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Organizational resilience in the context of the energy transition challenge: the case of Terna S.p.A.

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INTRODUCTION

Climate change is now an acclaimed and obvious problem: the extreme weather events we are witnessing with increasing frequency in all parts of the world are a manifestation of it.

This has prompted internal organizations such as the UN or supranational political and economic unions such as the European Union to try to take action, respectively with the “2030 Agenda for Sustainable Development”, designed to make the future sustainable and liveable for all the Earth's inhabitants, and the “Green Deal”, planned to transform the European Union into a resource-efficient and competitive economy without net greenhouse gas emissions by 2050.

These two initiatives lay the groundwork for the ecological transition process.
Ignoring or mismanaging this transition can be considered disastrous not only from an environmental point of view, but also from an economic one, for individuals, companies and the countries in general.

Companies have a great responsibility to align themselves with the standards of the initiatives above cited, while at the same time trying to cope with this epochal change by continuing to successfully perform their usual activities. However, this requires a thorough rethinking of how work is managed and performed within the organizations and the role of each worker in it. The key word in this process is “resilience”.

Therefore, the first chapter of this thesis is dedicated to defining what “resilience” means from an etymological perspective. The word “resilience”, with its meaning of “to recover”, “to rebound”, “to spring back”, is used in numerous disciplines, including the field of organizational studies. Two forms of resilience can be distinguished: one adaptive, namely the immediate response that an organization gives during a crisis or a post-crisis phase, and one proactive, or the ability to anticipate surprises and regard that events as a way to seize opportunities. Following Giustiniano et al. (2018), the dialectic synthesis between these two templates allows to be truly resilient. A further characteristic of resilience, in addition to its remarkable flexibility that grants it to be a useful and valid concept in different fields, is that it is a multi-level construct that takes into account three interacting levels of aggregation: intrasubjective (individual), intersubjective (team), and collective (organization). This first chapter will be helpful in giving theoretical coordinates on the topic of resilience.

The issue of sustainable transition is complex and has several sub-forms: in particular, ecological transition is a sub-category of that towards sustainability and, in turn, energy transition is one of the forms that ecological transition can take. Moreover, of all the ecological transitions that there have been in human history, this last we are facing is the only one that does not occur as a result of technological breakthroughs, but rather has the character of urgency for the preservation of the planet.

Therefore, in the second chapter, definitions of energy and ecological transition will be given to better understand how they fit into the above-mentioned UN and EU programmes, namely the SDGs of the

“2030 Agenda for Sustainable Development” and the “European Union Green Deal”, which will be explained in turn.

Organizing proactively anticipating change can often be necessary: it is certainly the case of a company, Terna, that owns the Italian national high and very high voltage electricity transmission network.

The added value of this thesis is that, in an emergency context with regard to the climate crisis, it aims to understand, using as case study a company that by the very nature of its business is at the forefront of the issue of enabling the energy transition, to what extent workers are needed to contribute to the challenge of transition bring resilience to the company to address this and other challenges.

In other words, in such a difficult situation, we cannot afford to ignore the role that the workers, the living soul of the company, play in order to face the challenge of transition, providing at the same time resilience to the company, and this thesis aims precisely to deepen this not negligible aspect. So, the third chapter is devoted to explaining the research methodology of the empirical study conducted within this thesis. The investigation, which aims to understand the company's proactive resilience and its propensity to “learning to learn” and leverage lessons learned in other challenges, is organized around two research questions .The first one aims to find out how Terna, as a company that owns a national high and very high voltage electricity transmission grid, has prepared proactively in terms of corporate organization to deal with and adapt to the consequences of the ecological transition; the second one intends to explore if there are some aspects of the new ways of working and other initiatives involving employees and people outside of Terna that can they be maintained after the ecological transition and used to meet new challenges. In order to do this, I conducted qualitative research with two different data sources. The secondary data source is the “2021 Annual Report” and was used to understand what strategies Terna put in place to manage the ecological transition from the point of view of the organization design and the role of employees. In particular, the creation of a real program for reorganization of the ways of working within Terna, “NexTerna”, and the special importance Terna attaches to Open Innovation emerged. The primary source consists of semi-structured interviews with five managerial figures in the technical field working at Terna. In preparing the interview questions, I felt it was critical to address the topic of organizational resilience to include two recent shocks: the Covid-19 pandemic and the war in Ukraine.

The interview responses were subjected to thematic analysis and findings from it are presented in Chapter 4. The macro-themes that emerged are as follows: I) Views about ecological transition and when and why it was implemented II) Role of workers for the ecological transition and the “NexTerna” with its main characteristics III) Organizational resilience and the skills to achieve it IV) From the Covid-19 to ecological transition: shocks and challenges for the organization V) The importance of open innovation for Terna VI) The significance of lessons learned for organizational resilience VII) A second recent shock after the Covid-19: war in Ukraine.

The fifth and final chapter is devoted to the discussion of findings. They are then contextualized and related to the theory presented in the first two chapters. Then, the managerial implications of the research and recommendations for future research are presented. Subsequently, conclusions close this thesis work.

1. Organizational resilience: an overview

1.1. Etymology of the word “resilience”

The word “resilience” comes from the Latin *resiliens*, present participle of *resilire* “ to rebound, recoil,” from *re-* "back" + *salire* "to jump, leap."

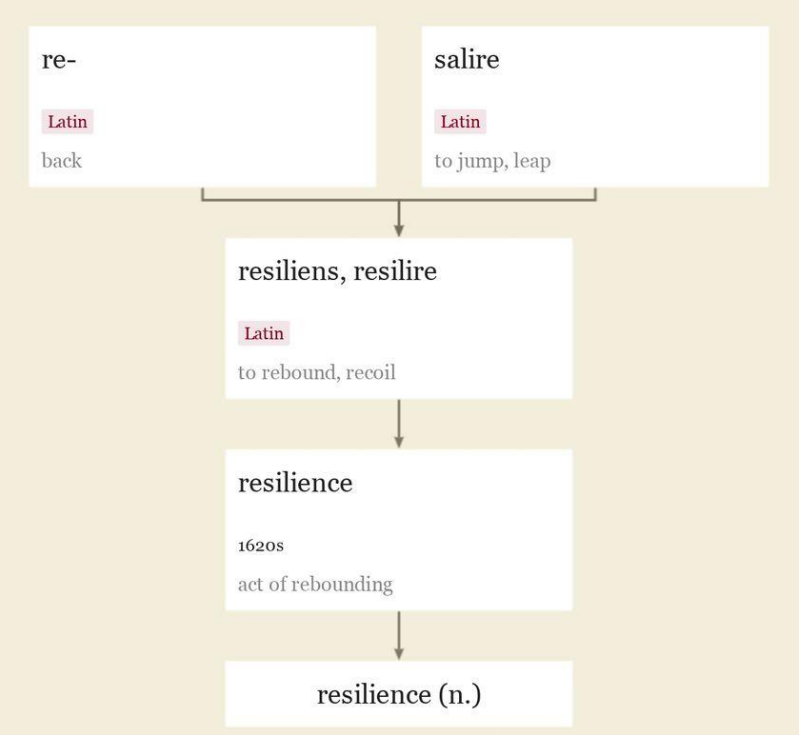

Figure 1.1. Etymology of the world “resilience” (source: Online Etymology Dictionary)

In the English language, this word made its appearance in the 1620s and went to denote an “act of rebounding or springing back” often of intangible things (Online Etymology Dictionary).

Although it was a word used by the Latins in classical times, it made its appearance in the scientific world in England between 1616 and 1626 thanks to the philosopher, politician and jurist Francis Bacon. Instead, the first time it appears in a dictionary it does so in the Glossographia written by the lawyer Thomas Blount, with a double meaning: to rebound and to return to the given word (Yaman-Galantini, 2019). In the first half of the 1800s, the world took on the meaning of rebounding. The year 1839 marks a turning point in the history of the use of this term: from this time, it is used to denote the “ability to recover from adversity,” thus essentially strength (Alexander, 2013). Since the early 1900s, the word “resilience” has found its way into multiple fields (Yaman-Galantini,2019).

1.2. The presence of resilience in multiple application fields

Beyond its etymology, the concept of resilience has been declined in a multitude of different ways, in keeping with the variety of contexts in which the concept is used.

Author	Context	Definition
Bodin and Wiman (2004)	Physical systems	The speed at which a system returns to equilibrium after displacement, irrespective of oscillations indicates the elasticity (resilience)
Holling (1973)	Ecological systems	The measure of the persistence of systems and of the ability to absorb change and disturbance and still maintain the same relationships between state variables
Walker *et al.* (2004)	Ecological systems	The capacity of a system to absorb a disturbance and reorganise while undergoing change while retaining the same function, structure, identity and feedback
Gunderson (2000)	Ecological systems	The magnitude of disturbance that a system can absorb before its structure is redefined by changing the variables and processes that control behaviour
Tilman and Downing (1994)	Ecological systems	The speed at which a system returns to a single equilibrium point following a disruption
Walker *et al.* (2002)	Socio–ecological systems	The ability to maintain the functionality of a system when it is perturbed or the ability to maintain the elements required to renew or reorganise if a disturbance alters the structure of function of a system
Carpenter *et al.* (2001)	Socio–ecological systems	The magnitude of disturbance that a system can tolerate before it transitions into a different state that is controlled by a different set of processes
Luthans *et al.* (2006)	Psychology	The developable capacity to rebound from adversity
Bruneau *et al.* (2003)	Disaster management	The ability of social units to mitigate hazards, contain the effects of disasters when they occur and carry out recovery activities that minimise social disruption and mitigate the effects of future earthquakes
Paton *et al.* (2000)	Disaster management	Resilience describes an active process of self righting, learned resourcefulness and growth. The concept relates to the ability to function at a higher level psychologically given an individual's capabilities and previous experience
Coutu (2002)	Individual	Resilient individuals' posses three common characteristics. These include an acceptance of reality, a strong belief that life is meaningful and the ability to improvise
Hamel and Valikangas (2003)	Organisational	Resilience refers to the capacity to continuous reconstruction
Horne and Orr (1998)	Organisational	Resilience is the fundamental quality to respond productively to significant change that disrupts the expected pattern of event without introducing an extended period of regressive behaviour

McDonald (2006)	Organisational	Resilience conveys the properties of being able to adapt to the requirements of the environment and being able to manage the environments variability
Hollnagel *et al.* (2006)	Engineering	The ability to sense, recognise, adapt and absorb variations, changes, disturbances, disruptions and surprises

Table 1.1. Definitions of resilience (source: Bhamra et al., 2011)

With reference to physical systems, resilience is described as “the speed at which a system returns to equilibrium after a displacement, irrespective of oscillations indicates the elasticity” (Bodin and Winman, 2004). This definition is also used in Engineering Resilience (ER). It is a key multidisciplinary field of study for understanding and managing security in complex systems. Complex systems are those systems with a large number of elements, building blocks or agents, capable of exchanging stimuli with each other and with the environment around them. Interaction between elements can occur only with immediate neighbours or with distant elements and also between very different agents. Existing complex systems are very different from each other. One speaks of a complex system referring to political and financial organizations whose dynamics of interchange between agents in the system can harm or influence human beings, society, and the economy. On the other hand, energy production is also a complex system, especially when it is one that involves great risks such as nuclear energy. To conclude, in the medical field, even a single neuron can be considered a complex system (Ottino, 2003).

The concept of resilience has also been elaborated in the framework of ecological systems, where it is considered as “the capacity of a system to absorb a disturbance and reorganize while undergoing change while retaining the same function, structure, identity and feedback” (Walker et al., 2004).

An interesting development in the relationship between ecology and resilience is the studies on “urban resilience”. They aim to understand whether urban systems are able to recover from vulnerable or whether they need to develop certain capacities to do so. Indicators to assess this capacity are based precisely on the attributes of resilience, but for them to be interpreted, it is necessary to take into account "the relation of resilience between vulnerability and sustainability” (Yaman-Galantini, 2019).

In engineering, it is considered the “ability to perceive, recognize, adapt to, and absorb variations, changes, disturbances and surprises” (Hollnagel et al., 2006).

The concept of resilience is also present in the field of energy resilience. In this area, it takes a multidimensional approach, being linked to the four dimensions of sustainability (economy, society, environment and governance).

Energy resilience is defined as "the ability of an energy system to retain, respond to, and survive disturbances resulting from a shock in economic, social, environmental, and institutional terms, resulting from the learning capacity to adapt to change" (Gatto and Drago, 2020).

Furthermore, resilience stands as an essential concept to describe "the ability to maintain the functionality of a system when it is perturbed or the ability to maintain the elements required to renew or reorganize if a disturbance alters the structure of function of a system" (Carpenter et al., 2001) or "the magnitude of disturbance that a system can tolerate before it transitions into a different state that is controlled by a different set of processes" (Walker et al., 2002). These are the definitions developed by scholars of social-ecological systems and show that resilience is a concept not only proper to the physical, environmental or engineering sciences, but that connects these worlds with the human beings.

It is also a present concept in disaster management. It is used, in that field, as a tool to recover from negative events, and is therefore considered as "the ability of social units to mitigate hazards, contain the effects of disasters when they occur and carry out recovery activities that minimize social and mitigate the effects of future earthquakes" (Bruneau et al., 2003).

In addition, in the context of disaster management, it is described also as "an active process of self righting, learned resourcefulness and growth, related to the ability to function at a higher level psychologically given the individual's capabilities and previous experience" (Paton et al., 2000). When it comes to disasters, the negative events considered can be many and very different. According to Carter (2008), disasters are considered to be:

- Volcanic eruption,
- Tsunami,
- Tropical cyclone (typhoon, hurricane),
- Flood,
- Landslide,
- Forest fire (or wildfire),
- Drought,
- Epidemic,
- Major accident, and
- Civil unrest.

These types of events, although belonging to very different categories, have disastrous consequences: from loss of life to environmental devastation, with damage that can affect entire ecosystems.

Moreover, such environmental damage is often followed by great upheaval due to loss or damage to personal property, essential services, and infrastructure (Carter,2008).

Finally, it is possible for such calamities to bring real sociological and psychological upheaval and the Covid-19 pandemic is a very recent large-scale example of this. In order to deal with events with such effects, true disaster management system must be put in place, consisting of a series of activities linked together in a continuous cycle. Indeed, disaster management as a series of unconnected events that end when the disaster ends is not possible.

This being the case, disaster management deals with:

- preventing a disaster with long-term measures.
- managing the moments immediately preceding a disaster
- managing the response to the disaster impact
- managing major post-impact factors (Carter, 2008).

It is possible to identify micro-activities related to these macro-phases of disaster management and, as mentioned a few lines ago, represent them in a continuum cycle.

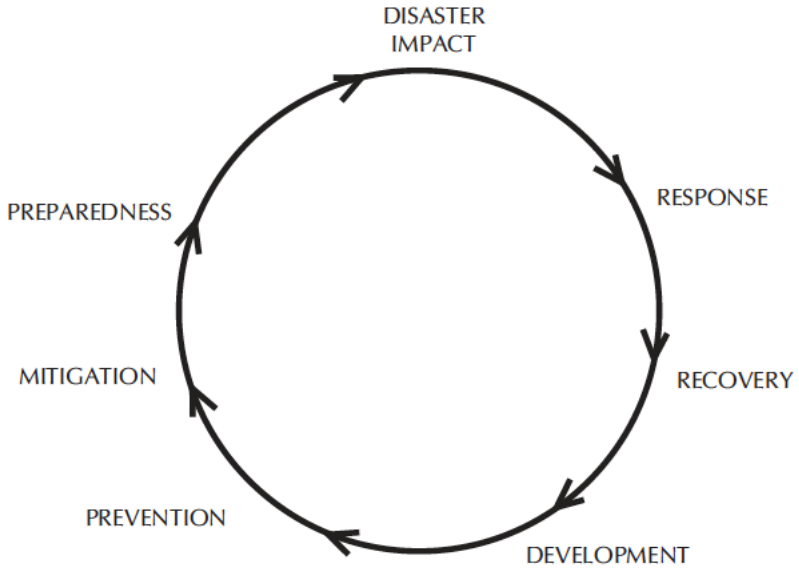

Figure 1.2. Basic Format of the Disaster Management Cycle (source: Carter, 2008)

In addition to these distinctly scientific contexts, the concept of resilience also belongs to those disciplines that deal more properly with mental states and processes, such as psychology.

In general, when we talk about resilience from a psychological point of view, we can define it as the "ability to cope with adversity and to continue functioning in stressful circumstances" (Bonanno, 2004). Furthermore, it was also considered as an achievable ability by individuals, a "developable capacity to rebound from adversity" (Luthans et al., 2006).

1.3. Adaptive and proactive resilience: resilience as a dialectical synthesis

As demonstrated in the previous paragraph, there are many definitions of resilience, ranging in scope.

An additional interesting definition that could encapsulate various aspects of it is the one provided by Andersen (2016). This description considers resilience not only as a matter of learning, but also of "learning to learn". Learning to learn is a process that involves resisting against the bias that keep one from undertaking new things, being receptive to new potential growth opportunities, activating oneself to acquire new skills, and, while these activities are being performed, continuing to do one's job and therefore also facing the challenges of the moment.

Thus, depending on the perspective, a distinction can be made between "proactive resilience" and "adaptive resilience". It is not possible to be truly resilient by adopting only one of the two perspectives: resilience can therefore be conceived as a dialectical synthesis between these two conceptual templates.

1.3.1. Adaptive resilience

If we consider resilience as a process, adaptive resilience represents the reactive part of it. From this point of view, resilience is the ability not only to absorb but also to use the knowledge one already has and transform it to adapt it to the current situation (Zahra and George, 2002). Thus, resilience in this form can be defined as the ability to bend, enacting necessary adaptations, but without breaking (Bridges, 1995, p.5).

This process does not happen once in the life of an organization and therefore cannot be considered permanent. Rather, it is submerged in the other dynamic and adaptive processes of this type, the sum of which makes the organization resilient when faced with troubles or adversity drawing a resilience process that is anything but static.

Adaptive resilience is certainly the most immediate response of an organization when faced with a crisis and post-crisis growth, which then has post-traumatic traits. Since it is a form of resilience that directly requires the organization to change, it is the most visible form of resilience and is a real test for the organization.

Not always at the end of an adaptive resilience process does the organization turn out to have "learned to learn." It could happen, in fact, that, the acquired resilience disappears, showing that the organization was not able to transpose within its knowledge system what it learned in that circumstance (Giustiniano et al., 2018).

There are constructs related to adaptive resilience such as adaptability, coping, hardiness, recovery, and redundancy that, while they differ from it, have aspects in common, and thus can contribute to it.

Adaptability is different from resilience because being adaptive can also mean only that the ability to adapt to a changing environment, whereas the organization might only restructure itself (Giustiniano et al.,

2018). It differs from recovery because, while this word suggests a return to the previous stage, being resilient means to evolve (Giustiniano.,2018). Again, resilience differs from coping because, while it may appear to help build resilience, coping strategies may actually do, by being maladaptive, a detriment to resilience capacities (Cicotto, 2014).

Instead, the difference between resilience and hardiness lies in the fact that the latter facilitates resilience and creates an avenue for its creation, but under stressful conditions.

Finally, resilience is different from redundancy, because the backups and buffering zones provided by the latter are of little use when there is a large change in conditions (Giustiniano et al.,2018).

1.3.2. Proactive resilience

Proactive resilience can be described as the cultivated preparedness to cope with surprises and the ability to see negative incidents as a means by which gain opportunities for the organization, team, and individuals and incentivize the growth of these entities them (Clair & Dufresne, 2007; Hamel & Välikangas, 2003; Story et al., 2013; Välikangas & Romme, 2013).

Furthermore, proactive resilience can be described as an “act of anticipation and active waiting” (Sull, 2005; Waugh et al.,2008). In this way, the organization remains ever vigilant and ready to pick up on the need for change, conceived as a source of opportunity and growth. In this way, transformation in response to environmental changes is possible, even before they occur (Hadida, 2009; Gilbert et al.,2012).

However, it is important to specify that the preparedness an organization can arrange for change remains a shock even with planning work behind it. In fact, it is necessary to take into account that resilience is about “absorption and not neutralization” (Giustiniano et al.,2018).

From the perspective of a dynamic process, it can be argued that proactive resilience integrates the mechanisms of adaptive resilience. Proactive resilience also contributes by adding devices that are types of "living systems," (Gilbert et al., 2012), such as cognitive structures and the ability to embed lessons learned and to implement them within the organization (Buchanan and Denyer, 2013).

Vulnerability, or the failure of resilience (Weick, 1993; Whiteman and Cooper, 2011), happens when there is an imbalance between feedback and sensemaking in favor of the former. This is a critical situation for an organization as its agents, at any level of aggregation, become very rigid in the face of threats (Giustiniano et al.,2018), thus lowering their adaptive capabilities.

Proactive resilience is complementary to adaptive resilience. In fact, an organization is proactively resilient by incorporating previous experiences into collective behavioral set. At the same time, experiences, as such, can be useful in learning and preparing for subsequent actions. For these reasons, proactive resilience can be considered "second-order and double-loop learning" (Giustiniano et al.,2018). Just like the proactive one, proactive resilience has relative constructs from which it differs but which help to build it. In this case, proactive resilience differs from agility, improvisation, robustness, and maneuverability and anticipation. The difference between anticipation and resilience is that the former aims to prevent potential

harms before they occur; resilience, on the other hand, involves dealing with unanticipated hazards only after they have emerged.
At the same time, however, anticipation makes an important contribution to resilience: in fact, resilient entities have a greater aptitude for recognizing and preventing future damages.

Even in the case of proactive resilience, there are constructs related to it, but different. First, resilience is different from flexibility. In fact, to be flexible means to adapt without hindrance, whereas resilience does not involve adjustments to return to the previous form. Resilience is also different from improvisation, which could be an isolated reaction related to a particular moment, but that does not build resilience (Giustiniano et al.,2018).
Robustness also does not go hand in hand with resilience: in fact, a system could be robust but fragile under pressure (Miller,1993). Resilience is also different from posttraumatic growth because, although both originate from difficult situations and for both result in improvement from them, they differ in sources of change after the moment of crisis (Tedeschi and Calhoun, 2004).

1.3.3. Anticipation: a construct related to proactive resilience

Given the empirical research that will follow in this thesis, I decided to make a particular focus on anticipation as a construct related to proactive resilience. As pointed out earlier, it is true that these constructs diverge from resilience but, at the same time, they contribute and have traits in common with it.

Anticipation in the sense of prevention can be defined as a "mode of anticipative control with the goal of predicting and preventing potential dangers before the damage is done" (Wildavky, 1988).

The difference between anticipation and resilience is that anticipation aims to prevent potential damages before they occur, while resilience involves dealing with unanticipated dangers only after they have emerged. Thus, anticipation and resilience differ for their orientation: while the anticipation has a fixing approach aimed purely to the prevention in the comparisons of the danger, the resilience has a type of approach oriented to the learning also after that the dangers are emerged. (Carroll, 1998).

At the same time, however, anticipation makes an important contribution to resilience: in fact, resilient entities have a greater aptitude for recognizing and preventing future damages. Moreover, what anticipation and resilience have in common are their antecedents. As defined by Lengnick-Hall and Beck (2005, p.70), resilience involves contextual, behavioral, and cognitive properties that allow an organization to understand current circumstances and develop a response that is a consequence of them.

In light of this then, the idea that resilience and anticipation are not at opposite poles. Indeed, Somers (2009) include anticipation in the very definition he provides of resilience. He considers resilience to be more than just survival; it entails identifying potential risks and undertaking proactive measures to ensure that an organizational thrives despite adversity (p.13). Boin and Eeten (2017) go even further, arguing that precursor resilience is a true form of resilience from anticipation and to which recovery resilience mirrors.

And, if one takes this view, organizational resilience can be understood as the ability to anticipate

future threats, interface with critical and negative events, and then adapt to changing conditions. This is an interpretation of organizational resilience that harmonizes the relationship of organizational resilience with anticipation and throws a rope towards the other perspective on resilience: the adaptive one. Proactive and adaptive resilience go to build Duchek's capability-based vision of resilience and the evolution of this can be considered precisely the conception of resilience as a dialectical synthesis between the adaptive and proactive perspectives that I will address in the next paragraph.

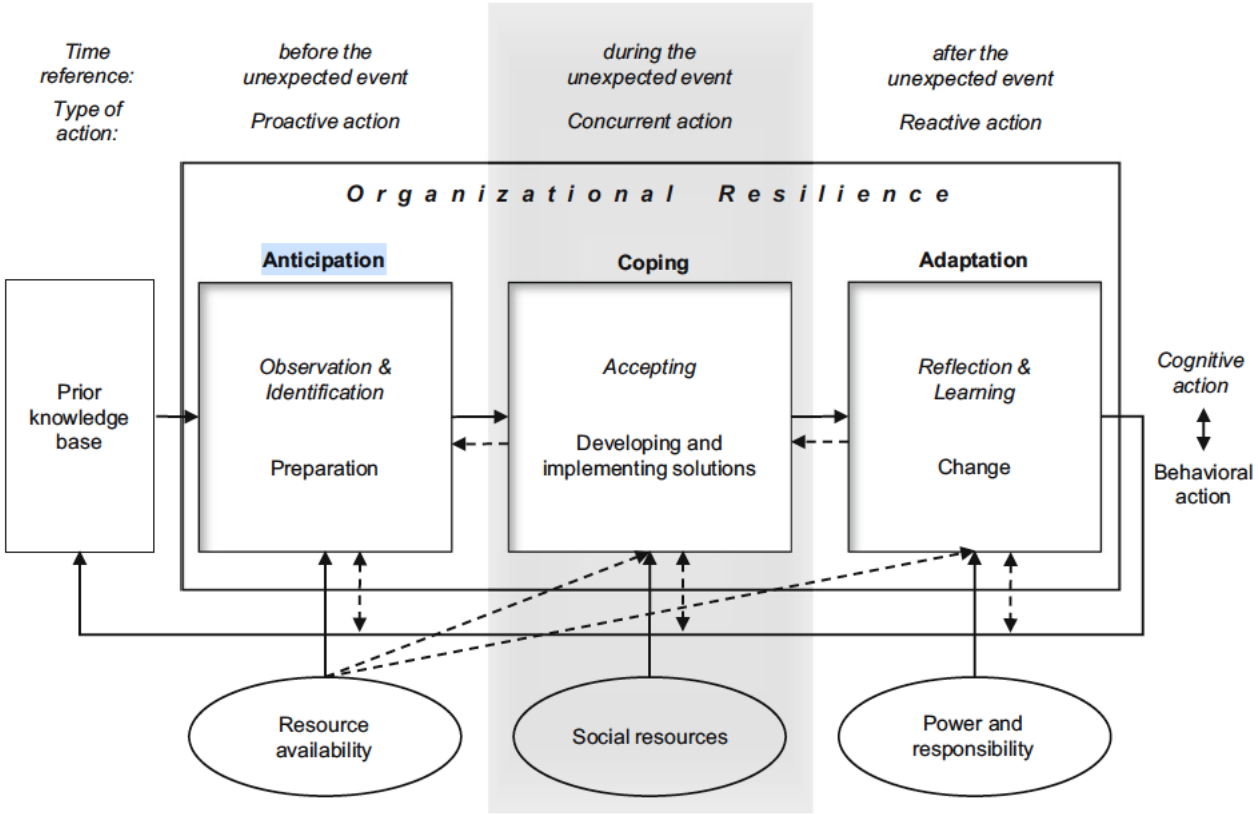

Figure 1.3. A capability-based conceptualization of organizational resilience (source: Duchek, 2020)

1.3.4. Resilience as a dialectic synthesis

Although, adaptive and proactive resilience may seem like two completely different ways of approaching challenges, we have stated that they are two visions whose interaction is essential to go about building organizational resilience. It is possible, at this point, to take it a step further: in order for the organization to develop resilience, a true dialectical interplay between proactive and adaptive resilience is necessary.

Neglecting proactive resilience, facing a challenge and ignoring how one coped with it corresponds to learning in the moment but forgetting for the future ("learning but forgetting"). This situation is because the organization react but without future anticipation, ignoring proactive resilience. At the same time, a focus by the organization only on proactive resilience with the consequence of ignoring adaptive resilience corresponds to contemplative thinking to which no action responds. (Giustiniano et al.,2018).

To describe how the dialectical synthesis between proactive and adaptive resilience is achieved, it is necessary to start from the fact that organizational resilience is be defined as a socially constructed process that enables individuals to be adaptive and flexible while performing a certain action (Cunha et al.,2002). Moreover, resilience is a multi-level construct that recognizes three levels of aggregation: intrasubjective (individual), intersubjective (team), and, finally, collective (organization). These levels interact with each other. Thus, at different levels of aggregation, it is possible to distinguish between resilient-rich individuals, who are able to generate in solutions to problems and maintain their adaptive capacity, and resilient-poor individuals who make inconsistent choices directed toward failure.

According to Baxter (2004), this duality should not be viewed as a contradiction but as a "unity of opposites." Thus, organizational resilience arises as a product of the dialectical interplay between proactive resilience and adaptive resilience, and the interdependence between the different levels of aggregation emerges as a property of organizational resilience.

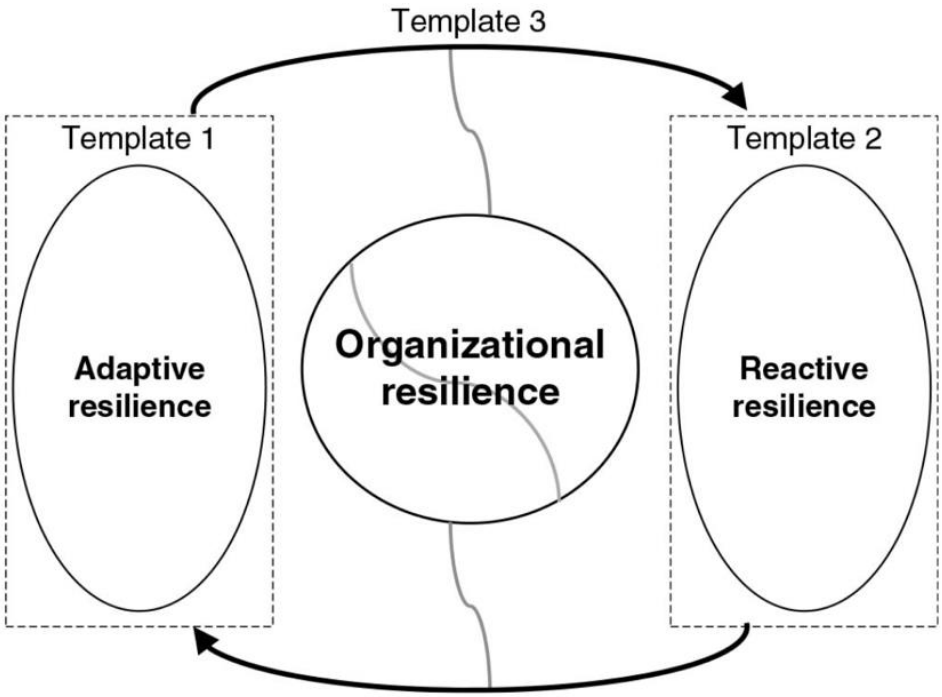

Figure 1.4. Organizational resilience as a dialectic synthesis (source: Giustiniano et al., 2018)

The figure above shows how the dialectical synthesis between proactive and adaptive resilience occurs. The two templates support each other and make the organization resilient.

The dialectical process is articulated involving:

- Adaptive resilience, which emerges when the organization is faced with a situation that is not usual for it. It is essential to be able to resist this pressure and bounce back because it allows the organization to respond adaptively. This form of reaction is made possible by the work undertaken by the other template, that of proactive resilience.

- Proactive resilience, which is a process through which the assumptions upon which the system stands are continually investigated. Much space is given to reflective practices and slow thinking is encouraged (Kanheman, 2011). Across proactive resilience, failures are seen as opportunities to learn (Birkinshaw and Haas, 2016). Hence, it is relative to "double-loop learning" (Meyer,1982), that leads the organization to reflectively ask questions about itself and its practices and to learn from past experiences (Yanow and Tsoukas,2009).
- The outcome, a dialectical vision in which the two templates support and challenge each other continuously and dynamically. Thus, it can be argued that organizational resilience "occurs when the two models are articulated in a dialectic relation of reciprocal constitution" (Giustiniano et al., 2018). Thus, it is only through this dialectical synthesis between adaptive and proactive resilience that the organization achieve resilience.

