership, therefore, coincides with the change in the strategic vision (Open Power). From the decade analyzed (2011–2021), there is a clear and radical separation between the first subperiod (2011–2014) and the second one (2015–2021). When Enel Green Power was created it was certainly not the flagship project of the group but the division that dealt with renewables, with a limited and marginal role (also operationally and logistically). Originally, Enel Green Power represented a subsidiary of the group and was led by Francesco Starace with a much younger team of managers than the top managers of the group. When Starace was appointed CEO of the group, he brought those young managers who previously worked at Enel Green Power to the top management (as can be seen from the sustainability reports), abandoning the previous industrial plan oriented toward massive investments in fossil fuels, which characterized the status quo of the sector in general, implementing, in fact, a gradual shift toward renewable generation. There was a need for a greater understanding of the speed with which the sector was changing (and continues to do so) and that this requires just as quickly in identifying new solutions and technologies.

Furthermore, under the leadership of Francesco Starace, an organizational change was made by implementing a matrix organizational scheme in the corporate structure, with the most disruptive aspect of the creation of the "Innovability" function (since then directed by Ernesto Ciorra), specifically in charge of combining innovation and sustainability, reporting directly to the CEO. Previously, innovation was, from an organizational point of view, a direct competence of the regulatory. The utility sector is generally conservative, because it is a highly regulated sector, where safety and security aspects are a priority in the management of operations and in the selection of technologies (Imperiale et al., 2023). In light of this aspect, Open Innovability represented an epochal change: the choice of an Open Innovation approach was determined by the structural conditions of the sector and by the related evolutionary dynamics, by the will of top management, and also by the personal experiences that concern the relationship between the current CEO and the current director of the Innovability function: Starace met Dr. Ciorra when the latter concluded his experience in consulting, concerning innovation and, in particular, Open Innovation: Ernesto Ciorra was, even then, one of the main experts in Italy of Open Innovation, as managerial experience (to which his academic experiences are added). This was the strong

