JUST2CE

A Just Transition to Circular Economy

CASE-STUDY EX ILVA TARANTO

FINAL REPORT

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Date – 05/12/2022

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This research examines a grassroots plan for a just transition of the city of Taranto towards a restorative and regenerative economy. Launched in 2018, Taranto Plan represents a significant effort at shaping a socially consensual imaginary of transition away from the jobs vs environment dilemma, and the unsustainability of a steel–based linear economy. This report opens with an historical background, reconstructing the development of a mono-industrial town and the impacts of six decades of steelmaking. After explaining the methodological approach, the report unfolds the findings, a detailed analysis of Taranto Plan, how principles of CE and environmental justice have been framed, the genesis, and its influences upon the transition debates in Taranto. In the discussion section the results, including the factor hindering and fostering a just transition in Taranto are compared with other relevant studies.

History Chart

Version	Date	Implemented by
V2.0	05.12.2022	Stefania Barca, Ilaria Boniburini, Emanuele Leonardi
V1.1		
V1.0		

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List of key-words and abbreviations

AIA	Autorizzazione Integrata Ambientale (Integrated Environmental Authorization)
BAT	Best Available Technologies
BF/BOF	Blast furnace/Basic oxygen furnace steelmaking process
CCLLP	Comitato Cittadini Lavoratori Liberi e Pensanti
CE	Circular Economy
CES	Centro de Estudos Sociais
EAFs	Electric Arc Furnaces
ECtHR	European Court of Human Rights
DRI	Direct Reduced Iron
GHG	Greenhouse Gas
Mt	Million tons
PM	Particulate Matter
PRA	Pre-Reduced Agglomerates
SIN	Siti di Interesse Nazionale (Sites of National Interest)
VDS	Valutazione del Danno Sanitario (Health Impact Assessment)

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Executive Summary

This research examines a grassroots plan for a just transition of the city of Taranto towards a restorative and regenerative economy. Launched on Mayday of 2018, Taranto Plan can be considered the outcome of an intense social mobilization emerged in July 2012; it was formulated by community organisations in a city deeply affected by environmental injustice, and represents a significant effort at shaping a socially consensual imaginary of transition away from the jobs vs environment dilemma, and the unsustainability of a steel–based linear economy.

Taranto, a city of about 200,000 people, is the home to the ex-Ilva, one of the biggest and oldest steel-making plants in Europe, which produces steel through an integral cycle, based on blast and basic oxygen furnaces. Set up in the early 1960s with funds from the Italian government, the ex-Ilva with its production and employment capacity has strongly influenced the territory's development, causing severe pollution and a public health crisis in the surrounding area, and compromising any alternative economic possibility. Currently, the factory still employs around 8200 people.

This report starts with a reconstruction of the historical background of this case study – the development of a mono-industrial town and the social and environmental impacts of six decades of steelmaking in the city of Taranto and surrounding areas. Second, the report offers a detailed analysis of Taranto Plan, capturing how the imaginary of transition has been articulated and how principles of CE and environmental justice have been framed. Third, referring to n. 23 semi-structured interviews, the report unpacks the collaborative bottom-up process that produced the Plan, investigating its genesis, strategy, dissemination and reception by public institutions, unions and other actors, and its influence upon transition debates in Taranto.

The study provides original insights on the role of working-class environmental activism in envisaging a just transition towards a post-fossil economy. Our study shows that different and competing visions of transition are emerging on the local level. On the one hand, those promoted by public institutions and the ex-Ilva management, representing a "technocratic" approach, oriented, implicitly or explicitly, to the preservation of the existing steelmaking industry. Applying a narrow understanding of justice in terms of employment preservation, these plans configure as an impediment to a regenerative transition to CE, or to a "just" transition. On the other hand, the markedly "convivial" approach of Taranto Plan. Arguing that a circular economy is incompatible with the continuation of steel-making, the Plan foresees a transition towards a restorative economy through a massive brownfield reclamation scheme, as a tool for both decontaminating the site and absorbing the redundancies that will follow the closure of the plant. We argue that, in its attempt to overcome formidable path dependency and lock-in to unsustainable development, the Plan's potential is jeopardized by a certain number of naiveties and critical limitations.

The study argues that a just transition requires sustained engagement and leadership of community organisations, informal groups and inhabitants affected by decision-making, both for embracing justice principles and anchoring these principles in context and place. However, in this respect the research brings out critical elements. The unity of purpose initially claimed by the Plan hides a persistent disconnection between social groups, which seem incapable to construct a new unitary narration of the territory, while the "politicization of the economy'" has thus given way to the gradual depletion of political conflict.

1. Overview of the work carried on in WP2 by the beneficiary

This case study address the following objectives of the JUST2CE's project:

Objective 1: To understand the current state of transition towards a Circular Economy in order to highlight the existence of differences in theoretical frameworks and ideological (political, cultural and gender) assumptions in different contexts. In particular, the case study contributes to: understand the ideological variety underpinning different ways of framing CE; assess the current state of transition towards the circular economy in territorial development and steelmaking industry.

Objective 2: To understand how geopolitical – North / South and Centre / Periphery – and class/gender relations enable or thwart the implementation and success of Circular Economy practices in selected cases. In particular, the case study contributes to: understand the positive/negative implications of CE transitions; identify key factors that hamper or enable CE practices within a wider geopolitical and sectorial landscape particularly with specific reference to social and environmental justice.

Objective 3: To develop a framework to design and evaluate Circular Economy practices based on sustainability, social and economic indicators but also on the principles of Responsible Research and Innovation (RRI), civic participation and participatory governance. In particular, the case study contributes to provide data and inputs for developing the qualitative and quantitative assessment of CE practices and will support well-targeted policy to design new or improve existing CE initiatives.

The beneficiary, the Centro de Estudos Sociais (CES), carried out desk and field research, dissemination, writing and archiving activities, while the third party Comitato Cittadini Lavoratori Liberi e Pensanti (CCLLP) provided support during the early phase of the filed work. Below the details of the activities, when it is not specified it means that the activities have been carried out by the CES's research team.

Table 1. Summary of activities

Timing	Activity
January-March 2022	**Research Design:** Desk analysis; Interview protocol writing (Draft and Final); Interview Protocol Review of Jealsa Rianxeira /Wesea and Rede Cooperativa Integral Minga Montemor case studies; Research team meetings (every two weeks); two CES meetings to exchange updates and concerns regarding the two CES's case studies.
January-March	**Training and WP2 activities:** "How to conduct an interview" (25.01); "Case writing" (30.03). WP2 workshops on 22 March with presentation of Taranto case study.
February-March	**Interviews' preparation:** three video conferences with Third Party CCLLP to discuss who to be interview; selection of potentials interviewees; contacting potential interviewees; collecting background information on interviewees; conducting our pilot interviews (14-26 February); Transcript of pilot interviews; refine focus, content and structure of interviews script;

29 March – 13 April	**Field work in Taranto:** making contact and fix meetings with interviewees; background research on interviewees; two meetings with CCLLP representative, conducting 16 interviews; meetings with informants; collecting literatures and data
April-June	**Interview transcription and analysis:** Interactive data collection and coding; Shaping hypothesis and recurrent themes; interviews' transcription. **Cluster meeting** with Sheffield case study (27 May). **Consortium Meeting** in Thassolonic (31 June – 1 July).
June-15 September	**Drafting Mid Term Report:** desk analysis; report writing (Draft and Final); mid term draft report review of Sheffield case study; report writing on progress for Consortium meeting;
September -November	**Training activities and WP2 workshops:** "The basics of qualitative analysis (28.09); "Jealse case" (10.10); "E-waste and" CE (10.11); "CE in African countries" (18.11). WP2 workshops on 21 October with presentation of Taranto case study.
15 September - November	**Drafting Final Report:** desk analysis; report writing

1.1. Dissemination activities

May 1st, 2022: Just2CE P.I. Mario Pansera participated as invited speaker in the music festival Unomaggio Libero e Pensante in Taranto (organized by the third party), with an audience of about 50,000 people. WP2 leader Maddalena Ripa also attended the event.

June 9, 2022: Emanuele Leonardi presented the preliminary findings of the case study at the annual conference of the Italian Society for Economic Sociology, with a paper titled "Relationship between work transformation and environmental justice in the Taranto Plan" (by Ilaria Boniburini, Stefania Barca, Alessandro Esposito and Emanuele Leonardi).

September 15, 2022: Emanuele Leonardi presented a paper titled "Labor, circular economy and grassroots mobilizations in the Plan Taranto (2017-2022)" at the "Re-opening the circle" workshop of the Polytechnic University in Milan.

2. Background & Introduction

The research examines *Piano Taranto* (in the following Taranto Plan), a proposal for a "just transition" of the city of Taranto from a linear economy, based on steel manufacturing, towards a restorative and regenerative circular economy, elaborated by a coalition of grassroots organisations in 2018. The transition foreseen by the Plan is grounded on the closure of the ex-Ilva steel plant, and on a massive brownfield remediation, whereby both measures are conceived as indispensable for decontaminating the site and for creating employment.

Taranto is a city of roughly 200,000 inhabitants, located in the Apulia region (South of Italy), which hosts one of the oldest and largest operating steel plants in Europe, known as ex-Ilva. A massive industrial compound (**Figure 1**), which

occupies about 15 million sqm, ex-Ilva is located near the city centre and adjacent to a pre-existing residential area called Tamburi[1], which counts today about 18.000 inhabitants.