1.4. Resilience as a multi-level construct: from individuals to organizations

It was illustrated that defining what resilience was has been something that multiple disciplines have wondered about. Also from the point of view of organizational studies, there has been the problem of defining what resilience is.

Indeed, many organizations are facing increasing complexity, equivocality, and environmental uncertainty (D'Aveni, 1995; Carroll,1998; Van Hove et al., 2015). It can be argued that the Covid-19 pandemic was an event that challenged organizations and fits neatly into this context. More broadly, there have been events in recent history that have been so disruptive that they have caused organizations to understand the importance of resilience. It has become vitally important to organizations, not only for their survival, but also to recover and strengthen themselves after a negative event (Tugade and Fredrickson, 2004).

Events	Business and Society	Environment	Politics
September 11 attacks (2001)		•	•
Space Shuttle Columbia Disaster (2003)	•	•	•
Madrid train bombings (2004)	•		•
Hurricane Katrina (2005)	•	•	•
Haiti Heartquake (2010)	•	•	•
Fukushima Daiichi Nuclear Disaster (2011)	•	•	•
Attacks in Norway (2011)	•		•
Global financial crisis (2008-2012)	•		•
Charlie Hebdo terroristc attacks (2015)	•		•
Nice attacks (2016)	•		•
Summer wildfires in Portugal (2017)	•	•	•
Oxfam scandal (2018)	•		•
Genoa bridge collapse (2018)	•		•
Global Covid-19 pandemic (2019)	•		•
War in Ukraine (2022)	•	•	•

Table 1.2. Recent events that showed the importance of resilience for organizations and management (source: own elaboration)

According to an analysis by Giustiniano et al., resilience can be considered as a multi-level construct spanning on three level of aggregation: intrasubjective (individual), intersubjective (team) and collective (organization and other forms of collectivity, i.e. communities).

It is important to point out from the outset that, although organizational resilience incorporates the collective personal resilience of individuals, it is not simply a sum of individual resiliences (Flint-Taylor and Cooper, 2017). In fact, when individuals come together in collective forms of action (teams, communities, and organizations), they acquire additional characteristics that enhance their response to pressures, adversities, and stressors (Giustiniano et al.,2018). Resilience at the individual level, at the collective level, at the team level, and finally at the organizational level will now be described.

1.3.1 Resilience in individuals

At the individual level, resilience has been defined differentially over time and for the various disciplines in which it is conceptually present (Caza and Milton, 2012).

The distinction between resilience as a trait of the individual, as a process, or, more recently, as a phenomenon, has been the subject of intense debate.

The description of resilience as an individual trait is characteristic of most psychological research on resilience. Exponents of this view of individual resilience are Michele M. Tugade and Barbara L. Fredrickson, two professors in the department of Psychology at Boston College and researchers at the National Institute of Health. First, it is necessary to establish what is meant by psychological resilience. It is defined as “the ability to bounce back from experiencing negative emotional experiences and through flexible adaptation to the changing demands of stressful experiences” (J.H. Block and Block, 1980).

Starting from the broaden- and-build theory of positive emotions (Tugade and Fredrickson 2004; Fredrickson 2004) as a framework for understanding psychological resilience, they want to demonstrate that resilient individuals use positive emotions to bounce back from negative emotional experiences. According to broaden-and-build theory, positive and negative emotions have different and complementary adaptive functions and cognitive and physiological effects. Negative emotions, for instance anger, anxiety, sadness and similar, circumscribe the set of though-action to which an individual may resort at a given moment to prepare to act in a certain way (e.g. escape when afraid).

Conversely, a subset of positive emotions such as joy, contentment, interest and love expand the thought-action repertoire, broadening the range of cognitions and behaviours that come to mind.

Joy drives to play and be creative, and the necessity to do so is evident not only in physical and social behaviour, but also in the intellectual and artistic one. Interest pushes the need to exploring, letting in new information, and expanding the self in the process. Contentment leads to enjoying current life circumstances and integrating them into new views of self and the world.

Love, seen as an amalgamation of the three previous emotions creates “recurring cycles of playing with, exploring, and savouring our loved ones” (Fredrickson, 2004),

To playing with, to explore or to savour and integrate each represents the ways in which positive emotions expand habitual ways of thinking or acting. These expanded mindsets, in turn, go on to build an individual's physical, intellectual, and social resources. This perspective on positive emotions may help explain why those who experience positive emotions in a stressful context are able to benefit from their expanded mindset and successfully regulate their negative emotional experiences.

The authors recur to three studies to predict the different ways in which resilient people use positive emotions. This research makes use of a multimethod approach, with the aim to examine the relationships between positive emotions and phycological resilience. From now on, we will refer to the three studies by calling them Study 1, Study 2 and Study 3. Participants' psychological resilience was assessed for all three studies with the Ego-Resiliency Scale. It was developed by Block and Kremen for the purpose of assessing “trait psychological resilience, which is the ability to modify responses to changing situational demands, especially to frustrating or stressful encounters” (Block and Kremen, 1996). This scale consists of 14 items, each of which is answered on a 4-point Likert scale, ranging from 1(does not apply at all) to 4 (applies very strongly).

57 people, undergraduates at the University of Michigan, between the ages of 17 and 40 and of various ethnicities, participated in Study 1. Participants were asked to mentally prepare a speech on a predetermined topic (specifically, “Why you are a good friend”). After the period of preparing the speech, they were required to pronounce it in a video camera while speaking clearly. Respondents were told that the recorded speech would be shown to peers for evaluation, but in fact no participants in the experiment shared their speech. This study aimed to monitor the bodily reactions and emotions of the participants, who were in fact consensually equipped with psychological sensors.

One finding from Study 1 is that experiencing positive emotions helps resilient individuals accelerate cardiovascular recovery after experiencing negative emotions. In this way, resilient individuals may have the opportunity to discover new mechanisms for relating emotions.

Another finding is that high-resilient participants rated the stressful task as less threatening, compared with low-resilient participants.

Going on, the objective of Study 2 was to examine the role of cognitive appraisals in psychological resilience. Two types of appraisals are involved in the experiment. Threat appraisals are those in which the perception of danger exceeds the perception of abilities or resources to deal with the stressor. Challenge appraisals are, on the contrary, those in which the perception of danger does not exceed the perception of abilities or resources to cope with it. Participant were 57 undergraduates of the University of Michigan, between the ages of 18 and 22 and of various ethnicities. The study was conducted as follows. Once the guidelines for preparing the speech mentioned in Study 1 were received, participants were instructed to listen, via random assignment, to one of two verbal instruction sets. In the challenge condition, participants were told to think of the task as a challenge to overcome. In contrast, in the threat condition, participants were told that their performance would be evaluated with the goal of predicting their academic and social success.

The findings of Study 2 confirm the predictions made by the authors: positive emotions and the two appraisals are important factors in their contribution to psychological resilience.

On the other side, results show that individuals with low levels of psychological resilience are not necessarily destined for meagre emotion regulation consequences. These individuals, using positive appraisals to generate positive emotions, have the ability to effectively regulate negative emotional experiences.

When instructed to appraise the task as a threat (vs. challenge), individuals with higher psychological resilience demonstrated relatively shorter durations of cardiovascular reactivity and relatively greater experiences of positive emotions. Conversely, durations of cardiovascular reactivity in response to the task did not differ by level of trait resilience for those instructed to appraise the task as a challenge (vs. threat). Consistent with our predictions, when assessing a stressful situation as a challenge, low resilient individuals may begin to resemble high resilient individuals who tend to exhibit trait-like positive emotionality. These outcomes suggest that low-resilience individuals may benefit from both positive appraisals and positive emotions during the coping process.

Study 3 verifies Tugade and Fredrickson's prediction that positive emotions are associated with resilient individuals' ability to find positive meaning in negative circumstances.

There were 192 participants, undergraduates at the University of Michigan, between the ages of 18 and 23 and of various ethnicities. Participants were asked to write an essay about the most important personal problem they were facing at the time in as much detail as possible. Afterwards, they were asked to answer open-ended questions about the meaning, significance, and long-term consequences of these

circumstances. The findings of Study 3 showed that the level of frustration with the reported problem was found to be equal between high- and low- resilient individuals. Differences emerged in participants' reports of positive emotions. In fact, when describing how they felt about the problems described, high-resilient individuals, despite the frustration, reported feeling happiness and excitement, compared with low-resilient individuals.

Across these three studies, the authors therefore demonstrated that the experience of positive emotions contributed to participants' ability to achieve efficient emotional regulation (Studies 1 and 2) and to find positive meaning in negative circumstances (Study 3).

As mentioned above, resilience takes the form of an attitude and a trait of the individual, to such an extent that the authors themselves distinguish between "high- and low-resilience individuals" in their work. In this way, resilience becomes a stable personality trait of an individual.

A completely different way to conceive of resilience is to view it as an actual dynamic process rather than a trait of the individual.

Luthar, Cicchetti, and Becker, in a paper on critical evaluations and future guidelines about the construct of resilience describe resilience as a process and contextually:

1. ambiguity in definitions and terminology,
2. variations in interdomain functioning,
3. instability of the resilience phenomenon, and
4. theoretical concerns, including questions about the utility of resilience as a scientific construct.

To begin, they argue that the basis for the difference in conceptualizing resilience as an individual trait rather than a process stems from the ego-resiliency literature.

Ego-resiliency consists of a range of individual traits from general resourcefulness and sturdiness of character to useful flexibility to respond to various environmental circumstances. On the other hand, resilience, when considered as a process, presupposes the experience of significant adversity.

There are thus two substantial differences between ego-resiliency and resilience: the former describes a characteristic of the individual, the latter a dynamic development process. Again, ego-resiliency does not necessarily involve exposure to adversity, whereas resilience does. For this reason, terminologically, the term resilience should be used only where there is a “maintenance of positive adjustment under challenging life conditions” (Masten, 1994).

In this type of situation, according to Masten, the term “resiliency” should also be avoided because it suggests the idea of a personal connotation. In fact, the scientific portrayal of resilience as an individual trait may lay the groundwork for considering that some individuals "simply do not have what it takes to overcome adversity" (Luthar et al., 2009).

Second, a characteristic of resilience that must be taken into account is its multidimensional nature.

In a study by Kaufman et al. involving children who had experienced maltreatment, it was found that nearly two-thirds of the children were resilient academically, but only 21% of them exhibited resilience in the area of social competence. Such a result may cast doubt on the veridicality of the resilience construct.

Thus, given such a difference for the same individual to exhibit competence in different domains, a person cannot be labelled as universally resilient. For this reason, in describing their findings, researchers should specify the domains to which these results apply, explicitly excluding other domains (e.g., "behavioral resilience," "emotional resilience", "educational resilience") (Luthar, 1993).

A further implication due to the multidimensional nature of resilience and thus inconsistencies among the tomorrows is the difficulty of identifying optimal indicators of resilience when studying individuals. Since there are different ways of assessing positive adaptation. One solution might be to take conceptual considerations into account when deciding whether to prioritize some outcome domains over others, to combine or consider separately, and "criteria for resilience stipulate excellent versus adequate functioning" (Luthar et al., 2000).

The third point considered by Luthar and colleagues regarding the critical evaluation of the concept of resilience revolves around the robustness of evidence on resilience. Starting from the assumption that this construct involves exposure to significant risks, it must be considered that there are uncertainties regarding the measurement of risk (for instance statistical risk versus actual risk or subjective versus "objective" risk). Doubts about the robustness of the construct are raised because it is difficult to assess whether, in a given study, all individuals considered resilient have experienced comparable levels of adversity. In addition, attention to the fact that there is "ontogenetic instability" in the phenomenon of resilience is drawn and this means that high-risk individuals rarely maintain positive adjustment over time.

In conclusion, the possibility of making progress in the area of resilience is penalized because of the fact that empirical studies are seen as opposed to theory-based studies (Luthar et al.,2000).

The last and more recent point of view on resilience is to consider it as a "phenomenon defined by the success of the process involved" (Leipold and Greve, 2009). In other words, Leipold and Greve argue that resilience, conceived as individual stability under significant adverse conditions, results from coping, i.e. assimilation and accommodation processes. These processes, in turn, are closely related not only to personal conditions, but also to situational ones. Resilience would therefore constitute an important conceptual and connective bridge between coping and development. Before explaining the integrative model of coping, resilience and development, some clarifications must be made about the assessment of coping reaction and the relationship between adaptation, stability and manteinance.

First of all, although the problem of how to evaluate the "success" of a coping reaction remains, one cannot disregard the link between its functionality and the individual's developmental situation. It follows that coping reactions and developmental processes differ from each other in the time frame: the former reflects short-term changes in reaction to a changing constellation that cannot be resolved with the means

available, development instead has to do with long-term changes in a person when he or she cannot, with his or her own emotional, cognitive, and behavioral baggage, deal with challenges.

Second, the temporal difference between coping and development is accompanied by a conceptual one. Stabilizing coping processes can be contemplated in this framework. and support the idea, also supported by Leipold and Greve, that resilience is neither an individual trait nor a specific process, but rather the description of a "normal development course under potentially endangering circumstances" (Leipold and Greve, 2009).

Therefore, not only visible changes produce development, but also the maintenance of equilibrium can be considered the result of a developmental process.

Finally, through this diagram, the integration of coping, resilience and development can be explained.

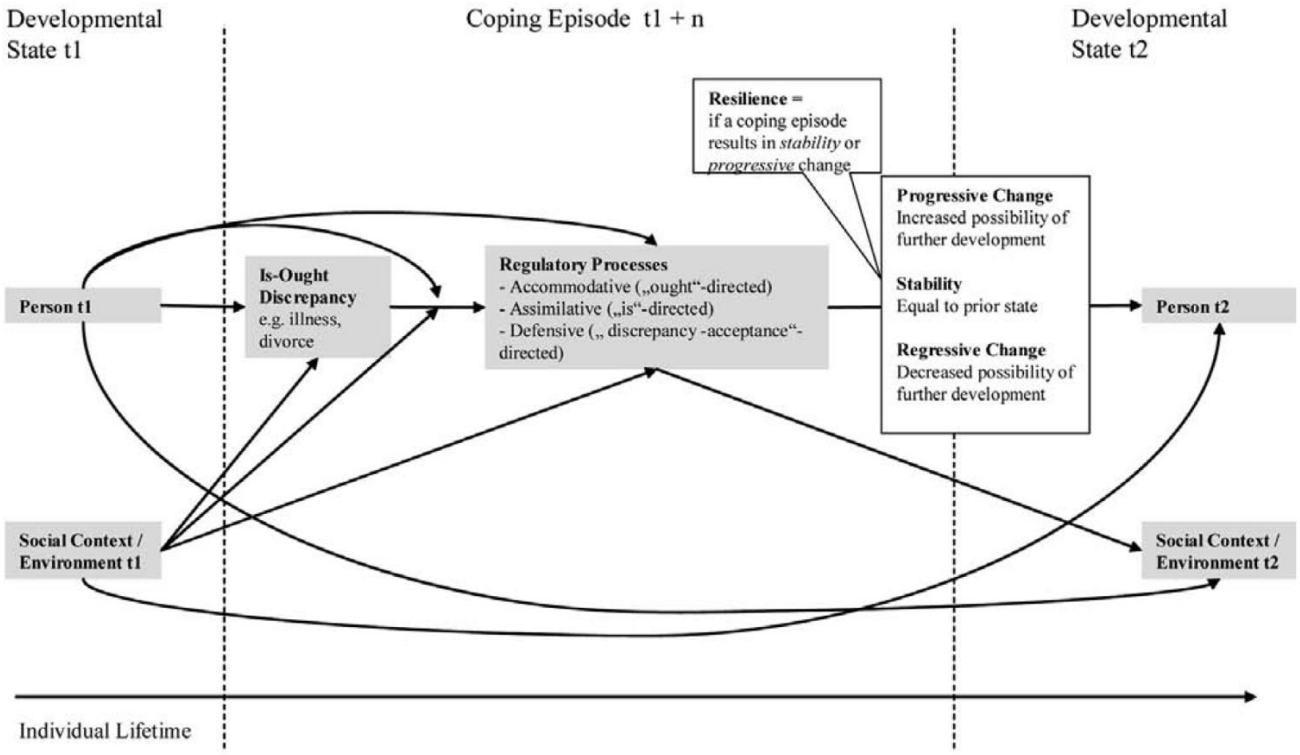

Figure 1.5. An integrative model of coping, resilience, and development (source: Leipold and Greve, 2009)

The starting point is the occurrence of a critical event or the presence of a developmental stressor in a person's life. It then, through regulatory processes, determines whether to recognize the stressor as such. If it is perceived as stressful, the subject activates assimilative processes, which include the activation of social resources, and accommodative ones. These two processes are fundamental because they influence the impact of the crisis on other dimensions of the individual's life, such as his subjective well-being or health.

When the individual enacts assimilative strategies, he or she essentially decides to take action to change the situation by enacting intentional self-development with the goal of improving alignment between their normative expectations and goals in relation to themselves (Brandtstädter, 2006).

It may happen, however, that this desire to solve the problem in an active way may come up against difficulties or costs that are too high. In this case, the reactive preference adjustments come put in action. They correspond to a revision of the goals and the standards to the light of the actual possibilities: it is the accommodative mode.

Two universally present aspects can be inferred from this discussion about the three views about individual resilience: first, resilience requires the presence of some negative stressors and that individuals are exposed to concrete threats (Luthar et al., 2000) Second, resilient individuals perform positive adaptation in the face of stressful or menacing events (Giustiniano et al., 2018).

According to Coutu there are three conditions that qualify individual resilience and also, more broadly, organizations:

1) acceptance of reality

2) the propensity to make meaning from an adverse situation

3) the ability to make do whatever is at hand (Coutu,2002).

Resilience as a process is viewed as a developmental journey characterized by evident competence in the face of difficulties in the workplace to which growth follows (Caza and Milton, 2012). Thus, not only is resilience not an intrinsic characteristic of the individual (Gillespie et al.,2007), but it cannot be separated from the context by which the individual is surrounded. Despite this, according to Giustiniano et al. (2018), one cannot ignore the fact that, there are some individuals who are more resilient than others by virtue of some of their personality traits, such as optimism and confidence.

As Tugade and Fredrickson's study has well demonstrated by using the Ego-resiliency scale by Block and Kremen (1996), individual resilience can be measured and there are various ways to do so.

The Resilience Scale (Wagnild and Young, 1993) is one of the first to be developed and also one of the best known and most widely used. It consists of 25 items, which are used to provide a global score based on two scores which represent two dimensions: personal competence and acceptance of self and life. There is a shorter version of this scale, consisting of 14 items and used in Brazil and Japan. Smith et al. (2008) use the Brief Resilience Scale (BRS) instead, which is useful for measuring recovery from stress. Nishi et al. (2013) validated another scale, namely the Tachikawa Resilience Scale, which consists of 10 items.

Finally, there is the PsyCap Questionnaire (PCQ) (Luthans et al.,2015), which measures not only resilience but also hope, optimism and self-efficacy. There are two versions: one consisting of 24 items (PCQ-24) and the other of 12 items (PCQ-12).

All measures, including the PCQ, are self-reported measures and, as such, have limitations. These limitations may be the result of the biased ideas that individuals have about themselves and about them some particular aspects about themselves.

Some, such as Harms et al. (2017), support the idea that implicit measures can help overcome this limitation and have developed a measure of implicit PsyCap (2021). Others, oppositely, are of the idea of bypassing any kind of self-report and implicit measure, using other-reports to assess PsyCap (Rego et al.,2017).

1.3.2. Resilience in collectives

As a multi-level construct, resilience connects the individual, the team, the organization and its environment. The latter can be as large as a country, for example. Resilience, in this case, can be described as the general quality that enables the individual, community, or organization to cope with, adapt to and recover from disastrous events (Horne, 1997; Buckle et al., 2000; Pelling and Ditto, 2001; Riolli and Savicki; 2003).

An example of a community that faced and successfully overcame a dreadful accident is that of the passengers of Uruguayan Air Force Flight 571, that crashed in the Andes Mountains of Chile on October 13, 1972.

The 16 survivors of the 45 passengers are the characters of a case of practical resilience when surviving under extreme conditions. They lived for ten weeks in poor sanitary conditions, melting ice from the mountains for drinking. Due to the harsh climate, which reduced the availability of vegetables and animals to eat, it was clear to the survivors of the flight that, to continue to survive ,they would have to eat the flesh of those who had died (Weick, 1993). This episode, which can be considered exceptional, has gone down in history as El Milagro de Los Andes (the Miracle of the Andes), is a case in which a group of individuals, all of Roman Catholic religion, give meaning to the practice of necrotic cannibalism. Some of the survivors have linked the eating of human flesh to Holy Communion, others have justified it with a sacred verse from John (15:13): “no man hath greater love than this: that he lay down his life for his friends” (Read, 1974).

If we consider that in the field of organization studies, sensemaking is the process by which people attribute meaning to something that happens (Weick, 1979), the miracle people of the Andes went even further, attributing meaning to what for them would have been considered a sin or even a taboo, namely the practice of cannibalism. This was possible through collective support and the de-tabooing of a practice considered profane allowed for the expression of resilience by the group, who challenged and questioned their own values (Giustiniano et al., 2018).

As anticipated, it is incorrect to view team resilience as merely the sum of individual resilience.

Indeed, there may be resilience processes that operate only at the collective level (Brodsky et al.,2011) through the creation of a culture that supports the community, the development of shared values, and a reinterpretation of stressors through sensemaking (as in the example of the Andes miracle workers).

Given all of these factors, Lengnick-Hall and Beck (2005) provided a definition of collective resilience. It is described as a "unique combination of cognitive, behavioral, and contextual properties that enhance the ability of a company [as well as other communities] to understand its current situation and develop tailor-made responses that reflect that understanding" (Lengnick-Hall and Beck, 2005, p.750).

1.3.3. Resilience at the team level

Before talking about resilience within teams, it may be helpful to define what is meant by them. Teams are the primary form of collectivity in which individuals gather and are defined as “social entities in which members share - implicitly or explicitly- a common identity and pursue some collective goal, interdependently ” (Giustiniano et al., 2018). A classic example of a team is the family until it is divided by divorce or lack of trust between members, but there are also temporary teams, which are those composed of individuals who work together to achieve a goal, and then are disbanded.

For the team level, resilience cam be defined as “a dynamic and psychosocial process which protect a group of individuals from the potential negative effect of stressors they collectively encounter. It encompasses processes whereby team members make use of their individual and collective resources to positively adapt during experiencing adversity” (Morgan et al.,2013, p. 552).

The analysis of resilience at the team level has not received much attention, despite being essential in the management practices of organizations today. Teams may face challenges that negatively impact resources, performance, and even the theme itself, as these circumstances may diminish its cohesion and the well-being of its members. When difficult situations occur, a reliable response from the team can only be had if it is resilient (Alliger et al., 2015).

Resilient teams have the ability to see error as a source for learning (Edmondson,2012) to the point that they develop the ability to appreciate imperfections (Weick 1979,1995), which enhances collective mindfulness and attention to possibilities for improvement. In addition, they are more willing to support other members in order to engage in productive behaviors such as this a means to improve their own performance (Clapp-Smith et al., West et al.,2009; Walumbwa et al., 2011). Finally, collective resiliency should be conceptualized as a social factor present in groups rather than an individual trait (Bennet et al.,2010).

Sharma and Sharma (2016) identified ten components that impact team resilience. These 10 components can be grouped into four factors:

1. Group structure. It concerns the relationships between team members and deals with fair communication, shared vision when facing stressful situations, and shared leadership.
2. Mastery approaches toward adversities. It represents the ability, possessed in common by team members, to promote learning and improvement in challenging situations.
3. Social capital. It consists of the social norms and trustworthy relationships that make it possible

for team members to work toward a common goal.

4. Collective efficacy. It represents the belief that team members, as a group, can organize themselves to accomplish tasks efficiently and successfully.

An important characteristic of resilient teams is that they abhor "blame culture" in the face of mistakes that are committed by team members. Conversely, they consider that addressing mistakes only constructively is important for cultivating resilience. Furthermore, this tendency not to attribute mistakes to individuals allows resilient teams to build authentic relationships (Pentland, 2012). In creating this positive environment, leaders also play a role: in particular, they must be able to combine humility and grit (Rego et al., 2017a; Rego et al., 2017b; Rego et al., 2018) and promote psychological safety among team members (Edmondson & Lei, 2014; Frazier et al., 2017; Hu et al., 2017).

1.3.4. Resilience at the organizational level

From an organizational perspective, for resilience to be considered a positive attribute, it is necessary that, on one hand, the members of the organization are able to cope with the challenges that arise unexpectedly (Weick and Sutcliffe, 2001 [2007]), and, on the other hand, that they are able to prepare the organization for the changes it may face (Garud et al.,2006). Therefore, organizational resilience contains these two elements, which are closely interconnected: the ability to react in the face of the unexpected and the ability to understand in advance the factors that could impact on the organization, changing it, and, consequently, prepare the organization for them. Thus, in this all-encompassing approach, there must be "balance between control and innovation" (Giustiniano et al., 2018).

Of course, for organizations, resilience is not an innate characteristic: on the contrary, there are processes through which it can be built.

Many organizational scholars have pushed the need to develop processes that go into building organizational resilience (Lee et al., 2013; Whitman et al.,2013).

Eisenhardt, Furr and Bingham (2010) explored the microfoundations of organizational performance and the role of leaders in balancing efficiency and flexibility in dynamic environments. In this analysis, they develop three intuitions:

1. From a structure perspective, organizations, while seeking efficiency, unbalance themselves towards flexibility and this occurs when organizations find themselves working in a dynamic and changing environment.
2. From the perspective concerning the environment in which the organization actually works, the authors argue that there is no dynamic context *per se*, but there are multiple levels of the environmental construct that "influence the importance and ease of balancing efficiency and flexibility".
3. Third, they highlight how leaders, in order to balance efficiency and stability, tend to favor single

but also cognitively complex solutions, trying to avoid maintaining contradictions. Eisenhardt and colleagues suggest that leaders, in order to balance efficiency and flexibility, should adopt heuristics-based "strategies of simple rules" and higher-order "expert" cognition.

Balancing Efficiency and Flexibility in Dynamic Environments

Current view	Neglected issues	Revised view
Structure Balance between the competing demands for efficiency and flexibility	Organizations often drift toward efficiency as they grow and age	Balance efficiency and flexibility by unbalancing to favor flexibility 1. Heuristics-based simple rules strategic processes 2. Simplification cycling 3. Flexibility-injecting structures
Environment Emphasize efficiency in stable environments, flexibility in dynamic environments	Environmental dynamism is a multidimensional construct (e.g., ambiguity, unpredictability)	Ease and importance of maintaining optimal structure depends upon unique implications of environmental dimensions
	Organizations often simultaneously face several environments	Balance for multiple environments within a single market or a single organization
Cognition Cope w/efficiency–flexibility tension via coexisting and contradictory agendas for efficiency and flexibility	Higher-order thinking and expertise provide elegant, single solutions	Cope w/efficiency–flexibility tension via single higher-order solutions using expertise 1. Abstraction to resolve apparent contradictions 2. Cognitive variety to flexibly recombine efficient mental templates 3. Interruptions

Table 1.3. Balancing Efficiency and Flexibility in Dynamic Environment (source: Eisenhardt et al., 2010)

From these findings, it can be deduced that for resilience to occur, hierarchical structures based on a strictly top-down approach should be avoided (Somers, 2009).

Based on these considerations, the difficulty of balancing efficiency and flexibility and finding the right organizational structure for resilience to manifest is understandable.

Given these troubles in building resilience, the BSI group, a business that helps organizations excel, published in collaboration with Cranfield School of Management a business report that offered an organizational resilience framework for companies (https://www.bsigroup.com/) The report has two objectives: "manage risk and adapt for future business success".

The model consists of a combination of the standard "plan-do-check-act", already developed by Deming (1982) with the so-called "4Sight". Designed as an organizational resilience agency for leaders, 4Sight considers four sights that leaders should adopt when dealing with complex problems, when facing big changes or a crisis, that when reality presents itself as "incomplete or contradictory knowledge".

The four pivotal elements of the model are:

1. Foresight: anticipate, predict and prepare for your future
2. Insight: interpret and give an answer to the conditions that you are living in that particular moment

3.Oversight: monitor and review the happened events and make an assessment and a valuation of them

4.Hindsight: from this experience, draw a useful lesson.

PDCA	4Sight
Approach	**Approach**
Plan (defining your policy, objectives and targets)	Foresight (Anticipate, predict and prepare your future)
Do (Implement your plans within a structured management framework)	Insight (Interpret and respond to your present conditions)
Check (Measure and monitor your actual results against your planned objectives)	Oversight (Monitor and review what has happened and assess changes)
	Hindsight (Learn the right lessons from your experience)
Act (Correct and improve your plans to meet and exceed your planned results)	Act (Respond to and create disruptions and opportunities)
Works well when the challenge:	**Works well when the challenge:**
Is easy to identify and define	Is difficult to agree; easy to deny
Is resolvable using current expertize and known solutions	Requires new ways of thinking, beliefs, roles, relationships and approaches to work
Has a definite stopping point – when the solution is reached and can be judged as right or wrong	Has no stopping rule – how much is enough? No right or wrong, just better or worse outcomes
Leader's role:	**Leader's role:**
Agree goals, build commitment, provide answers	Identify the problem, connect people's interests to the work of solving it and ask searching questions
Clarify roles and responsibilities	Empower people to act
Keep emotions out – "we can solve this"	Let people experience threat – within a productive range of distress
Fit solutions around current ways of working (culture, practices)	Challenge norms—"we could be very different"
Seek consensus and reduce conflict	Embrace diversity of opinion and scepticism
Focus on "making what we do better"	Focus on "doing better things"

Table 1.4. Comparing PDCA and 4Sight for Organizational Resilience (source: Denyer, 2017, pag. 23)

From the table above, you can see what the limitations of PDCA are when compared to 4Sight.

First, PDCA is useful in reproducing consistency over time, while and alone comes across as a simplistic model that works well when "the challenge is easy to identify and define". Complementarity with 4Sight enables planning that makes continuous development of existing processes and systems possible.

The second consideration that can be made concerns the different perspective with which the two models look at reality: in fact, while PDCA assumes that everything will go exactly as it has been programmed and planned, 4Sight contemplates and considers the possibility that unexpected events may occur and the need to acknowledge it.

2. Ecological, energy transition, and international actions for sustainability

2.1. Ecological transition

One of the first times the word “transition” was used in combination with the topic of ecology was in 1972, in the “The Limits to Growth” report, also known as the “Meadows Report”. This was a team project, commissioned by MIT from the Club of Rome, which involved experts from various fields (educators, economists, humanists, industrialists, scientists, and national and international civil servants) from ten countries.

The intent of the project was to make a “Predicament of Mankind”, that is, to examine a number of problems that bedevilled people of all nations: poverty, loss in faith and traditional values, uncontrolled development of cities, economic and financial problems such as inflation and employment, and, last but not least, environmental degradation (Meadows et al., 1972).

In the report, the transition emerged as a shift from a growth model to one of global equilibrium, with a view to averting the ecological risks that would result from population and economic growth.

Fifteen years later, the “Our Common Future” or Brundtland report of the World Commission on Environment and Development, recommended a “transition to sustainable development”, identifying the same threats acknowledged by the Meadows report as problematic for “our common future”.

These initial remarks give the opportunity to state two things. The first is that human development in all its forms (economic, demographic, urban) has been perceived for decades as risky and needing attention for the life of the planet and all its human and non-human inhabitants.

The second is that ecological transition, involving issues pertaining to the environment, is but one of the forms of which the sustainable transition is composed.