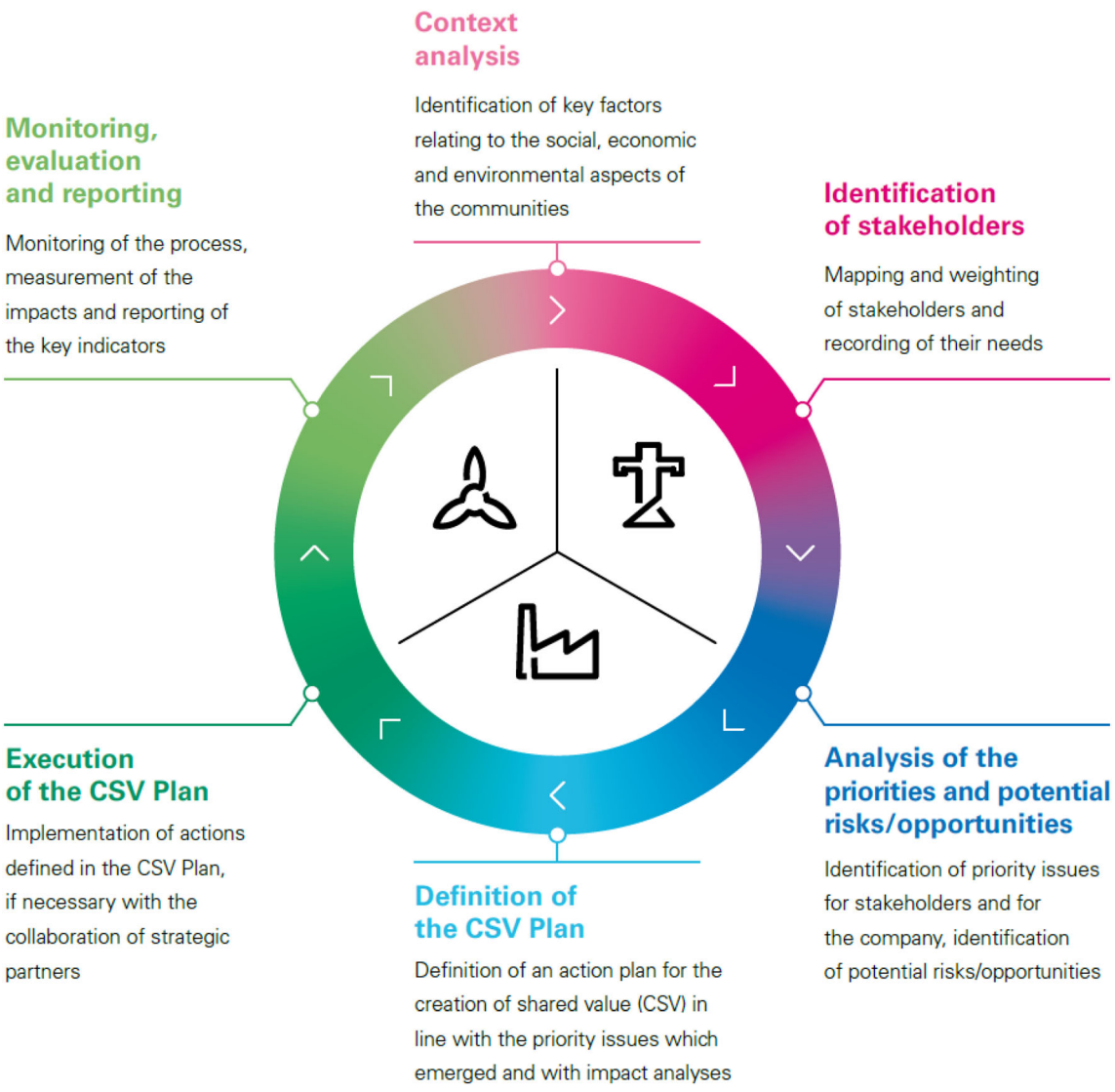

FIGURE 1 ENEL CSV model. ENEL Group (2011–2021), Sustainability report, p. 67

motivation that pushed Starace to involve Ciorra in the organizational transition and change of leadership.

The first element that marked the transition from an ego-system toward a more open and ecosystemic perspective for ENEL is the intersection between strategy and sustainability: When the change in strategy that impacted the entire business model was adopted, the top management decided to attribute a central role to sustainability. The strong propensity for innovation emerges in the objectives of the industrial plan, based on the sustainable strategy of the group of which innovation becomes an enabling and accelerating factor: Sustainability is the goal, and Open Innovation is the means to get there first possible.

This is the principle that clearly summarizes the cogeneration synallagm between Open Innovation and the sustainability objectives on which the overall strategy of the group is based. Innovability's Open Innovation has resulted in the emergence of businesses that were previously considered marginal, noting instead their centrality.

Circularity parameters and social and technological parameters characterize the embedded innovation approach based on the maximization and optimization of stakeholders' engagement (start-ups, universities, research centers, communities and communities, consumers and customers, suppliers, employees, NGOs, international organizations, and sustainability networks). In this sense, there are multichannel tools and ad hoc tools to engage each of the stakeholders to be involved in the open innovative process:

- *ENEL foundation*, in charge of academic relations and the production of scientific research, also through the financing of research and doctoral projects, even more, operational actions such as capacity building.
- *Innovation by vendors*, co-innovation activities with suppliers, aimed at inserting technological innovation along the entire value chain, through the use of circularity parameters and social and technological parameters.