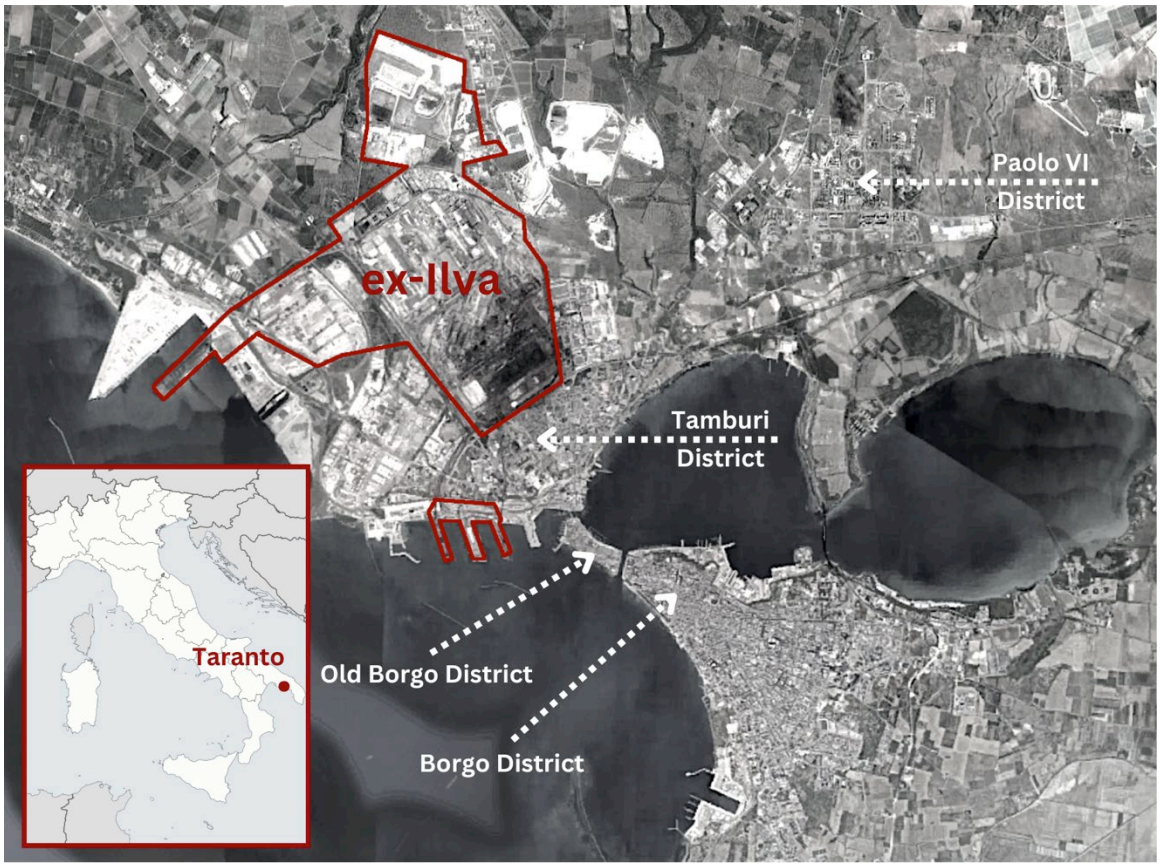

Figure 1: Taranto city map with location of ex-Ilva and districts

The plant mobilizes an integral cycle of steel production from raw materials (mainly coal, iron ore and flue dust[2]) to final steel products (cold rolled, galvanized or zinc coating pipes, sheets and plates) through a blast furnace/basic oxygen furnace (BF/BOF) process (Ilva Riva Fire, 2011; Acciaierie Italia, 2022; ISPRA 2022). This type of process involves nine interrelated operations: coke production, sinter production, liquid cast iron production, liquid steel production, semifinished product preparation, finished product preparation, heat and electricity supply, and handling and transport of raw, intermediate, and waste materials (**Figure 2**). The ex-Ilva site includes 200 km of railways, 50 km of roads and 190 km of conveyor belts, mineral parks and quarries, 12 coke batteries, 5 blast furnaces, 2 sinter plants, 2 mills converters, 2 hot rolling mills including finishing facilities, 2 zinc plants and 3 pipe production plants. At full capacity, the steel plant can produce up to 10 mt (million tons) of steel per year (Romeo, 2019). However, due to the critical conditions of the plant, the effective production has decreased to 4,1 mt in 2021 (Acciaierie d'Italia, 2022). In terms of employment, the maximum occupancy was achieved in the course of 1980, reaching about 21.791 units (Ilva Riva Fire, 2011). Since then, the rate of employment has decreased progressively to 8165 in 2021, including a number

[1] The ex-Ilva's proximity to the residential area is better understood considering that the minerals parks and one of the blast furnaces are located respectively 170 meters and 730 meters away from the neighbourhood, and the enclosure wall of the industrial compound is only 135 meters from the nearest house (Ruscio, 2015, p.79).

[2] This is a mixture of oxides and coke fines, also containing silicon, calcium, magnesium along with zinc, lead and alkali metals.

of employees in layoff (Acciaierie d'Italia, 2022). Set up in the early 1960s with funds from the Italian government, the ex-Ilva turned Taranto into a monoindustrial town, progressively eroding traditional agricultural and fishery activities, precluding the development of commercial activities in the primary and tertiary sectors, and generating structural dependence on the employment opportunities the plant has been offering.

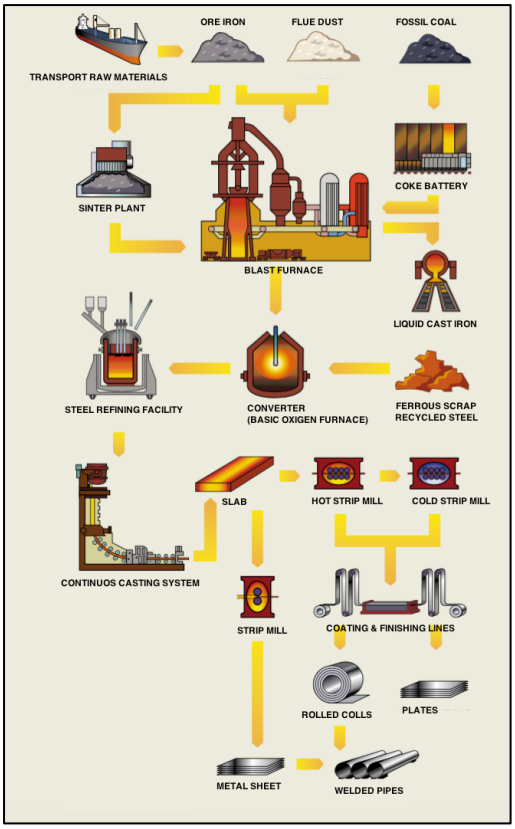

Figure 2: The ex-Ilva production cycle

Basically, the raw materials arrive by sea and are transported to the primary parks area on conveyor belts; from the parks, with additional conveyor belts, the raw materials enter the coke battery (*cokeria*) and the sinter plant (*agglomerazione*) to produce respectively the two main ingredients - coke and agglomerate - for the production of liquid cast iron in the blast furnace. From the blast furnace (*altoforno*), the liquid cast iron (*hot charge*) together with the ferrous scrap (*cold charge*) is converted into liquid steel by steel mill converters (*covertitore LD*) and, after refinement treatments, are solidified in a continuous casting system (*colata continua*) to produce the semi-finished product called "slab" (*bramme*). The finished product preparation includes machineries for making pipes, metal sheets and finish facilities. Up to the production of the semi-finished product, including the quarries connected with blast furnaces and steel mill converters and related conveyor belts this ensemble of processes are referred as "hot area", the main incriminated section of the ex-Ilva. The transformation of final products is refereed as the "cold area". In addition, to these there is the supply of energy and the handling of a series of waste materials, final products and byproducts, including gas, which is collected through offtakes located at the top of the blast furnace, stored in tanks, partially reused and dispatched to other facilities. Other byproducts include the tar, taken away from ships and 'pulverous carbon injection', coming from the crushing of the coke under-sieve and used as an end of blast furnaces and as an auxiliary fuel in the pipe production.

The main factor behind the formulation of Taranto Plan is the fact that Ilva has been the single most important cause of urban environmental degradation, causing a serious public health crisis. Beside the emission of atmospheric pollutants, the ex-Ilva has accounted for the unauthorized production and discharge of hazardous liquid and solid waste, contaminating the surrounding agricultural land and causing biodiversity loss. Among the many atmospheric contaminants, those particularly noteworthy for their high carcinogenic potential are particulate matter (PM10, PM 2,5), sulfure dioxide (SO2), carbon monoxide (CO), carbon bioxide (CO2), nitrogen bioxide (CO), and nitrogen dioxide (NO2); lead, cadmium, nickel, arsenic, vanadium, chromium and polycyclic aromatic hydrocarbons (PAH); the dioxins, disseminated also through water, soil and the food chain; benzene and asbestos (Forastiere, Biggeri, & Triassi, 2012). A number of epidemiological studies and scientific assessments, carried out over the last ten years, have proven the correlation between these contaminants and excess mortality and morbidity at the city level. For instance, results from the latest assessment of industrially contaminated sites, commissioned by the National Health Institute (Istituto Superiore di Sanità) can be summarised as follow: the exposure to PM10 and SO2 of industrial origin was found to be associated with increased mortality from cancer, cardiovascular and kidney illnesses, and with increased hospitalization in most cases. In particular, for 10 µg/m3 increases in PM10 and SO2 concentrations, excesses were observed in neurological, heart, kidney, digestive illnesses and respiratory infections. Pregnancies with abortive outcomes were found to be associated with SO2 exposure. Major excesses for respiratory diseases were observed among children aged 0-14" (SENTIERI, 2019, p.134). Recent studies (Lucchini et al, 2019; Renzetti et al, 2021) assessing the exposure of schoolchildren to heavy metals such as lead, mercury, cadmium, manganese, arsenic and selenium,

revealed serious neurobehavioral effects on child development. Even if the exposure for a single component is within protective level, the cumulative effect of these metals is harmful (Carta & Petrini, 2021).

A cohort study on mortality and morbidity in the area of Taranto (Mataloni et al, 2021) shows a significant correlation between socioeconomic position and health status: people living in the districts closest to the industrial zone (Tamburi, Paolo VI, Old Borgo and Borgo, and the nearby municipality of Statte), featuring lower socioeconomic indicators, show higher mortality/morbidity levels compared to the rest of the city area. Similarly, a 50% excess mortality has been found in Taranto residents, compared to residents of the Apulia region, for a number of industrially caused illnesses between 2015 and 2017 (Gennaro et al, 2022).

Beside such tremendous health impact, the effects of the steel monoculture are even wider. Rising unemployment, determined by the crisis of the steel sector, has determined the outmigration of the new generations, also due to the search for better conditions in terms of education and public health. Between 2008 and 2017 Taranto has lost 3.643 young people between 18 and 30 years old (CGIL Puglia, 2017).