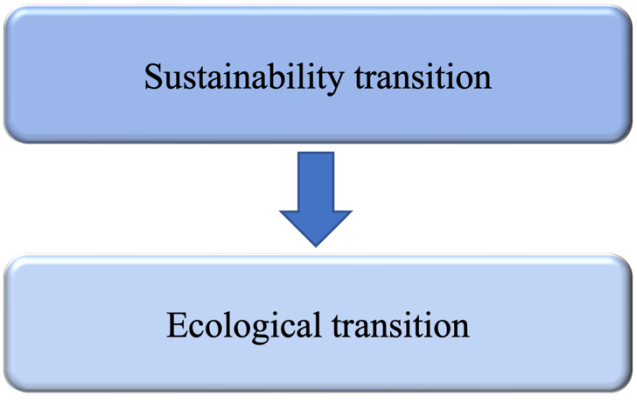

Figure 2.1. Ecological transition as a form of sustainability transition (source: own elaboration)

Moreover, in accordance with the European observatory for Transition, ecological transition refers to:

- energy transition, then the achievement of energy efficiency by using renewable sources;

- industrial transition, thus the preference for local production of goods made from recycled materials in the perspective of a circular economy;
- agri-food transition, that is, the replacement of industrial agriculture by an organic one.

Sectors such as transportation or energy and water supply can be defined as socio-technical systems.

These systems are composed of networks of various typologies of actors (companies, individuals, collective entities and other organizations) and institutions, which set technical and societal standards and good practices, as well as regulations. Along with the network of actors and institutions, "material artifacts and knowledge" are part of socio-technical systems (Geels, 2004; Markard, 2011). Through their interaction, they provide services for the society. Therefore, contact among individuals (singular or gathered in organizations) is a key part of the sustainable transition process. This view is also supported by Rob Hopkins (2014), a professor specialized in environmental issues and founder of a movement for the ecological transition of cities, who argues that "the ecological transition process refers to changes in habits and lifestyles, economic development and planning, based on experiential learning of the various actors involved."

Ultimately, socio-technical transition is a chain of actions that result in a major change in socio-technical systems (Geels and Schot, 2010).

Thus, it is possible to deepen the meaning of the transition. It entails significant shifts in many areas, including technological, material, organizational, institutional, political, economic, and sociocultural. Transitions involve different actors and take place over a long period of time (e.g., 50 years and more). New products, services, business models, and organizations develop during such a change, partially complementing and partly substituting for current ones (Markard et al.,2012).

The fundamental difference between socio-technical transitions and technological transitions is that the former, in addition to major changes from a technical point of view, involve a change in the habits of actors, an intervention in a regulatory function by institution and a consequent change from a cultural point of view.

Thus, socio-technical transitions encompass several supporting technological and non-technological innovations: these are called complementary infrastructures. For example, train transportation, that represented a new way of getting around, required the creation of infrastructure such as tracks, new traffic planning in the involved areas, and *ad hoc* regulation by the institutions. At the same time, it also changed the practices of users in other areas than mobility (e.g., way of producing and trading) (Markard et al.,2012).

As a form of sustainable transition, ecological transition shares its characteristics, which make it a peculiar topic within the debate for the social sciences (Köhler et al.,2019):

- multi-dimensionality and co-evolution: technologies, markets, user behaviours, customs, traditions, infrastructures, policies, industrial structures, and supply and distribution chains are all components of socio-technical systems. As a result, transitions are co-evolving processes implying changes in a wide array of areas and dimensions. Furthermore, transitions

are not linear processes, but rather a complex of "multiple and interconnected events".

- multi-actor process: transition is a multi-actor process in which all the actors mentioned above are called to take part in. They have their own assets, expertise, ideas, attitudes, opinions, methods, and ambitions. Transitions contain a huge spectrum of agency (e.g., decision-making, tactical computation, learning, investing, conflict, power dynamics, and forming alliances) and this makes it impossible for one area or discipline alone to successfully deal with the transition.
- Köhler et al. (2019) also captures an interesting aspect that is at the heart of the transition process: the relationship between stability and change, the dialectic of which should not be overlooked by the actors and disciplines involved at the forefront of the transition. Indeed, while it is true that many sustainable innovations have been introduced (e.g., solar panels, wind turbines, electric vehicles, urban agriculture), there is also a world moving around the less sustainable alternatives that are entrenched in terms of society's habits and at the center of a profitable economic inducement (to give an example, gas-fired power plants and intensive agricultural systems) (Unruh, 2000).
- long-term process: transitions are long-term processes because innovations take time both to develop and to spread widely. As mentioned in the previous point, a difficulty also lies in disrupting existing habits on the part of users. As a matter of fact, all social phenomena have impetus value for transitions, but only a few provide a flywheel force (Rotmans et al.,2001). According to Rotmans and his colleagues, in a transition can conceptually distinguish four stages:

    1. A dynamic equilibrium phase in which the status quo does not change visibly.
    2. A take-off phase in which the change process is initiated as the system's state begins to transform.
    3. A breakthrough phase in which observable structural changes occur as a result of a cascade of socio-cultural, economic, institutional, and ecological changes that interact. Collective learning, diffusion, and embedding processes all occur during the acceleration phase.
    4. A period of stabilization during which the rate of social change slows and a new dynamic equilibrium is established.

  Since the established equilibrium presupposes stability and inertia, a transition entails a fundamental shift in the introduction of new practices and rules, which can be accelerated by unanticipated or one-time events such as an oil crisis, a war (for example, the war in Ukraine, which is still ongoing and could alter the energy transition for political reasons), or major accidents (e.g., the nuclear catastrophe at Chernobyl).

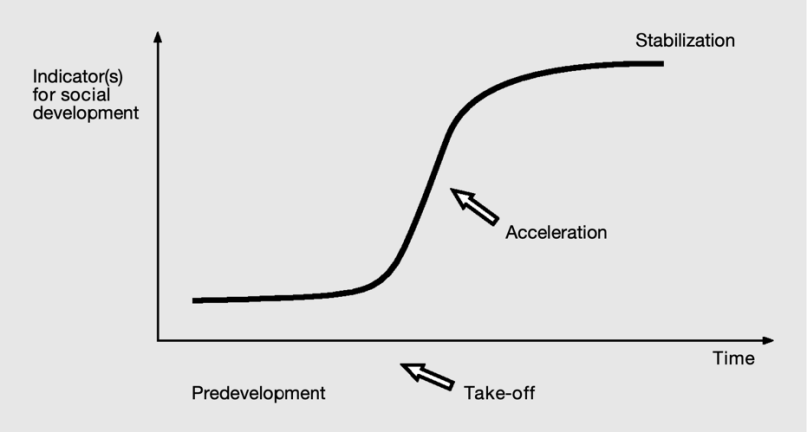

Figure 2.2. The four phases of transition (source: Rotmans et al., 2001)

- open-endedness and uncertainty: these are certainly due to the fact that "there are several processes of transition" (Rosenbloom, 2017), thus the outcome of it unpredictable. Moreover, all the stakeholders already mentioned can play a key role in changing the fate of the transition. Also because of this, transition is not a linear process.
  The transition can go through failures, phases of great stagnation or phases of hype, which are also often conditioned by price trends in the market. In addition, the outcome of the transition may be conditioned by political or sociocultural processes (e.g., the sense of urgency to incorporate a sustainable innovation or not may be subject to rises or falls resulting in changing public agendas).
- values, contestation, and disagreement: since there is no unambiguity in defining what is meant by sustainability, there is also no agreement on transition pathways to achieve it. Moreover, very often transition processes encounter resistance from cyclopean industries whose business models are threatened by the transition (e.g., the oil industry or the agribusiness industry). These industries often act strategically to protect their interests by slowing down the sustainable transition process.
- sustainability is a public good, subject to free-riding. Therefore, private actors (whether businesses or citizens) have limited incentives to pursue it. Thus, a well-designed public policy intervention is needed. It must act through the promulgation of environmental standards, regulations, and innovation policies, but also by providing subsidies to privates to promote their participation and actively involve them in the sustainable transition process.

At this time, it is appropriate to state that sustainable transition involves a large multitude of actors and multiple disciplines.

Among them, certainly firms play a key role, insofar as they can play the role of innovators, bringing new products and services to the market, revolutionizing their business models, and paving the way for the

formation of industries suitable for developing and producing the new technologies (Farla et al.,2012; Planko et al.,2016).

In addition to these activities, they may direct and influence collective expectations and carry out lobbying for the introduction of new policies or standards related to their businesses (Konrad et al.,2012; Rosenbloom et al.,2016).

In analyzing the role of industries within the context of sustainable transition, it is possible to observe a marked difference in the approach to the topic between transition scholars and organizational studies researchers (Köhler et al.,2019).

Transition scholars focused primarily on the influence of firms on the transition process (e.g., on the abilities of industries to foster or hinder it) and how changes within organizations connected to transitions also impact policy, institutions, and society. However, in terms of time, transition scholars have only just begun to analyze the role of industries within the framework of transitions. Organizational studies, on the other hand, has been examining disruptive innovations and changes and the consequences of the creation of new industries for longer. This is the reason why organizational scholars have often highlighted the link between social responsibility and sustainability issues (Bansal and Song, 2017; Hahn et al., 2016), as for example has been happening for some time with the climate change question (Wittneben et al., 2012).

Subsequently, it can be concluded that transition scholars use a more systemic approach, a methodology that is less common in management studies (Bansal and Song, 2017).

2.1.Energy transition

Energy transition can be defined as the "changing composition of primary energy supply" (Smil, 2017). In the current historical period, with this expression is meant the shift from traditional fossil fuels (e.g., oil, natural gas, and coal) to renewable sources (e.g., wind or sun) to produce energy. Thus, the energy transition process is purportedly focused on decarbonization, or the progressive reduction aimed at the complete elimination of CO2 in the atmosphere, as envisioned by the Paris Agreement. It is a legally binding international climate change treaty adopted by 196 Parties at COP 21 in Paris on December 12, 2015 and went into effect on November 2016. Its goal is to keep global warming considerably below 2 degrees Celsius, preferably 1.5, compared to pre-industrial levels. The Paris Agreement is particularly important in the fight against climate change because for the first time a binding agreement confronts nations with the need to take common and necessary actions to combat climate change and adapt to its effects.

Countries want to reach global peaking of greenhouse gas emissions as soon as possible to produce a climate neutral world by mid-century in order to meet this long-term temperature objective.

Furthermore, given the elements to which the ecological transition refers according to the European observatory for Transition mentioned in the previous section, it is reasonable to consider the energy transition as a form of the ecological transition.

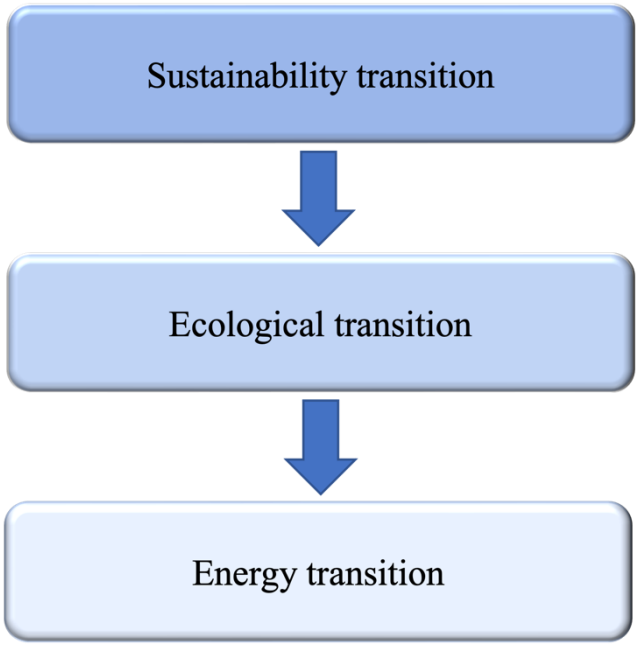

Figure 2.1. Energy transition as a form of ecological transition (source: own elaboration)

Solomon and Krishna (2011) identify several interrelated reasons why a process of transition from some energy sources to others can become necessary. A process of energy transition can be undertaken when:

1. the local or regional supply of resources that a community relies on is depleted or running out. This can affect both some renewable resources (such as forests) and fossil fuels.
2. the cost of the resource traditionally used to produce energy rises and, at the same time, the price of another source falls.
3. air or water pollution, or the threat to health caused by the energy resource commonly used, can no longer be ignored.
4. the advent of new technologies (e.g., electrification) makes a shift necessary to take advantage of these new discoveries. This is also often a large-scale phenomenon geographically.
5. improvements in existing economic activities stimulates a transition and results in further cost savings because of utilizing energy efficiency.

Humans, throughout the history of the last few centuries, have been involved in more than one ecological transition, and the process that has decarbonization at its center and that the globe is concerned about in recent years is only the latest one.

The first ecological transition of the modern age is in the early 1700s in the UK and concerns the shift from using wood to using fossil fuels to produce energy. The process that led to the use of fossil fuels as primary sources of energy was very long and differentiated for various economic sectors, ranging from 80

to 400 years (Fouquet, 2010). The shift to new sources of energy, which occurred at the same time as the Industrial Revolution, was necessary for three reasons: regional scarcity of wood, difficulty in shipping it because of the little energy it produced, and high labor costs (Smil, 1994). This transition was also accelerated by the rapid growth of cities such as London, Birmingham, Liverpool, and Manchester, which allowed huge flows of cheap coal to pass through as the price of wood rose inexorably (Allen, 2009). Before the Industrial Revolution, alongside wood, animal labor and wind and water were the preponderant means of producing energy. Thus, in the 1700s, England was experiencing a historic moment of great expansion, thanks to increased agricultural productivity and the impetuous development of cities, which led to the creation of economies of scale. In general, wage labor in Northern Europe cost more than in the rest of the continent (Allen, 2009), so British businesses made changes in the way they worked: they substituted coal (which was a cheap source of energy) for labor, also making use of the new technologies that were being developed during the Revolution, in particular the coal-powered steam engine.

During the 20th century, steam engines, cumbersome and unsuitable for rapid road transport, were replaced by internal combustion engines, with the result that by the end of the century Karl Benz built the first automobile powered by an internal combustion engine (Loeb, 2004). In other words, one of the first gasoline-powered vehicles made its debut, ushering a new era. Thus, the second ecological transition began: from coal to oil. The automobile and oil industries fed off each other. Oil discoveries also led to a surplus in production and thus, in the early 1900s, to lower prices. Again, the transition to new raw materials for energy creation brought changes in the way of working, particularly for the automobile industry. Henry Ford and Alfred Sloan revolutionized the way automobiles were produced (Solomon and Krishna, 2011), replacing craftsmanship with mass production, so that the time each worker used to assemble a complex artifact would be reduced. Although coal was still a source still present and fundamental to industrial progress in the 20th and 21st centuries, the dependence on oil of industrialized countries, would steadily increase over the years. Due to the latter's easy availability and affordability, oil had been an incontestable energy source until the early 1970s (Solomon and Krishna, 2011).

In actual fact, given the crucial role that this energy source played, it was often used by OPEC[1] as a weapon against countries that were politically hostile to their goals. In June 1967, soon after the start of the Six Day War pitting Israel and Egypt against each other, Algeria, Libya, Kuwait, Saudi Arabia and Iraq opted for a limited embargo against West Germany, the United Kingdom and the United States, as these countries gave their support to Israel (Solomon and Krishna, 2011). However, the U.S. domestic production surplus in this case buffered the effects of this embargo, which thus proved ineffective (Yergin, 1991).

[1] The Organization of Petroleum Exporting Countries (OPEC) is a permanent intergovernmental organization of 13 oil-exporting developing countries that coordinates and unifies the petroleum policies of its member countries. OPEC member countries are: Algeria, Angola, Ecuador, Equatorial Guinea, Gabon, Iran, Iraq, Kuwait, Libya, Nigeria, Republic of Congo, Saudi Arabia, United Arab Emirates (https://www.opec.org/opec_web/en/17.htm).

However, the oil embargo with the most significant repercussions began in October 1973 and was the consequence of Western support for Israel in the Yom Kippur conflict against Syria and Egypt.

In particular, the countries affected were the United States, Western Europe and Japan. The embargo was imposed not only by OPEC members, but also by Syria and Egypt. This embargo lasted longer than the previous one and came after the United States had reached its peak for crude oil production in 1970. In addition, oil export prices were increased by 70% and there were also production cuts (Yergin, 1991). The 1973-1974 oil embargo had negative macroeconomic consequences and even triggered a global recession.

This shock prompted several nations to undertake policies of detoxification from foreign oil to prevent this situation from happening again. For instance, Japan decided to embark on a path to achieve energy efficiency based on nuclear power and foreign investment (Fukasaku, 1995). Instead, the Netherlands pioneered the true path to energy transition based on innovation support only in 2001, but the project was abandoned after 10 years (Kern and Smith, 2008). Nixon's United States, on the other hand, inaugurated the Project Independence Modeling System in 1974. The project had 3 goals: expanding domestic energy supply from all sources including renewables, energy conservation and efficiency, and creating alternate energy sources and technologies for fossil fuels (de Marchi, 1981). However, the plan did not achieve its goals (Tietenberg and Toureille, 1976). Finally, Italy, given the need to immediately find an alternative to oil from the Middle East, decided to pursue investment in nuclear power. In fact, this nation goal was to develop atomic energy for peaceful purposes, that is, to achieve, although not in the immediate term, energy independence from foreign countries. Quite the opposite, energy demand was insistent and immediate: this reduced the room for manoeuvre for Italy about the policies it could implement. For example, as it became necessary to return to bilateral agreements with oil producers, Italy found itself acting as a bridge in the a between North African oil countries and the continent (Labbate, 2013).

Instead, the very scarcity of oil availability and climate change are the very reasons why the 21st century energy transition is of paramount relevance. Unlike the energy shifts there have been in the past, which were mostly due to economic motivations (from wood to coal during the Industrial Revolution) or technological innovations (the invention of internal combustion engines), this transition has the character of urgency, not only because a widely used resource such as petroleum is running out, but also because climate warming, to which fossil fuel use to create energy contributes, is a problem that threatens the survival of all species on the planet: the 21st century energy transition thus seems to be not a choice, but a necessary step for the preservation of life on Planet Earth in the not-so-distant future.

Given the theoretical background and empirical research that I will address in the next chapter of this dissertation, I find it useful to draw a line that unites the energy transition, climate change, changes in the world of work due to the first two, and organizational resilience. First, according to an International Energy Agency report taken up by the World Economic Forum, the energy transition will generate 10.3 million net new jobs globally by 2030. This increase will be matched by a reduction of 2.7 million jobs in the fossil

fuels sector. Most of these will be in the automotive, power generation and energy efficiency sectors. Essentially, the WEC argues that the role of people, alongside that of technology, is foundational to the transition.

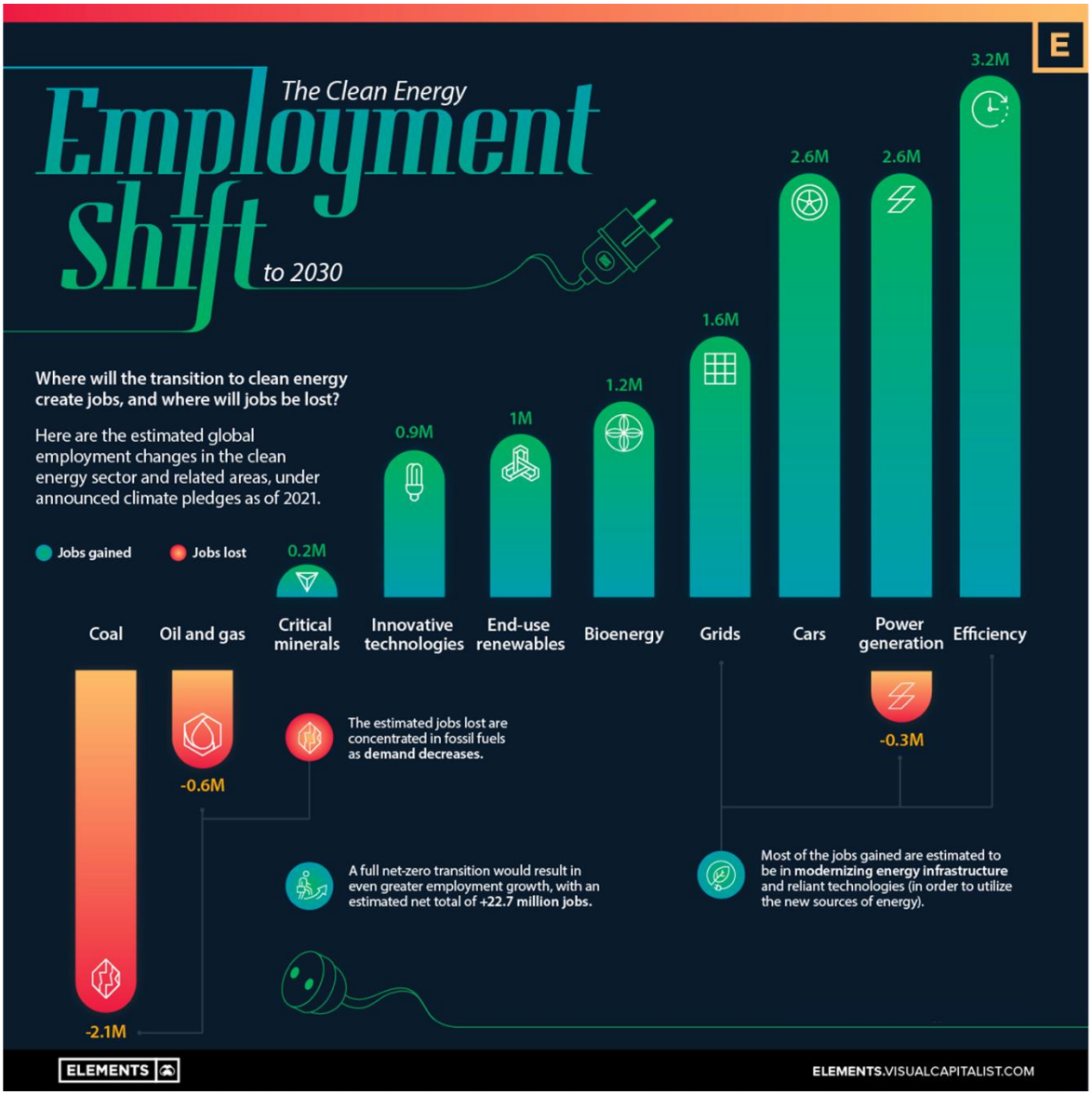

Figure 2.2. The Clean Energy Employment Shift to 2030 (source: IEA World Energy Outlook 2021)

It is relevant to consider that these numbers were estimated by the IEA with reference to announcements of climate commitments in 2021. In fact, if a full net-zero clean energy transition is considered, jobs gained and lost would more than double in all sectors. Furthermore, an addition of 22.7 million jobs to existing ones must also be counted.

Given these projections, the labor market will certainly undergo major changes. Within it, of course, companies will also move. These, not only have to revolutionize themselves to adapt to this new scenario from the standpoint of creating new jobs, but they are also called upon to understand the extent to which the work they already do and the way of working that they already adopt will be changed by the energy transition and thus by climate change: the discourse on organizational resilience naturally emerges.

First, climate change does not only bring with it the need to change the way energy is produced and consumed: rather, in some cases it requires a real rethinking of the way organizations make use of the resources, such as water or land, that surround them. Organizations may find this difficult to manage, since it is not easy to predict the impact these decisions might have. These entities are therefore challenged to make decisions by managing risk (Howard-Grenville et al., 2014). Consequently, more focus will be paid to organizational structures that emphasize resilience and responsiveness (Whiteman & Cooper, 2011), rather than scale or expansion, to the point where "proactive adaptability" could become a veritable new normal for organizations. Second, the development of new technologies will be a major change for companies: they will have to come to terms with the changing infrastructure that provides them with energy.

However, according to Howard-Grenville (2014) and her colleagues, the response to climate change will involve significant changes in work. Specifically, these responses would have to do with how work is distributed, how employees interact with one another, and how firms use physical assets.

In the present case, the efficient use of energy could lead to:

- decentralize and desynchronize some activities: in this case, workers could be encouraged to work remotely, with the aim of avoiding transportation, or to work not during rush hour.
- locate around population centers the production of some goods to block them from being shipped great distances. This would result in a change in economic activity, which would certainly involve employees.
- make employees understand that the skills they already have can be expendable in the new, challenging context of energy transition. At the same time, they may realize that new hard skills are needed to meet technological and innovative needs or even soft skill have to be enhanced, such as the ability to collaborate and communicate internally among colleagues. At the same time, the capabilities to interact externally with other organizations and companies in order to foster paths of open innovation, can be added to the essential skills of worker. Henry Chesbrough, one of the earliest scholars to give a notion of innovation in the new millennium, relates the use of external ideas and technological expertise.

  Indeed, "open innovation is a paradigm that states that firms can and should make use of external ideas, as well as internal ones, and access by internal and external routes to markets if they want to advance their technological competencies" (Chesbrough, 2006). In the context of the energy transition, technological innovation is as important as ever, and the ability to understand when it is appropriate to draw on external or internal resources other than their own is critical for managers in all sectors.

Linked to this last point is the idea that social processes play a critical role in the development of renewable energy policies and programs (Miller at al., 2015).

There are five types of interactions, combinable with each other, to explore the opportunities given by clean energy and the relative plans (Berry, 2020). They can be based on:

1. Collaboration: it involves different stakeholders, experts, businesses, customers, regulators, suppliers, community organizations and residents. Furthermore, collaboration with a variety of actors allows the organization to gain credibility and legitimacy regarding its clean energy projects, because through these interchanges it is possible to receive technical information that increases the success of the projects.
2. Network connections: it consists into the use of social and firm networks to gain access to a wide range of experience and practical information, as well as to generate support for the programs.
3. Trust: it is necessary that all types of relationships between the various actors mentioned above must be based on trust so that the goals that have clean energy at their core can be pursued and the programs to do so implemented. A first form of trust that the organization should earn concerns the goodness of the project it is going to be proposed to stakeholders: indeed, doubts, by some stakeholders, about the motivation or intent from which a project could be eventually moved. Such misunderstandings should be overcome through program design. A failure in this phase can undermine the organization's entire project. The second form, on the other hand, concerns trust based on the expertise and on the experience of the stakeholders with whom the organization dialogues for its clean energy projects.
4. Empowerment: it is essential for all the stakeholders involved. In fact, the clean energy project must involve and be supported by all the stakeholders on whom its implementation depends, from the citizens of a possibly interested-by-the-program area to the employees of a company going through an energy transition process.
5. Learning: it occurs through collaboration, the utilization of social and corporate networks, the creation of trust, and stakeholder empowerment. Undoubtably, they all require some degree of learning.

This confirms the fact that although the energy transition is based on major technological changes, people and workers are a foundational aspect of it.

The abovementioned changes, due to the efficient use of energy, will not have the same impact worldwide. Assuredly, in developing countries the rethinking of employment methods, human resource management, distributed work coordination, and corporate site choices should be radical. These countries are, in fact, going through economic and population growth, as well as profound urbanization, and this could affect the way work is done, the nature and distribution of employment.

To conclude, organizational scholars have seen a link between organizations' sustainability commitments and their ability to attract and retain workers. Because the consequences of climate change undoubtedly touch all employees in their personal lives, a winning strategy for organizations could be to engage employees in their efforts to combat climate change. In this way, the company becomes stronger, obtain internal compactness and more resilient to this looming energy change.

2.2. International actions for sustainability

2.2.1. United Nations Sustainable Development Goals

When it comes to the transition to sustainability, whatever form it takes, it is unavoidable not to mention the 2030 Agenda for Sustainable Development and the seventeen Sustainable Development Goals of the United Nations. It is the result of UN conferences for sustainable development held in 1992 (Rio de Janeiro Earth Summit), 2002 (Johannesburg World Summit on Environmental Sustainability), 2012 (Rio de Janeiro United Nations Conference on Sustainable Development) and the Millennium Development Goals that expired at the end of 2015. Although the Agenda is not legally binding, the goals contained within it are the global benchmark for the path to a sustainable way.

The 2030 Agenda, adopted by all member states of the United Nations in 2015, "provides a shared blueprint for peace and prosperity for people and the planet, now and into the future." Within it, there are the 17 Sustainable Development Goals (SDGs), which call all countries to action to be achieved. They seek action on multiple areas: an end to poverty and hunger, health and education for all, equality, access to clean water for all humankind, economic growth and industrial innovation, peace and justice, maintenance, and protection of biodiversity on earth, clean energy and climate action.

Figure 2.3. United Nations Sustainable Development Goals (source: United Nations)

As can be seen from the image above, some goals, such as 7, 11, 12, 13, 14, 15 are closely related to the theme of environmental sustainability. Two of them deserve further study within the scope of this thesis: number 7 and number 13.

Goal 7 aims to assure affordable, reliable, sustainable, and modern energy for all. The realization of Goal 7 thus envisions the possibility for certain parts of the world, namely Africa and Asia, which often

remain in the dark due to growing poverty, to have access to energy. Indeed, the Covid-19 pandemic destroyed what little progress had been made in those areas. In addition, Goal 7 also calls for everyone to have access to energy sources that allow for safe cooking. The dangers in cooking are a scourge that especially touches sub-Saharan Africa. The bulk of the poor cook with hazardous and polluting fuels like wood and charcoal, with damage to health and the environment.

One of the most relevant aspects of Goal 7 to this dissertation is the UN emphasis on the relationship between effective climate action and accelerated action on modern renewable energy, where the latter is prerequisite to achieving the former. On the positive side, the share of renewable energy in total final energy consumption has gradually increased to 17.1% in 2018 from 16.4% in 2010. Most of this improvement is due to the electricity sector with the share of renewable energy used exceeding 25%. On the downside, electricity accounts for only 21% of total energy, so there is much work to be done in transportation and heating. In particular, for the latter, the traditional uses of biomass, such as burning wood to generate heat, are still widespread: they account for 14 % of overall heat consumption.

Second, improving energy efficiency and increasing the deployment of renewable energy are critical to the overall goal of reducing greenhouse gas emissions. To achieve this goal, a systematic and substantial financial commitment is required from Member countries.

Continuing, Goal 13 calls for immediate action to address climate change and its consequences. Although the Covid-19 pandemic has slowed down the economy, the climate crisis, on the contrary, has not suffered any setbacks. In fact, even in 2020, at the height of the pandemic crisis, greenhouse gas concentrations continued to rise, even reaching new records.

Under these assumptions, it is difficult to achieve what the Paris Accords set out. For this reason, countries are drafting nationally determined contributions (NDCs). They are used to systematize an individual country contribution to the climate fight and to enhance the country adaptation efforts to a changing climate (for example, building flood defences or switching to drought-resistant crops). Developed countries are stepping up resources to provide technical assistance and support to less developed ones, which are particularly vulnerable to the effects of climate change, in order to help them for the development and the implementations of such plans.

2.2.2. European Union Green Deal

As has been repeatedly stated, climate change and environmental disasters are a huge threat to the world: the Green Deal is how the European Union intends to address them. It aims to make the EU economy modern, resource-efficient and competitive. The three cornerstones of the Green Deal, communicated by the European Commission at the end of 2019, are:

- carbon-neutrality by 2050, meaning zero greenhouse gas emissions by that date. By this commitment, Europe aims to become the first climate neutral continent by that year.
- the decoupling of economic growth from resource use.

- a just and inclusive transition that leaves no person and no place behind. Specifically, it will have to put people at the center, thus paying attention to regions, industries, and workers, who will have to go through the process of materializing the planned measures, facing a difficult task. I consider it is valuable in the context of this thesis to specify that two of the benefits that the Green Deal is intended to bring are precisely the creation of jobs appropriate to future needs combined with skills training for the transition and a globally competitive and resilient industry.

To be the first climate-neutral continent is certainly a noble and ambitious goal, but the EU has also stated that it is aware that climate change and biodiversity loss have no national boundaries: therefore, on the one hand, it will try with its expertise and financial resources to induce neighbouring countries to embark on a path of sustainability together, and, on the other hand, it has specified that the EU Green Deal should be conceived as an integral part of the Commission's strategy to enact the 2030 Agenda and the UN Sustainable Development Goals.

Figure 2.4. The European Green Deal (source: The European Green Deal)

Macro-areas have been identified on which to intervene with targeted actions. They are: climate, agriculture, industry, environment and oceans, transportation, financing and regional development, research and innovation, energy.

The European Commission has adopted a set of proposals to transform the EU's climate, energy, transport, and taxation policies to reduce net greenhouse gas emissions by at least 55 percent by 2030 compared to 1990 levels, setting some sort of intermediate target before the 2050 target.

About energy, the Commission proposes to increase the binding target for renewable energy in the EU energy mix to 40%. The proposal promotes the deployment of renewable fuels, such as hydrogen in industry and transport.