- *Innovation hub e innovation lab*, tools designed to allow the company to interface with start-ups and innovative SMEs. The difference is that hubs are conceived as corporate "antennas," structures allowing to get in touch more easily with ecosystems, instead labs are places and structures that the company makes available to host start-ups, and companies to test their products, providing experts, machinery, climatic chambers for insulation, and everything needed to experiment with new technologies.
- *proprietary innovation and crowdsourcing platform*, a multi-channel platform, initially designed to identify almost individual innovators but over time the company has been able to find that the audience is much wider. The concept lies in the publication of challenges for innovation and in the relative reception of responses from the audience of innovators. It is a substantially different tool compared to the proactive and more direct search for innovators, which instead takes place through innovation boot camps;
- *sustainability manager*, subjects responsible for interacting with communities, who collect social and economic development needs directly from the communities.
- *internal entrepreneurship programs* to foster innovative inputs from employees.
- *cultural and training programs* aimed at avoiding the stigmatization of errors and failures (e.g., "My best failure" program), encouraging creativity and lateral thinking.

The innovative projects undertaken by Enel are constantly monitored, both from a quantitative and qualitative point of view, through an internal management system that before 2021 was defined as PPM, Portfolio Projects Management, and which from January 2021 was redefined as IPM, Innovation Projects Management. It is a mere structured repository aimed at archiving innovation projects, based on a dashboard of indicators that monitor the various steps that each project goes through up to the scale-up phase. The dashboard is the representation of the entire repository, which then highlights the flows of projects and how these are skimmed along the entire innovation process:

- the *origination* phase is the one in which all the projects deriving from the various scouting sources are collected. Also, in this phase there is the selection of those projects that can represent solutions to strategic needs (a sort of "short list" is created);
- this phase is followed by the *approval, execution, and monitoring* phases (the latter based specifically on the IPM dashboard);
- the *reporting* phase is developed, finally, focusing on the testing of the projects, through real feasibility tests (PoC, Proof of Concept).

In fact, the interviewees clarified that not all innovation projects reach the scale-up phase (pre-implementation) because, as one of them points out "the goal of innovation and finding solutions that improve processes and identify new products and services for the business and the scale-up of solutions within the various business lines always has the aim of generating new value." The innovation process is a sort of tool that helps to synthesize and identifying the projects to be carried out, with the awareness of learning by failing; as told by one of the interviewees "upstream of the process there are the ideas and their creators, the scouting sources of Enel's open innovability ecosystem have the task of catalyzing those ideas." For example, until February 2021, from what emerged from the data collected by the company and shown by two of the interviewees through an internal operational dashboard, it appeared that 17,283 were the solutions proposed overall, of these 78% of these had already been evaluated, among which 1,597 were interesting and 965 were approved but in the end, only 180 passed in scale-up, i.e., accepted for implementation. Another of the subjects interviewed points out that "the entire innovation process is developed in response to the strategic needs defined by the individual business lines along the entire value chain and it is precisely the business lines that adopt these innovative solutions, bringing them to a large scale." What feeds the innovation process and marks its starting point are the innovation tools, or scouting sources, concerning technological flows aimed at improving energy transition, sustainability, and digitization policies: crowdsourcing, innovation hubs, and labs, networking with partners and universities, business line (BL) internal scouting. It is important to specify that one

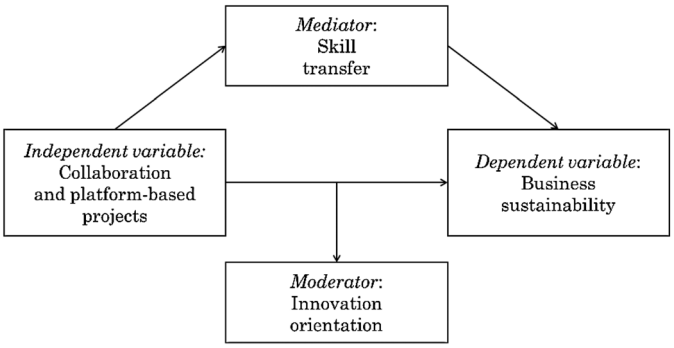

FIGURE 2 Experimental model of "open" SOI. Our elaboration

of the interviewees highlights how "company's sustainability reports are nothing more than the story of the results of the IPM process as a snapshot of the Open Innovability ecosystem." An initial limit with respect to this innovative process was represented by internal resistance when there was the phase of leadership change and strategy renewal. "The more a company has an established culture, the more this culture tries to preserve itself" (cited by one of the interviewees). Making a cultural change as well as a strategy and business change is very complicated, you need a commitment from the top management and the people who are put in charge of the change management process.