The evident hazards of the steel plant have called for a number of legislative interventions, particularly for the so called “hot area”, the section with the greatest environmental impact. Since 2012, when public prosecutor Patrizia Todisco requested the legal confiscation of the “hot area”, ex-Ilva has been under judicial seizure; nevertheless, a “right of use” has been issued to the joint venture formed in 2020 between the French-Indian ArcelorMittal company and Invitalia (the National Agency for Inward Investment and Economic Development owned by the Italian Ministry of Economy). In this situation, effective recovery measures remain to be fulfilled, and the plant continues its activity thanks to a series of governmental permits.

Based on the above, we can say that Taranto configures as a ‘sacrifice zone’ at the service of steel production, a place of deep environmental injustice, where “the ecological crises result from the contradictions between the environmental and public health costs of industrial production and the inescapable dependency of social reproduction on industrial jobs” (Barca & Leonardi, 2018, p.493).

Over the last ten years, a number of news reports, studies, and autobiographical memoirs have examined the environmental impact of the ex-Ilva in Taranto, the legal confiscation of the “hot area”, the many property shifts, and future scenarios (Campetti, 2013; Leogrande, 2013; Pavone, 2014; Petrini, 2022). Research efforts can be grouped in three main clusters: 1. Those which focus on the link between union politics and environmental justice (Barca & Leonardi, 2018; Bez & Virgillito, 2022; Greco, 2021; Mandelli & Novelli, 2022); 2. Those which focus on ethnographic explorations of social actors (Vignola, 2017; Alliegro, 2020); 3. Those which focus on managerial practices and/or technological innovations (Lai, Panfilo, & Stacchezzini, 2019; Rugiero, 2022). Our research focuses on how Taranto’s working-class community has responded to the hazards of the steel monoculture by articulating its own imaginary of just transition to a regenerative economy, and by engaging both in social conflict and in industrial planning. Responding to the “framing” dimension of Just2CE theoretical framework, the study investigates the conceptual and narrative dimension of Taranto Plan, asking: what are the objectives, principles, envisaged strategies, and devised tools of Piano Taranto? What vision of the CE does the Plan incorporate, and what kind of CE could it facilitate, if implemented? Considering the centrality of the environmental justice perspective in our theoretical framework, we also asked how visions and concepts of environmental justice have been enclosed in the Taranto Plan. Second, the “vulnerability” and “distribution” dimensions of Just2CE multidisciplinary framework were taken into consideration in asking what would be the effects of implementing the Plan. The starting point of Taranto Plan is the closing of the steel plant; this, however, would have strong impacts in terms of employment and income (re)distribution. According to the Plan, the transition to a new economy represents a win-win solution for both the city’s economic system and the national economy, which can break down the large costs of the steel plan in favour of new entrepreneurial possibilities. Our research asks what are the challenges, in terms of distributive justice and social vulnerability, of a post-steel transition? One risk, which is often overlooked is that, although the relation between job losses and environmental degradation is often presented as a zero-sum game – if something is to be gained in terms of good jobs, something must be lost on the side of health and environment – things are more complicated than that, as employment casualisation and environmental degradation are far from incompatible, as demonstrated by the case of another steel plant in Southern Italy (Bagnoli),

which was closed in the 1990s without generating any effective clean-up and economic recovery process. In that case, social impacts added up to environmental impacts, constituting a case of "noxious deindustrialization" (Feltrin, Mah, & Brown, 2022).

The research scrutinizes the genesis of the Plan and the participatory process behind it, investigating how different interests were negotiated, how relationships among the stakeholders have evolved since, and who supported or rejected the Plan. A distinctive aspect of the research is the complex and at time contradictory relationships among the organisations and socio-political movements supporting Piano Taranto, and the history of the workers 'and citizens ' mobilization, particularly the one built around the steel-plant. The main research questions regarding the process are: When and why the idea of drafting this proposal was born? How did the participatory process work? How was the Plan disseminated, and how was it received by other organisations? What is the social and political legacy of Taranto Plan, what is likely to be its future? Which factors may support or hinder its adoption? In addition, as the Plan is conceived to operate in a strong relationship with national and local institutions, we explore how the plan was positioned within institutional processes and actors. We ask: how has Plan Taranto been received by institutions? What has been its political impact? Which political actors would endorse circular economy patterns in Taranto? Which other actors may be able to enact circular economy patterns in Taranto? Under which conditions might those actors productively interact with the Plan?

In term of "learning", we asked how different "visions of desirable futures" have emerged, but also if others were excluded – and why. Basically, to which extent Plan Taranto can be considered a form of democratization of knowledge through a participatory process? How can this experience be improved and become instrumental in implementing the transition to CE? The case study has also taken seriously the suggestion to view conversations as tools for building reflexivity (Lynch, 2000), in the sense that interviews have become opportunity for co-learning.

Ultimately, the research aims to contribute to understand which factors enable (or hamper) a veritable transition to CE in Taranto, and to reflect on the role of working-class environmental activism in supporting just transition. In accordance with Janosoff's *technologies of humility*, we ask: "what is the purpose; who will be hurt; who benefits; and how can we know?", keeping in mind the deep connection between the transition to CE and the global horizon of environmental justice for all the actors involved.

2.1. Case study description

The case study focuses on a bottom-up strategy towards replacing the socially and ecologically unsustainable steel monoculture with alternative economic possibilities. Taranto Plan is composed of about eighty pages, subdivided in ten chapters (see Annex 1 for Taranto Plan's structure). It is made of two parts: the first provides information about the major societal concerns regarding steel production and its politics in Taranto, while the second part outlines strategies and tools for addressing it. Following an extensive analysis of the environmental hazards linked to the ex-Ilva plant and their devastating impact on the health of Taranto's workers and citizens, the document continues with a critique of the supposedly strategic role of steel in the Italian economy, as repeatedly claimed by the Italian Government over the past decade. This critique is based on a detailed scrutiny of financial aspects, including investments, debts, loans and costs being mobilised and supported by the Government after 2012. This part concludes by identifying winners and losers from this process, in terms of (private) financial benefits and (public) social and environmental costs. Subsequently, Piano Taranto unfolds with an outline of what would instead be needed to rehabilitate the territory and boost local economies, focusing on reclamation and sustainable development. On this basis, the responsibilities of each institutional level in seizing new opportunities are identified and discussed.

The document has been drafted between October 2017 and April 2018 through a civil society-led participatory process in response to the incontestable evidence of a severe socio-ecological crisis, publicly ascertained by the judiciary in 2012. The process involved several community-based organisations, a rank-and-file union, environmental movements, and individual citizens (see Table 2, in the following chapter, for details of organisations involved). It was publicly launched at a press conference on the morning of May 1st 2018, in occasion of the annual Labor Day event (Unomaggio

Taranto), a recurrent nationwide music festival organised by the *Committee of Free and Reflective Citizens/Workers* (in the following CCLLP, Just2CE third party) with the participation of artists, environmental activists, experts and public intellectuals, and attended by tens of thousands of people (mostly, youth from Taranto and surrounding areas, the Apulia region and other areas of Southern Italy). Since then, the Plan has been used as a political platform to engage with social, political and environmental organisations, including local, regional and national governmental bodies. The Plan is therefore both a participatory planning practice and a tool for grassroots mobilization towards a just transition.

The most distinctive contribution of this case study to the JUST2CE project lies in the fact that it represents an example of how community organisations and social movements can shape a consensual solution to the *jobs vs environment dilemma*, and to severe financial, market, environmental and public health problems on the local scale – in short, to the unsustainability of a steel–based linear economy. Compared to top-down interventions (state and/or corporate), this case provides different insights on the factors enabling or hampering a just transition to CE. Here, in fact, the key motivation to mobilize a CE approach is the urge to respond to environmental injustice and address unmet social needs. This leads to framing proposals based on alternative values and beliefs, beyond mere economic growth and profit, thus producing social innovation (Raj et al, 2022; Belda-Miquel, Pellicer-Sifres, & Boni, 2020). Analysing how Taranto Plan contributes to the dialectic and struggles between alternatives visions of "the economy" offers the opportunity to explore in more depth the political dimension of the concept of *transition* (Pansera, Genovese, & Ripa, 2021). Although, generally speaking, the CE can be seen as an ambiguous and basically a-political concept, lacking considerations of socio-ethical issues (as argued in Just2CE Multidimensional Framework), Plan Taranto offers insights on the possibility for politicizing the transition to CE. According to Genovese and Pansera (2020) "the depoliticisation of CE is not yet irreversible. We think that there is an opportunity (even the imperative) to reshape the debate about the transition towards a new economic paradigm that takes into account environmental and social limits to growth". Moving from this urge, our analysis of Taranto Plan is not oriented towards an evaluation of its technical elements, but rather pays attention to the political and social conflicts engendered by a transition to CE, seen from a place deeply influenced by a history of monocultural economy, social fragmentation, dispossession – but also resistance.

The roots of Taranto Plan lay in the intense social mobilizations which took place against ex-Ilva in the first decade of this century, culminating in 2012 with the constitution of the CCLLP, our local partner in this case study. Building upon previous – similarly qualitative – research conducted by Stefania Barca and Emanuele Leonardi from 2015 to 2018, which dissects the history of workers' and citizens' mobilizations, within and around the steel-plant (Barca & Leonardi, 2016, 2018), Taranto Plan is analysed from an environmental justice perspective. Involving community organisations and individuals with different backgrounds, interests and identities (i.e. current and former workers of ex-Ilva, women, parents, health professionals, environmental activists, and others), the participatory process behind Taranto Plan represents working-class environmentalism – i.e. that "form of activism that comes to link production with reproduction and ecology as inextricable elements of a struggle for re-framing the economy from below" (Barca & Leonardi, 2018, p.2).

2.2. Socio-political and environmental context: Institutions, Social relations, Power

The socio-political context in which the Taranto Plan was developed can be characterized as one of economic dependency on a single, all-powerful employer – which is typical of monoindustrial towns - where right to a healthy environment comes into conflict with the right to livelihood/income almost exclusively provided by the steel factory. Although the intensity of this dependency has varied over time – as industrial employment has been steadily decreasing – Taranto's community has been particularly vulnerable to the so-called job blackmail. In the following paragraphs we argue that steel production tends to determine every space in the city – from productive sites (marginalizing alternative economies) to reproductive areas for sociability.