In addition, another key step is to reduce the energy used in order to decrease not only emissions but also costs for consumers and industries. Therefore, the Commission has proposed that the European Union's energy efficiency targets be raised and made binding, so that by 2030 there can be a 36-39% reduction in final and primary energy consumption.

Finally, the tax system needs to be set up to support the transition through the provision of appropriate incentives. Thus, the Commission's proposal was to align the minimum tax rates for heating and transportation with the climate goals of the Greed Deal. However, at the same time, to enable an equitable transition it is necessary to mitigate social impacts and help vulnerable citizens.

To organize the goals of the Green Deal in a timely manner, the Commission has required the countries of the union to develop National Plans by the end of 2019. As was mentioned in the previous paragraph for UN, also the Commission had made it clear that countries would need to allocate significant national contributions to ensure the success of the project. The national energy and climate plans will start in 2023.

Italy, of course, also presented the "*Piano Nazionale Integrato per l'Energia e il Clima 2030*" (*PNIEC*), or "National Integrated Energy and Climate Plan 2030", prepared with the Ministry of Economic Development, the Ministry of Environment and Land and Sea Protection and the Ministry of Infrastructure and Transport. The Italian plan is divided into five lines of action to be developed in an integrated way: from decarbonization to energy efficiency and security, passing through the development of the internal energy market, research, innovation and competitiveness.

3. A qualitative reseach: proactive organizational resilience in a company owner of a national transmission network: the case of Terna S.p.A.

3.1. Terna S.p.A: company overview

The Terna Group is the owner of Italy's national transmission grid (NTG) of high and extra-high voltage electricity and is the largest independent power transmission network operator (TSO) in Europe.[2] It therefore manages a national public service and operates under a monopoly regime according to the rules defined by the Regulatory Authority for Energy, Networks and Environment and in implementation of the guidelines of the Ministry of Economic Development. The Group operates 74,855 km of high-voltage lines.

The company has 5,136 employees and is responsible for planning, development and maintenance of the national transmission grid and management of electricity flows. It is also in charge of electricity dispatching, i.e., those activities aimed at ensuring that the supply of energy fed into the grid is constantly equal to demand, i.e., electricity consumption. The Group main business is based on regulated activities (85,5% of the turnover), but the company also deals with unregulated activities to support the energy transition, offering technological and digital solutions to commercial and industrial customers (13,6% of the turnover), including renewables integration and grid development activities with energy companies abroad (0,9% of the turnover).[3]

Terna was founded in 1999, after the liberalization of energy sector, with Enel as the primary shareholder. In compliance with Legislative Decree 79/1999, which provides for the separation of the national transmission grid from its operation, i.e., from transmission and detachment activities, two companies were created: Terna, owner of the national transmission grid, and GRTN (National Transmission Grid Operator). In 2004, Terna was listed on Italian stock exchange.

Ownership and grid management are merged in 2005. To protect Terna's autonomy, the Ministry of Economy and Finance purchases 29.99 % of the company’s capital.

Between 2009 and 2013, Terna acquires 18,600 km of high-voltage lines from Enel, thus becoming the owner of 98.6% of the national grid and the first independent operator in Europe as well as the seventh in the world. In addition, two new operating companies are established in 2012: *Terna Rete Italia S.p.A*. for Regulated Activities, and Terna Plus S.r.l. for the growth of services in the Non-Regulated. Today, the latter company oversees plant development and construction activities in South America and, more generally, the development of new business in the world.

Through one of its subsidiaries, namely Terna Energy Solutions S.r.l., the Group acquires 90% of Brugg Kabel AG (Brugg Group), one of the leading European operators in the overland cable sector.

[2] https://www.terna.it/en/about-us/introducing-terna
[3] https://www.terna.it/en/about-us/business

The presentation of the Industrial Plan, "2021- 2025 Driving Energy," marks a turning point in the company's history, given its commitment to the ecological transition.[4]

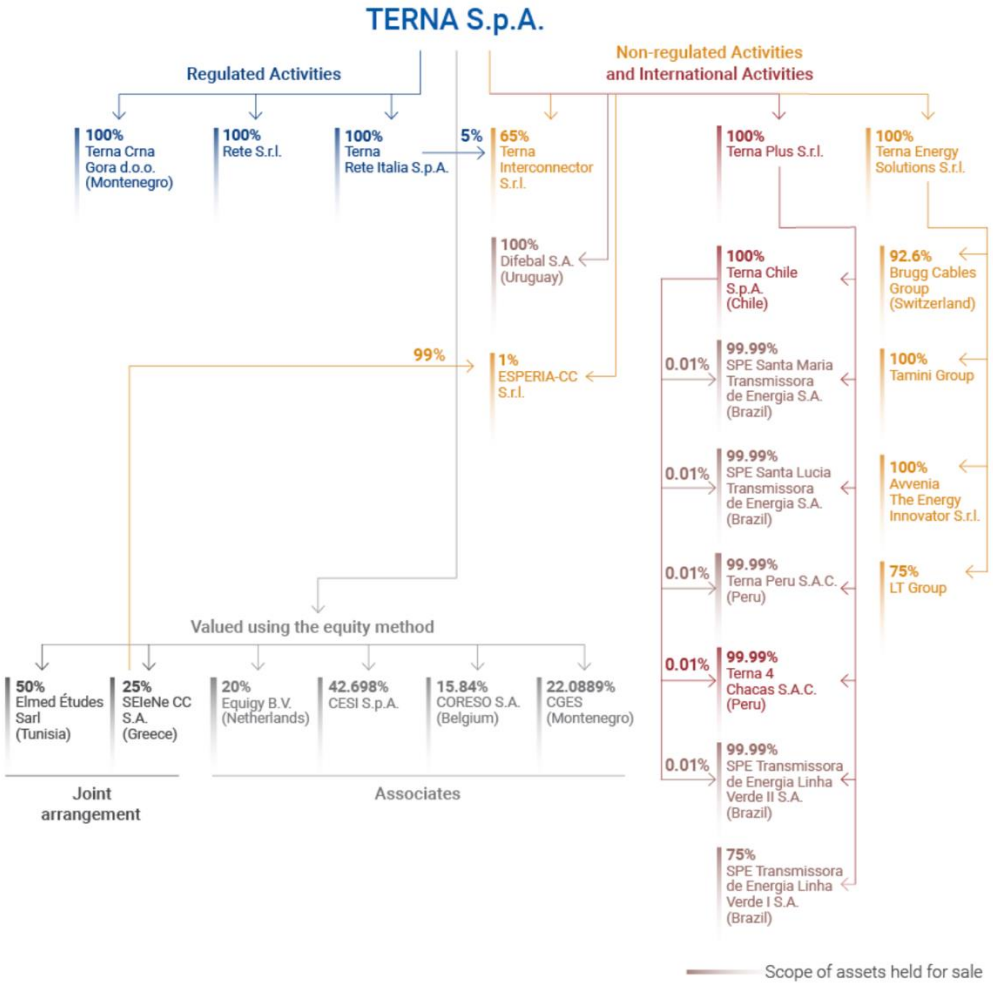

Figure 3.1. Corporate structure (source: https://www.terna.it/en/about-us/introducing-terna/corporate structure)

3.2. Terminological reconciliation

In the “2021 Annual Report”, the company frequently uses the phrase “ecological transition” referring to its activities and goals. Other times, however, it uses the expression “energy transition”. I consider this to be the case for two reasons:

- Terna's way of contributing to the ecological transition, given the business it is in, is to drive purely the energy transition. So, for the company, its way of contributing to ecological transition regards energy, and it often refers to the energy transition as synonymous with the ecological one, thus looking at the transition process as if it were a single block.
- Because this companies wants to give, despite the business it is in, a broader scope to its mission as enablers of the energy transition. Thus, it sees itself as advocate of a transition that

[4] https://www.terna.it/en/about-us/story

encompasses multiple aspects, not just the more properly energetic one.

For this reason, the expression "ecological transition" will often be present in the following paragraphs.

The distinction between ecological transition and energy transition made in Chapter 2 is still valid, but, in order to better study what happens within a reality as precisely as possible, it is good, as will be seen, to try to adopt, among other things, the language of the individuals who are part of it.

3.3. Goals of the study

It was possible to understand, thanks to the second chapter, the urgency there is to take action to assume more sustainable ways of living and producing. The energy transition, linked to the way of producing energy, is but one way to do this and should be understood as a part of the ecological transition.

At the same time, however, it must be recognized that, in order to achieve the goals proposed by the Green Deal or even by the 2030 Agenda, a major effort and a complete revolution in the *modus operandi* of all of us is required: in fact, as is evident and as has already been reiterated in the previous chapter, climate change and environmental disasters know no national boundaries or hierarchies within society, even if less developed countries must be credited with an even greater organizational and reorganizational effort than developed ones. For this very reason, some measures such as the European Union Green Deal push for less developed countries to be assisted and supported to draft their own programs for energy transition and sustainable development.

> It is worth repeating once again that, despite the high level of technological innovation that a challenge such as the transition requires, nothing can ignore the human being. I have used the word "reorganization" and the relative verb several times, not by chance: this is something that, within the company, only employees can strive to enable. In other words, it is the people who create the innovation and give it a place, so that it can serve the noble challenge of ecological and energy transition. The real effort is that of the human mind, which, on the one hand, has to give birth to refined technologies to revolutionize the way of producing energy that has been the same practically for 60 years, and, on the other hand, has to make another effort: to understand that everything is changing, and reorganize itself.

This is where the other major theme of this thesis comes in: organizational resilience: the shift is momentous and organizations are called upon to withstand the shock that this is creating and will create.

In Chapter 1, I explained the difference between two forms of resilience: adaptive resilience, defined as "the capacity not only to absorb but also to utilize the knowledge one already has and transform it to adapt to the current situation" (Zahra and George, 2002), and proactive resilience, or "acts of anticipation and active waiting" (Sull, 2005; Waugh et al.,2008). I further specified, sharing the view of Giustiniano et al. (2018), that there is a dialectical synthesis relationship between the two forms of resilience: in other words,

for an organization to be resilient, it is necessary for both forms of resilience to manifest.

The purpose of this research is to understand how a company that, if only by its nature, is at the forefront of enabling the energy transition has decided to reorganize the work within it to proactively react to this major shift. In the research, as it will be specified in few lines, Terna is held up as an example of a company owner of a national transmission network electricity in high and extra-high voltage. The research is basically organized around two research questions:

1) How has Terna, as a company owner of a national transmission network electricity in high and extra-high voltage, proactively prepared itself in terms of corporate organization to deal with and to adapt to the consequences of ecological transition?

2) Are there aspects of the new ways of working and other initiatives involving employees and people outside Terna that can be maintained after the ecological transition and used to address new challenges?

In the first question, I want to investigate whether the company had prepared itself in terms of its corporate organization for the ecological transition by practicing those “acts of anticipation and active waiting” that I mentioned a few lines ago. Thus, whether or not the company was able to anticipate the change that was coming and consequently organize itself proactively practicing that “anticipative control with the aim of predicting and preventing potential dangers before the damage is done” (Wildavky, 1988), I mentioned in the paragraph 1.3.3., with the scope to conceptualize anticipation as a construct related to proactive resilience. Moreover, since it is clear that the ecological transition is, given the environmental situation, an obligation and not an option, I chose to understand whether the company studied proactively how to adapt to the consequences of this major shift, trying not to suffer them passively.

The second question, instead, aims to understand whether Terna has considered that form of resilience that is identified with the expression “learning to learn”, so if they think that the innovations introduced with the ecological transition can become part of the company's baggage and spendable for other challenges.

Also, by using the expression “initiatives involving employees and people outside Terna”, I try to understand whether open innovation, so important for clean energy projects, as seen in the second chapter, was used by the company in order to make useful contributions to the transition by connecting its employees with external realities.

3.4. Research methodology

The objective of this research is to understand the role of organizational resilience in the context in

the energy transition for one company in particular.

Given this, I decided to use a qualitative method to conduct this research. Before deciding whether to use a qualitative or quantitative method for the experimental analysis featured in this thesis, I delved into the characteristics of both research methods.

Over time, some definitions of qualitative analysis have been provided. Together, they can draw a complete picture of what is meant by qualitative analysis. Kick and Miller (1968) defined it as a "method of conducting social research that entails observing people in their own environments and conversing with them in their own language and terms" (Tailor, 2010). Hoepfl (1997) describes qualitative analysis as "any type of research that yields results that are not based on statistical techniques or other quantification methods.". Still, he states that "the qualitative investigation acknowledges the social world's multifaceted and dynamic nature". Ali and Yosuf (2011) add that "nowadays, any inquiry that does not involve statistical methodologies is referred to as qualitative". Thus, combining these definitions, it is possible to say that qualitative research concerns "observing people in their own environment, communicating with them in their own language and on their own terms, and striving to comprehend the complexities while analyzing and interpreting data from multiple sources" (Basri, 2014).

According to Hoepfl (1997), qualitative research has preeminent characteristics. He presents them as follow:

1. the natural surrounding serves as a data source for qualitative research. The researcher seeks to observe, describe, and interpret contexts as they arise, trying to maintain a state of "emphatic neutrality".
2. Qualitative research mostly uses inductive data analysis.
3. The researcher is defined as the human instrument of the data collection process.
4. Reports that are derived from qualitative research are descriptive and report quotations in the text.
5. Qualitative research requires special attention to the management of idiosyncrasies.
6. Qualitative research is interpretive in nature: the purpose of the researcher is to detect what the events mean to the individuals who experienced them, and to interpret them.
7. Qualitative research has a non-predetermined design: the researcher must focus as much on emergent aspects as on research outcomes.
8. Academic qualitative research involves, therefore, many methods to be conducted: case study, focus group, ethnography, phenomenology are some of them (Trumbull and Watson, 2010). All of these methods have in common the goal of gaining a deep understanding of the phenomenon, investigating relationships and meanings, which are multidimensional, complex and cannot exist regardless of actors and researchers (Parker, 2003).

   Qualitative research, therefore, has several types of data collection: the survey, group focuses, interviews, observations and secondary data sources (Harrell and Bradley, 2009). In my research, I chose to use two: interviews and a secondary data source. On the other hand, it is important to explain the characteristics of quantitative research so that it can be clear why I chose the qualitative method to

conduct my research. According to Taylor (2010), the quantitate method is used to "offer objective explanation of a phenomenon and show how certain procedures can be used to control the phenomenon".

The findings of this type of research also hand on principles and laws. In addition, most of the data are numerical and lend themselves to statistical treatment. The goal of the researcher undertaking quantitative research is therefore to give valid and objective descriptions of the phenomenon, showing how phenomena can be controlled by manipulating the variable, taking care that his personal biases do not impact the analysis and interpretation of the data. The aim of my research is to understand what reasoning there is behind the company's choices about how to organize work in order to get prepared for the challenge of energy transition and possibly gain, through this work organization, organizational resilience. It is crucial for me to understand the respondents' perceptions of the phenomenon and the change taking place, and to do this, I tried to put myself in their reality, communicating as much as possible with the respondents in their own language, which I tried to get to know by reading the "2021 Annual Report", by Terna, as I will explain in the next paragraph, so that they would feel comfortable and the research would be as rigorous and free from communicative misunderstandings as possible.

Continuing, my research aims to understand the whole context, giving importance to the human behavior. Thus, a reductionist approach, typical of quantitative research (Basri, 2014), does not fit with this. For this reason, given the characteristics of the qualitative research listed a few lines ago, the choice of it seemed the most appropriate.

In general, qualitative research was often considered second-class (Bluhm, Harman, Lee, & Mitchell, 2010) and thus even some universities and business schools were reluctant to use it (Basri, 2014). This belief stemmed from the fact that the social sciences are considered similar to natural science and therefore comparable in study to the "physical object" (Kottler & Minichiello, 2010). Today, interdisciplinary research in the field of accounting and management has caused many qualms about the rigor of qualitative research to be overcome, making increasing use of qualitative research methodologies (Parker, 2003). At the same time, Parker (2003) points out that qualitative researchers often make criticisms of quantitative ones, as they consider the latter type of research limited in understanding problems in both behavioral and social sciences such as accounting and management, since, according to defenders of the qualitative method, there are not completely "value free" researchers, as quantitative research strictly requires instead.

3.5. Secondary data source: Terna's 2021 Annual Report

The idea of conducting this research was born in February 2022 by consulting two different documents: the "2021-2025 Industrial Plan" and the "2020 Sustainability Report". Instead, in March 2022, the company published its first Integrated Report, titled "2021 Annual Report", which incorporates both the "2021-2025 Industrial Plan" and all financial and non-financial information for 2021. Thus, it is the most up-

to-date document at the moment.[5] For the purposes of the empirical research conducted in this thesis, the "2021 Annual Report" constitutes my secondary source of data. In fact, according to Harrell and Bready (2009), secondary sources of data are existing data that the researcher can use in his or her analysis.

Reading this company report, the idea arose in me that there might be a relationship between the ecological transition, which has become necessary due to climate change, and organizational resilience.

Furthermore, Terna defines in its report, people as "key enabling factors for the ecological transition".[6] By its very nature, that of a company that is an owner of a national transmission network, the responsibility for transition is, objectively, present. Given the importance of people within the company in meeting this challenge, I took from the report information about the new ways to work that the company designed for its workers so that they could rise to their role as enablers.

Obviously, the reading of this Report was only the starting point for my research: indeed, the Report was used to formulate the interview questions as clearly as possible, trying to assimilate my language to that of the interviewees, and figure out which points to go into in order to understand whether, these new ways of working helped the company to gain resilience. Specifically, whether the company has prepared for the shift, anticipating the necessity to implement changes in its organizational structure, and is set up to "learning to learn" from shocks.

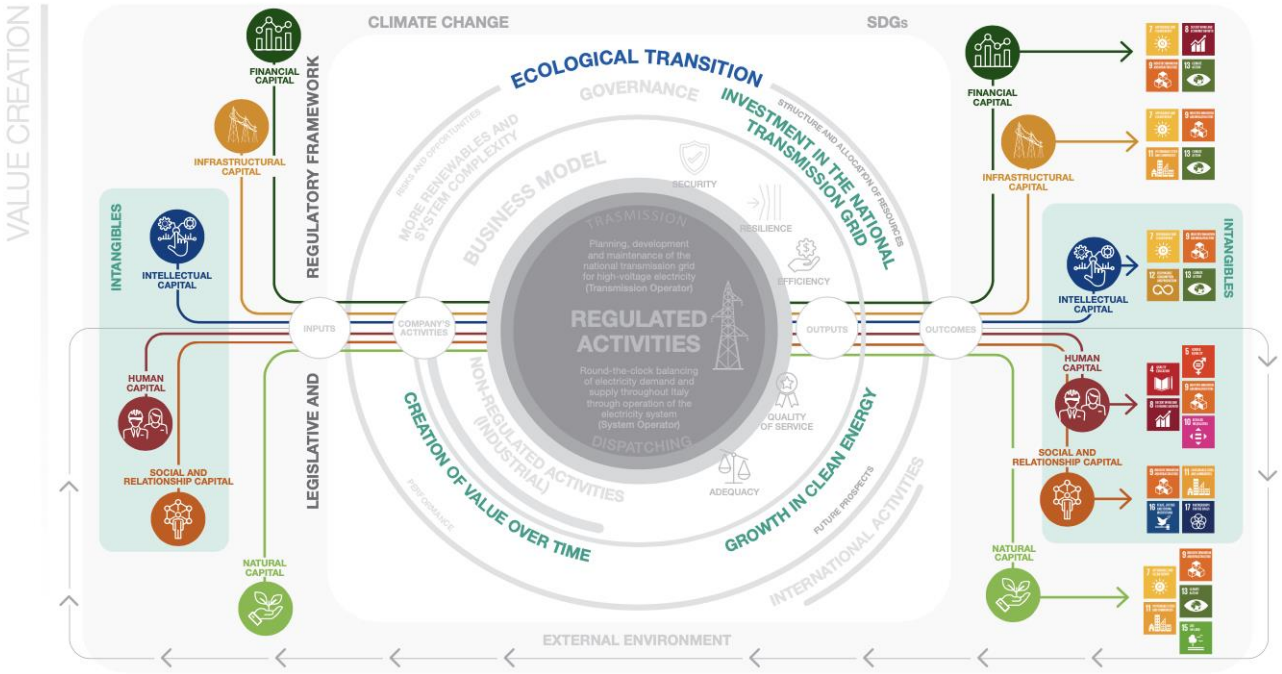

Figure 3.2. The value creation process and the business model (source: Terna 2021 Annual Report)

This image is useful to situate what has been done so far. The entire corporate action for ecological transition:

[5] https://download.terna.it/terna/Terna_2021_Integrated_Report_8da18ab57d1d0e4.pdf
[6] Ibidem, p.40

- takes impetus from the problem of climate change, because of which, as was mentioned in Chapter 2, an ecological transition is necessary, which for the company in question takes the form of the energy transition,
- takes into consideration the SDGs developed by the United Nations, not only the strictly climate-related ones described in Chapter 2, but also others concerning education, equality, and peace and justice,
- inscribes everything within a precise legislative and regulatory framework: by this is meant not only the Paris Agreement, the objectives of which have been previously explained, but also the European Union's Green Deal and thus the *PNIEC*.

Again, from this graphical representation, we can identify the area of research interest of this thesis. Indeed, we need to consider intangibles, particularly “Human Capital” and “Social and Relationship Capital”.

Both types of capital are considered inputs that can create outcomes.

Firstly, human capital is people, or Terna human resouces, who are considered key enabling factors for the ecological transition. They, through their skills, are the inputs to achieve the goal of the transition. Building on this idea, the company launched the “NexTerna” program in 2021, aimed at bringing about a cultural transformation in all areas of the company. It involves certain issues such as introducing inclusive leadership, achieving work-life balance, and optimizing workplaces to improve logistics and life quality.

Secondly, “Social and Relationship Capital” consists of relationships with various stakeholders to enable ecological transition.

The input consists, precisely, of the relationships between Terna and other stakeholders, such as institutions, academy, citizens, businesses, financial analysts, media, and electricity companies. These relationships are made to create value in the medium, short, and long term. Outcomes are programs, tools, and initiatives to support the transition. In other words, it reiterates what Howard-Grenville (2014), discussed in Chapter 2, argued that the ability to collaborate and communicate internally among colleagues is critical to meeting the challenges of climate change, and the need for ecological transition is one of them.

In addition, the importance of open innovation is also recognized, as was also explained in Chapter 2.

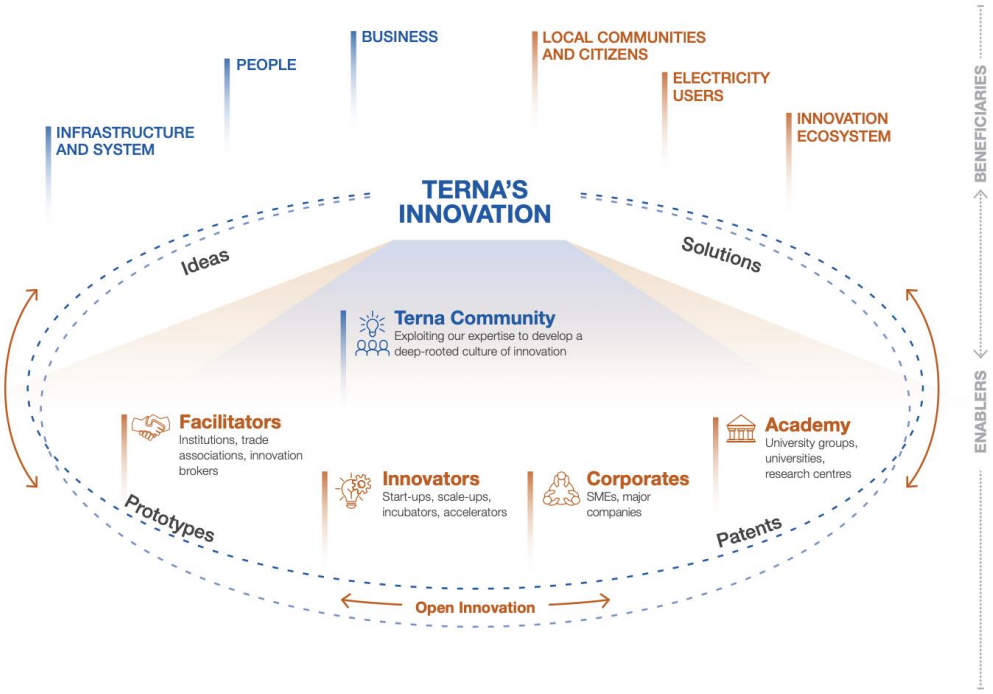

Figure 3.3. Terna's Innovation through Open Innovation (source: Terna 2021 Annual Report)

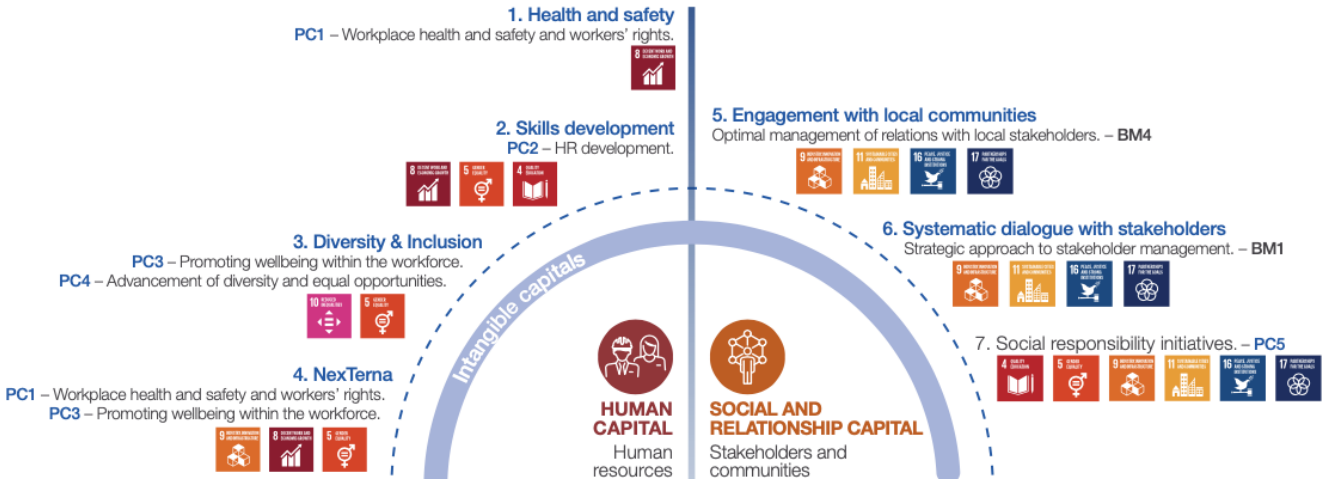

Figure 3.4. Reference SDGs for activities related to human capital and social and relationship capital (source: Terna 2021 Annual Report)

3.6. Primary data source: semi-structured interviews

For this analysis, I chose to use semi-strucured interviews as the primary source of data. Before explaining what a semi-structured interview is, it might be useful to explain how the questions in a qualitative analysis are structured and why they are structured in that way. Questions used as an investigation tool in this type of research often start with or include words like what, how or why. This is because the researcher who carries out a qualitative analysis has as primary purpose to interpret, observe and describe what happens in a particular context, how it happens and what meaning the participants give it.

Thus, the questions are formulated in order to reach an "in-depth knowledge" of the phenomenon, considering however the impossibility of capturing a "genuine ontological reality" (Parker, 2003).

According to Harrell and Bradley (2009), researchers use interviews to gather opinions and perceptions or background information, such as an expert's knowledge of particular “subject, facts, and descriptions of processes”. Often, as in the case of the qualitative research in this thesis, interviews have both aspects. On the other hand, Harrell and Bradley draw attention to the fact that ignoring questions about the interviewee's background information or treating these questions superficially during the interview can affect the quality of the data collected.

An important factor that the researcher must consider when deciding to use interviews as a source or as one of the data sources in qualitative research is the amount of control he has during interaction with respondents. In this regard, it is possible to distinguish three types of interviews: unstructured, semi-structured, structured.

In unstructured interviews, the researchers have a precise plan to use as guide, but, at the same time, have minimal control over the respondents' answers. As a result, the discussion can develop in multiple directions, and the data collected are really numerous and multifaceted. Unstructured interviews are designed for those who have the idea of spending a lot of time in the social reality or in the community they study or analyze an aspect of.

In the semi-structured interview, the researcher always has a reference guide, but there are topics and questions that must be covered. The style of this type of interview is essentially conversational. Semi-structured interviews are particularly suitable for those researchers who have as their goal to get to the bottom of a topic through the answers they receive in the interview.

In the end, there are the structured interviews, which are those in which the researcher exerts the most control. In this type of interviews, the questions that are asked to respondents are all equal and asked in the same order. This certainly has the advantage of reducing the number of topics not covered by the interview and the possibility for the researcher to mitigate inappropriate responses (Fowler, 2002). A disadvantage of structured interviews is that, when an interviewee does not understand a question, it is impossible to explain it to him except through a written explanation given before the interview or leave the respondent to interpret the term or question in question. Often, there the only possible explanation is the repetition of the question. Think kind of interview is indicated when the research has a very large sample and its data can be considered to have value for a huge amount of people (Harrell and Bradley, 2009).

I chose to use the semi-structured interview because it provided as much flexibility as rigor to my research. Flexibility lies in the fact that I was able to ask my respondents different questions and to provide additional explanations, where required, unlike in structured form of interview. For example, sometimes during the interviews I made theoretical *excursus* on organizational resilience so that they could better follow the thread of research. Moreover, although I have assured the answers to all the questions and therefore the total coverage of the topics that I had intended to cover at the beginning of the interview, sometimes I did not follow for the questions the order that I had foreseen, but I arranged them following the rhythm and the macro-topics that emerged from the interview, so that respondents would feel comfortable

and that "conversative" style of the semi-structured interview would be exploited. At the same time, the research was rigorous because all the questions were answered and it was relevant to how I had written the question. There was no risk of losing control over the progress of the interview, as can happen using the unstructured model.

3.6.1 Interviews

After identifying the research questions and the most appropriate research strategy to answer them, I contacted the people I intended to interview. Since the energy transition is a topic with very important technical implications, I chose to interview technicians who were able to give me information about new ways of working and corporate reorganization by experiencing it in the field, thus trying to understand how the work done by People management could translate “on the ground”. Given the characteristics of qualitative analysis that I set out above, the samples used in this type of research do not consist of large populations, because only small and targeted samples of respondents are used, which can provide essential and accurate information (Sale, Lohfeld, & Brazil, 2002). Thus, I got a total of five interviews, which took place between mid-March and the first week of April.

Respondent Name	**Respondent’ s r ole within the company**
Cosimo Pisani (Respondent 1)	Responsible for the Stability and System Logics unit in the Strategy, Development and Dispatching Directorate.
Silverio Casulli (Respondent 2)	Head of Grid Resilience and Security Planning, former HR Organization and Change Management Expert.
Respondent 3	Head of System Efficiency and Sustainability Interconnections, Grid Planning and Interconnection Director in the Development and Dispatching Strategies Division.
Respondent 4	Grid Planning and Interconnection in the Development and Dispatching Strategies Division.
Fabio Di Ninno (Respondent 5)	Head of System Strategy and Positioning.

Table 3.1. Corporate role of respondents (source: own elaboration)

Respondent 1 is Responsible for System Operation, while the other respondents are concerned with strategy, i.e., the objectives and criteria of which the planning process for the national electric transmission grid is composed, in the national and European context, on different time plans. Specifically, Respondents

2,3,4 are responsible for medium/long-term planning, while Respondent 5 is responsible for very long-term strategies.

The respondents were all contacted by e-mail. After receiving affirmative responses to the request to be interviewed, each interviewee received another e-mail from me containing two attachments:

- a document containing the presentation of the research, in which I introduced myself and explained in what capacity I had contacted them; then I explained my thesis project (chair of reference, theoretical background, the case study role I had thought of for the company). This was followed by the questions, first presented in Italian and then translated into English. This was so that the interviewees could read how the questions would be reported in the language in which the thesis would be written. In addition, I chose to attach the questions so that they could prepare as well as possible and in advance for the interview.
- An informed consent form for the interview, where my contact information (phone number and institutional email) was present. In addition, the project was briefly presented again. Next, I included the estimated time for the interview, i.e., 50 minutes, and made the interviewees aware that they could, of course, choose to decline to answer any questions. I also informed them that the interview would be recorded and transcribed by me to conduct an analysis for research purposes, and I repeated it verbally before starting each interview.