4.3 | The Model of Open SOI

Following the experience of the case study of Enel an experimental model of Open SOI has been developed, in order to show how Open Innovation is a catalyst for sustainability.

In particular, the model, as evident in Figure 2, can also be replicated in future research perspectives and extends the considerations set out in the field of sustainable innovation also to Open Innovation dynamics (Arnold, 2011; Rupo et al., 2018), observing the existence of a link between corporate sustainability (dependent variable) and "open" strategic projects based on collaboration with stakeholders and on the sharing of knowledge, skills, and know-how (mediation variable) also through platform-based models. In this sense, the role of the moderator is played by the innovative scope of the sharing and collaboration policies adopted (Lozano, 2007; Mendes et al., 2021).

The objective of the model is to demonstrate how Open Innovation is, in fact, a catalyst for sustainability, due to the potential role of accelerator that collaboration and sharing policies play in defining and achieving CSR strategic objectives, in an integrated and ecosystemic perspective in which the organization builds its strategy proactively, in concert with its stakeholders (Clarkson, 1995; Donaldson & Preston, 1995; Freeman, 1999; Freeman et al., 2010; Bidhan et al., 2010), with the academic and scientific world, civil society and local communities, local institutions, employees, customers, suppliers and other companies, competitors or not, in which every single actor is an active protagonist of the ecosystem and participates in a more equitable development with a positive impact from a socio-environmental point of view. Starting from their skills, critical success factors, and their own distinctive traits, companies can implement Open Innovation strategies, increasing their value, developing forms of networking and ecosystems with other companies and organizations with which to build relationships, and exchange ideas and flows of knowledge both inbound and outbound. In fact, companies need to assume a position of exchange with those who are the partners and, more generally, the stakeholders of the ecosystem that is being created.

5 | DISCUSSION: DEVELOPING THE SKiN (SKILLS AND KNOWLEDGE IMPROVING NETWORKS) FRAMEWORK

Considering the previous studies and the existing literature, as evidenced in section 2 (Adams et al., 2016; Arcese et al., 2015; Bigliardi & Filippelli, 2022; Bogers et al., 2020; Costa & Matias, 2020; Gyamfi & Sein, 2021; Melane-Lavado & Álvarez-Herranz, 2020; Pizzi et al., 2020; Rauter et al., 2017; Rauter et al., 2018; Roszkowska-Menkes, 2018; Venturelli et al., 2022) and with the aim of deepening and specifying the analysis of the Enel case by focusing attention on the dynamics related to skill transfer (mediator) shown in the model developed in section 4, it is possible to conceive a representation (Table 6) of the strategic Open Innovation approach adopted by Enel. This representation shows the ecosystem as a scheme for the management of corporate relations, resulting from the exchange between the elements of the first column, *Skills* (considered as a whole as a set of tools and attributes that determine the know-how already present in the company) and those of the second column, *Knowledge*, a set of "hard" and "soft" knowledge (technologies, organizational models, managerial approaches, information logic…) that the company derives, as an enrichment, from the ecosystem itself. The last column, that of the *Networks*, reports details on the forms and ways in which the

TABLE 6 SKiN Framework for ENEL

Skills (know-how – outbound flows)	Knowledge (enrichment – inbound flows)	Network features (bridges)
• Matrix organization • Integration between innovation and sustainability as an open business model (Innovability) • Open power vision and CSV as a multi-stakeholder interactive approach • Lean/Agile/Design thinking • Distance from logics related to purely economic-financial parameters and circular economy investment logics • ISO 56002:2021 "Innovation Management Systems" standard implementation	• Disruptive technologies (IA, blockchain, robotics, AR/VR …) • Crowdsourcing ideas • Improvements about platform business model • Efficiency in the operation of commercial channels, tools and platforms through stakeholders engagement • Digitalization and cyber security improvements • Research projects and results	• Partnership agreements • Futur-e • Innovation hub and lab • Innovation community • Start-up ecosystems • Idea Factory • We4U and Enel Foundation • "Open Innovability" function • Call 4 ideas hub • Bootcamp and scouting activities • Innovation and sustainability challenges