We characterize Taranto's social context as a historical dialectic between hegemony and counter-hegemony. By *hegemonic processes* we indicate governmental, top-down and technocratic approaches to territorial planning. In the

history of ex-Ilva, State-led decision-making processes have been crucial, not least because the factory was built with funds from the Italian government. The ensuing decisions, taken by various governments, after the factory's privatization (1995) up until today, have, overall, consolidated the dangerous *status quo*, as recognized by the judgment of the European Court of Human Rights of 24 January 2019 (Longo, 2019). By *counter-hegemonic processes* we indicate those social and political conflicting initiatives claiming alternative visions and policies for ex-Ilva and the surrounding territory. The latter involve a variety of practices: counter-information, contestation, public events, participatory planning, imaginary-building and so forth. All are intended to provide a different narrative for the future, based on the concept of 'liberation'. The best exemplification of this counter-hegemonic process is the slogan "Taranto libera!" (Liberate Taranto!) that characterize the Unomaggio music festival since its first edition in 2013.

State industry: steelmaking as social and economic development

The ex-Ilva plant was built the early 1960s, right on the edge of the city, adjacent to an existing residential area, in complete disregard of the existing urban zoning plans; it started to operate in 1964 by the name of *Italsider*, a State-controlled company. Its presence prompted the building of supporting activities, including the Cementir plant (which recycled the slug discharged by the steel plant) and a Shell refinery (supplied by oilfields in the nearby Basilicata region). The construction of the steel plant determined a deep transformation of the territory: "from that moment on, it was the city that grew and modelled itself around the factory. It was the times and rhythms of the factory that marked the times and rhythms of the urban fabric" (Leogrande, 2018). Every part of the city became functional to the factory, oriented to the stabilization of steel monoculture, also through a pervasive cultural discourse, pedagogical programs (Leogrande, 2013; Marinelli, 2012; Romeo, 2019), and cultural propaganda (La Porta, 1980), shaping popular consciousness entirely around the plant (Nistri, 2009).

During the 1970s, the plant size more than doubled the original. This enormous expansion was justified by two different sets of reasons: on the one hand, the increasing demand for steel expressed by the Italian economy; on the other, the full implementation of the plans for the industrial development of Southern Italy envisaged by the Italian State after World War II. From 600 hectares of surface, Italsider ended up occupying 1500 hectares - an area twice as large as the entire city. In about ten years, the production capacity shifted from 3 mt to 11,5 mt of steel, while employment increased from 4,500 to about 20,000 workers (SAN-Portale degli archivi d'impresa; Cerrito, 2010). The enlargement of the plant, however, required dramatic changes to the spatial setting of the city, colliding with the development envisaged locally. For the first time, the relationship between the plant and the city was questioned, and the impact of *Italsider* challenged (Alliegro, 2020), also through art (Romeo, 2019). Besides, in those years, environmental and public health concerns regarding pollution started to arise, internationally and nationally.

In the early 1980s, the factory reached the maximum expansion of its employment base. That period, however, coincided with a global economic recession, a structural crisis of the company and the contraction of the European steel market. From a peak of 21,785 direct and 10,000 indirect employees in 1980, employment levels dropped to 12,000 direct and 3,000 indirect employees in the 1990s (Cerrito, 2010). By then, the development process envisaged with the establishment of steelmaking in Taranto folded back on itself, like "a ship that had to expel manpower to face stormy seas" (Romeo, 2019), putting an end to those expectations of prosperity that had characterised the previous two decades. As a result, the ensuing restructuring plans, aimed at "saving the factory", obtained large support from social actors and unions. At the same time, an extensive number of biomonitoring, environmental and epidemiological studies and public health assessments started to be carried out, proving that in the previous twenty years, the ex-Ilva had caused a severe increase of pollution in the surrounding area. Already in 1986, the Italian State included Taranto in the list of the national sites "at higher risk of environmental crisis". In 1991, the Ministry of Environment declared Taranto and other four nearby municipalities "areas with high environmental risk", and in 1998 it became part of the first group of contaminated sites of national interest (SIN), which require special environmental monitoring and land remediation accordingly to site characteristics, quantity and hazardousness of pollutants, extent of the environmental impact in terms of health and ecological risk, and the detriment to cultural and environmental heritage. However, the obligations of the integrated environmental authorization (so-called AIA - Autorizzazione Integrata Ambientale), required by EU directives and other statutory requirements, remained unfulfilled, since both the management and public institutions were providing inadequate responses to the pollution emergency, which was becoming apparent.

The privatization: steelmaking as a competitive sector of national interests

In 1995, the Italsider plant was sold to the Riva family and became Ilva. A restructuring process took place, involving intense bargaining with unions, the Region and the State. It included managerial and labour transformations, reflecting the progressive casualisation of industrial relations. With the closure of the "hot area" of the Ilva steel plant in Cornigliano (Genoa), following a Program Agreement fostered by a strong mobilisation against the environmental impact of the factory, the production quotas of that plant were transferred to Taranto. This plan was opposed by environmental organisations in Taranto, and rejected by the City Council itself, but political opposition faded away once trade unions welcomed the project. As a consequence, during the following decade Ilva became the biggest steelmaking plant in Europe for production capacity, producing over 10 mt of steel a year. Economic profits themselves were outstanding (530 million in 2007). At the same time, the attention paid by citizens, activists and scholars to the plant's environmental impact, as well as investigations by statutory authorities on pollution, increased.

Starting with the privatization, the original hegemonic approach had changed (Chiarello & Greco, 2014): from a catalyst of growth and development for Taranto, steel production started to be depicted as a strategic and competitive sector of national interests, which justified the ever increasing pace of production and profits despite highly polluting outputs, gradually brought to light by increasing monitoring activities. This period of profound transformations changed both social and labour relations, as management became increasingly authoritarian (Romeo, 2019). The company's anti-union attitude formed the background for its increasing environmental impacts, leading to an unsustainable degradation of both working and living conditions in the city.

In 2012, following several epidemiological reports and taking into account the regional Cancer Register, Public Prosecutor Patrizia Todisco requested the legal confiscation of the "hot area" due to environmental disaster. This judgment, which forms a turning point in Taranto's history, was based on two in-depth studies (one chemical and one epidemiological) that certified dangerous and uncontrolled emissions, dumping particles and toxic waste in contact with the aquifer (Lai, Panfilo, & Stacchezzini, 2019). The epidemiological study (Comba et al, 2012) showed, for both men and women, an excess of mortality for different pathologies, as well as higher infant mortality, compared to the regional population, for pathologies etiologically correlated with exposure to the contaminants emitted by ex-Ilva.

At this point, production was already declining, about 13-15% compared to 2007 (Ilva Riva Fire, 2011) and the illusion of a recovery faded away. Employment was still stable, around 11.500 workers (La Stampa, 2012). Despite the evidence brought up by the judiciary, the Italian government remained faithful to its strategy. The emblem of this approach is the thirteen decrees "Salva-Ilva" [*save Ilva*], which allowed bypassing the 2012 sentence, keeping the hot area in productive continuity (Lai, Panfilo, & Stacchezzini, 2019). Against these decrees and Ilva's managers, a number of administrative and criminal proceedings were initiated, which are still pending. In January 2015, the Riva company broke into insolvency proceedings, but already before that ex-Ilva had been run by three government-appointed extraordinary commissioners who were mandated to operate, sell and liquidate the company and its assets. In June 2017, Italy awarded most of ILVA's assets to ArcelorMittal InvestCo, a consortium led by the world's leading steel manufacturer, but ownership and management have now returned (partially) to the Italian state under the name of Acciaierie di Italia Holding.

Since 2012, the governmental rhetoric has been based on two points: on the one hand, the impossibility to absorb the occupational impact of the factory in case of its closure and, on the other, the importance of steel production for the European iron and steel market. The inevitable result of this hegemonic discourse has been the normalization of the health, environmental and social disaster of the city (Tortorella, 2021a, 2021b). The contradictions of industrial development and the hegemonic rhetoric have not gone unchallenged. Particularly interesting for contextualising the genesis of Taranto Plan is the counter-hegemonic approach – an environmental justice activism, which spread across different social sectors – that emerged in 2008 and reached its peak in 2012. In 2008, the movement *AltaMarea* was born as a reaction to the shocking discovery of dioxin in cows' and sheep's milk, as revealed by a study conducted by the environmentalist and pacifist blog *Peacelink* (Bonelli, 2014). This led to a strike on 29 November 2008, when 20.000 citizens marched through the streets of Taranto, followed by another a few months later. Although transversally

representing activists from different social classes, Altamarea failed to involve the working-class in the construction of a viable social and political pathway (Corvace, 2011).

August 2012 represents a crucial moment for the entire social and environmental movement. Only a month before, in July, Taranto's *Committee of Free and Reflective Citizens/Workers* (CCLLP) was born after the public prosecutor's office had requested the legal confiscation of the "hot area" of the ex-Ilva plant. The first public appearance of the Committee happened on August 2, 2012, during a strike called by the confederal unions against the judiciary confiscation – a strike that signalled the complete subordination of the national trade-unions to the jobs vs environment trade-off. "Enough with your speeches! It's our turn to speak up" yelled Cataldo Ranieri, ex-Ilva worker and dissident trade-unionist, who – supported by a group of chanting committee's activists – took the stage to publicly denounce the responsibilities of politicians and unionists in sacrificing the lives of workers, the first to be exposed to industrial pollution, and of citizens at large. Initially, the composition of CCLLP was the result of an encounter between different sectors of the city (radical antagonist groups, environmentalists, families, steel workers, etc.). This kind of complex relationships between environmental, social, political and employment issues still represents a paradigmatic example of a possible way to think and practice a working-class ecology (Barca & Leonardi, 2018). At the same time, the different visions, strategies and ideas from every part of the movement led to fragmentation, and to a crisis of coalition politics.