  The last part of the form was devoted to the quotation agreement. The form concluded my signature as researcher and that of the respondent in question.

With respondents 1, 2, 5, the interview was conducted on Microsoft Teams, with camera on both by me and the respondents. Respondents 3 and 4, on the other hand, chose to produce a joint written interview, using the questions I had sent them earlier. However, a meeting was held via Microsoft Teams between me and the Respondents 3 and 4 once a first draft of the interview had been produced by them, in order to understand whether the questions had been well interpreted by them and the answers comprehensive for the purposes of the research. In this way, the advantage of the semi-structured interview, which consists of the researcher being able to provide the respondents with additional explanations of the content of the questions, was exploited.

Although I had planned for 50 minutes, two interviews lasted about fifteen minutes longer, and the average duration of all interviews was 59 minutes, not including the meeting with Respondents 3 and 4, which lasted 54 minutes. The very nature of these interviews meant that some of them lasted a few minutes longer than I had initially thought since they were, as I mentioned, semi-structured interviews with open-ended questions, the interviewees had the opportunity to range a great deal, thanks to the non-rigid structure of the exchange between me as researcher and them, staying, at the same time, focused on the questions. After transcription, which I did by hand by replaying the interviews I had recorded, I got a total of 63 pages of interviews.

A set of sixteen questions was presented to the respondents. In order to test the resilience of the

organization and the relationship to the way of working within Terna, two "big shocks", which may have changed or will change the course of the ecological transition, took an important role within the questions asked: these were the Coronavirus pandemic and the war in Ukraine. Covid-19 pushed the world to a halt for a few months in 2020, forcing companies to review their organization and the way its employees work suddenly due to lockdown and social distancing. The war in Ukraine is, on the other hand, still sadly raging at the time this thesis is being written: among all the problems that this conflict has already brought, such as a true humanitarian crisis and numerous economic complications, for example the increase in the price of some raw materials, the issue of the future of the energy transition in Italy and abroad comes to the forefront because of the dependence on Russian gas.

The questions include various themes, in order to investigate the organizational resilience of the company in analysis as comprehensively as possible.

First, respondents were asked to clarify their position in Terna. Next, I requested to them to provide a definition of ecological transition that included what the interviewee had learned working "in the field". It should be pointed out again that the company itself has defined, in its report, energy transition as a challenge[7]. Thus, like all challenges, it has effects that would hopefully be best anticipated in order to stem the negative consequences. The interviewees were then asked when planning for the ecological transition had begun and, in this context, how Terna had sought to understand the new role that would be played by workers within the energy transition.

Next, I included a question on New Ways of Working from the "NexTerna" program, asking respondents to make a focus on how they can make employees enablers of the energy transition and thus pillars in addressing this business challenge.

I went on to ask if and how Covid-19, as a shock that has changed the way of working globally for all sectors, had played a role in shaping the new corporate organization and ways of working. I then focused on soft skills, asking respondents what of them workers at various levels should have for the company to be resilient and proactively respond to epochal challenges such as those of the ecological transition. I also asked whether they thought it was possible to enable real resilience training for workers in general and proactive resilience training for management figures. A little more than halfway through the interview, I inquired each respondent what he thought might be the harms of mismanaging the ecological transition or underestimating its effects on the economy and the environment. I then shifted the focus of the interview to open innovation for sustainability and ecological transition, asking the interviewees whether contributions from outside were helpful in redefining the new business organization and ways of working. Moreover, as I mentioned in the first chapter, resilience means not only reacting proactively before the consequences of an event impact an organization or society or adapting to changes after the event happens to continue to operate successfully, but also "learning to learn" from crises and challenges. So, after premising this to the interviewees, I asked them whether, in their opinion, there were any lessons that could be learned from the transition challenge

[7] https://download.terna.it/terna/Terna_2021_Integrated_Report_8da18ab57d1d0e4.pdf, p.3

that could make the company resilient and whether some of the changes introduced to accompany the ecological transition from the perspective of corporate organization and way of working could be retained to meet other challenging situations.

The interview closed with the second major shock in recent years as a theme: in fact, I asked the interviewees what I called a “projection question” about the future of ecological transition in Italy and abroad, considering the war unleashed by Russia against Ukraine and today very delicate geopolitical situation. Then, I asked whether they believed that the situation created by the conflict in the would reshape Terna's plans for ecological transition in a profound way. The last question was different for all five respondents and was phrased according to their position within the company. I asked Respondent 1, i.e., the System Operations Manager, whether it was correct to assume direct involvement of workers who deal with technical tasks at various levels so that Terna can react proactively to the expected or unexpected consequences of a shock such as the war in Ukraine. Interviewee 2,3,4, who are responsible for medium/long-term planning, I queried whether medium/long-term strategies will be reviewed so that Terna and its workers can proactively react to the expected or unexpected consequences of a shock such as the war in Ukraine. Interviewee 5, in charge of very long-term strategies, I asked about the future of long-term strategies, so that the goal of proactive reaction for Terna and its workers to the expected or unexpected consequences of a shock such as the war in Ukraine would be achieved.

After being transcribed, each interview was subjected to thematic analysis. This was useful for me to highlight recurring themes in the interview in order to organize and identify the findings of this research.

4. Findings

As anticipated in the previous chapter, the findings will be organized according to the themes that emerged during the interviews, after they were precisely subjected to thematic analysis. In this chapter, the findings of the research interviews will be reported, so only what were the themes that emerged during the interviews. They will be commented on in more detail and discussed in the next chapter.

4.1. Views about ecological transition and when and why it was implemented

First of all, respondents gave very different definitions of ecological transition learned from working "on field". It was defined as:

> "a cyclopean overhaul of how to manage and operate the system, changing de facto dispatch of production of energy to one that is no longer a traditional fossil-based one, thus fundamentally characterized by certain dynamic features and performance on the ability to provide grid services, to a system that in essence the massive penetration of renewable sources economically and safely." (Cosimo Pisani, Respondent 1)

Alongside these highly technical definitions, there were other respondents who preferred to give a vision of the ecological transition partly related to Terna's activities:

> "the concept of ecological transition, a topic that is dear and of primary importance for a company like Terna, is rich in facets, points of view and viable paths despite the fact that it remains characterized by a single, important objective: to ensure a significant reduction in CO2 emissions in the air, making a significant contribution to the fight against climate change. This transformation cannot, however, be considered zero-impact for the Electricity System, by opening the door to a number of challenges." (Respondent 3 and 4)

> "Terna actively supports the ecological transition, practically being the enabler of the ecological transition. In fact, there are several programs, such as "Phase Out Carbon", which is decommissioning of all polluting power plants and achieving some very ambitious targets for renewables, defined both by European bodies and by Italian legislation. So, as Terna, for us the ecological transition is to enable, all those initiatives, all those programs that can promote the integration, within the Italian energy system, of cleaner sources, so renewables, wind, hydro, accompanying as we go along the decommissioning of what are the "more polluting" energy sources." (Silverio Casulli, Respondent 2).

After specifying that he thinks the ecological transition means many things (including waste management and circular economy), the Respondent 5 Fabio Di Ninno provided a definition of it through pillars, linking some characteristics of transition to broader aspects of society:

- Pillar 1. Energy efficiency: "the best kilowatt/hour is the one that is not consumed, and so this must be a key assumption and clear to everyone. This also ties in with the concept that you have to untie social welfare to consumption: therefore, this is a macro economic and social issue"
- Pillar 2. Decarbonization: "this is an economic, environmental, and social issue. One pillar is to decarbonize as much as possible, and, to decarbonize as much as possible, we are going to have to make a very large use of electrification, which is not the only weapon, but it is perhaps the main weapon. So, we are going to have to put installations, as far as the energy sector is concerned, of power generation to the discharge of CO2, and there will have to be a mammoth renewal towards forms of energy that now have established technologies: therefore, the solar and wind ones, no longer having CO2 emissions in the atmosphere."

In terms of when the company decided to plan for the energy transition, which coincides with why this activity was undertaken, it can be inferred from the table below that the respondents captured different situations as turning points:

Respondent	**Moment when Terna began planning for the transition**
Cosimo Pisani (Respondent 1)	"Basically, in our collective imagination such an idea has always been there, and we have been guided by international regulations, which have definitely given it a boost: the UN SDGs, the Green Deal, the Paris Climate Agreement, etc."
Silverio Casulli (Respondent 2)	"When European Commission defined all those European programs and their entry into force, and when (the European Commission) defined targets regarding renewable penetration within the system in Europe for 2030, 2040, 2050. We thought that in order to be able to reach these targets it was necessary, as Terna, to plan the development of the system in a certain way, so that we could accommodate this large volume of renewables dictated by the European directives."

Respondent 3 and Respondent 4	"Already within the 2013 Development Plan, reference is made to the National Energy Strategy (NES) identifying the energy sector as the key element in ensuring the country's economic and sustainable growth. In PS 2021, *PNIEC* has particular importance regarding these evidences."
Fabio Di Ninno (Respondent 5)	"A few years ago, when we realized that there was still a discrepancy between network planning and resource planning. What happened in the first wave of renewables was a very fast deployment of plants, facilitated precisely by a generous incentive policy that could not be followed by an equally fast grid development, precisely because of physiological permitting and construction mechanisms. There has been a strong realization that infrastructure and resources need to be planned in an orderly and coherent manner."

Table 4.1. Moment when Terna began to plan the ecological transition according to the Respondents (source: own elaboration)

Thus, while Respondents 1 and 2 understand the time when Terna began transition planning as when awareness of the importance of climate change and sustainability began to be raised internationally with some of the UN SDGs, the Green Deal or the Paris Climate Accords, Respondents 3 and 4 say the need for energy transition planning was in the air as early as 2013, but it gained new importance with the *PNIEC*.

Respondent 5, on the other hand, provides a more technical answer, involving the system and the resources.

4.2. Role of workers for the ecological transition and the "NexTerna" program

On how the company sought to understand the role of workers so that they could act positively in enabling the ecological transition, different views emerged, some of which shared aspects.

Indeed, Respondent 1 affirms:

> "I does not think that the process of energy transition initially went side by side equally with a process of reorganization of the ways of working, of the "new ways of working", but I think the main and strongest driver was obviously the pandemic to begin to rethink about the new ways of working

and basically then to try to become aware of the fact that our ways of working and then also our contracts were basically obsolete compared to the new situation."

Respondent 2 agrees with the idea that Covid is to be considered a driver for reorganization of work but, at the same time, he considers, as a driver toward this activity, also the energy transition. He says:

"there have been two strong pushes on this issue: on the one hand the energy transition, and then also what happened with Covid. With The Covid, the philosophy of the worker changed completely; so, on the one hand, the energy transition that was going on pushed towards a different profile of people who had a much broader knowledge on the issues of sustainability and digitalization, just to give a push to renew the processes that were in place and carried out by our company. Secondly, also the Covid, because we found ourselves from a situation where the standard condition was doing the activities 5 days out of 5 in the office, to a situation where for several months we were homebound, so full smartworking."

Then he proceeds to say:

"these two circumstances gave the impetus for a new program put in place by the Human Resources Department about New Ways of Working, based on the identification of new programs and new working methodologies."

Fabio Di Ninno gives an even different view, arguing that the company has envisioned a multidimensional role for workers:

"workers are definitely required to become aware of precisely multiple dimensions, rather than performing the single task that may be very thorough from a technical point of view, but does not keep in mind the ultimate goal in all its facets. We envisioned the new role of workers through becoming aware that the transition invests so many areas, so many dimensions, and so many professional skills".

To conclude, Respondent 3 and 4 answer by saying that the company made sure that workers were "engaged and passionate", thus envisioning the embodiment of their role within the difficult challenge of the transition: the "NexTerna" project, according to their vision, was born out of this specific need and is Terna's concrete way of thinking about involving workers.

Hence, coming to the program “NexTerna”, the interviewees gave their description of it. Through their responses, it was also possible to understand what aspects of this reorganization program stand out most when put into practice in the field. The themes that emerged when describing the project are presented in the next subparagraphs.

According to Respondents 3 and 4,

> “New ways of working” is Terna's working methods transformation project that aims to increasingly put people at the center of cultural change. The goal is to create even greater involvement of all Terna people in the goals of the Industrial Plan”.

Thus, according to them, the program is aimed at a real company-wide cultural transformation, all based on people. Silverio Casulli adds a piece to this definition:

> “the program aims to create a different way of working and, on the other hand, to achieve results that the current energy transition required. It is a program divided into several sites.”

4.2.1. Smartworking, coworking, and new workplaces

One of the themes that emerged involved new ways and places to work. All hold importance within the “NexTerna” program.

Smarworking emerged as a necessity and an obligatory work reality during the Covid-19 pandemic. The “NexTerna” program, finalized in 2021, decides to maintain this mode of work.

Fabio Di Ninno sees smartworking as a way of working that is flexible and no longer anchored to adherence to set schedules, of working morning/afternoon and then disconnecting at a certain time, but working flexibly with a physical location that does not necessarily have to be office, but can be home, can be coworking, can be other places, where the worker can set the whole schedule, streamline, optimize, and perhaps the goal is just that, the work performed in compatibility then with the private life.

Coworking emerges, at this point, as one of the forms of smartworking. In this regard, the company has identified new locations:

> “we identified coworking locations that were also different from the location where the normal activity was carried out. We identified locations in the Roman context and also in the context of big metropolises that were closer to big rail hubs. And so there we pinpointed locations where each of us can go and work independently: this is to reduce travel and to facilitate the reconciliation of work and private life, so to meet family needs, because precisely after Covid everything changed:the philosophy and our way of working”. (Silverio Casulli, Respondent 2)

Thus, Terna believes it is essential to empower the worker to perform his or her role as flexibly as possible. Thus, not only does it use smartworking as a work solution, but it also goes further by identifying places where the worker can carry out activities pertaining to his or her job even when he or she needs to move. Fabio Di Ninno gives an example:

> "if there has to be a trip from Termini during inconvenient hours, the employee can go to work at the coworking location near Termini this is a form of "new way of working".

Respondent 3 and 4 provide, in their written discussion, a comprehensive list of these new organizational models, made possible by new technologies and necessary by the current complex scenario we are experiencing. This background

> "flows into an optimization of locations and their use, examples will be virtual offices, distributed offices and forms of coworking that can ensure both work functionality and logistical and quality-of-life benefits."

As it may be deduced, it opens the great theme of work-life balance and smartworking at its service. This topic will be discussed at length later. For now, it is possible to establish that the company has considered it essential to maintain smartworking and give it new spaces to facilitate its employees, giving them material tools (coworking locations in nerve points) and intangible (flexibility in working hours and places) so that they can be ready and equipped to meet the challenge of the energy transition.

4.2.2. A new form of leadership

Smartworking, as has been reiterated throughout this thesis and several times in recent years, has changed the way people approach work. During the early months of the pandemic, coinciding in Italy and other countries of the world with lockdown, such a way was the only one to relate to work, at least for certain tasks. These changes, among other things, required a revision of the leadership model that could work even if there was no direct contact between workers. This situation, at least in an early period, led to greater difficulties in organizing and coordinating tasks.

As I mentioned in the previous subsection, Terna decided, in 2021, when it conceived the "NexTerna" program, to maintain the use of smartworking even after the most crucial phases of the pandemic, while, at the same time, designing a new and suitable leadership model.

The design of this model, the project of which is called "Leading Next", is an integral part of the "NexTerna" program.

Respondent 2, Silverio Casulli, reiterates the fact that the reorganization became necessary because being at home, in smartworking, makes it different to manage both with one's manager, but also internally, among peers, so Terna identified this

> "new leadership model focused on goals, achievement, and performance, so as to improve the whole work environment."

From the themes that emerged from the responses of respondents 2,3,4, it is possible to identify some characteristics, organized in the table below, of "Leading Next".

Features of Leading Next
Core values: • resourcefulness • sustainability • innovation • involvement
"Rituals": meetings conducted on a systematic, daily, weekly basis and consisting of field training activities.
Protection, guarantee, and recognition of the indispensable value of welfare.

Table 4.2. Essential features of the "Leading Next" project according to Respondents 2,3 and 4 (source: own elaboration)

4.2.3. Well-being and work-life balance

The issue of worker well-being has already emerged in the course of discussing the research findings, both in the context of smartworking, coworking and new workplaces, realities that have taken strength to foster this aspect as well, and in the context of new leadership, where it has emerged as one of the preponderant requirements in designing it. Therefore, I found it necessary to expand the discussion on this topic.

Indeed, Silverio Casulli states, referring to the new places to work:

> "they have been identified to reduce travel and facilitate work-life balance, thus meeting family needs, because precisely after Covid everything has changed: the philosophy and our way of working".

So, beyond the new ways and spaces of working and a leadership that works ad hoc for this as well, there is another, fundamental aspect, mentioned by Respondent 1 Cosimo Pisani:

> "somehow, there has been an attempt to target so many aspects that would privilege the right to disconnection in the balancing of personal life and work."

A practical example of attempting to reconcile work and life and increase the well-being of workers is the establishment of a company nursery:

> "(company nursery) is one of the many things that try to minimize the discomfort. Getting up in the morning, knowing that you have to get your child ready and having to go to the other side of Rome to drop him off. Then at work, badging. The company has invested a lot in these things to try to provide an opportunity, a chance, for its employees to live in a better way and with better quality". (Cosimo Pisani, Respondent 1)

According to Fabio Di Ninno, this and others are part of those Diversity&Inclusion policies that also aim at zeroing the gender gap, as the ultimate goal of these activities is :

> "to give a balance on all dimensions: thus on the dimensions of social well-being, stress at work, its compatibility with children and personal life".

4.2.4. Digitalization and reorganization of corporate processes

Digitalization, of course, is a topic that comes up often when discussing the reorganization of work by taking advantage of new technologies.

Silverio Casulli reports that Terna has activated a whole series of initiatives to foster digitalization, which is therefore considered an important factor in enabling the energy transition.

At the same time, however, other initiatives were also undertaken regarding business process improvement, which looked at the link between the activity, the degree of digitization required and the importance of the person who would perform it. Casulli says:

> "there are also other initiatives as far as business process improvement is concerned, so we started to question what we were doing in the past and asked ourselves: okay, but can this activity, for example, starting right from the basic activity, be done in a different way? So there we identified a basket of activities that are performed with a low degree of digitalization by putting the resource at the center and trying to understand: OK, but can this activity also be done in a different way, simplifying the person's tasks?"

Thus, the degree of digitalization required by a certain activity is the discriminating factor in this part of the business reorganization process: activities that do not necessarily require people to perform are digitalized. Instead, where the presence of the worker is deemed necessary, the activity itself is rethought in light of his or her comfort in performing it, modifying, if the task permits, certain parts of it to simplify the performance. The human resource and its relationship to his or her job role and task thus play an important part in this phase of the corporate restructuring.

4.3. Organizational resilience and the skills to achieve it

From Terna's perspective, people are at the center of the ecological transition and play a role as enablers. The transition is a major shift with impactful outcomes. It is a challenge, but it could become one of many: gaining organizational resilience is undoubtedly important to deal with this and those to come.

Therefore, as people play this critical role in this key change, it is of paramount importance that they understand the epochal nature of the ecological transition and the importance of organizational resilience in this context.

Respondents have different but complementary views with respect to the characteristics a company in their industry must have to be considered resilient.

Respondents 3 and 4 started from the definition of resilience within physical systems, which I have mentioned in the first chapter of this thesis, and then declared the basic characteristics that characterize a resilient company:

> “a pivotal requirement, capable of meeting the previous definition, is undoubtedly to project, understood as the ability to plan. Thus, it is planning, adaptation, and innovation that are the fundamental and necessary drivers for a company to call itself resilient.”

Another view that emerged follows the common thread of the resource at the center of change:

> “I believe that a resilient company should be one which must have the employee at the center, so it should be driven, in some way, by the individual's sensibility.” (Cosimo Pisani, Respondent 1)

He, therefore, continues:

> “the strategic directions of the company must certainly be dictated by the managerial pull but, clearly, the latter, in order to be able to do their work properly, must be supported by the technical staff who are somehow educated on the subject and must fundamentally have a very cross-cultural

attitude that is not limited exclusively to technicalities. So, certainly expertise is one of the essential aspects. Secondly, there is social responsibility, and this is something that the company invests so much in. There are so many meetings that we do with local communities anyway.
If you want, resilience basically means being able to continue doing what you do as the whole scenario around changes. Sure, today maybe you go for renewable, tomorrow you go for electric car, tomorrow you go for management services. So, you need that competence to be able to switch from one thing to another: in my opinion these are three ingredients, although not the only ones."

Thus, according to Pisani, corporate resilience is fundamentally based on three pillars.

First, the capacity of employees to combine technical skills with a cross-cultural attitude that is not limited only to the more technical aspects of their role is taken into great consideration.

Second, the importance of social responsibility is recognized, which is embodied in dialogue with stakeholders, and, in this case the interviewee makes a focus on local communities, whose needs are in some way involved in Terna's projects.

Finally, recognizing, as I mentioned earlier, that the ecological transition may be only one of many challenges, according to Pisani the resilient company is able to switch from one change to another while trying to continue to perform its activities.

Silverio Casulli shares this view. In fact, according to him:

"to be resilient a company should have the ability to adapt to the context in which it operates, thus not being rooted to its own habits, and so being able to respond effectively to challenges coming from the external context. Consequently, it should possess a great deal of flexibility so that it can quickly change its vision and adapt to different inputs coming from the outside world."

Fabio Di Ninno argues that for a company to be resilient, it should possess, at the organizational level, a structure capable of absorbing temporary or more impactful shocks. At the same time, however, he draws attention to the functionality of buffer solutions. He explains:

"there is a predisposition to anticipate certain unforeseen events: however, buffer solutions and permanent solutions can be adopted. Obviously, buffer solutions are often underestimated, but, the moment when an unforeseen event occurs the company's responsiveness and reacting promptly to that unpredicted event is crucial, even with temporary solutions to deal promptly and proactively with the early stages of a shock. Parallel to optimizing that temporary solution, a more long-term resolution must be thought of and conceptualized. Thus, I expect a resilient company to react to the unexpected and then to distinguish precisely the short-term from the long-term."

When the topic of the soft skills that workers must possess in order for the company to be resilient is emerged, Pisani takes up in part the discussion previously conducted on the importance of "cross-cultural attitude" and adds:

> "the company cannot make the effort to adapt if there is not a critical mass of people behind it who are clearly aligned at every level based on the goals and the things that are being done. So, clarity in goals and the worker who clearly feels like an active part of the change process: these are the fundamental skills."

This response echoes the one given by Di Ninno and the link between the two answers is given by the importance assumed by workers' communication skills. Di Ninno says:

> "there definitely has to be a clarity of communication at various levels, in years past perhaps it was less fundamental, because the way of working was a bit more vertical, a bit more compartmentalized. Nowadays, transversality is an absolute value, and the contamination of skills as well. So, being able to adapt one's language, one's terminology to the person in front of you, leveraging both their training, their predisposition, their temperament, are important soft skills for workers, because today you find yourself having to speak at all levels. Hierarchies are still there but they are more flexible, less rigid. So, for me, being able to communicate is one of the main skills that workers should have: it is functional in adapting the message that you want to convey and make the communication empathetic."

It is understandable from the answer, but it is confirmed by the interviewee himself, that he pays very particular attention to the neuro-linguistic programming also in the context of the working relationships: the responsiveness to the linguistic universe of the interlocutor and the ability to intercept also his or her sensory preferences are abilities that push the worker's ability to communicate to a more advanced level.

However, another view has emerged regarding soft skills, completely based on the worker's ability to manage interpersonal skills among people:

> "it is important for each worker in this context to be able to manage his or her team, to coordinate work even remotely, to manage the relationship with colleagues: these certainly are the three soft skills that a person should possess in order for the company to show resilience and also to have capacity for innovation and creativity." (Silverio Casulli, Respondent 2)

Once again, therefore, the issue of work that does not take place in the office or on company spaces

emerges. Distance should then be offset by autonomy and the ability to make decisions in the absence of physical contact with one's supervisor or other colleagues. These relational and autonomy skills, Casulli further explains, were already required in the past, but they were given much less weight. Instead, as the company has now adopted an organizational-working model that involves smartworking, these soft skills have become essential so that energy is not wasted: they are the new skills for employees in a company that wants to be resilient by facing a challenge.

Respondents 3 and 4, in some ways, provide an even different opinion:

> "the skills needed to meet epochal challenges, such as those of the ecological transition, include analytical thinking, creativity, innovativeness, flexibility and, of course, resilience."

This is, undoubtedly, something relevant to our study: resilience is seen as a means, a skill that the employees should already possess, as if the resilient worker equals resilient company schema applies.

Interviewees 3 and 4 explain why:

> "resilience thus falls under Soft Skills, despite the fact that, underlying it, there certainly turn out to be the ability to adapt, resourcefulness and flexibility, as well as having the right mindset, the ability to set goals and maintain a positive attitude."

What the two interviewees claim is that there are a number of soft skills, such as precisely the ability to be adaptive, to set objectives, and to maintain a positive disposition, which, when added together, return resilience as a result.

To conclude this paragraph, I think it is necessary to address the subject, which emerged from the interviews, of the possibility of training in resilience.

All respondents attached important value to training in resilience for workers and proactive training for managers. Casulli considers the activities related to the new leadership model within the program "NexTerna" and the "rituals", or the information sessions I talked about earlier, essential to form resilience.

He explains:

> "in order for a worker or manager to be resilient and to do his or her work proactively, we have identified the cardinal points to be implemented in our leadership model. In this context, rituals are essential, that is, field training activities that help a worker to be resilient and adapt to the new context."

The theme of the training sessions for resilience is taken up by Fabio di Ninno:

> "in my opinion, resilience training for workers in general and proactive resilience training for management figures is possible: already treasuring what has happened by analyzing it as lesson learned and passing on the key elements through information sessions, I imagine can be an effective vehicle for increasing the degree of resilience."

Respondents 3 and 4 and, on the other hand, although they support and view positively resilience training for workers in general and proactive resilience for managers, are adamant that training alone is not enough to deal with situations where resilience or proactive resilience is required and that experiencing such circumstances in reality is essential to becoming resilient:

> "Resilience training also comes from knowing how to give and receive the necessary support to oneself and colleagues, committing oneself to become physically and mentally healthier, clear-headed and efficient, being ready to respond, even in the case of extreme events, in a reflexive manner. Other resilience training opportunities for management figures are, undoubtedly, mentoring and coaching. These considerations, therefore, leave room for the possibility of real courses aimed at developing a resilient attitude, which, however, cannot be separated from experiencing real situations."

Pisani, on the other hand, despite his reliance on training for proactive resilience, believes that it, in order to be truly functional, must be imparted to a subject who, already by personal inclination, is proactively resilient.

> "Proactive resilience, in my opinion, is a trait that you have or you have anyway more easiness to develop because it is a mindset: in short, if you have it, all the decisions you make, all the settings you give, are already inherently resilient, that is, they are already held within contingency, the fact that the scenario is changeable."

In addition, Pisani finds adaptive resilience training even more challenging because it would all have to be built on a simulative basis and what the human resource brings home is not as effective as experiencing the situation on the job.

4.4. From the Covid-19 to ecological transition: shocks and challenges for the organization

That Covid-19 was not only for Terna, but for all organizations a watershed, among other things,

from the point of view of changing ways of working, emerged several times in the course of the thematic analysis and thus the findings of this thesis. For now, it is therefore possible to confirm the momentous significance of this shock for companies and organizations in general. Given its importance, it therefore needs to be investigated further. In analyzing the interview responses, I discerned a conceptual line based on the shocking impact of both the Coronavirus and the challenging nature of ecological transition: indeed, albeit with due and necessary differences both required and require a reaction from companies.

When the topic regarding the link between Covid-19, which, as an "unpredictable" shock, changed the way of working worldwide for all sectors and its role in defining Terna's new corporate organization and ways of working was touched upon, no interviewee downplayed the link, but, again, different views emerged on the value of it.

Casulli, for example, believes the Covid, despite its emergency and tragic nature for all humanity, was used by the company as an opportunity, in fact he states:

> "the Covid emergency represented an opportunity for a big change in both ways of working and organization, so Terna decided not to be passive in these changes, but to encourage, through organizational changes and changes in the methodologies in which work is done, this transformation, and that is why we started this "NexTerna" program of New Ways of Working so that, through new possibilities and new ways of working, new technologies and new spaces, we could make work more and more efficient, free and rewarding for everyone."

Be that as it may, another vision also emerged regarding Covid-19's role in corporate reorganization: according to Di Ninno, it would play the role of an accelerator toward rethinking corporate organizational structures:

> "there was already in the pipeline a vision of change, however (the Covid) was definitely an accelerator. Even here within Terna, trivially, for work at home there were relatively small pilot projects. However, taking more than 4,000 people, apart from the operatives who obviously continued to work (in presence) and putting them to work at home was already an incredible shock. So, the business organization reacted by imagining what the new solutions might be more in the long term, and we revised the way of working. Working smart does not mean working from home: working smart means balancing work-life time and shifting to working by objectives."

Other respondents, however, reported the focus, respectively, on smartworking and remote work:

> "smartworking was something that had been started on an experimental level before the pandemic, but the pandemic forced us to have to apply it, and so we learned the lesson and, in its current state,

we have been strongly trying to enhance it. This is a new way of doing our work, progressively enriching it." (Cosimo Pisani, Respondent 1)

Thus, Respondents 3 and 4, argue that the Covid-19 pandemic has not only turned out to be a health emergency, but has also fueled an economic and labor market crisis, generating a huge impact on people, and on their way of conceiving work. These considerations have led, even within the Terna world and before the definition of a new corporate organization, to the experimentation of remote work:

"Terna has inaugurated two Smart-hub Working locations in Rome and from co-working spaces in Milan and Cagliari, a great opportunity for cross-fertilization, i.e., inter-company, cross-functional exchange on the different cultures developing in the company." (Respondent 3 and 4)

Although the consideration provided by interviewees 3 and 4 brings us back to one of the most classic reactions that companies and organizations have fielded during the pandemic, namely the enabling of remote working, their response is relevant for the purposes of this thesis' research: they, in fact ,inform that the introduction of remote working also precedes corporate reorganization. As it was possible to read earlier, smartworking and coworking spaces are key points of the "NexTerna" program: the fact that these instances were enabled by Terna prior to the development of the company reorganization program opens the way to venture to the existence of a link between smartworking and remote working conceived as the company's resilient response during the pandemic period and the same new ways of working considered as successful in addressing the ecological and energy transition under "NexTerna".

It is natural at this point to bring the focus to the challenge that the interviewees, as part of Terna, are experiencing: that of the energy transition. All respondents highlighted two major areas to which the impacts of mismanaged or neglected energy transition would be unsustainable: the environment and the economy.

Pisani argues:

"The repercussions could be serious for both the country system and the individual. Let's give an example: tomorrow morning I go to buy a diesel car. I am implicitly doing double damage to myself because it is likely, to a good approximation, that I am once again not managing the system, which in this case is my household level, taking into account the contingency and, in any case, a whole series of goals that are bandied about all over the place; second I am doing economic damage to myself because with good substance I am buying an asset that will be fundamentally devalued from here on because maybe the reference scenario will change and I will not be able to circulate, for example, in urban centers with that car, which already happens. To close with a dry answer: the damages would clearly be, at the level of the final effect, this economic I just described and global warming."

Casulli fully agrees with this response, while Di Ninno gives an even more alarming view:

> "the damage is the survival of the planet, if you will, even the extinction of humanity. If we increase the Earth's average temperature by 2 degrees until 2050, the consequences are cascading: much drier areas, increased social inequality. Also, the poorest populations are mostly made up of farmers, people who work on the land; therefore, it goes to emphasize and increase these social differences. So, there will be peoples who will have to migrate looking for more suitable climates. On the environment and the economy is the collapse. The problem is that (the ecological transition) it is no longer an option and not everyone has understood that."