Note: Our elaboration based on conducted interviews.

various ecosystems were conceived and created. This representation can be defined with the acronym *SKiN* (Skills and Knowledge improving Networks), an analytical framework that has two implications: firstly, the interchange between the elements "Skills" (internal) and "Knowledge" (external) determines the identification and the shape of the ecosystem; secondly, it is precisely the ecosystem, in the forms in which it operates and is conceived, that always returns new knowledge to all the players involved, a win-win logic for mutual and shared growth dynamics.

The case, as such represented, confirms the previous literature on Sustainable Open Innovation, according to which SOI is considered to be an outside-in process, whereby external knowledge is gathered to support the internal development of sustainability-oriented innovations (Bogers et al., 2020; Costa & Matias, 2020; Gyamfi & Sein, 2021; Melane-Lavado & Álvarez-Herranz, 2020).

Furthermore, the contribution to SDGs Agenda 2030 thanks to Open Innovation practices in Enel is confirmed in the sustainability reports as well as in interviews. This fact confirms previous research on the issue (Pizzi et al., 2020).

Beyond legal requirements, the case of Enel shows a perfect integration between a sustainable strategic and industrial plan, thus confirming a strategic role covered by sustainability in the company process.

Enel does not set itself the goal of carrying out operations to acquire control over the equity of start-ups (corporate venture fund) but instead chooses to adopt an approach aimed at making them become a relevant industrial customer for start-ups (corporate venture client). The advantage of this approach lies in a greater ease in building relationships because the fear that the company will later want to control them is reduced; moreover, more opportunities emerge in the co-innovation phases with start-ups and co-development of their products: If the start-ups are not very mature but have products in the engineering or prototyping phase, Enel can undertake to purchase of a certain supply relevant for the future. In doing so, the start-ups adopt changes to the product to follow the requests of the company that becomes its customer. There are, therefore, cases in which the relations between the company and start-ups concern bidirectional flows of exchanges and knowledge, other cases in which the start-ups are more mature and have products that the company buys as well as manufactured.

Enormous difficulties can be encountered in relations with start-ups due to the fact that a large group like ENEL has processes that are structured but not designed for interaction with start-ups (e.g., in the qualification procedures for a public tender, start-ups can't even remotely qualify as payment terms are absolutely not compatible with their availability). Enel aims to solve this type of criticality, sometimes creating specific processes and procedures for start-ups, also in derogation of the company's internal procurement policies and/or payment policies (by granting, for example, advance payments for the execution of some works and supplies). For the company, it is much more effective, in terms of an innovative approach, to find a counterpart who takes care of developing its own idea. Instead, another difficulty encountered by Enel in its path of open innovation is represented by the fact that very often, especially through crowdsourcing, the company finds itself receiving proposals and ideas, which, although interesting, do not meet the interest of the proponents. To invest themselves in the solutions, they indicate but which, ideally, they would just like to give an idea. Enel, on the other hand, is interested in counterparties who get involved by taking risks themselves and invest in their own idea, engaging in the creation of a prototype; a reality, in essence, with which Enel can co-innovate, co-develop products, to which to provide support but without having to replace them.

An initial limitation was also represented by internal resistance when there was the phase of leadership change and strategy renewal. "The more a company has an established culture, the more this culture tries to preserve itself" (cited by one of the interviewees). Making a cultural change as well as a strategy and business change is very complicated, you need a commitment from the top management and the people who are put in charge of the change management process.