Towards the re-nationalisation of ex-Ilva: technological fix

After 2012, due to the environmental, judicial and economic problems of the Riva family, the situation became even more dramatic, with annual production of steel fluctuating between 4 and 6 mt, and continuous lay-offs which have changed the employment structure of the city considerably. In 2021, as shown by the latest report of Acciaierie d'Italia (Leone, 2022), the plant employed 8,165 workers. Since 2020, when Italy's Prime Minister Giuseppe Conte stipulated the agreement between Arcelor Mittal Holding Srl, Arcelor Mittal Sa and Invitalia, "for a new phase of environmentally sustainable development of Ilva in Taranto" (Invitalia, 2021), several meetings between unions, the State, local institutions and the management have taken place, followed by declarations announcing a new industrial plan and foreseen innovations (Mandelli & Novelli, 2022). Meanwhile, in May 2021, the Court of Assizes emitted a number of convictions and fined ex-Ilva for 4 million euros, while confiscating (again) the hot area of the plant. The latter decision, however, will not have effect until the Supreme Court of Cassation confirms it.

The company's latest Sustainability Report (Acciaierie d'Italia, 2022) contains guidelines for development, essentially based on three objectives: full employment, meaning that all employees would return to work within 3-5 years; environmental sustainability through a transition to hydrogen[3] within 10 years; and economic sustainability, i.e. balance between the cost-effectiveness of production and the sustainability of the product (ibidem, p. 24). Interestingly, the document defines the pathway to transition in three phases. The first one runs up until 2025, where 25% of the production is expected to take place with reduced environmental impact through energy efficiency. The second one runs from 2025 to 2030, where traditional steel will be produced with electric furnaces, although this shift has to take place in parallel with the production of the blast furnace, which cannot be stopped in any case. This is considered to be the most delicate and complex phase, because it will be necessary to feed on gas, with the risk of high costs and greenhouse gas emissions. The third phase is the transition to hydrogen, which requires larger investments than the previous phase. Actually, an investment of around 800-1000 million EUR is needed for each electric oven. The key characteristics of the steel sector are also included in the report, highlighting the importance of the steel industry in the global, European and Italian market, all registering an increase in demand. This lead the report to conclude that is necessary "a plan to defend the [value] chain, starting from the launch of the Taranto pole, capable – alone – of producing almost 10 million tons per year from the integral cycle, with benefits in terms of price control and the certainty of supplies to the national automotive sectors, household appliances and shipbuilding" (Ibid, p.29).

International jurisdiction over the ex-Ilva case

[3] It is a process which aims to replace the coke and other fossil fuels used in traditional, blast furnace–based steelmaking with hydrogen, eventually with green hydrogen created with renewable electricity.

In February 2021, as a reaction to Arcelor Mittal's appeal against the contingency ordinance issued by Taranto's Mayor Rinaldo Melucci for the overrun in emissions, the Regional Administrative Court issued a historic ruling. The Court clearly stated that the contested measure "has been violated to the detriment of the health and the right to life of the citizens of Taranto, who have paid, in terms of health and human lives, a contribution that certainly goes well beyond those 'reasonable limits', whose compliance only can allow, according to our Constitution, for the continuation of such an industrial activity" (TAR Apulia, 2021, p. 57). The importance of this ruling rests on an assumption, for the first time clearly accepted by jurisprudence, that no balancing act between strategic production and environmental and health effects can justify the sacrifice of an entire territory.

In 2013, the European Commission started infringement proceedings over Italy's failure to apply EU environmental legislation. In May 2022, evoking the "right to development", introduced in 1986 by the UN – defined as "the right to participate in, contribute to, and enjoy economic, social, cultural and political development, in which all human rights and fundamental freedoms can be fully realized" (Graziuso, 2022) – the European Court of Human Rights (ECtHR) has again condemned the Italian State for putting citizens' health at risk in Taranto, confirming what the Court had already held in an earlier ruling, that of 24 January 2019. Both judgments take an important position on the Italy's failure to comply with citizens' right to respect for their private life and for effective remediation, recognized respectively by the articles 8 and 13 of the European Convention. These sentences have been considered significant steps towards the recognition, at the jurisprudence level, of environmental harm in Taranto (FIDH, 2022). As sustained by the Legal Research Group ELSA, the latter judgment has many merits, in particular, it points out to the Italian State's responsibilities: it "had introduced a regulation inspired by an unreasonable cost-benefit evaluation and did not implement the urban rehabilitation plan to stop the harm" (Graziuso, 2022). However, they also stress out that the judgments could have been more radical, recognizing the infringement of other articles of the Convention, further obligations, and questioning the legitimacy of the exclusion of punishment provided by the "Salva Ilva" decrees. The 2019 ECtHR sentence is also addressed by Ciuffoletti (2020) to discuss the effectiveness of contemporary and imaginative reasoning, by judicial bodies on environmental litigation, in protecting the environment. She points out that the Court, with reference to Taranto and to the violation of art.13 of the Convention, not only denounces and censors the lack of legislative remedies, but, it significantly stresses the lack of relevant domestic case-law precedents, which can open for new legal perspectives.

A recent UN publication – "Report of the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment" – complements these pronouncements. Issued at the beginning of 2022, Article 45 reads: "The ex-Ilva steel plant in Taranto has compromised people's health and violated human rights for decades by discharging vast volumes of toxic air pollution. Nearby, residents suffer from elevated levels of respiratory illnesses, heart disease, cancer, debilitating neurological ailments and premature mortality. Clean-up and remediation activities that were supposed to commence in 2012 have been delayed to 2023, with the Government introducing special legislative decrees allowing the plant to continue operating" (UN, 2022, p.11).

It is not up to the judiciary to identify the guidelines for replacing a detrimental linear economy towards a regenerative one, capable of responding to questions of justice (environmental, social, gender) as highlighted by the JUST2CE project. However, in the context of Taranto, these judgments remain the only available instruments for keeping business in check. As jurist Stefano Rodotà stated almost ten years ago: "it is the predominance of the economic sphere that sanctions the existence of a conflict between the right to employment and the right to health; if they were both guaranteed in the first place, these claims would not be opposed today" (quoted in Petrini, 2022, p.382).

3. Case-study design & methodology

The chosen methodological approach is social ethnography, a deep enquiry in the relationships between social movements, workers, unions and institutional subjects, involving semi-structured interviews, participatory observation, to a direct approach with subjects most of the time hidden, but representative of the social and political dimension (Dal Lago, De Biasi, 2002; Mollona, 2009). For several years, the members of the research team have been involved in social

mobilizations in Taranto, participating to meetings and public events, and engaging in different ways with environmental movements and the JUST2CE's partner CCLLP. Part of this involvement overlap with previous – similarly qualitative – studies conducted by Stefania Barca and Emanuele Leonardi from 2015 to 2018, which dissect the history of workers' and citizens' mobilization within and around the steel-plant (see Barca & Leonardi, 2016; Barca & Leonardi, 2018). The deep understanding of the complex and multi-stratified history of workers' and social movements with the highly polluting facility enabled the research team to truly adopt a gender-based and decolonial approach alongside the perspective of environmental justice as a class issue. This research positionality allows to bridge the environmental and social inequalities divide. Interviews have been conceived as knowledge-production conversations, in which knowledge is created during the interview.

3.1. Selection of participants, inclusion and exclusion criteria

The interviews have been structured following a non-probabilistic sample strategy, mainly purpose and quota sampling. Five broad categories of stakeholders have been identified (Table 2), corresponding to different typologies of information, data and insights to be collected. The first two categories of stakeholders represent respectively those who have directly contributed to the elaboration of the Taranto Plan and those who officially supported it. The interviewees were selected taking into account affiliation, gender and age group, as well as the need to capture different aspects of the Plan, its conceptual dimension, the participatory process and the broader context. The third and fourth categories of stakeholders, trade-unions and public institutions, reflect the objective of evaluating the social and political influence and impact of the plan, factors supporting or hindering the adoption, actors and processes enacting CE production patterns. The last category of stakeholders comprises individuals whom at various title – professional, academic, personal – hold a specific knowledge or expertise in some areas concerning Taranto Plan, other economic transition projects for Taranto or, more generally, the historical and social context.

Stakeholders' identification was conducted in collaboration with the local partner CCLLP, considering other informants' recommendation; previous research conducted by Stefania Barca and Emanuele Leonardi; and knowledge on the local context gathered by the researchers involved in the interview process. Other stakeholders have been identified and contacted through information collected along the way or provided by other interviewees. The stakeholder identification process was reassessed regularly throughout the development of the project, both to ensure that no groups or individuals had been missed out, but also to identify alternative individuals due to unavailability.

Table 2. Stakeholder organisations interviewed

Type of stakeholder/actor	Institutions	Description
Stakeholders belonging to civil society organisations and citizens who have contributed to the elaboration of Piano Taranto	Comitato dei Cittadini e Lavoratori Liberi e Pensanti; Tamburi Combattenti; Giustizia per Taranto; Taranto respira; LMO (former FMLUniti Cub).	Due to their involvement in the redaction of project, and participatory process, they can give account of different aspects of the Piano (vision and goals, articulation of CE and environmental justice, genesis, evolution and future development) and processes within the steel-plant and in the city.
Stakeholders belonging to civil society organisations and citizens who have endorsed Piano Taranto.	Giorgio Forever; Legamijonici; Peacelink.	Due to their support to the project they can give account of different aspects of the Piano (points of agreement and disagreement, how it was received by organisations and communities); different meanings attached to CE and environmental justice; and processes within and around the Piano.
Confederal Unions, Social or Community Unionism; Rank-and-file Unionism	FIOM/CGIL; UILM/UIL; USB; COBAS	Due to their direct involvement in territorial issues and/or their direct engagement in collective bargaining workers conditions they can give account of processes within and around the steel-plant processes, clarify their position towards Piano Taranto, CE and environmental justice and factors which support or hinder a veritable transition

Other relevant organisations, including public environmental agencies; relevant political parties and other groups.	Rosa D'Amato (Movimento 5 Stelle); ISDE Medici per l'Ambiente Taranto; ENEA- National Agency for New Technologies, Energy and Sustainable Economic Development	As institutional subjects involved in the evaluation of the project or in territorial issues, they can clarify views on the projects, explain why public institutions did not adopt the plan, and provide insights on factors that support or hinder a veritable transition.
Others	Experts, scientists, research institutes, reporters, journalists	Due to their expertise in some areas of the Piano Taranto, in depth knowledge of Taranto historical social or environmental development, or being involved in other economic transition projects for Taranto steel manufacturing they can provide insights within and around the Piano and transition topics, including CE.