Because of these social inequalities and environmental harms that could result from poor transition management, Respondents 3 and 4 claims for a Just Transition: an economic process with the goal of producing plans, policies and investments that can ensure a future where all jobs are sustainable and decent, net emissions are zeroed out and poverty eradicated. In other words, an opportunity to maximize environmental, economic and social benefits through an ecological transition.

4.5. The importance of open innovation for Terna

All respondents agreed on the importance of open innovation for the new business organization to support the energy transition. Respondents reported practical examples that they thought helped the company in addressing the shift. What is at stake here is always the ability of internal resources to open an avenue to the outside world so that they can succeed in getting input to improve the company's role in the ecological transition. Indeed, as I explained in Chapter 3, whatever the value of an innovation, people are essential in the process of enhancing it. Through these open innovation experiences, new opportunities for transition have been opened. Some are more narrowly concerned with improving certain skills of workers, others are well-executed examples of communication with external partners to give a boost to the transition from a more technical point of view. Once again, the human resource proves to be central to the ecological transition process, because, through the ability to identify the right partners and to establish a dialogue with them that will then also lead to real practical innovations, he or she shows itself to be a material enabler and facilitator in the transition challenge. I organized the activities realized through open innovation while illustrating their objectives in the table below.

Goal	Activity
Learning more about energy transition issues	Collaboration with EPRI Electric Power Research Institute, or a long-standing company in the power

	system industry for addressing issues regarding transition within pools of people and TSOs (Transmission System Operator) that have holdings around the world.
Improving the individual capabilities of workers	Collaboration between Terna's Human Resources Team and innovative start-ups in the field of business organization to identify innovative training paths under the "NexTerna" program. These paths, through digital training and interaction with virtual software, help to improve and train the soft skills of each figure.
Making infrastructure functional to contribute to the ecological transition through the use of Advanced Materials[8]	Collaborations with outsiders for coating pylons and cables. Pylons have been coated to turn structures into photo catalysts that can break down organic pollutant molecules, such as those from road traffic, using sunlight. Second, the cable coating not only had the same catalytic function as the pylons, but it was extremely hydrophobic, allowing water to drain from the conductors without creating damage.
Monitoring the landscape that arises around the electrical infrastructure to preserve the environment and the demands of the stakeholders concerned	Application of special sensors on pylons to prevent fires, landslides, mudslides, disturbance of bird flight, and additional and possible problems with local wildlife that could be caused by the infrastructure.
Keep in touch with other European TSOs for joint action in the area of energy transition	Terna's membership in ENTSO-E, the European association for cooperation of electricity TSOs.
Continuous and multidimensional improvement in support of ecological transition	Open communication channels with academies and research institutions.

Table 4.3.Goals and activities of open innovation in Terna according to respondents (source: own elaboration)

[8] Advanced Materials, as explained by Respondents 3 and 4, are materials with "superior" properties or performance that can create value in the power grid of the future. The category includes all technologically advanced materials characterized by properties useful for realizing applications at a lower cost and higher efficiency, supporting the energy transition.

4.6. The significance of lessons learned for organizational resilience

As was explained in Chapter 1, resilience means not only reacting proactively before the consequences of an event impact an organization or society or adapting to changes after the event happens to continue to operate successfully, but also "learning to learn". All interviewees emphasized this aspect of "learning without forgetting", and more than one respondent identified this process with the phrase "lessons learned".

Again, Covid has been something of a master in understanding the importance of learning from the past to better deal with future shocks and challenges:

> "there are numerous lessons from the Covid emergency that help us to define a way of working more innovatively and prevent us from repeating the same mistakes again when the same type of events occur. So yes, making the company resilient and more robust definitely helps us not to make the same mistakes in the future, as well as improving the aspects that obviously need to be improved: in general, it definitely helps us not to go through the same mistakes again in the past." (Silverio Casulli, Respondent 2)

Respondents 3 and 4, on the other hand, follow Terna's classic line, that is, of people as enablers of the transition. they explain:

> "Terna, as a TSO, places itself in a virtuous dynamic, in line with the objectives of the European "Green Deal", standing as a candidate, as a driver to facilitate an acceleration of the ecological transition; this position and commissioning, however, place it in front of challenges that have not yet been faced, complex situations that cannot be separated from the ability and desire to "learn to learning". This tendency of the company, which starts from the attitude of its people, can certainly contribute to making the company resilient."

The importance of making one's own what one has learned in facing a challenge, according to some of the respondents, would be a real process, which, as such, should be systematized:

> "the learned lessons are now fundamental. Events are often unpredictable, so it is not so much coping with the event. The error is human and there can be, however, this must be accompanied by the post analysis of that event to understand how to deal with a similar situation in the future. So, the company becomes resilient to the extent that it systematizes these lessons learned such as what was acted upon, what could have been improved upon, and what will have to be done next time, and, by processing all these situations, it gets, if not really a vademecum of everything that can happen, an awareness, an elaboration of everything there may be to adapt to what may happen in the future."

(Fabio Di Ninno, Respondent 2)

> "Only and exclusively if you set up processes in the way that you do things, you identify the solution, you line it up, you see the effect it has, you internalize the lesson learned, and you try to create a virtuous circle. This is a model widely applied in Terna regardless of the ecological transition. You can treasure behaviors, identified solutions, operational models for handling issues of a certain caliber and a certain relevance, and those then, however, are the company's assets." (Cosimo Pisani, Respondent 2)

As a result, there are some changes introduced to accompany the ecological transition that can become corporate baggage and a winning card for meeting the challenges of the future, before the consequences of them become a shock to the company.

There was an almost unanimous response from interviewees that the "NexTerna" program with its related New Ways of Working and open innovation were useful in addressing other challenges. Casulli's response is illustrative with respect to this idea:

> "in my opinion, the whole model that has been put in place by the company so far can be replicated in new situations. It helps to respond better, to make the company resilient should new episodes occur: it is a model that supports the worker and advantages the company to respond better should new emergency episodes arise".

Pisani and Di Ninno also identified which aspects of "NexTerna" should be retained. Indeed, they believe it is essential to maintain company policies that aim to ensure well-being and work-life balance, thus placing the resource at the center of any challenge.

Regarding open innovation, Di Ninno mentions a number of innovations brought through this channel that, while not strictly related to transition, could improve our lives ss inhabitants of the planet Earth:

> "open innovation is crucial for environmental protection, for example when making submarine cables, and is useful for finding solutions and ideas for the preservation of local wildlife. In addition, masking on stations (made with open innovation) is useful to make visual disturbances minimal after the construction of the work. The electrical work provides support in intercepting the spread of fires: a camera placed on an electrical infrastructure has a vantage point and is also integrated with the territory in order to prevent catastrophic events. There are many challenges that can be reconciled with each other and should benefit from all the changes that are being put in place."

4.7. A second recent shock after the Covid-19: war in Ukraine

The ecological transition is a challenge for the attention of society as a whole, and therefore, as part of it, for companies and organizations as well.

Sometimes, under special circumstances, the commitment required by ecological transition can become a challenge within a challenge: this was the case during the most acute phases of the Covid-19 pandemic, and it is so now, because of the war unleashed by Russia against Ukraine.

The issue of energy dependence is one of the central themes when trying to understand the consequences of the conflict. In light of this, no respondent ruled out that the war in Ukraine will have an impact on the ecological transition. If it is considered that, as interviewees 3 and 4 explain, each process is influenced by the input conditions and boundary conditions so as to define the output, likewise the ecological transition and the energy sector cannot disregard the current geopolitical situation between Russia and Ukraine, considering also the weight of the two nations within the continental and Italian energy mix.

According to Casulli, in the short-to-medium term, the Ukrainian crisis may slow down the ecological transition, because, to cope with the oil and gas crisis, it may be necessary to restore the old conventional sources. Despite this, however, he does not contemplate a reversal to coal, which is a polluting source. Rather, he sees more plausible a return, albeit brief, to nuclear power. At the same time, however, he believes that the renewable targets will not be challenged by the war in Ukraine.

Contrariwise, Pisani argues that:

> "we must necessarily reactivate coal. In the transitional and immediate, unfortunately, the contingency will be managed, in my opinion, somewhat going against what are our goals and guidelines, because the alternative would be an equally high price, which means completely impacting the quality-of-life standards that so far people have gained from domestic electrification."

Di Ninno links back by saying:

> "I hope that in this dramatic context there will be an increase in awareness that energy dependence is a dangerous and even illogical factor, because Italy is a country rich in renewable primary source: sunshine, but also wind. Investment in renewable plants and sources means investing in one's own energy security and independence or greatly decreasing dependence."

This argument is supported also by Casulli, but he believes it is important, in addition to fostering energy security and self-sufficiency within the country and the system-Italy,

> "to look at interconnections with Europe with a critical eye, so that strengthening them can somehow

make the system more secure."

In this situation of great uncertainty, interviewees also have different ideas about whether the war contingency in Ukraine may lead to redesigning Terna's ecological transition plans in a profound way. This chart illustrates their views on this issue.

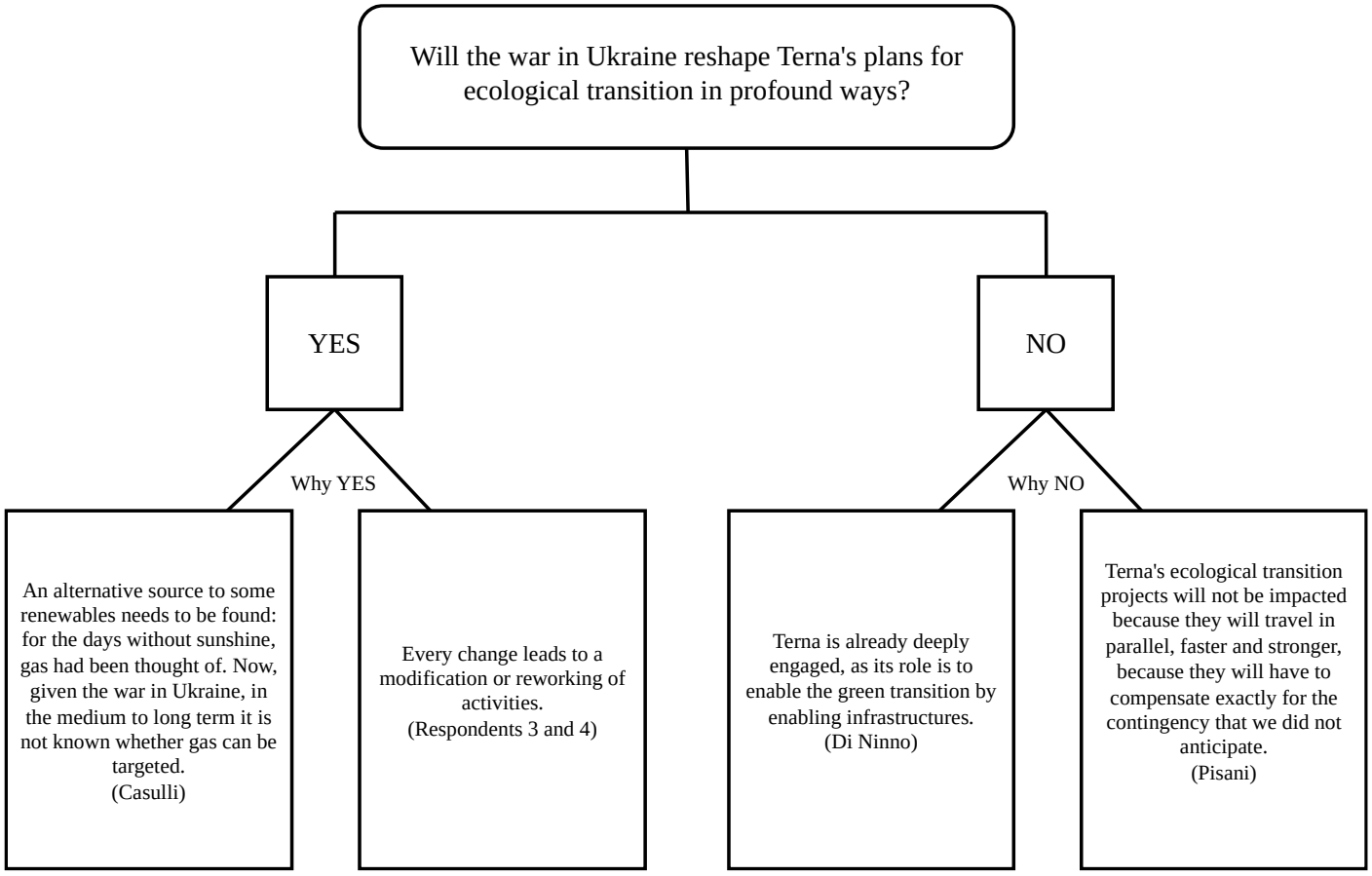

Figure 4.4. The future of Terna's ecological transition projects in light of the war in Ukraine according to respondents (source: own elaboration)

Aside from their opinions on a general review of the company's plans for the ecological transition due to the war, a focus was made on the area each of them is concerned with, to understand whether on a smaller scale, the company's strategies will be reviewed so that Terna and its workers can proactively respond to the expected or unexpected consequences of such a shock.

In reconstructing the findings obtained by investigating this, I would like to open with the response of Di Ninno, who is, as I have already pointed out, responsible for very long-term strategies, because, in my opinion, it accurately paints the degree of emergency of the situation we are experiencing:

"Terna and the relevant European Bodies are monitoring all the dynamics underlying the war. In fact,

the synchronization of the Ukrainian electricity system to that of Europe took place on March 16. The technical experts, the regulatory experts, the IT experts, have been working every day to put together all the communication channels, the legal part, the contracts, and the technical aspects, which is to figure out what would happen when the Ukrainian power grid was synchronized to see if there could be any fluctuations or other technical aspects to monitor. It was not a long-term strategy, but it was a ready response of Terna and other European TSOs to meet the need of a country at war, of a country that was invaded. So, if the decision was made to stop importing gas from Russia, we are already assuming the short-term scenarios and there will be reactions to cope with short-term emergencies, maybe transiently rehabilitating coal-fired power plants, however, at the same time thinking about a long-term and very long-term solution. Terna is monitoring these situations, both to cope with the emergency situation and to cope with the situation when it is fully operational."

This response accurately describes the role of people as a means by which to respond to shocks. At the same time, it shows, as has been mentioned earlier in the dissertation, the value that people can bring to technologies: in this case, the possibility to synchronize the European and Ukrainian power grids existed from an infrastructural point of view, but it would not have happened in such a solicitous manner without the great work of a large number of experts in different sectors.

According to Respondents 3 and 4, however,

"the different organizational processes within the Terna reality are being evolved with the aim of providing workers with tools and knowledge to be able to react proactively to external events; example is the "NexTerna" program, launched in 2021, which aims to change the way people work in order to deal with major challenges."

So, according to them, the goal of proactive resilience fits perfectly, from time to time, within the aforementioned and presented "NexTerna" program.

Instead, Casulli believes that medium- and long-term projects will be reviewed by Terna only where there is a re-examination at the national level. He states:

"if decisions are made at the national level, I am m talking at the level of the Ministry of Ecological Transition, which put in place initiatives that in some way diverge from what was assumed in our Development Plans certainly yes, certainly Terna will also have to make sure to rebalance, to readjust the vision to 2030 and beyond to favor these new directives. Whereas, if the directions from the government point of view does not change, I do not think probably".

Pisani, who, as it was possible to see earlier, is in charge, among other things, of System Stability and Dispatching, provides an answer, which, given the nature of his role, differs in some ways from that of the other interviewees. Concerning the plausibility of direct involvement of workers dealing with technical tasks in order for Terna to proactively react to expected or unexpected consequences of a shock such as war, he argues:

> "I think basically no, because in fact what is happening now is not something new: if we refer to the international situation, it is simply a return to the past, so we know exactly how to handle the problem, as opposed to handling, for example, pandemic, where that monster was unknown and so there was the specter of having to fight with nothing on the other side. So, I simply believe that the work will be reorganized, that there will be a part of the company that will continue to do its work: dispatching will always be like this, dispatching is transparent to a certain extent with respect to the reference scenario."

As can be understood, this view leverages the cyclical nature of a certain type of crisis, such as war, and the value this cyclicality has as a lesson for coping with such types of shocks.

5. Discussion

This last part of the thesis is devoted to discussing the results of the research conducted, namely the findings presented in the previous chapter. They, in this section, will be interpreted and correlated with the theoretical basis of this research addressed in Chapters 1 and 2. Next, the managerial implications of these results will be stated and recommendations for future research will be presented.

5.1. Discussion of the results

When, in Chapter 3, the research design was presented with all the details related to it, I explained the reasons why the idea of studying the existence of a possible link between ecological transition and organizational resilience had arisen in me with regard to Terna. Likewise, I presented the two research questions that would be useful in understanding the value of the above link.

The first aims to understand how Terna has proactively prepared in terms of its business organization to cope with and adapt to the consequences of the ecological transition.

The second, on the other hand, intends to investigate whether there were any innovations introduced to manage ecological transition that would be retained as they were deemed useful in addressing other challenges in the future. Obviously, I consider the two questions closely linked in order to be able to give a complete view of the link between organizational resilience and ecological transition, with Terna's human resources as enablers.

Therefore, while logically giving different and neatly separated answers to the questions, they will be addressed organically within the discussion in order not to break the conceptual link between the two.

The first research question, then, aims to understand the proactivity of the company in realizing the need to enable the ecological transition. This will, of course, require a change in some habits and organizational structures, then an adaptation within the company. The kind of adaptation I am talking about is not a disruption of the organizational structure and the life of the company, but rather an adaptation that arises from the ability to anticipate the need for change and to make modifications within the company that will disrupt it as little as possible and enable it to be strong, ready, resilient during the stages of going through change: so, I am referring to proactive resilience and anticipation as a construct related to proactive resilience, topics addressed in the first chapter of the thesis.

First, then, it is necessary to discuss whether this anticipatory capacity has manifested itself. I think it is useful to examine this question from two different aspects: the temporal and the cognitive aspects of the respondents.

From a time perspective, in 2013, in an official Terna document, namely the Development Plan, the idea that the energy sector was of paramount importance not only for economic development but also for sustainable growth was reported. So, it can be affirmed that the issue of growth, a word that denotes a path

toward something, in this case sustainability, that is taking place, was already related to the topic of energy.

Therefore, since it was published in a company document, the idea of a link between the two themes was already born in Terna, albeit with less precision than it is now: in fact, in the second chapter, it was explained that the sustainability transition is only the first form, with the broadest meaning, of green transition, which is then followed by the ecological transition and, in the case of this thesis, the energy transition.

After this date, a great impetus toward awareness of the need to take note of the climate change problem and act accordingly came from the UN SDGs, the European Union Green Deal, and the Paris Accords. It can be said, then, that after an initial understanding of the need for a sustainable transition nine years ago, the acquisition of the significance of international actions taken in order to facilitate and promote the transition marked a moment of awareness in corporate history. Although, in fact, the UN SDGs are not legally binding, they have assumed a preponderant role in reshaping the corporate organization from a human resources perspective, as can be understood from the particular importance they possess within the 2021 Annual Report. In fact, I have spoken, within Chapter 3, about the importance of certain intangibles, namely “Human Capital” and “Social and Relationship Capital”: they are fundamental to understanding the role of the UN SDGs in Terna's reorganization. The company, in fact, has not only made its own the Goals more closely related to climate, but, linking them directly to Human Capital" and "Social and Relationship Capital, also those related to peace and justice, equality and education. Thus, it can be said that the UN SDGs have played a preponderant role in imagining the new role of human resources.

In addition, the European Union Green Deal has also been influential; it, in fact, has certain objectives that are legally binding and therefore must be pursued by the company, and the same is true of the Paris Agreement.

Second, the need to enable this latest energy transition from fossil fuels to renewables, which, unlike the previous ones I presented in Chapter 2, is of an urgent nature, emerges consciously within this research.

The awareness that ignoring the necessity of transition means collapse for the environment and suffering for all humanity is well present within the Terna people interviewed. But it is not only the environmental disaster that is of concern, because, similarly, the economic-social consequences are seen as a strong input to enable the transition: problems such as inequality and climate migration of the poorest whose livelihood is tied to agriculture are consequences no less disastrous than the environmental ones. The tones in which these concerns are expressed denote deep awareness of the harms of a need toward transition ignored or mismanaged. While the economic, social, and environmental consequences that have appeared problematic in this research have emerged with the same concern as early as the 1972 “The Limits to Growth” report whose contents were explained in Chapter 2, I believe they may be well entrenched within Terna, given that energy is the first and fundamental business it deals with.

Again, however, there is a strong reference not only to the European Union Green Deal, but also to the Paris Agreement, both of which call, precisely, for a Just Transition, that unites as much the aspect of

environmental protection as it does economic and social protection, through investments and policies dedicated to zeroing out both emissions and poverty and the degradation of the dignity of human beings in their jobs.

To return to the theoretical background of this thesis, as defined by Lengnick-Hall and Beck (2005, p.70), in addition to contextual and behavioral skills, cognitive ones are essential to understand the currencies that an organization is going through in order to develop a response. This understanding should therefore lead to recognizing potential dangers and taking proactive steps to make sure an organization survives and thrives in the face of adversity (Somers, 2009). It is possible, to conclude this discourse, to say that the cognitive skills related to the ability to perceive the context have allowed to understand the gravity of the environmental situation that mankind is experiencing and, although these alarm bells have been launched for decades, the capacity to understand the seriousness of the context in which we find ourselves keeps high the attention of the company for the good management of the transition, so that even the company itself has control over its enablement and is not overwhelmed by the changes that it will bring inside and outside, or, even worse, by the catastrophe if ignored or underestimated.

To continue this discussion, I consider it might be useful to stay on the topic of cognitive skills. In fact, at a higher level, they allow the planning and the putting into practice of actions towards an objective with a contextual monitoring of the two. Even in the case of Terna and the energy transition, in order to achieve the goal of enabling the transition, the company had to plan. In this thesis, it is relevant to consider how the planning of the role of the workers within the challenge of the energy transition has taken place, that is how it has been imagined to make them enablers of the transition.

To address this topic, one cannot avoid mentioning the first of the great recent shocks that I have included as essential to address the theme of organizational resilience: Covid-19 pandemic.

Covid-19 has, of course, changed the way of life of everyone and has imposed, from one day to another, radical transformations not only in the working life, but also in people's private existences. At least in the very early stages of the pandemic, the house had become the place of work: although forcibly, this new mode of work has presented the pros, allowing the continuation of work activities that can be carried out remotely safe from an "unknown enemy" like the Covid, but has, on the other hand, caused serious imbalances in the relation between private life and work, which continuously encroached on each other.

There are various visions about Covid-19: sometimes it was seen as an opportunity for change in respect of which Terna had decided not to bring passively, but to become in harmony with these changes.

This attitude conceives resilience as "absorption and not neutralization", in accordance with what was argued by Giustiniano et al. (2018) and already explained in the Chapter 1 analyzing proactive resilience.

A second vision that emerged reputes Covid-19 as an accelerator of change. In fact, the fact that about 4,000 Terna workers (excluding those whose duties include continuing to work in the presence) had to suddenly work from home has already been a shock in itself that has led Terna to update its method of

working while thinking about potential long-term solutions.

After passing the most critical part of the pandemic, it was immediately clear that nothing could ever be as it was before, including business organization.

One of the changes that had to be made was to stabilize contracts that included, among other things, smartworking, which fully entered into one of the company's working modes. Although initially this was not necessarily intended to accompany the ecological transition, it would have been negative for the company to ignore completely the new scenarios that, during the pandemic, allowed the company to continue its work.

So, first, in the planning of new ways of working, it was considered necessary not to deny the workers of what had been an acquisition of Covid-19. Moreover, having worked during the pandemic challenge, it also seemed successful in addressing the more specific challenge of energy transition.

Furthermore, the role imagined for employees in order to be ready to address the energetic shift was multidimensional: they should, in addition to have precise technical skills, be able to conceive all the implications of their work, grasping the ultimate goal behind every single task.

These instances contributed to the birth of "NexTerna", the cultural and multi-year transformation program intended to create new methods of working through the informed, active participation of Terna's people[9], in order to make them enablers of the transition[10]. The main points of the program had already arisen during the reading of the 2021 Annual Report, but the information emerged in the interviews are useful to provide the perception of the program from the operational point of view by the management figures who were questioned. The main points of the program are:

- the maintenance of smartworking and the introduction of coworking and new workplaces. As mentioned earlier, Covid changed everything, demonstrating, in some ways and for certain types of tasks, that presence in the office is not strictly necessary. For this reason, smartworking, along the lines of what had started during the pandemic, paved the way for new forms of flexibility regarding the workplace. In addition, empowering workers to perform their tasks from home limits travel and thus the release of pollutants into the atmosphere, indirectly benefiting the ecological transition. In addition, to facilitate workers, Terna has identified coworking locations near train stations in various cities so that employees with a need to move can balance this necessity with the work tasks to be performed. In addition, the company has opened two Smart-hub Working locations in Rome and co-working spaces in Milan and Cagliari to foster inter-company contamination and dialogue. This is an initial cue in which one can grasp full adherence to the topic of open innovation addressed in Chapter 2. Indeed, through the creation of these new places to work, the company contextually creates the space and opportunity for ideas to flow from the inside to the outside and *vice versa*, strengthening the company's technological competencies.
- a new form of leadership. With the change in the way work is organized and the closeness of team members no longer appearing as obvious as in the pre-Covid period, a retooling of the way

[9] https://download.terna.it/terna/Terna_2021_Integrated_Report_8da18ab57d1d0e4.pdf, p.52
[10] Ibidem, p.45

leadership is conceived within the company has become necessary to the point that Terna has decided to develop a program, called “LeadingNext” within the “NexTerna” project. This redefinition of the conception of leadership certainly has at its core the goal of ensuring the efficiency and smooth functioning of the team so that it can deal resiliently with challenges. Therefore, it may be useful to analyze the characteristics of the “LeadingNext” program in light of the four factors, identified by Sharma and Sharma (2016) and which I explained in the first chapter, in which the 10 characteristics of the resilient team are divided into.

First, the structure of the team can have an impact on its resilience: Good communication, a common understanding of situations where the team is under pressure, and shared leadership are necessary within it. These are key points, because unlike before, when also in Terna the relationship between colleagues and with managers was more immediate, now the way of making decisions also changes, as it is not always possible to ask for information on how to act in person. The issue of worker autonomy, that automatically comes to the attention, will be explored later.

Second, resourcefulness and striving for innovation are prerogatives in the “LeadingNext” program and are fundamental to mastering adversity and encourage learning and development in difficult circumstances.

Third, Sharma and Sharma (2016) argue that social capital is a factor that can influence a team's resilience. For this impact to be positive, there must be social practices and reliable relationships among team members that enable them to work toward a common goal. It can be said, according to the interviews, that the “rituals” introduced by Terna within the “Leading Next” program meet this need: they are meetings that the company organizes systematically, on a weekly or daily basis, that aim to provide on-the-job training on the topic of leadership. At the same time, the frequency of these meetings ensures that all participants have a clear idea of the leadership implemented for the the new way of working. Thus, rituals can be considered a time when social norms are built and the resulting training allows for an unambiguous view of the company's management on the issue of leadership, and such a shared view certainly is helpful in increasing trust among team members and pursuing a shared objective.

Finally, the new leadership model, with the purpose of improving the entire work environment is based on performance and goal achievement. For this to happen and thus group collective efficiency to manifest, it is necessary for each member of the team to be aware that he or she is part of a group. The involvement that Terna aims to build within “Leading Next” is certainly helpful to this objective. Last but not least, the importance of the indispensable value of welfare for workers is recognized, which, posing as a fundamental issue, will be better addressed in the immediately following section.

- the importance of workers well-being and work-life balance. Once again, to begin with, it is necessary to start with the changes introduced by Covid-19 in the ways of working: specifically, in this case, smartworking and its downsides, i.e., continuous on-call availability of workers or at least

trespassing on scheduled hours are considered. In order to prevent these disadvantages of smartworking or remote working from being maintained even after the most acute phases of the pandemic crisis, one of the first forms of well-being that emerged from the words of the interviewed figures was that of the right to disconnect, in order to balance the relationship between work and private life. Here again, leadership comes into play: it is necessary for the leader to boost team members' psychological well-being, and this is critical to empowering team members (Edmondson & Lei, 2014; Frazier et al., 2017; Hu et al., 2017). Another practical example of how Terna has sought to increase the well-being of workers consists of the establishment of a company nursery in the Rome office. This action brings multiple advantages. First of all, it reduces the route, and therefore the time spent, of employees before and after work, with consequent benefits also on the environment in case they move by their own means that are not electric ones or bicycles. This also, consequently, has a positive impact on how stressful the worker conceives his or her job to be in relation to the compatibility of it with parenthood.

To conclude, the establishment of the company nursery was also conceived as an Inclusion policy, as this would allow female workers at Terna to continue doing their jobs without necessarily having to choose between the latter and family.

- digitalization and reorganization of corporate processes. It consists of a preliminary analysis of activities, distinguishing them by the degree of digitization required an those that do not necessarily require human labor are digitized. In a second step, there is a process to simplify the activities that must necessarily be performed by workers.

Therefore, the program designed to make it possible for workers to be dwellers within the challenge of ecological transition consists of these features. In other ways, it was Terna's response to the urgency of pursuing a path toward sustainability. It can be described as a complex program that is accompanied by countless technical and engineering actions and innovations that, of course, cannot be covered here.

The company has defined itself as a director of the transition: thus, it falls within the vision of proactive resilience as an “act of anticipation and active waiting” (Sull, 2005; Waugh et al.,2008).

The “NexTerna” program is a response to how it has prepared itself, but one must then consider what are the ideas about the various facets of organizational resilience that would go into characterizing Terna.

What makes a company resilient is, obviously, the people in it. This part of the discussion is therefore devoted to setting in context and analyzing what emerged from what was supported by the respondents on the topic of resilience from different perspectives.

First, some characteristics that make a company resilient have been identified. The abilities to plan, understand the context to adapt and consequently innovate, are key prerogatives for a company to be considered resilient. In addition, the company should also be able to move from one change to another while trying to perform its activities efficiently. There are evidences to affirm that these characteristics refer to the proactive form of resilience.

Second, the theme of CSR emerges, which is related to the dialogue with stakeholders and local communities. I consider appropriate to give a practical example. The problem of the opposition of some environmental associations or at any rate some private citizens to the installation of some renewable energy infrastructure, such as wind turbines, because they are considered elements of disfigurement of the landscape came up during an interview. Undoubtedly, the company has a responsibility to these actors. It is as important as ever, in this case and others related to it, for Terna's human resources to engage in dialogue with relevant stakeholders, taking advantage of the five types of interaction identified by Berry (2020) and discussed by me in Chapter 2, to explore opportunities for clean energy and related projects. They thus consist of: collaboration among relevant stakeholders, the need to create a network of project support and a relationship of trust with all stakeholders, from private citizens to company employees, empowering them; the four types of previous interaction led the company to learn.

To conclude, in order to be resilient, a company should be able to withstand temporary or more significant organizational shocks, including using buffer solutions at first and then studying and systematizing a more long-term solution in the second instance. As it can be well understood, the ability to communicate, to identify the moment when it is right to change strategic direction and not take root in habits that could damage the company, and to know how to distinguish when the “hot moment” of a shock that has arrived ends and the moment when, more cold, longer-term solutions can be considered, have little to do with the hard and technical skills of the employees. Sometimes, for a company to be resilient, soft skills are as important as hard skills. Where the company is facing a challenge, which in this case is that of transition, it should set clear goals so that workers manifest a cross-cultural attitude and feel part of the change process.

In other words, it would be necessary to consider that link, of which we have spoken in Chapter 2, identified by the scholars of the organization, between the commitments to the company’s sustainability and the ability to adapt and maintain workers. This link is made by virtue of the fact that climate change affects everyone and therefore the employees have, through the work within the company, the ability to play their part in the fight against climate change. As a result, the company grows stronger, achieves internal compactness, and becomes more resistant to this impending energy transition.