In addition, the ENEL case demonstrates that it is a global reality, characterized by a vision and paths of open and sustainable strategic innovation, with the active involvement of the various stakeholders, as resources, looking at relationships interwoven with them as opportunities to increase one's experiential baggage and knowledge, as opportunities for challenge and improvement, for the regeneration of value within their organizations and the co-creation of value for the community.

6 | CONCLUSIONS

In the last years, the aim to build a more sustainable world is one of the most relevant targets to reach over the world. Nevertheless, previous studies have underlined the important role covered by Open Innovation to do it (Bogers et al., 2020; Rupo et al., 2018). Unfortunately, up to now, Open Innovation and sustainability have been studied as two independent issues, and only in the last years, Sustainable Open Innovation has become a unique issue from the convergence between the concept of Open Innovation and sustainability as well as a challenge for the future business models of companies (Bogers et al., 2020). Furthermore, previous studies have focused on the agri-food industry, while the other sectors are underdeveloped.

In this sense, the present work has focused on how Open Innovation is a catalyst for sustainability, by proposing a model for the case study in an underdeveloped sector, such as the energy one, presented the case study of a large utility.

The analysis of the case has been conducted by triangulating semi-structured interviews, and documents. Specifically, through the analysis of the ENEL case study, the relationship between Open Innovation (OI) and a strategic approach to CSR has emerged. The strategic approach to CSR, guided by open leadership aimed at involving stakeholders and creating shared value, creates an organizational culture and an environment favorable to the development of Open Innovation strategies; furthermore, the Open Innovation processes support the integration of the social, environmental, and economic objectives of companies.

In fact, starting from two disruptive changes, such as a change in leadership and in organization structure, the entire activity of the Group has been marked by the integration at all levels between innovation and business, introducing the figure of an innovation manager within each business line, adopting integrated sustainability policies in the business itself.

In this perspective, an experimental model of "Open" SOI has been developed, in order to show how Open Innovation is a catalyst for sustainability. This model - which can also be replicated in future research perspectives, and which extends the considerations set out in the field of sustainable innovation, also to Open Innovation dynamics (Arnold, 2011; Rupo et al., 2018) - has been used to demonstrate the Open Innovation approach adopted by Enel. The model has been further deepened and specified through the SKiN framework, which can be considered a magnifying lens of the experimental "open" SOI, focusing attention on the dynamics related to skill transfer, by representing the ecosystem as a scheme for the management of corporate relations.

The implications of the paper are both theoretical and practical. From a theoretical point of view, the research contributes to the existing literature on Sustainable Open Innovation in the particular sector of energy. Furthermore, this case study may provide practitioners and policymakers with how Open Innovation could support company processes in the perspective to achieve the SDGs. With reference to managerial implications, the evidence provided by the case of ENEL allows us the emerging considerations of an analysis perspective that looks at *organizational permeability* as a critical success factor for both sustainability policies and innovation, in all its possible configurations (strategic, technological, civic, cultural, etc.). This permeability analysis is intended precisely as the observation of what, in terms of ideas, skills, knowledge but also resources, crosses company boundaries in or out, looks precisely at the type of flows and exchanges that characterize relationships inter-organizational and Open Innovation strategies, with a view to co-evolution and mutual learning. This analysis may encounter as a limit the difficulty (sometimes even the inability or impossibility), found among company managers and decision-makers, to quantify these flows or, even before that, to identify them adequately. In light of these criticalities, the SKiN framework aims to provide a qualitative and replicable level of investigation in this sense, allowing organizations to obtain an overall and effective reference framework in managing relationships and interactions with various stakeholders. This model can also be combined with other indicators, analytical and decision-making tools, already used by companies; indeed, it can produce a clear and concise mapping of them, which can prove to be effective to strengthen strategic connection initiatives and improve the ability to conceive "bridge" structures and spaces, which facilitate these processes of shared development.

As regards the limits of the paper, they are linked, above all, to the focus on a single case study as a methodological approach. The single case study is based on an in-depth analysis, but it is difficult to be extended to others.

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CONLICT OF INTEREST

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

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