3.2. Structure of the interviews

Initially, a sample questionnaire to guide the interview was drafted for the main categories of interviewees (Appendix 1) to guide the process. However, after conducting the first interviews, it became necessary to tailor the questionnaires for each participant to be interviewed and the interviewer conducting the research, and careful consideration was given in selecting the topics accordingly to interviewees' background and their engagement with Taranto Plan and the various issues concerning it. Basically, 6 typologies of questions were posed: 1. About their understanding of the territorial context, problems and conflicts; 2. About the inception of the Plan and the participatory process; 3. About their understanding of the objectives, ethics, principles embedded in the Plan, highlighting conflicting views, convergences and divergences; 4. About the dissemination of the Plan and reactions of stakeholders to the Plan; 5. About their understanding of CE, just transition and justice dimensions; 6. About their understanding, positioning, and critiques on other transition plans and projects for Taranto.

3.3. Interview procedure

Stakeholders were contacted by telephone or via email. The engagement strategy varied accordingly to the degree of acquaintance. Beforehand the following items were prepared: an interview schedule, a list containing a set of theme and questions – based on background information on the interviewee and her organisation, and the questionnaires above described. These served as a guide. However, these were adapted over time: for instance, wording and questions' order – according to the information and conditions emerging during the interview. The interviews were conducted all in person, except two, which were conducted online. We carried out 23 interviews.

At the start of the interview, the researcher informed the interviewee of the project and outlined the roles and responsibilities they are taking towards one another throughout the whole research process. In some cases, the consent form and project description were sent by email in advance. A number of stakeholders (research institutes, economic organisations and business networks) asked questions in advance. In those cases we send an outline of the topics to be covered in the interview. Basically, the interviews followed a three steps procedure: an opening for warming-up and create an atmosphere that will accommodate the free flowing of ideas, followed by the core discussion, where topics and questions were addressed, and a closing to wrap up the meeting. The interviews' length was between 30' and 1h30'.

The team members of this case study are Stefania Barca, Emanuele Leonardi and Ilaria Boniburini; the latter conducted the majority of the interviews.

See the Inform consent sheet in Appendix 2.

3.4. Data management

Data collected is safely and anonymously stored in external drives in the archive of the library at the Centre for Social Studies, with specific registration and restricted access. Data will be transferred to a platform currently being developed by the IT department and that will specifically serve safe data storage purposes.

3.5. Data analysis

Interviews were not transcribed integrally. The research teams performed an initial coding process in order to identify the main topics addressed. Some of the topics were based on the questions themselves. Afterwards, for each interview a synthesis was annotated and a selection of quotes transcribed. Comments about emotional reactions and delays, but also personal histories and background were made. The major themes initially identified were the following: Taranto Plan (genesis, content, critics, reactions and impact; factors hampering/supporting its implementation); CE (meanings given; concepts, principles and articulation mobilized in Piano Taranto or other transition plans); Environmental Justice (meaning, relation with Taranto, principles and account mobilised in Taranto Plan or other transition plans); other proposals for Taranto; Taranto context (political, environmental, social, social movements). Finally, the findings were clustered around the main topics, taking into account the multidimensional framework and the research questions. On the basis of the theoretical backdrop, we analyse the results of the interviews paying attention to the most relevant elements for our purposes.

3.6. Data gaps and limitations

3.6.1 Access to research field

The research field was distant from researchers workplace; we planned three main fieldwork trips, hoping to conduct all the interviews. However, in many cases it has been difficult to plan much in advance the interviews, last minutes arrangements occurred most of the time. Most of the people and organisations we contacted were not much inclined to conduct an online interview. Telephone ones were in two cases accepted but very difficult to conduct, they ended up to be more like conversations than interviews. The ex-Ilva plant was not accessible.

3.6.2 Interviewer-interviewee interaction

During the interviews a number of difficulties were encountered. People with different backgrounds needed tailoring questions and language. Bridging the language of the project (English) with that of the field research (Italian) required some adaptation of scientific terminology. The ex-Ilva and its impacts (especially related to health issues and everyday life difficulties) is a sensitive matter which brought emotions during interviews. There were difficulties to stick to the questions: either people were eager to talk about their experience and give opinions on the ex-Ilva politics, or they wanted to avoid answering certain questions and talked a lot about other related matters, often connected to the activities carried out by their organisations in Taranto. We encountered skepticism among a number of stakeholders. This required significant effort in convincing people to give the interviews (except people close to our partner CCLLP). Some people felt uncomfortable, especially at the beginning, so the interviews required introductory conversations, sometime lengthy, to make the person at ease. CE related questions were particularly difficult; only few people felt comfortable answering to them, only three people showed to have given CE some thoughts before the interview.

3.6.3 Covid-19

Covid-19 had a considerable impact in the first and second field trip. At least seven interviews were cancelled and postponed because of this. In a couple of cases selected informants were not be able to retrieve at a later stage, although other concerns may have played an adverse role, as described below.

Others

During the fieldwork two political elections took place. On 12 June 2022, local elections were held to determine the mayor and city councillors. On 25 September 2022 was the turn of the Italian general elections. In our opinion, these events exacerbated the reluctance to grant interviews, as the ex-Ilva is a highly controversial and divisive topic. The unwillingness affected most the public institutional actors. None of them granted an interview, not responding to our requests or postponing to the bitter end, in some cases after extensive exchange of mails and phone calls. Similar reluctance occurred with associations representing economic actors, a research institute, three non-profit organisations – all of whom had previously signed the Taranto Plan – and a union. The EU project did not provide a privileged entry point; we also found that structured institutions had difficulties to identify who should have given the interview, to identify the official voice. It has not been possible to interview people belonging to these organisations, most likely because of political contingencies.

4. Findings

4.1. Objectives, principles, feasibility and implications of Piano Taranto

The following paragraphs focus on the fundamental concepts, values and ethics embedded in the Taranto Plan. We address the "framing" dimension of the Multidisciplinary framework, crucial for understanding "the processes through which actors seek to impose interpretations and order upon an ambiguous social world" (Hajer & Laws, 2009). However, as transforming the local economy through the closure of the steel plan would have strong impacts, the vulnerability and distribution lens helps to identify the critical issues entrenched in the transition foreseen by the Plan.

4.1.1 Shutting down Ex-Ilva as a pre-condition for a just transition to CE

The first tenet of the Taranto Plan is "clear" as much as "radical": based on the economic as well as environmental unsustainability of the steel-based linear economy, the ex-Ilva plant must be shut down. Neither relocating production nor "greening" (in Italian *ambientalizzazione*) options[4] are considered viable transitions to a regenerative economy, as they still prevent the right to a safe and healthy life.

"*We do not consider the adoption of technologies that 'reduce' the environmental impact acceptable as we do not consider the sacrifice of any citizen to be ethically permissible to produce steel. The most exposed population is the one residing closer to the plant, and these are mainly citizens of a lower socio-economic status, upon whom the greatest burden of this situation falls and has always fallen in violation of Article 2 of the Constitution*" (Piano Taranto, 2018, p. 23).

All our interviews to people supporting Taranto Plan shows that the ex-Ilva represents an impediment to the regeneration of the city, i.e. something to be removed in order for an alternative type of development to take place. For instance, in explaining what the Plan is about, an activist and ex-Ilva worker points out that: "*The Plan dealt with the closure of the plant […] The organisations focused on what at the time was considered to be an obstruction to the economic development of the city of Taranto*" (Interview 2). Other interviews repeated that people should stop seeing the dismantling of the ex-Ilva as a frightening event that would bring further precariousness and insecurity, instead it should be viewed as an opportunity to foster other activities, more useful for Taranto and for the planet, because the steel plan has desertified the city's economy and polluted the environment, preventing alternative economies to flourish.

The closure of the steel plant is advocated for three main reasons:

[4] These options include different types of measures for mitigating the polluting emissions and environmental impact of steelmaking processes as discussed in more depth in paragraph 4.1.3.

1. Steel production in Taranto is unsustainable due to the environmental and health damages caused by its toxic emissions. Chapter 3 of Taranto Plan (Piano Taranto 2018, pp. 16-29) explains in details, through scientific data, medical and epidemiological reports, how the dramatic health crisis in Taranto is correlated to the ex-Ilva environmental pollution. Our interviews offer additional details. They highlight how the health-work-environment blackmail produces contradictions, which are strongly spatialised. For instance, the dust pollution in the Tamburi district (the neighbourhood adjacent to the plant) generates unsustainable living conditions and prevents ordinary everyday activities such as playing, going to school, opening the windows. What also emerged is how living in such a city generates in the population inevitable perception of impending risk and uncertainty, which impacts on mental health and societal dynamics.

2. Taranto's ex-Ilva is economically unviable. The claim, by governments and management, that its production is strategic to the national economy and fundamental to Taranto's development is considered a false myth, because Taranto's steel serves the national market only minimally – there is actually a problem of overproduction. The activists claim that ex-Ilva remains marketable only due to European import fees on Chinese steel, and because it is allowed (by the Italian State) to produce without complying with environmental and safety requirements, which of course reduce production costs.

3. The full costs for saving the company are huge and often omitted, while those for diversifying the economy, investing in alternative sectors, including CE practices and landfill restoration, are overestimated. In addition, ex-Ilva's exposure to banks, suppliers and the Italian National Social Security Institute (so called INPS, Istituto Nazionale Previdenza Sociale) results in significant indebtedness. In 2015, the bankruptcy court of Milan declared that, despite measures made available by special legislative provisions, there are no means to simultaneously satisfy debts' obligations and the cost of implementing the interventions required by the environmental plan. A CCLLP's activist argue that *"the funds being spent for rescuing the plant and trying to mitigate its impact could be spent to create a completely different development, an economic alternative to the steel industry. In the Taranto Plan we have shown that since 2012 over 12 billion Euros of public money have been spent, money which would have been more than enough to reconstruct the local economy, protecting workers and incomes and indeed leading to even more employment"* (Interview 4).