In the second instance, a key soft skill is the ability to communicate with one's colleagues or, if appropriate, with one's manager, at an advanced level. Especially after Covid, corporate hierarchies, which still exist, no longer have the rigidity they once did. Transversality and contamination of skills are vital factors. At the communication level, the ability to adapt to and understand, on the one hand, the language and terminology of the interlocutor and, on the other hand, the temperament and his or her inclinations is a fundamental soft skill for today's worker who finds himself talking to people at all levels. Hence, then, the ever-increasing importance of neuro-linguistic programming in the context of working relationships: one should not only be able to communicate by capturing the other person's terminological-linguistic universe, but also his or her sensory preferences, to establish a high-level and goal-oriented communicative interchange.

Continuing, one of the post-Covid challenges is precisely to be able to manage one's team, if a manager, and/or to be able to handle relationships among colleagues, and to coordinate all this remotely successfully even if remotely, that is, without that immediate interaction that one has when working in presence in the same environment. By trying to overcome these difficulties and considering the three just named as soft skills, the company can gain resilience and show its propensity for innovation and creativity to meet challenges.

Once again, it is essential to distinguish the times into “before” and “after” the Covid-19 pandemic: in fact, autonomy and the ability to make decisions without constantly confronting one's colleagues and superiors were already required skills before the pandemic, but now, no longer taking for granted the physical presence of all concerned in one place, they have become real indispensable soft skills in order not to waste energy that instead should be devoted to facing challenges. To end this discussion about soft skills, resilience was also seen as a sum of some of them, such analytical thinking, resourcefulness, flexibility, ability to adapt, to clearly determine goals and maintain a positive attitude. This vision of resilience along with some elements that characterize the proactive, such as determining goals, includes other elements such as, the ability to adapt, which can be considered proper to adaptive resilience, to the extent that the company can use the knowledge one already has and transform it to adapt it to the current situation (Zahra and George, 2002). These skills, taken together, should return resilience. Obviously, it is not easy to acquire them all the more so because the skills considered present both aspects of proactive and adaptive resilience and therefore, the resulting resilience is complete and complex, the result of the process of dialectical synthesis between its proactive and adaptive form, perfectly in accordance with what was described by Giustiniano et al. (2018). Thus, alongside the experience, one of the ways to try to gain resilience can be training: for managers and figures who make strategic decisions would be useful a training to proactive resilience, anticipative of the challenges and shocks that they bring with it; instead, for the other figures, a training on how to acquire resilience more generally could be supportive. Much could be done already in rethinking the leadership model, including in the so-called “rituals” spaces for training to resilience both at managerial and general level for workers. Moreover, moments of information-training on resilience could be introduced at company level: after understanding what happened and having learned it as a lesson, it is possible to pass this knowledge to corporate human resources through information sessions, making them a vehicle to increase the degree of company resilience. Obviously, these moments of resilience training are useful in the process of creating organizational resilience for both managers and other workers only if accompanied by practical experience: in other words, so that the company can really say resilient, should prepare the field through resilience training in order to lower the degree of destructiveness of a shock when it occurs. Also, an even more precise and tailor-made form of resilience teaching is still possible: mentoring. In this case, it would be a real sharing of the experiences in the field between a subject with more experience and a subject with less know-how. The advantage of this form of training is that, being largely made to measure, it can go to fill in targeted way gaps in the level of skills of the mentored person, strengthening it.

In the process of forming resilience, the nature of person in question could also have a weight. In other words, for training to be successful a person must already, by his inclination, be proactively resilient. According to this vision, resilience is seen as a trait of the individual, namely "the capacity to rebound from unpleasant emotional experiences and to adjust quickly to the shifting demands of stressful situations" (J.H. Block and Block, 1980). Thus, the idea of a relation between the success of the formation to resilience and the traits of the person is also linked to the vision of Giustiano et al. (2018), which argues that there are individuals who possess certain qualities, such as optimism and confidence, that lead them to be more resilient than other individuals who do not have such capacity.

I would like to conclude this first part of the discussion with a central topic for the research carried out in this thesis: the importance of open innovation for the ecological transition in the case of Terna. I have already said that this thesis deals with the question of transition not from a purely technical point of view, but aims to understand how people organize innovation and infrastructure to make the transition a fruitful path. The ability to understand which external actors can make important contributions to this challenge and the ability to communicate with them are fundamental activities. In the case of Terna, there are communication channels that remain open to foster the flow of ideas and knowledge to nurture technological advancement for the transition with academies and research institutions. To name two, there is an active collaboration with EPRI Electric Power Research Institute and a membership in ENTSO-E.

In the former case, the relationship between Terna and the Research Institute is useful to learn more and more about the transition issue by staying in touch with various TSOs that have holdings around the world.

In the second case, on the other hand, Terna, through a membership in ENTSO-E, stays in touch with other European TSOs to move joint actions in the area of energy transition. In addition, the project to reorganize working methods has itself benefited from a number of external contributions in order to be improved. In particular, a collaboration has been created between Terna's Human Resources Team and innovative start-ups in the field of business organization in order to identify training paths that allow, through digital tools and virtual software, to improve the soft skills of workers.

Alongside more properly technical innovations such as the use of Advanced Materials as a coating for pylons in order to enable the absorption of pollutants using sunlight, an example of open innovation particularly functional consisted in the intervention of external actors for the installation on the pylons of special sensors that, in addition to preventing natural disasters such as fires, landslides and mudslides, they monitored the possible problems that the infrastructure could create to the wild fauna that live in the surrounding environment (for example interference in the flight of birds). In this way, the demands of environmental associations which feared for life around electric infrastructure have been respected.

The second research question aims to understand whether there are particular new ways of working or contributions from outside that the company intends to maintain in order to meet other challenges. Thus,

this part of the research strives to figure out the ability and intention to “learning to learn”,that is, to put in place that process that requires overcoming biases that prevent one from trying new things, being open to new opportunities for growth, motivating oneself to learn new skills, and continuing to do one's job while engaging in these activities, so also meeting the current problems (Andersen, 2016). Consequently, this second part complements the first one that was intended to investigate about proactive resilience. In fact, again, activating learning processes to learn from a previous shock in order to implement them in the next challenge can be considered a form of proactivity, that is, “active waiting” (Sull, 2005) by the company for a possible next shock. Once more, Covid-19 pandemic arises powerfully on the scene. In particular, having it brought more innovative ways of working, the company, in order to be resilient, should take note of these changes that have been made and have been successful in meeting the Covid challenge, improving them contextually. Of course, again, the process of becoming aware and willing to improve, of “learning to learn” is all in the hands of the workers, who, are called upon to find the right fit for each innovation so that it can really be fruitful for the company in the case of complex situations and challenges that will come. For this to happen, the process of learning what has been learned from another challenge must be systematized. While in the first phase human error in attempting to respond to the shock must be contemplated, in the second phase it becomes essential to conduct a post-analysis of the facts to understand how to approach such a situation in the future. The process of creating resilience from the lessons learned would be structured in these steps: understanding what was done to cope with a shock, understanding what should have been improved, and finally, understanding what needs to be done the next time in the event of a similar situation.

In a second step, these three aspects should be processed in order to obtain a kind of *vademecum* that takes into account what may happen in the future and how to cope with them. This is considered the only way to create a virtuous circle of resilience and make the lessons learned become corporate assets: first react and then, cold, systematize the lessons to be learned. This is, however, a process that applies whether the company has been proactive or has had to adapt quickly to the consequences of a shock.

Terna uses this process to try to store lessons learned for all challenges, so not just the transition challenge.

After clarifying the process that should lead to an understanding of what lessons learned should be internalized for the future, it emerged that the New Ways of Working of the “NexTerna” program along with open innovation as was described above are useful in addressing new challenges beyond those of the ecological transition.

First, the program “NexTerna” is considered successful to address new challenges because, offering support to the worker thanks to strong policies that aim to bring well-being to workers and take high consideration of the work-life balance of which examples were reported before, the company comes advantage, strengthening in resilience and managing to better face the emergencies that gradually emerge.

Therefore, beyond the reorganization of the way of working, the well-being of the worker seems indispensable for it to perform better.

Secondly, there are aspects of open innovation, born from Terna's communicative capacity with the outside world, that can be maintained even for challenges not strictly related to the ecological transition. One of these is the installation of cameras on electrical infrastructure that help to intercept the propagation of fires, thus avoiding natural disasters. There are, therefore, challenges that can have points in common and mutually benefit from the innovations put in place to address them. In order for the company to be resilient, it should have the ability to understand what should not be wasted but kept for the next challenge.

The ecological transition has taken on or can take on the contours of a challenge within a challenge.

This was the case in the most acute stages of the Covid-19 pandemic, where, while trying not to disregard the commitments made in the fight against climate change and the transition to renewable energies and a more sustainable way of living and producing, companies had to fight with an unknown enemy.

The same situation is being experienced now because of the war in Ukraine, where the issue of energy supply is central and is a real political tool: therefore, in addition to witnessing a real humanitarian crisis and, from an economic point of view, an increase in the prices of raw materials and energy that harms both individuals and companies, it is not possible, at this stage, to say precisely what consequences this conflict will have on the energy transition process. For a company like Terna, this situation presents a real challenge.

From what has emerged, the assumption from where to start is that each process is influenced by both input conditions and boundary conditions: therefore, both the energy transition as a challenge in general that is brought to society's attention and the energy business sector cannot ignore the geopolitical tensions between Russia and Ukraine, considering also the impact of these two countries in the continental and Italian energy mix.

So, one thing seems certain: the conflict will certainly have a direct impact on the way energy will be produced or supplied. On this point there are non-unanimous responses that emphasize how uncertain the situation is.

Views have emerged that in the short to medium term, the war situation in Ukraine will have an impact on the energy transition because, in order to deal with the gas and oil crisis, the old conventional sources of energy will have to be used again. Nevertheless, this step backwards will not involve coal, which is a polluting source, but will result, in a return, albeit brief, to nuclear power. In general, according to this forecast, sustainability targets will not be affected by the war in Ukraine.

In contrast, however, other diametrically opposed views have emerged that, in the short term, it will be necessary to reactivate coal, which has gone by way of derogation from the targets and guidelines for the ecological transition. If this does not happen, to pay with an equally high price will be private citizens, whose quality-of-life standards, such as the possibility of domestic electrification, will be impacted.

Investing in renewable infrastructure thus stands as a means, in a country like Italy, which is rich in renewable primary sources such as sun and wind, of gaining energy security or decreasing energy dependence, looking optimistically toward true independence in this respect. In addition, in order to acquire

energy security, it is necessary to look at interconnections with Europe and strengthen them to make, precisely, the whole system safer.

This wartime occurrence is exactly the kind of “complexity, equivocality, and environmental uncertainty” (D'Aveni, 1995; Carroll,1998; Van Hove et al., 2015) that companies are facing in recent history and from which the importance of organizational resilience, critical to survival and recovery from such negative events (Tugade and Fredrickson, 2004), has arisen.

In addition, it should not be forgotten that transition, as it was possible to see in the second chapter, also has as its characteristic the fact that it is an uncertain (Rosenbloom, 2017) with an unpredictable outcome and nonlinear process

Certainly, the situation being experienced cannot be ignored, as something as fundamental as energy is involved. In order to ensure that the consequences of this situation do not overwhelm the company, Terna must surely weight what are its strategic choices to emerge strong and resilient from this contingency. Since lack of certainty is, in this contingency, the main theme, there are doubts whether the war in Ukraine will fundamentally reshape Terna's designs on the ecological transition: the people interviewed split into two opposing positions. This seems understandable, considering how shocking the situation is not only for organizations, but for the entire world of citizens of democracies. In fact, on the one hand, the idea that any change leads to a modification or reorganization of activities is supported. Thus, a process of reviewing them becomes necessary in any case in which the surrounding conditions change.

Besides, there would be a real change of practical order to be made for a reason soon stated. Alongside the use of renewable energy sources, such as solar energy, another source must be placed to make up for it on days when there is no sun. If until before the war, it was thought that it could be gas, this solution, because of the war and its consequences, does not seem feasible in the medium to long term. The opposing view, on the other hand, argues that Terna's strategies will not be deeply impacted because this company is already deeply involved in enabling the sustainable transition by empowering electricity infrastructure. What will occur will not impact Terna's projects on the transition, but they will travel in parallel, faster and stronger because they have to compensate for the problems that arose from the war, an unforeseen shock. What can be said, with a good approximation, is that, although without upheaval, the contingency should be considered with very high attention by Terna, given the delicate and unstable geopolitical situation, in which power relations are also based on energy availability and its supply.

Thus, although without deep revisions, reorganizations involving workers with technical tasks and smaller-scale strategic policy reviews cannot be ruled out. In terms of medium- to long-term projects and employee involvement, the “NexTerna” program is seen as valuable in providing workers with knowledge and tools to react proactively to external events and to face major challenges precisely through a change in the way they work. In addition, medium to long-term projects could change only if there are modifications made at the national level, thus in case the Ministry of Ecological Transition implements initiatives that diverge from what is set out in the Development Plan prepared by Terna. Only in this case will there be a

revision of what had been planned for 2030 and beyond, in harmony with the new decisions by the institutions. Accordingly, there is no idea of a change in strategy for the medium to long term on the horizon that starts directly from the company because of the war in Ukraine, but company plans could change only as a result of a variation in governmental directions regarding ecologic transition.

The general uncertainty brought by this contingency is mitigated, however, in some respects by two things: the cyclical nature of the war and the way in which some technical tasks are carried out.

Essentially, while this particular conflict can be looked upon, if only in some ways, as a surprise, the war, as a historical and social event, is absolutely nothing new, but amounts to a return to the past that makes it easier to manage the contingency. Indeed, unlike Covid-19, where one had the impression of fighting with a specter, with nothing on the other side, war as a general phenomenon, its course and consequences are known. Thus, war conceived as a known historical recourse does not mean, for Terna, an upheaval with boundaries that are difficult to contain. What may occur will be that, despite a reorganization of work to meet contingencies, there will be one part of the company that will continue to work in the same way all the time: the part deputed to dispatching, that is, the management of energy flows on the grid so that supply and demand are always in balance. In fact, when the whole situation is changeable, dispatching remains the same, is transparent to the reference scenario.

Moreover, with reference to the war situation, its severity, rather than prompting very long-term strategic actions, required interventions, with a deployment of work by human resources, that were considerable and immediate. In fact, in addition to continuous monitoring of the underlying dynamics of the conflict operated by Terna and the other European Bodies, on March 16 2022, just 20 days after the start of the war, they synchronized the Ukrainian electricity system to that of Europe. To enable such an operation with this speed, once again, alongside the right electrical and technological infrastructure, the work done by people has been crucial. In fact, the regulatory experts, the IT experts, technical experts, legal experts, and contract lawyers worked diligently to open all the communication channels necessary to enable synchronization and try to understand what would happen when the Ukrainian network was synchronized to the European network, i.e., whether fluctuations or other technical criticalities might occur.

So, in correlation to what I stated a few lines ago, no very long-term strategies are contemplated for the time being as energies are committed to responding, today, to the needs of a country at war, of a State that has been invaded. What is relevant, however, for the purposes of our research on resilience is that the company acted proactively in case a decision was made to stop importing gas from Russia. In fact, it is envisioning what the short-term scenarios might be to cope with the emergency, thinking about a transitional rehabilitation of coal-fired plants. While dealing with the contingency in the short term, the company is thinking about long-term and very long-term solutions. Accordingly, it is trying to anticipate the consequences of a possible stop of gas imports from Russia, while at the same time trying to understand how the situation will have to be handled when the changes are fully effective. In this difficult situation, the importance of two key points of this thesis becomes clear: open innovation that enabled various

professionals to collaborate with each other and synchronize the Ukrainian network with the European network in rapidity, and the indispensability of people in reacting promptly and proactively to these shocks.

5.2. Managerial implications

From the results discussed, it is possible to draw some practical implications that could be brought to the attention of companies. Terna was, in this thesis, the case study that represented a company particularly involved in enabling the energy transition, but there are already implications that can apply to a more general audience of companies facing not only a period of heightened environmental alert due to climate change, but in general any major challenge to their business. Issues to pay attention to are presented below:

- Worker well-being is the first and fundamental factor in meeting any challenge: actions should be taken to increase it. Companies, and organizations in general, are composed of people, whose actions enable their success. Since Covid-19, there has been a great window of awareness among workers about the importance of well-being and work-life balance, values whose importance has been posed with greater force than the pre-pandemic period. Some innovations introduced to work during the lockdown improved, for the most part and despite some drawbacks, these two elements. To date, asking the worker to eliminate or nearly eliminate smartworking and remote working has an impact on them, who have reorganized their lives around these new habits. Business resilience is built by the strength of the employees and his or her confidence in the company they work in: making them physically and mentally comfortable is a key prerogative for companies. Alongside smartworking and remote working, considering workers' parenting as important to the company could lead to improved performance: thus, conceiving spaces for their children, where possible, could be an interesting idea for companies to consider.
- Be a funnel to get ideas flowing in and out of the company. As has been repeated many times throughout this thesis, reality is becoming more and more complex and the stimuli for innovation greater and greater, so open innovation has become crucial for companies in order to create a virtuous circle: ideas enter the company from the outside, are enriched and become, on their way out, a value to society, and this process also applies in reverse. In a world where a company's mission is no longer only strictly related to what it produces in terms of goods or services, the more open it is, the more it can understand what demands are made by the stakeholders of its interest and try to meet them. In addition, being open to contributions from outside can help support the social responsibility that is required to the companies. To make this possible, workers' communication skills are critical.
- Resilience training can be a useful and successful idea. Each company faces collective shocks, such as Covid-19, and shocks that involve only itself. Given that the test case for putting into practice corporate resilience is in the field, training and mentoring can prove to be effective tools for creating a basic framework for managers and employees to work on for resilience. It must never be forgotten the nature of resilience, or that of a creature born from the dialectical synthesis of its proactive and

adaptive form: knowing a shock of the past could help workers to grasp, through some similarities, that another challenge is coming along similar to something already faced or practically new, showing proactive resilience. Moreover, through the systematization of the learned lessons, it is possible to identify the winning strategies that, during the post-shock adaptation phase, have allowed the organization to return stronger than before or as before.

5.3. Recommendations for future research

I have repeatedly said that the energy transition is a challenge in the challenge. It has been for Covid-19 and it is now being for the war in Ukraine. While for Covid-19 it was possible to draw more precise conclusions regarding the theme of organizational resilience, in the case of the war in Ukraine this moment, unfortunately, has not yet arrived. The uncertainty that has emerged regarding the future of the energy transition due to the instability brought by the war demonstrates this. It is important that in the future there is research to understand whether and how the energy transition has been impacted by Russia's war against Ukraine, how organizational resilience has been useful to overcome this shock and what are the lesson learned for the challenges and shocks of the future. In addition, it will be essential to investigate how the only people who can do this have made all the aforementioned actions possible: the employees.

CONCLUSION

The times in which we live are undoubtedly complex. The difficulty of the challenges to be faced is amplified when they have to be met at the same time: this is the case of the climate crisis and the ecological transition that had to be handled before during a global pandemic, from which, in any case, we have not yet got out completely, and then a war, the one against Ukraine moved by Russia, which has the problem of energy supply among the main sore points.

Of course, as part of society, organizations also had to confront these challenges and, from the case study addressed in this thesis, the importance of workers to face proactively these shifts and to build on what they learned from a shock is evident, In particular, it is important, so that workers can become enablers of transition, the need not neglect the innovations at the level of work organization introduced with the Covid-19, such as smartworking and remote working. These, however, to be truly functional, must be accompanied by a revision of the concept of corporate leadership consequently to the increased autonomy of workers. In addition, in the post-pandemic period, there is greater awareness of the importance of well-being and work-life balance: the greater the commitment the organization engages on these issues, the greater the involvement of the employees and their ability to make the company resilient. Furthermore, closing off to the outside world and looking within the own company for resources to address, not only proactively, a shock, is undesirable: it might have been unsuccessful before, and it is even more so when you have to deal with a complex problem like the ecological transition. Thus, open innovation has become fully-fledged in the tools that can be used to address challenges. The ability to intercept which stimuli from the outside can be useful for the company is part of the communicative and relational skills of the workers, therefore of their soft skills. For a company to be resilient, among the soft skills the workers should have there is the ability to understand the goal towards which they are going, and to reach together the complete picture that goes beyond the performance of their tasks, with an aptitude for transversality and contamination.

What the future of the ecological transition will be in the light of the crisis in Ukraine is unknown. There is no unity on whether or not it will redesign Terna's projects for the transition and, more generally speaking, it is not known exactly to what extent it will change how we will be supplied with energy and whether there will be a return to the past, for example to nuclear power, obvious turning to the most polluting coal. This uncertainty also affects the role of the workers: it is not clear whether to manage simultaneously the contingency of war and its consequences and the energy transition will be required a further change in the way they work: investigating this topic could be a starting point for future research.

6. APPENDIX

6.1 Interview procedure

MASTER'S THESIS INTERVIEW QUESTIONS

ROLE AND NAME OF RESPONDENT:

MASTER'S THESIS PROJECT PRESENTATION:
My name is Sofia Pia Annarelli and I am a student at LUISS Guido Carli in Rome, enrolled in the Master's degree program in Global Management and Politics. I am preparing my dissertation in Global Organization Design and HRM. The theoretical topic of the thesis is proactive organizational resilience, related to the topic of energy and ecological transition. In other words, my thesis attempts to understand how an organization can preemptively act proactively to avert the economic and environmental damage that could result from underestimating the need for such a transition.
I would be honored if Terna S.p.A would give me the opportunity to become the practical case study for my thesis paper, as the largest independent electricity transmission grid operator in Europe, playing the role of director and enabler of the ecological transition.
In particular, I would like to focus on the "New ways of working" being people considered enablers of the energy transition and the role also played by Open Innovation, as respectively described in the 2021-2025 Business Plan and the 2020 Sustainability Report (later 2021 Annual Report).
Questions follow. Thank you for your availability.

LIST OF QUESTIONS:

1) Before we begin, could you briefly clarify your position from an operational standpoint?

2) There are many definitions of ecological transition, could you give me one that summarizes what you learned operating in the field?

3) When did you start thinking that it was necessary to "plan" for ecological transition?

4) As you began planning for the transition, how did you try to understand the new role that would be filled by Terna’s workers?

5) Could you explain in detail the main points of the "New Ways of Working" (obviously limited to what a person outside the company might learn)?

6) In your opinion, what are the characteristics that a company operating in your sector must have in order to be considered resilient?

7) Did "unpredictable" shocks such as Covid-19, which changed the way the world works for all sectors, play a role in defining the new business organization and ways of working? If so, how?

8) What soft skills do workers, at various levels, need to have in order for the company to be resilient and proactively respond to epochal challenges such as those of the ecological transition?

9) Is it possible, in your opinion, to provide real resilience training for workers in general and proactive resilience training for management figures?

10) The ecological transition is, as we have said, an epochal challenge. What would be, in your opinion, the damage of mismanaging it or, even worse, underestimating its effects on the environment and the economy?

11) In the Sustainability 2020 report, the most recent one on the Internet (later 2021 Annual Report), you gave a lot of space to the importance of Open Innovation for sustainability. Were these contributions from outside helpful in redefining the new company organization and ways of working?

12) Resilience means not only reacting proactively before the consequences of an event impact an organization or society or adapting to changes after the event happens to continue to operate successfully, but also “learning to learn”. What are the lessons that can be learned from this challenge that could make the company resilient?

13) Are some of the changes made to accompany the ecological transition suitable for retention to address other challenges? If so, which ones?

14) A "projection" question: what do you think will be the future of ecological transition in Italy and abroad, in light of the war unleashed by Russia against Ukraine and today's delicate geopolitical situation?

15) Do you think that the situation mentioned in the previous question will reshape Terna's plans for ecological transition in a profound way?

16) FOR RESPONDENT 1: If yes, is it correct to assume that there will be a direct involvement of workers dealing with technical tasks at various levels will come so that Terna can proactively react to the expected or unexpected consequences of such a shock?

FOR RESPONDENT 2, 3, and 4: If yes, is it correct to assume that medium/long-term strategies will be reviewed so that Terna and its workers can proactively react to the expected or unexpected consequences of such a shock?

FOR RESPONDENT 5: If yes, is it correct to assume that very long-term strategies will be reviewed so that Terna and its workers can proactively react to the expected or unexpected consequences of such a shock?

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8. EXECUTIVE SUMMARY

Climate change is a dramatic situation, the effects of which can be seen in our everyday lives, and the need for us to have to take cover is as urgent as ever. Awareness of this can be gleaned from the various actions that have been taken from the international perspective that have sustainability at their core, such as the SDGs of the United Nations 2030 Agenda for Sustainable Development, the European Union Green Deal and the Paris Agreement.

This thesis aims to address the relationship between energy transition, as a challenge to be faced and potential shock if mismanaged, and organizational resilience. To achieve this goal, I chose Terna, one of Europe's leading power transmission grid operators, as a case study.

Thus, the theoretical background of this thesis is resilience. Etymologically, resilience comes from the Latin word *resiliens*, the present participle of the verb *resilire*, meaning "to rebound", formed in turn from *re-* "back" + climb "to jump". In the English language, this word appeared, with the meaning just mentioned, in the 1620s and the use with scientific value of the term has been had thanks to the philosopher, politician and jurist Francis Bacon. 1839 marks a turning point in the use of the word "resilience": it begins to be used to denote the "ability to recover from adversity" (Alexander, 2013). Since the 1900s, this word has spread across multiple disciplines and numerous contexts (Yaman-Galantini, 2019).

With reference to physical systems and in the field of Engineering Resilience, it is defined as the "speed at which a system returns to equilibrium after a displacement, irrespective of oscillations indicates the elasticity" (Bodin and Winman, 2004).

Resilience is also a concept found in the study of complex systems, that is, those systems in which there are a large number of elements that exchange information with each other and with their surroundings.

Complex systems are, for example, political and financial organizations, whose dynamics of interchange among agents can have an influence on human beings, the economy and society.

According to Walker et al. (2004), in the context of ecological systems, resilience is considered as "the capacity of a system to absorb a disturbance and reorganize while undergoing change while retaining the same function, structure, identity and feedback". In addition, there is an interesting link between ecology and resilience that consists of "urban resilience" studies, which aim to understand whether urban systems are able to recover from vulnerable or whether they need to develop certain capacities to do so.

The concept of resilience is, of course, also present in the field of energy. In this context, it possesses a multidisciplinary approach, linked to the four dimensions of sustainability (economy, society, environment and governance). Energy resilience is thus the "ability of an energy system to retain, respond to, and survive disturbances resulting from a shock in economic, social, environmental, and institutional terms, resulting from the learning capacity to adapt to change" (Gatto and Drago, 2020).

Resilience, moreover, is not only a widespread concept in the physical, environmental, or engineering sciences, but is also present in the field of social-ecological systems, which link the human

beings to the aforementioned sciences. In this field, resilience is described as “the ability to maintain the functionality of a system when it is disrupted or the ability to maintain the elements necessary to renew or reorganize if a disturbance alters the structure or function of a system” (Carpenter et al., 2001) or “the extent of the disturbance that a system can tolerate before moving to a different state that is controlled by a different set of processes” (Walker et al., 2002).

In the context of disaster management, resilience is considered as a tool to recover from negative events and “an active process of self righting, learned resourcefulness and growth, related to the ability to function at a higher level psychologically given the individual's capabilities and previous experience” (Paton et al., 2000). The adverse events that disaster management deals with are very different from each other but share a considerable degree of drama: they are, to name a few, volcanic eruptions, tsunamis, tropical cyclones, epidemics, civil unrest.

Finally, resilience is also a concept found in psychology, where it denotes the “ability to cope with adversity and continue to function under stressful circumstances” (Bonanno, 2004). It has also been regarded as an attainable skill by individuals, a “developable ability to recover from adversity” (Luthans et al., 2006).

As it is possible to understand, there are numerous, diverse meanings of resilience. Andersen's definition is another intriguing one that might encompass a number of its facets (2016). This definition views resilience as a function of both learning and “learning to learn.” Learning to learn is a process that involves resisting against the bias that keep one from undertaking new things, being receptive to new potential growth opportunities, activating oneself to acquire new skills, and, while these activities are being performed, continuing to do one's job and therefore also facing the challenges of the moment.

Depending on the perspective, a distinction can be made between “proactive resilience” and “adaptive resilience”. It is not possible to be resilient by adopting only one of these two perspectives: resilience can therefore be conceived as a dialectical synthesis between these two conceptual templates.

Adaptive resilience can be seen as the ability not only to absorb but also to use the knowledge one already has and transform it to fit the current situation (Zahra and George, 2002) and to bend by implementing necessary changes but without breaking (Bridges, 1995, p.5). This form of resilience is certainly the most immediate response of an organization when faced with a crisis and post-crisis growth, which then has post-traumatic traits. It is the most visible type of resilience and a true test for the organization because it calls on the organization to change in a straightforward way. In fairness, the organization does not always prove to have “learned to learn” at the conclusion of an adaptive resilience process. In reality, it is possible that the organization will not be able to include what it learned in a situation in its knowledge system if the acquired resilience fades (Giustiniano et al., 2018).

Proactive resilience can be described as the cultivated preparedness to cope with surprises and the ability to see negative incidents as a means by which gain opportunities for the organization, team, and individuals and incentivize the growth of these entities them (Clair & Dufresne, 2007; Hamel & Välikangas, 2003; Story et al., 2013; Välikangas & Romme, 2013) or as an “act of anticipation and active waiting”

(Sull, 2005; Waugh et al.,2008). Therefore, it is present when the organization is constantly seeking change, which is seen as an opportunity for advancement. This makes transformation possible in response to environmental changes even before they occur (Hadida, 2009; Gilbert et al., 2012). It is crucial to note that even with preparation work done in advance, the level of change readiness that an organization can establish for itself still comes as a surprise. Indeed, it is important to remember that resilience is about "absorption, not neutralization" (Giustiniano et al., 2018).

Given the empirical study of this thesis, I thought it was necessary to make a particular focus on anticipation as a construct related to proactive resilience. There are, in fact, constructs related to proactive resilience that, while differing from it, have aspects in common and thus can contribute to it, and anticipation is one of them. Anticipation can be defined as a "mode of anticipative control with the goal of predicting and preventing potential dangers before the damage is done" (Wildavky, 1988). The distinction between anticipation and resilience is that anticipation seeks to avert prospective harm before it materializes, whereas resilience deals with unexpected threats only after they have surfaced. However, anticipation also contributes significantly to resilience; in fact, resilient entities are better able to foresee and avert future harms.

By proceeding, organizational resilience can be defined as a socially constructed process that enables individuals to be adaptive and flexible while performing a given action (Cunha et al., 2002). Furthermore, resilience is a multilevel construct that recognizes three interacting levels of aggregation: intrasubjective (individual), intersubjective (team) and, finally, collective (organization). Thus, as mentioned a few lines ago, organizational resilience originates as a product of the dialectical interaction between proactive resilience and adaptive resilience, and the interdependence between different levels of aggregation emerges as a property of organizational resilience.

It is then possible to move on to the description of resilience in individuals, in collectives and at the organizational level.

At the individual level, there is extensive debate about three different conceptions of resilience: it is considered an individual trait, a process, or, more recently, a phenomenon.

The conception of resilience as an individual trait is characteristic of most research on resilience.

Exponents of this view are the Prominent professors Michele M. Tugade and Barbara L. Fredrickson.

They showed that resilient people use positive emotions to recover from negative emotional events by leveraging the broaden-and-build theory of positive emotions (Tugade and Fredrickson 2004; Fredrickson 2004) as a framework for understanding psychological resilience. According to the broaden-and-build idea, positive (joy, contentment, interest and love) and negative emotions (anger, anxiety, sadness) have varied and complementary adaptive functions as well as cognitive and physiological impacts.

A completely different way to conceive of resilience is to view it as dynamic process as opposed to an individual quality. Luthar, Cicchetti, and Becker argue that ego-resiliency literature acts as the foundation for the distinction between conceptualizing resilience as an individual feature and as a process.

Ego-resiliency encompasses a variety of personal qualities, such as overall resourcefulness, character sturdiness, and beneficial flexibility to adapt to changing environmental conditions. Resilience, on the other hand, assumes the experience of severe adversity when seen as a process.

Thus, there are two key distinctions between ego-resilience and resilience: the former refers to an individual trait, the latter to a dynamic process of development. Once more, ego-resiliency is not always associated with facing challenges, whereas resilience is.