4.1.2 Land reclamation as the main tool for redevelopment

Taranto Plan foresees the transition towards a restorative economy through a massive brownfield restoration, which is intended as a tool for both decontaminating the site (and its surrounding), and absorbing the redundancies that will follow the closure of the plant. Such strategy is based on a multidisciplinary study by Confindustria (2016), the main Italian owner's association. It includes an analysis of the technological, economic and financial aspects and procedural proposal for rehabilitating polluted sites in Italy, in order to enhance their opportunities for industrial redevelopment and innovation. It states that if the public system invested 10 billion over 5 years to decontaminate the most polluted areas of Italy, there would be a fiscal return between VAT and various taxes of almost 5 billion (i.e. half of the expenditure would return, and new possible investments would be created for 20 billion, producing an added value of around 10 billion) giving new job opportunities to 200,000 people.

Starting from the economic model adopted and exemplified in Confindustria's report, Taranto Plan demonstrates the environmental and social benefits of brownfield remediation in Taranto, by highlighting the investments required and prospective jobs, and the amount of tax revenues in favour of the State and statutory local authorities. In a nutshell: for the reclamation of 4,000 hectares (which include ex-Ilva site, others SIN[5] areas nearby and contaminated urban areas in Taranto) about 850 million Euros would be needed, to which about 1.3 billion must be added for the purpose of reusing parts of the ex-Ilva area for other activities. The investment for the Taranto's area alone would amount to just over 2 billion euros, with an employment effect capable of generating over 40,000 potential jobs – that is, almost 30,000

[5] SIN, sites of national interest, are very contaminated areas classified as dangerous by the Italian State.

more than those currently employed by ex-Ilva and related industries (Piano Taranto, 2018, p.55). Taranto Plan highlights the economic benefits related to the brownfield decontamination activities, in terms of workforce directly or indirectly employed and the prospective economic returns on investments. It suggests that some decontaminated areas within ex-Ilva could be privately developed through public incentives. For the most part, however, it is expected that the reclaimed areas would return to the public, hosting massive green areas, but also multipurpose services, and scientific research. It is also pointed out how, through a program of public incentives, education and training, that decontaminating could become an economic hub for the reclamation circuit, transforming Taranto into a driving force and excellence hub for the rehabilitation of polluted territories.

All our interviewees acknowledged the importance of decontaminating the site, and most of them recognised to Taranto Plan the merit of developing this aspect, regardless of their support to the overall proposal. The interviewees not supporting the plan pointed out that ex-Ilva's management had already started some remediation works and taken some containment measures; when interviewing the ex-Ilva workers on this point, however, criticism emerged, concerning both the effectiveness and the actual implementation of remediation works.

"The strength of Piano Taranto lies in brownfield remediation. It could be really done, wisely, if you believe it. The money was there. We could, through decontamination works, gradually arrive to the closure, because we never said push a button and shut down. However, the factory will close by itself, it is in decline, but it will leave behind an environmental disaster and thousands of people out of work. Both of these problems could be addressed by brownfield remediation. The other strength of the Piano lies in the control of that money, to ensure no waste of money or speculation. Not like they are doing now with what they call bonifiche *(decontamination). I see what they are doing, contracting out some activities when we [ex-Ilva workers in layoff] could do it"* (Interview 3).

Some people not supporting the Plan, including the confederal trade-unionists (CGIL-CISL-UIL), claimed that the economic model adopted in it was not so reliable; further studies would be needed to establish the most appropriate clean-up techniques given the existing level of contamination and site-specific characteristics, and to define the exact amount of funds requested for implementation strategies, which include actors and legal framework. We made several attempts to interview Confindustria, with the intention of exploring this matter and verify Taranto Plan's calculation and proposal, but our request has been repetitively postponed and eventually ignored.

Another institution, EURISPES – a private organisation working in political, economic and social research since 1982 – in its 2021 Report on Italy, has sustained the thesis of the feasibility (and necessity) of dismantling ex-Ilva. It declared that "the same resources, financial and human, committed to keep the plant alive, can be used to dismantle the plants, reclaim the territory and return it to its natural vocations […] According to calculations, albeit approximate (but the Institute has decided to verify through an in-depth analysis the costs and benefits of a possible conversion), it would take about ten years for the first phase, to dismantle the plant; another ten years to reclaim the territory; and another ten years to start a series of alternative activities linked to tourism, services, environment and agriculture sectors, maintaining the same employment levels or even increasing them" (EURISPES, 2021, p.5). An interview to a CCLLP member (Interview 1), confirmed by a press release by the same organisation dated 14 May 2021, claims that EURISPES, by the voice of his president, anticipated a further study to analyse the costs and benefits of closing the ex-Ilva and undertake alternative regenerative economies also to absorb the job redundancies. Unfortunately, our request for an interview to further discuss the matter was declined.

4.1.3 The "greening" of Ilva and "green steel" as false solutions

Taranto Plan rejects the idea that technical solutions aimed at mitigating the environmental impact of the steel-making production would allow for a regenerative economy to take place in Taranto. The document strongly criticises *ambientalizzazione* (greening), a term originally used in Taranto to identify the environmental remediation works and BAT (best available technologies) measures for reducing ex-Ilva's pollution. These actions, in compliance with EU directives, several Italian Integrated Environmental Authorizations and environmental plans issued by ministerial decrees between 2011 and 2017, are due by 23 August 2023 – a deadline that was postponed several times. Some of the necessary works include the gigantic covering structure of the mineral parks and the shedding of the conveyor

belts; the suspension and refurbishment of the coke batteries and blast furnaces; the installation of bag filters on chimneys. These measures have taken place in the last years and are not yet completed (ISPRA, 2022). Taranto Plan considers these measures ineffective, for many reasons: when implemented, they are seriously overdue; they cannot treat fugitive emissions and environmental air pollution outside the strict area of treatment; they deal exclusively with the "hot area", dismissing completely a consistent part of the industrial process which is not free from emissions; and, most importantly, it is not certain that by fulfilling all integral environmental requirements the plant will stop to pollute.

Ex-Ilva workers (Interviews 3 and 4) explained how steel production in Taranto involves lots of correlated environmentally risky activities, which are underestimated. For instance, every year hundreds of ships dock in the port where the iron ore arrives and then gets delivered to mineral parks by conveyor belts – extending for a dozen kilometres. At the time of writing, these parks have been covered with gigantic sheds to limit the dispersion of materials such as iron ore and coal. However, the persistence of the dust – still being deposited on the sheds themselves, on the balconies and windows of Tamburi's houses – proves that the problems is not solved, because there are other mineral parks which have been not covered. On July 2020, a whirlwind submerged Tamburi with dust, in spite of the two sheds. Let us recall that the mineral parks and the furnaces are located respectively 170 metres and 730 metres from the Tamburi neighbourhood, where about 18,000 people live, which implies that enormous efforts are required to mitigate risks (FIDH, 2017). This is a lesson to be learnt from the Thyssen Krupp steel plant in Duisburg (comparable to Taranto for size, location and productive cycle), whereby even in the face of drastic improvements to the facilities (like those required by statutory authorities for ex-Ilva), the phenomenon of "slopping", that is the runaway of gas and reddish clouds, could not be eliminated (Taranto Plan, 2018, p.22).

Two interviews (1 and 7) explain that an impact assessment predicting the likely environmental and health impact of the ex-Ilva once the remediation measures are all in place is still lacking, as recently pointed out by Italy's most prominent environmental organisation, Legambiente (2022). Similarly, following the two-days meeting of the Ilva Observatory for monitoring the Environmental Plan compliance, ISPRA commented "ADI [Acciaierie d'Italia] announced that it has completed 88% of the AIA prescriptions referring to 2017 […] It is not certain that by completing the AIA those plants are free from potential pollutants. If the question is they [the management] are carrying out the prescribed environmental measures, the answer is yes, because they have obtained funds seized from the Riva for this. They are doing them but that does not say if the measures are enough" (Minafra, 2022). Taranto Plan points out that, in the absence of a process assessing the impact on human health of a given amount of steel by a specific production process, it is not possible to take informed decisions. The VDS (Valutazione del Danno Sanitario), the statutory Health Impact Assessment by the Apulia Region, for example, established that, even after the implementation of all requirements as defined in 2012, 12,000 people would have been exposed to unacceptable cancer risk (ARPA Puglia, 2013). However, VDS has been amended so that the evaluation on the state of health of population could be done *ex post* (after the release of AIA) instead of *ex ante*. As a consequence, it cannot not be used to assess the potential risk but only to establish if the population is suffering or has suffered damage to health, making this tool ineffective – as many epidemiologists have reported.

As one Plan supporter – a former Ilva worker – recounts:

"When it is said that it is enough to turn off the "hot working area", we disagree. Ilva must be closed completely, because we must take into account the whole structure, even what cannot be seen, what happens underground, in the caves. I'll give you the example about one of the plants of the "cold working area", the pipe factory, where I worked. There is a machine, which extends 2-3 floors above ground, that shapes the sheets metal into tubes. This machine extends also below ground by as many meters as it emerges, as a matter of stability. These machines run on oil: where did all the oil used over the decades go? You cannot see it, but it is there and it is part of the problem […] Only the workers really know the plants, their impact, and actual conditions. I worked in many segments of the productions, pipe mills, coatings, grinding wheel, welding, maintenance. From a technological point of view it could be interesting to study this process, if it was not for the history and damaged caused. The Riva family in Germany have distinguished themselves for different industrial processes, not so polluting. But here it is a completely different story" (Interview 3).