The last and most current perspective on resilience is to think of it as a "phenomenon determined by the success of the process involved" (Leipold and Greve, 2009). In other words, Leipold and Greve assert that coping, or the assimilation and accommodation processes, leads to resilience, which is defined as personal stability under major adverse conditions. These processes, in turn, are tightly tied to situational as well as personal factors. Therefore, resilience would serve as a crucial conceptual and connecting link between coping and development. To conclude, individual resilience can be measured and there are multiple scales to do so: Ego-resiliency scales by Block and Kremen (1996) and used in Tugade and Fredrickson's study, The Resilience Scale (Wagnild and Young, 1993) for the evaluation of personal competence and acceptance of self and life, Brief Resilience Scale (BRS) for the measurement of recovery from stress (Smith et al., 2008), Tachikawa Resilience Scale (Nishi et al.,2013), which consists of 10 items, and finally, the PsyCap Questionnaire (PCQ) (Luthans et al.,2015).

For the team level, resilience can be defined as "a dynamic and psychosocial process which protects a group of individuals from the potential negative effect of stressors they collectively encounter. It encompasses processes whereby team members make use of their individual and collective resources to positively adapt during experiencing adversity" (Morgan et al.,2013, p. 552).

The analysis of resilience at the team level has not received much attention, despite being essential in the management practices of organizations today. Teams may experience difficulties that have a detrimental impact on their performance, resources, and even the team itself because these issues could weaken its cohesiveness and its members' well-being. The team can only respond effectively to challenging conditions if it is resilient (Alliger et al., 2015).

In their study, Sharma and Sharma (2016) found 10 factors that affect team resilience. These ten elements can be divided into four categories:

1. Group structure. It addresses fair communication, having a common vision in difficult times, and shared leadership as it relates to the interactions between team members.
2. Mastery approaches toward adversities. It stands for the shared capacity of team members to encourage growth and learning in challenging circumstances.
3. Social capital. It comprises the interpersonal trust and social conventions that enable team members to work together toward a common objective.
4. Collective efficacy. It stands for the conviction that a team may function effectively and efficiently when its members work together to plan and carry out duties.

Third, resilience at the organizational level should be considered. According to Weick and Sutcliffe (2001 [2007]), in order for resilience to be viewed positively from an organizational standpoint, people of the organization must be able to both deal with sudden obstacles and help the organization get ready for potential changes (Garud et al., 2006). As a result, organizational resilience consists of these two interrelated components: the capacity to respond to the unexpected and the capacity to foresee potential changes in the organization and, as a result, to prepare the organization for them. Thus, there should be "balancing between regulation and innovation" in this comprehensive strategy (Giustiniano et al., 2018).

Moving on, the second chapter of this thesis is devoted to addressing the literature about the other macro-topics of this discussion, which includes the ecological and energy transition, and international actions for sustainability. One of the first times the word "transition" was used in combination with the topic of ecology was in 1972, in the "The Limits to Growth" report, also known as the "Meadows Report". The goal of this report was to make a "Predicament of Mankind", that is, to examine a number of problems that plagued people of all nations: poverty, loss of faith and traditional values, uncontrolled development of cities, economic and financial problems such as inflation and employment, and last but not least, environmental degradation (Meadows et al., 1972). Fifteen years later, the World Commission on Environment and Development' published the "Our Common Future" or Brundtland Report, that recommended a "transition to sustainable development", identifying the same threats recognized by the Meadows Report as problematic for "our common future". Thus, the ecological transition, involving environmental issues, is but one form of which the sustainability transition is composed.

According to the European observatory for Transition, ecological transition refers to:

- energy transition, which is the use of renewable energy sources to achieve energy efficiency;
- industrial transition, which is the preference for locally produced goods made of recycled materials from the standpoint of a circular economy;
- agri-food transition, which is the switch from industrial to organic farming.

Sectors such as transportation or energy and water supply can be categorized as socio-technical systems. These systems involve the participation of various types of actors, such as individuals, companies, organizations and collective bodies. They establish social and technical standards, and best practices such as regulation. In addition to networks and institutions, "material artifacts and knowledge" are also part of socio-technical systems (Geels, 2004; Markard, 2011).

Ecological transition is a form of sustainable transition and shares its traits. It encompasses multi-dimensionality, co-evolution and is a multi-actor process: this means that it has as components multiple structures (e.g., technologies, markets, policies, user behaviors, industrial infrastructures) that co-evolve, and many actors are involved, as mentioned earlier. Moreover, it is a long-term process and the relationship between stability and change is often knotty: for while some sustainable innovations are introduced, others are opposed by the giant market behind less sustainable alternatives that are entrenched in terms of society's habits (for example, gas-fired power plants and intensive agricultural system) (Unruh, 2000).

On the other side, energy transition can be defined as the "changing composition of primary energy supply" (Smil, 2017). In the present-day historical era, with this expression, is meant the shift from traditional fossil fuels (e.g., oil, natural gas, and coal) to renewable sources (e.g., wind or sun) to produce energy. Given the factors the European observatory for Transition, which was mentioned a few lines earlier, attributes to the ecological transition, it makes sense to view the energy transition as a form of ecological transition. The first ecological transition of the modern era occurs in the early 1700s in the United Kingdom, when energy production shifts from wood to fossil fuels. The transition to new energy sources, which happened concurrently with the Industrial Revolution, was necessary for three reasons: regional scarcity of wood, difficulty in shipping it due to the little energy it produced, and high labor costs (Smil, 1994).

Instead, internal combustion engines supplanted steam engines during the 20th century, which were heavy and impractical for quick road transport. As a result, by the end of the century, the very first internal combustion engine-powered car was created by Karl Benz (Loeb, 2004). To put it another way, one of the first gasoline-powered cars was introduced, starting a new age: the second ecological transition from coil to oil started at that point. The oil and automobile sectors fed off each other. Furthermore, the transition to new raw materials for energy creation brought changes in the way of working, particularly for the automobile industry. Henry Ford and Alfred Sloan revolutionized the manufacturing of automobiles by eschewing handcrafting in favor of mass production, which cut down on the amount of time required for each worker to build a complex artifact.

Differently from these two, the 21st century energy transition is extremely important for two reasons: the actual scarcity of oil and climate change. Unlike previous energy transitions, which were primarily driven by economic factors (such as the Industrial Revolution's switch from wood to coal) or technological advances (such as the development of internal combustion engines), this one is urgent because, in addition to the scarcity of a resource as important as petroleum, it also poses a threat to human survival due to climate change: the 21st century energy transition thus seems to be not a choice, but a necessary step for the preservation of life on planet Earth in the not-so-distant future.

Given the theoretical background and empirical research that I will address in this dissertation, I find it useful to draw a line that unites the energy transition, climate change, changes in the world of work due to the first two, and organizational resilience. First, according to the International Energy Agency, the energy transition will generate 10.3 million net new jobs globally by 2030, mainly in the automotive, power generation and energy efficiency sectors. This increase will be matched by a reduction of 2.7 million jobs in the fossil fuel sector. Second, according to Howard-Grenville (2014) and his colleagues, an efficient response to climate change involves significant changes in the way work is done: in particular, they would have an effect on how work is distributed, favouring the decentralization and desynchronization of some activities and the localization around population centers of the production of some goods to avoid them being shipped great distances, how firms use physical assets and how employees interact with one another.

Indeed, there are some worker skills to pay attention to, such as the ability to collaborate and

communicate internally among colleagues and, at the same time, possess the capabilities to interact externally with other organizations and companies in order to foster paths of open innovation. One of the first scholars to describe innovation in the new millennium was Henry Chesbrough, who connected the utilization of outside ideas with technological knowledge. As it turns out, “open innovation is a paradigm that asserts that firms can and should employ external ideas, as well as internal ones, and access by internal and external channels to markets if they wish to enhance their technological competencies” (Chesbrough, 2006). Technology innovation is more crucial than ever in the context of the energy transition, and managers across all industries should be able to recognize when it is appropriate to use internal or external resources in addition to their own.

To conclude this part of the discussion, there are social processes that play a critical role in the development of programs with renewable energy policies at their core (Miller at al., 2015). They consist of five types of interactions that, combined, allow for the exploration of the opportunities given by clean energy and the related plans (Berry, 2020. They are: collaboration among the different stakeholders of these plans, that are, as mentioned above, multi-actor, network connections, building relationships based on trust, empowerment, learning as outcomes of these interactions.

As I mentioned at the beginning of this executive summary, the SDGs of the United Nations' 2030 Agenda for Sustainable Development and the European Union's Green Deal have been from the key international actions to shed light on the problem of global warming and act accordingly.

The 2030 Agenda, adopted by all member states of the United Nations in 2015, “provides a shared blueprint for peace and prosperity for people and the planet, now and in the future”. Within it, there are the 17 Sustainable Development Goals (SDGs), which call all countries to action to be achieved. They advocate for action in a number of areas, including the elimination of hunger and poverty, equality, access to clean water for all people, economic development and industrial innovation, justice and peace, preservation and protection of the earth's biodiversity, and clean energy and climate change. Two of them deserve further study in the context of this thesis: number 7 and number 13.

Goal 7 aims to guarantee affordable, reliable, sustainable, and modern energy for all. One of the most relevant aspects of Goal 7 to this thesis is the UN's emphasis on the relationship between effective climate action and accelerated action on modern renewable energy, where the latter is a prerequisite for achieving the former.

Goal 13, instead, demands immediate action to combat climate change and its consequences. Despite the fact that the Covid-19 pandemic has slowed the economy, the climate crisis has not suffered any setbacks. Indeed, even at the height of the pandemic crisis in 2020, greenhouse gas concentrations continued to rise, breaking new records.

Continuing as part of international climate action, the Green Deal has emerged as the European Union way of addressing climate change and environmental disasters. It aspires to make the EU economy

modern, resource-efficient and competitive. The EU Green Deal is based on three key points, communicated by the European Commission in late 2019:

- climate neutrality by 2050, thereby making Europe the first climate neutral continent.
- the decoupling of economic growth from resource use.
- a just and inclusive transition that leaves no person or place behind. Specifically, it will have to put people at the center, thus paying attention to regions, industries, and workers, who will have to go through the process of materializing the planned measures, facing a difficult task. In the context of this thesis, I believe it is important to emphasize that two of the benefits that the Green Deal is intended to bring are precisely the creation of jobs that are appropriate for future needs, combined with skills training for the transition, and a globally competitive and resilient industry.

The Commission has required the countries of the Union to develop National Plans by the end of 2019 in order to organize the goals of the Green Deal in a timely manner. As mentioned in the previous paragraph for the United Nations, the Commission had made it clear that countries would need to make significant national contributions to ensure the project's success. The national energy and climate plans will be implemented beginning in 2023. Italy, of course, presented the "*Piano Nazionale Integrato per l'Energia e il Clima 2030*" (*PNIEC*), or "National Integrated Energy and Climate Plan 2030," developed in collaboration with the Ministries of Economic Development, Environment, Land and Sea Protection, and Infrastructure and Transport.

During the development of the Green Deal and its goals, the Union stated that although achieving carbon neutrality first is a noble and ambitious goal, climate change and biodiversity loss know no national boundaries or hierarchies within society.

As part of society, companies are also involved and are expected to play their part in combating climate change: this is closely related to the empirical investigation I conducted in this thesis, the research design of which is discussed in Chapter 3.

I decided to conduct qualitative research that had Terna S.p.A., the company that owns the national transmission network (NTG) of high and extra-high voltage electricity in Italy and the largest independent power transmission network operator (TSO) in Europe, as a case study. The objective of the study is to understand how a company that, if only by its nature, is at the forefront of enabling the energy transition has decided to reorganize the work within it to proactively react to this major shift. To achieve this aim, I organized the research essentially around two research questions:

1) How has Terna, as a company owner of a national transmission network electricity in high and extra-high voltage, proactively prepared itself in terms of corporate organization to deal with and to adapt to the consequences of ecological transition?

2) Are there aspects of the new ways of working and other initiatives involving employees and

people outside Terna that can be maintained after the ecological transition and used to address new challenges?

In the first question, I wanted to find out if the company had prepared itself for the ecological transition in terms of corporate organization by engaging in “acts of anticipation and active waiting”, which I mentioned at the beginning of this summary as part of the theoretical consideration of resilience. Thus, whether or not the company was able to anticipate the change that was coming and, as a result, organize itself proactively practicing that “anticipative control with the goal of predicting and preventing potential dangers before the damage is done” (Wildavky, 1988), with the scope to conceptualize anticipation as a construct related to proactive resilience. Furthermore, because it is clear that, given the environmental situation, the ecological transition is an obligation rather than an option, I chose to investigate whether company studied proactively how to adapt to the consequences of this major shift, rather than passively suffering them.

The second question, on the other hand, seeks to ascertain whether Terna has considered the type of resilience associated with the expression “learning to learn”, and whether they believe that the innovations introduced with the ecological transition can become part of the company's baggage and spendable for other challenges. Also, by using the expression "initiatives involving employees and people outside Terna," I tried to understand whether the company used open innovation, which is so important for clean energy projects, to make useful contributions to the transition by connecting its employees with external realities.

Before going any further, I think it is necessary to explain why sometimes in the parts about the research, then its design and the presentation of the results, I used the expressions “energy transition” and “ecological transition” as synonyms, although I explained the difference a few lines ago. Firstly, given its business, Terna is purely an enabler of the energy transition and so its way of contributing to the ecological transition is about energy and often refers to the energy transition as synonymous with the ecological transition, thus looking at the transition process as if it were a single block.

The second motivation is that this company wants to give, despite the sector in which it operates, a broader scope to its mission as an enabler of the energy transition, conceiving of itself as an apex figure in the transition that involves multiple aspects, not only that of energy.

Thus, given that the objective of this research is to understand the role of organizational resilience in the context in the energy transition for a company in particular, I decided to use, as a research method, the qualitative one for a number of reasons soon stated. In qualitative analysis, the natural surrounding serves as a data source for qualitative research. The researcher seeks to observe, describe, and interpret contexts as they arise, trying to maintain a state of “emphatic neutrality”. Moreover, it is interpretive in nature, so the purpose of the researcher is to detect the meaning of events for the individuals who experienced them, and to interpret them. The goal of my research is to understand the reasoning behind the company's decisions about how to organize work in order to prepare for the challenge of energy transition and possibly gain organizational resilience through this work organization. It is critical for me to understand the respondents'

perceptions of the phenomenon and the change taking place, and to do so, I tried to put myself in their reality, communicating as much as possible with the respondents in their own language (reason why I decided not to overlook their habit to use “ecological transition” and “energy transition” as synonyms) , which I tried to get to know by reading Terna's “2021 Annual Report”, which I will talk about shortly , so that they would feel comfortable and the research would be as rigorous and free of communicative misinterpretation as possible. Continuing, my research sought to understand the entire context while emphasizing human behavior. As a result, the reductionist approach common in quantitative research does not fit. For all these reasons, choosing to use a qualitative research method seemed the most appropriate.

In my empirical research, I chose to use two data sources: one secondary, or a company report, and one primary, or semi-structured interviews. The secondary data source is Terna’s 2021 Annual Report which incorporates and all financial and non-financial information for 2021 and so is the most up-to-date document at the moment. Reading this company report, the idea arose in me that there might be a relationship between the ecological transition, which has become necessary due to climate change, and organizational resilience.

The report served as the starting point of my research and was used to formulate the interview questions as clearly as possible, attempting to assimilate my language to that of the interviewees, and determining which points to delve into in order to identify whether these new ways of working helped the company gain resilience. Specifically, whether the company has prepared for the shift by anticipating the need to make changes to its organizational structure and is prepared to “learning to learn” from shocks.

From reading the report, the importance of some intangibles emerged, particularly the so-called “Human Capital” and “Social and Relationship Capital”. Both types of capital are considered inputs that can create outcomes. A relevant factor is that both types of capital involve outcomes closely and intentionally linked by the company to the content of certain SDGs. “Human Capital” consists of Terna's human resources, considered key enabling factors for the ecological transition and the focus of the “NexTerna” program, launched by the company in 2021 with the goal of bringing about a cultural transformation in all areas of the company.

It involves certain issues such as introducing inclusive leadership, achieving work-life balance, and optimizing workplaces to improve logistics and life quality. Secondly, “Social and Relationship Capital” consists of relationships with various stakeholders (institutions, academy, citizens, businesses, financial analysts, media, and electricity companies) to enable ecological transition. These relationships are made to create value in the medium, short, and long term. Outcomes are programs, tools, and initiatives to support the transition.

Regarding the first data source, namely interviews, I chose its semi-structured form, which provided rigor and at the same, time, flexibility to my research. Since the energy transition is a topic with very important technical implications, I chose to interview technicians who were able to give me information about new ways of working and corporate reorganization by experiencing it in the field, thus trying to understand how the work done by People management could translate “on the ground”. I got five interviews.

I contacted the interviewees by email and, after receiving their affirmative willingness to be interviewed, sent them a further email attaching a document containing a presentation of the research and all information strictly related to it, and an informed consent form to the interview with my contact information (phone number and institutional email). A set of sixteen questions was presented to the respondents which included various themes in order to investigate the organizational resilience of the company under analysis as comprehensively as possible. In order to test the resilience of the organization and the relationship to the way of working within Terna, two "big shocks" which may have changed or will change the course of the ecological transition, took an important role within the questions asked: these were the Coronavirus pandemic and the war in Ukraine. Other questions, about the "NexTerna" program, the idea of organizational resilience and soft skills request to the employees to achieve it, the impact of Covid-19, the influence open innovation, views and future plans in the light of the uncertainty consequences of the war, and the importance paid to lessons learned, were asked of the interviewees.

Although, of course, I gave different answers to the two research questions I presented earlier, I chose to addressed them organically within the discussion in order not to break the conceptual link between the two. With regard to Terna's proactivity and its ability to act in advance to avert the consequences of a mismanaged or neglected ecological or energy transition, it can be reasonably said that this ability has manifested itself. Indeed, in the 2013 Development Plan the company already communicated that it saw the energy sector as an apical element not only for economic development but also for sustainable growth. So, albeit with not too defined contours, the idea of a link between energy and its potential in the sustainable transition, which, as I said, is only the first and largest form of green transition, was present. After 2013, Terna was not indifferent to the alarm bells raised in the context of the UN SDGs and the Green Deal, to the point that some of the SDGs have become, as highlighted a few lines ago, parameters on which sector the success of some corporate initiatives, while Green Deal, the need to enable and a Just Transition. On the other hand, all respondents were highly aware of the harm of poor management of the transition: from environmental to economic disaster-social inequality at the expense of the poorest populations whose livelihood is linked to agricultural activities, to all these risks, of which he already spoke "The Limits to Growth" 50 years ago, is already given the utmost attention. For these dangers to be averted and the tragic consequences of poor management of the transition anticipated in order to be the most possible neutralized, the act of planning is necessary: at this point, the importance of cognitive skills, that, at a higher level, allow the planning and the putting into practice of actions towards an objective with a contextual monitoring of the two, is manifested. In imagining the new role of the workers and the new ways of working, Terna cannot preside over the talk of Covid-19, which has changed the lives of all and the way of working of many.

Covid-19, however, stripped of its dramatic character from the pandemic point of view, can be seen in two different and both positive ways. First, it can be conceived as an opportunity for change in respect of which Terna had decided not to stay passive, but to become in harmony with these changes. This attitude conceives resilience as "absorption and not neutralization", in accordance with what was argued by

Giustiniano et al. (2018). A second vision, however, sees the Covid-19 as an accelerator of change: the fact that 4,000 Terna workers suddenly found themselves at home was a push to update its method of working while thinking about potential long-term solutions. From a strictly practical point of view, this update concerned first of all the contracts, which have been revised to give a systematization to smartworking and remote working.

A change has occurred however also in the role imagined for the workers, because, in order to be ready to address the energetic shift, multidimensionality is necessary: workers should, in addition to have precise technical skills, be able to conceive all the implications of their work, grasping the ultimate goal behind every single task. From the idea that the innovations brought by Covid-19 are now part of the corporate working reality and the abovementioned instances, the "NexTerna program", a cultural and multi-year transformation program intended to create new of working through the informed, active participation of Terna's people, in order to make them enablers of the energy transition, was born. Its main points are:

- the maintenance of smartworking and the introduction of coworking and new workplaces. In some ways and for certain types of tasks, Covid-19 demonstrated that physical presence in the office is not strictly necessary. As a result, smartworking, similar to what had begun during the pandemic, paved the way for new forms of workplace flexibility. Furthermore, allowing workers to work from home reduces travel and thus the release of pollutants into the atmosphere, indirectly benefiting the ecological transition. Terna has also identified coworking locations near train stations in various cities to help workers balance their need to move with the work tasks that must be completed. In addition, to foster inter-company contamination and dialogue, the company has opened two Smart-hub Working locations in Rome, as well as co-working spaces in Milan and Cagliari. This is an initial cue that indicates complete adherence to the topic of open innovation. Indeed, by establishing these new work environments, the company contextually creates the space and opportunity for ideas to flow from within to without, thereby strengthening the company's technological competencies.
- a new form of leadership. This was necessary because, working from home or not strictly in the office, people had to be more autonomous, since the proximity to their colleagues or managers to discuss issues is not as frequent as before. To systematize the new form of leadership was created, under the program "NexTerna", a real project, "Leading Next". So-called "rituals", meetings conducted on a systematic, daily, weekly basis and consisting of field training activities, are considered essential to raise awareness of the new form of leadership among the entire corporate population.
- the importance of workers well-being and work-life balance. Here also we had to start from Covid-19, because one of the elements of well-being in the era of consolidated smartworking is the right to disconnect. Another practical example of Terna's efforts to improve employee well-being is the establishment of a company nursery in the Rome office. This action has numerous advantages. First and foremost, it reduces the route, and thus the time spent, of employees before and after work, with

subsequent environmental benefits if they travel by non-electric or bicycle means. As a result, this has a positive impact on how stressful the worker perceives his or her job to be in terms of its compatibility with parenthood.

- digitalization and reorganization of corporate processes. It consists of a preliminary analysis of activities, categorizing them according to the degree of digitization required, and digitizing those that do not necessarily require human labor. In the second step, there is a process to simplify the activities that workers must perform.

So, the program designed to enable workers to be dwellers within the challenge of ecological transition includes these features. The "NexTerna" program is a response to how it has prepared itself, but it is also necessary to consider what ideas about the various aspects of organizational resilience would go into characterizing Terna. Undoubtedly, what makes a company resilient are the people in it. According to Terna's interviewees, a resilient company must be able to plan, understand the context in order to adapt and innovate accordingly. In addition, the company should be able to move from one change to another while trying to carry out its activities efficiently. There is evidence to say that these characteristics relate to the proactive form of resilience. Second, the theme of CSR emerges, which is related to stakeholder and local community dialogue. I assert it is appropriate to provide a practical example. During an interview, the issue of some environmental organizations' or at least some private citizens' opposition to the installation of some renewable energy infrastructure, such as wind turbines, because they are considered elements of landscape disfigurement came up. Without a doubt, the company bears responsibility to these actors. In this case and others like it, it is more important than ever for Terna's human resources to engage in dialogue with relevant stakeholders. To summarize, in order to be resilient, a company must be able to withstand temporary or more significant organizational shocks, which may include using buffer solutions initially and then studying and systematizing a more long-term solution in the second instance.

Moreover, sometimes, for a company to be resilient, soft skills are as important as hard skills. A key soft skill is the ability to communicate with one's colleagues or, if appropriate, with one's manager, at an advanced level. Especially after Covid, corporate hierarchies, which still exist, no longer have the rigidity they once did. Transversality and contamination of skills are vital factors. At the communication level, the ability to adapt to and understand, on the one hand, the language and terminology of the interlocutor and, on the other hand, the temperament and his or her inclinations is a fundamental soft skill for today's worker who finds himself talking to people at all levels. Hence, then, the ever-increasing importance of neuro-linguistic programming in the context of working relationships.

Continuing, one of the post-Covid challenges is precisely to be able to manage one's team, if a manager, and/or to be able to handle relationships among colleagues, and to coordinate all this remotely successfully even if remotely, that is, without that immediate interaction that one has when working in presence in the same environment. By trying to overcome these difficulties and considering the three just named as soft skills, the company can gain resilience and show its propensity for innovation and creativity to

meet challenges.

Once again, it is necessary to distinguish between “before” and “after” the Covid-19 pandemic: in fact, autonomy and the ability to make decisions without constantly confronting one's colleagues and superiors were already required skills before the pandemic, but now, no longer taking the physical presence of all concerned in one place for granted, they have become true indispensable soft skills in order not to waste energy that should instead be devoted to facing the pandemic. To end this discussion about soft skills, resilience was also seen as a sum of some of them, such analytical thinking, resourcefulness, flexibility, ability to adapt, to clearly determine goals and maintain a positive attitude. This vision of resilience along with some elements that characterize the proactive, such as determining goals, includes other elements such as, the ability to adapt, which can be considered proper to adaptive resilience, to the extent that the company can use the knowledge one already has and transform it to adapt it to the current situation (Zahra and George, 2002). These skills, taken together, should return resilience. Obviously, it is not easy to acquire them all: therefore, the question arises as to the possible usefulness of a training to the proactive resilience for managers and to that in general for the workers. Although resilience is considered all-round achievable only in the field, moments of information-training on resilience could be introduced at company level: after understanding what happened and having learned it as a lesson, it is possible to pass this knowledge to corporate human resources through information sessions, making them a vehicle to increase the degree of company resilience. Mentoring is an even more precise and tailored form of resilience. In this case, there would be a genuine exchange of field experiences between a subject with more experience and a subject with less know-how. The benefit of this type of training is that, because it is largely based on measurements, it can be used to fill gaps in the mentored person's skill level, thereby strengthening it. The nature of the person in question may also play a role in the process of developing resilience. In other words, for training to be effective, a person must already be proactively resilient. Resilience is viewed as an individual trait in this vision.

I would like to conclude this first section of the discussion of the results with a central topic for the research conducted in this thesis: the importance of open innovation in the case of Terna's ecological transition. This thesis approaches the issue of transition not from a purely technical standpoint, but rather seeks to understand how people organize innovation and infrastructure to make the transition a fruitful one.

Understanding which external actors can make significant contributions to this challenge, as well as communicating with them, are critical activities. In the case of Terna, communication channels remain open to encourage the exchange of ideas and knowledge in order to foster technological advancement for the transition with academies and research institutions. There is an active collaboration with EPRI Electric Power Research Institute and membership in ENTSO-E, to name two. Furthermore, Terna's Human Resources Team has formed a collaboration with innovative start-ups in the field of business organization in order to identify training paths that allow workers' soft skills to be improved through the use of digital tools and virtual software.

The second research question aims to understand whether there are particular new ways of working or contributions from outside that the company intends to maintain in order to meet other challenges. Thus, this part of the research strives to figure out the ability and intention to “learning to learn”. Consequently, this second part complements the first one that was intended to investigate about proactive resilience. Once more, Covid-19 pandemic arises powerfully on the scene. In particular, having it brought more innovative ways of working, the company, in order to be resilient, should take note of these changes that have been made and have been successful in meeting the Covid challenge, improving them contextually. Of course, the process of becoming aware and willing to improve, of “learning to learn”, is entirely in the hands of the workers, who are tasked with finding the right fit for each innovation in order for it to truly be fruitful for the company in the face of complex situations and challenges that will arise. For this to happen, the process of learning what has been learned from another challenge must be systematized. While in the first phase human error in attempting to respond to the shock must be contemplated, in the second phase it becomes essential to conduct a post-analysis of the facts to understand how to approach such a situation in the future. The process of creating resilience from the lessons learned would be structured in these steps: understanding what was done to cope with a shock, understanding what should have been improved, and finally, understanding what needs to be done the next time in the event of a similar situation. In a second step, these three aspects should be processed in order to obtain a kind of *vademecum* that takes into account what may happen in the future and how to cope with them. This is considered the only way to create a virtuous circle of resilience and make the lessons learned become corporate assets: first react and then, cold, systematize the lessons to be learned. This is, however, a process that applies whether the company has been proactive or has had to adapt quickly to the consequences of a shock.

Terna employs this method to attempt to save lessons learned for all challenges, not just the transition challenge. After clarifying the process that should lead to an understanding of what lessons learned should be internalized for the future, it became clear that the new ways of working of the "NexTerna" program, combined with open innovation, are useful in addressing new challenges beyond those of the ecological transition.

First, the “NexTerna” program is regarded as successful in addressing new challenges because, by providing support to workers through strong policies that aim to bring well-being to workers and take into account the work-life balance, examples of which have previously been reported, the company gains an advantage, strengthening in resilience and managing to better face the emergencies that gradually emerge. As a result, beyond reorganizing the way of working, the worker's well-being appears to be essential for improved performance. Second, there are aspects of open innovation that can be maintained even for challenges that are not strictly related to the ecological transition, as a result of Terna's communicative capacity with the outside world. One of these is the installation of cameras on electrical infrastructure to aid in the interception of data.

The ecological transition has taken on or can take on the contours of a challenge within a challenge:

it was so during the pandemic.

The same situation is being experienced now because of the war in Ukraine, where the issue of energy supply is central and is a real political tool: therefore, in addition to witnessing a real humanitarian crisis and, from an economic point of view, an increase in the prices of raw materials and energy that harms both individuals and companies, it is not possible, at this stage, to say precisely what consequences this conflict will have on the energy transition process. For a company like Terna, this situation presents a real challenge.

So, one thing seems certain: the conflict will certainly have a direct impact on the way energy will be produced or supplied. At this point there are non-unanimous responses that emphasize how uncertain the situation is.

Views have emerged that in the short to medium term, the war situation in Ukraine will have an impact on the energy transition because, in order to deal with the gas and oil crisis, the old conventional sources of energy will have to be used again. Nevertheless, this step backward will not involve coal, which is a polluting source, but will result, in a return, albeit brief, to nuclear power. In general, according to this forecast, sustainability targets will not be affected by the war in Ukraine.

In contrast, however, other diametrically opposing views have emerged that, in the short term, it will be necessary to reactivate coal, which has gone by way of derogation from the targets and guidelines for the ecological transition, with a fall in quality of life for private citizens if this does not happen. Investing in renewable infrastructure thus stands as a means, in a country like Italy, which is rich in renewable primary sources such as sun and wind, of gaining energy security or decreasing energy dependence, looking optimistically toward true independence in this respect. In addition, in order to acquire energy security, it is necessary to look at interconnections with Europe and strengthen them to make, precisely, the whole system safer. Investing in renewable infrastructure is thus a means of gaining energy security or decreasing energy dependence in a country like Italy, which is rich in renewable primary sources such as sun and wind, with an eye toward true independence in this regard. Furthermore, in order to achieve energy security, it is necessary to examine and strengthen interconnections with Europe in order to make the entire system safer.

In a view of great uncertainty about the influence the war may have on business strategies and ways of working, on March 16, 2022, the Ukrainian power grid was connected to the European grid. Closed the discussion with this achievement, which, in my opinion, can reasonably be considered a triumphant example of the importance of workers beyond technological means. People's efforts, in addition to the proper electrical and technological infrastructure, have been critical in enabling such a fast operation. Indeed, regulatory experts, IT experts, technical experts, legal experts, and contract lawyers worked tirelessly to open all communication channels required for synchronization and to try to understand what would happen when the Ukrainian network was synchronized to the European network, i.e., whether fluctuations or other technical criticalities might occur. In general, the company has taken a productive attitude toward this shock, as it attempts to anticipate the consequences of a possible cessation of Russian gas imports and to understand

how the situation will have to be handled once the changes are fully implemented

From this broad discourse, it is possible to deduce the practical implications to bring to the attention of the companies:

- The well-being of workers is the first and fundamental factor to face any challenge.
- Be a funnel to let ideas flow in and out of the company.
- Resilience training can be a useful and successful idea.

While it was possible to draw more precise conclusions about the theme of organizational resilience for Covid-19, this moment has not yet arrived in the case of the Ukrainian war. The uncertainty that has emerged regarding the future of the energy transition as a result of the war's instability demonstrates this. It is critical that future research is conducted to determine whether and how Russia's war against Ukraine has impacted the energy transition, how organizational resilience has been useful in overcoming this shock, and what lessons have been learned for future challenges and shocks. Furthermore, it will be necessary to investigate how the only people who can do this have accomplished all of the aforementioned feats.

In addition, it will be crucial to investigate how the only people who can do this made all the above actions possible: employees.