Over time, *ambientalizzazione* started also to mean technological changes to the industrial process like the use of pre-reduced agglomerates (PRA) in blast furnaces instead of iron ore, or innovative systems such as Electric Arc Furnaces (EAFs) and Direct Reduced Iron (DRI) fuelled by gas in substitution to blast furnaces in order to reduce the environmental impact of steelmaking. During the interviews, Taranto Plan's supporters criticise the adoption of EAFs/DRI technology at the ex-Ilva as a solution for the environmental emissions and health threats. They point out that these innovations remain "unfeasible and inadequate", because the transformation of the existing steel production cycle into Electric Arc Furnaces (EAFs) and Direct Reduced Iron (DRI) requires time, massive infrastructural changes and large investments (Interviews 1 and 3). In fact, Leonardi and Novati (2021) state that, for producing 8 mt/year, an investment of around 2.5 billion euros is required, to which the costs of decommissioning blast furnaces – plus overall layout adaptation – have to be added. It is also recognised that the EAF/DRI technologies, operating by gas, significantly reduce the emission contribution, but only by switching to green hydrogen it is possible to produce steel in a way that is fully compatible with decarbonisation objectives[6] (Rugiero, 2022; Leonardi & Novati, 2021). This pathway towards CO_2-neutral steel industry or what is called "green" steel[7] was discussed during the Third Round Table on Steel held in May 2021 at the MISE (Ministry of Economic Development) the debate. Activists supporting Taranto Plan commented that these solutions are "utopian and not attainable at the moment" (Interviews 1 and 3).

Basically, Taranto Plan considers both approaches – remediation measures and technology innovations – as false solutions: they both dismiss the human costs (health impact) being paid by Taranto's population since the establishment of the industry, because none of them proposes a solution that rapidly stops pollution. Both options, supported by the government, prioritise steel production and employment over health concerns, reinforcing the job vs environment dilemma, even if they are represented as responses to environmental pollution. The ecological dimension seems becoming a sterile objective, articulated in terms of "decarbonisation", whereby the human consequences of other air pollutant emissions (e.g. CO, SO, PM), wastewater contaminants and hazardous wastes (including arsenic, lead, and zinc) are dismissed.

4.1.4 Restorative transition has to be based on diversification by establishing new and circular economies

First of all, the Plan clearly establishes the need to have a diversified economy to overcome the negative impacts of the steel monoculture, which has impeded the development of alternative economic activities, contributing to high levels of unemployment, especially among young people (above 40%), and out-migration, and haltered the capacity to imagine a different future. This vision is common to both sides of the debate, as testified by the fact that the word "diversification" comes up in almost all the interviews, even by those that have not supported the Taranto Plan.

"A monoculture economy cannot be a circular economy, circularity is linked to the diversification of activities, not to a single activity, such as ex-Ilva which holds the city in its grip and prevents other developments. Because one must be able to choose, there cannot be only the factory, in this way we also lose many young people, who leave to study and then don't come back because there are no other opportunities here" (Interview 9).

In the Plan, the transition is envisaged to be based on the development of a mix of alternative (i.e. non-steel based) economic sectors and activities, such as brownfield decontamination, renewable energy production, circular economy, energy efficiency (buildings products and services), maintenance, port and intermodal development, tourism and culture. Many interviewees insist on economies that are "*not polluting*" or "*sustainable and ecological*", "*green and clean*", "*not relying on fossil fuels*", "*based on characteristics of the territory*". The renewable energy sector is presented by listing the direct added value of the operators in the sector, the indirect consumption (generated by the salaries received by relevant employees) and the added (induced) value of the suppliers or customers. The estimate, taken from a study developed by Althesys and commissioned by Greenpeace, considers the different stages of the

[6] It is a steel-making process designed principally to lower greenhouse gas (GHG) emissions to be in line with the EU's climate targets, as well as potentially cutting costs and improving the quality of steel. A new report by the European Commission (Somers, 2022) shows that the EU steel industry focuses mainly on hydrogen-based steelmaking as a decarbonisation strategy.

[7] It is worth pointing out that hydrogen substitution can make steel production CO2 neutral (around 98% lower than the conventional BFBOF route) only if the entire process uses "green" electricity (Swennenhuis, de Gooyert, & de Coninck, 2022).

value chain and different technologies. A particular role in the restructuring of the economy is attributed to the port, foreseeing an enormous potential for maritime traffic and port activities. Due to its history, its socio-cultural characteristics, and favourable geographical position, Taranto is envisaged to become an important commercial crossroads for consumer goods, vehicles through ferry and vessels that carry wheeled cargo and tourism. The arrival of cruise ships and boats for leisure purposes is seen as main driver for expanding the tourism asset.

In the urge of identifying "*alternative economies*" with respect to the heavy industries with a flagrant environmental impact, the environmental and social impacts of these non-steel based economic sectors, especially the port activities (both for logistics and tourism), have been underestimated. Reasoning about the social impacts of the envisaged new economies is confined to employment potentials, in quantitative terms. When questioned on this aspect, interviewees stated that it was urgent to prove that other economic possibilities could bring jobs and absorb redundancies from the closure of the ex-Ilva. However, as we explain in the discussion section, this approach is problematic. When questioned about this lack of considerations of potential impacts, a number of replies converge on "*in any case they will be much 'less worse' than the ex Ilva*". Other interviewees admit that further considerations and analysis of social and environmental costs and benefits are needed, and further discussion should be had. Two people (Interviews 7 and 9) said that other sectors were neglected, above all farming and agri-tourism, or more broadly the reclamation of the abandoned rural areas around the urban centre, which have been forbidden to agriculture due heavy soil and water contamination.

Compared to 2018, a stronger appreciation of cultural values and heritage is emerging from our interviews, as those are seen as important elements for imagining a different future (and a different image of the city) and as economic assets on which to build a tourist industry. In the Plan, tourism is mainly addressed in relation to the port development, and confined to the necessity of connecting cruising to the different tourist assets of the city, such as the archaeological heritage (i.e. the national museum Marta, the Old Town, the Castle), the naturalistic itineraries in the province (i.e Gravine and ancient settlements dating back to Bronze Age), food and wine tours, the WWF Oasis "La Vela" and the related EcoMuseo, the Mar Piccolo. Today, on the other hand, interviewees reveal a wider articulation, as cultural tourism is seen as a favourable economic sector, which can benefit the territory in terms of income, jobs, restoration of historical factories, conservation of landscape, revival of local traditions and skills (Interviews 2, 3, 4, and 7).

4.1.5 Transition to a regenerative economy and CE as publicly driven and publicly funded process

Taranto Plan invoked a conversion plan, to be started immediately (even in the unfortunate hypothesis of facilities still running for some time), and capable of engaging all the statutory authority stakeholders, identifying precise, timely and measurable actions. By ascribing to each public entity specific tasks and responsibilities, the Plan was intended to offer a fundamental guideline for designing and implementing the transition towards a restorative economy.

For instance, the national government was called to legislating the 'exit strategy' from ex-Ilva by cancelling its previous "saving-decrees" and providing for the safeguard of workers' income; to guiding the brownfield decontamination and reclamation of the Taranto's SIN areas; to selling to Taranto's municipality consistent portions of ex-Ilva land for economic and communal uses. The Apulia Regional Government (and the Province of Taranto to a certain extent) were expected to invest in education and training, to ensure that the city was ready to "make the most" out of the transition to an ecological economy. Although it clearly emerges from the plan and interviews that the economic transition implies labour transformation and reorganisation of employment, this is seen as an automatic consequence of new investment in training programs. Two interviewees, however, pointed out that this is not only an issue of training, but one of cultural shift, and that the entire education system should be re-oriented.

"When showing to my students the redevelopments of Pittsburg, the Rurh, Siostad, an industrial district of Stockholm that was reclaimed and became a green district (based on renewable energy and built through sustainable construction methods) at the end they would say "but we are not like them". What do we need to be like the Swedes? We need to train for the future, for what is not yet existing. What is the meaning of taking students to ex-Ilva for the training program? Then you can only replicate the existing condition. It is necessary to train them for alternative visions. […] Taranto's people are neither culturally nor professionally ready for the reconversion, they lack alternative skills" (Interview 12).

Finally, Taranto's municipality was requested to have a strategic coordination role in fostering sustainable development policies, oriented to the growth of local economies (fishing, mussel farming, agri-food, art-crafts, and the like), and to implementing projects capable of launching virtuous supply chains.

Other stakeholders were considered to have a relevant role in the transition: labour unions, trade associations, the various organisations representing manufacturing and service companies, the chamber of commerce, etc. Following the example of the Nord Pas-de-Calais region in France, these actors were expected to coordinate, together with the institutions, social and entrepreneurial partners and inhabitants, the transition towards a resource-efficient, productive and sustainable economy. Specifically, they were called to coordinating the remediation and recovery of polluted areas, and the planning of new economic activities by stipulating agreements program among institutional partners and establishing participatory processes involving the city and its inhabitants. They were also foreseen as becoming points of reference for all the realities involved in the aforementioned reconversion, searching for and making accessible to the community all the opportunities offered by national tenders and funds.

A number of European funding schemes were identified in Taranto Plan as appropriate to financing the transition. On this basis, the responsibilities and roles of each institutional actor in seizing, managing and coordinating these funds were identified.

4.2. CE as an emergent concept

CE in Taranto Plan is seen both as a means to an end, and as the end itself. It is considered a means for pushing forward environmental sustainability and the "ecological conversion of the economy", or "an opportunity to create 'good jobs' without causing damage to the environment and public health". It is also considered an "important objective and change of approach for addressing the increasingly scarce resources of the planet" (Taranto Plan, 2018, p. 60). What is highlighted in the Plan about CE is its overall economic and environmental benefit linked to waste management: recycling, re-using, prevention, redesign, material recovery and the short disposal chain "for converting in a positive sense the peculiarities of current workers and those who do not have a job, useful for stemming the phenomenon of climate change and the infinite consumption of resources in a world which is instead finished by definition" (Ibid). The Plan derived its narrative about CE from the "Waste strategy annual report" by Althesys, an Italian consultant to several regional and national institutions specialized in energy, water, waste management and recycling industry and manufacturing.

The interviews revealed that the CE aspect of the Plan was not discussed as widely as others – brownfield remediation, reasons for closing down ex-Ilva, or funding. Only two interviewees remembered the Taranto Plan included CE. More interesting were the answers to the first questions "What is meant by CE? What could it mean for Taranto?". On the one hand, the interviews revealed that CE, in certain contexts, remains an emergent concept, not yet a buzzword, and freely interpreted following the possible meaning of "circularity" and "circulation":

"*an economy that does not waste anything, that is able to put back on the market things in other forms but that do not affect the ecosystem. In Taranto it could mean reclamation of industrial areas like ex-Ilva for other uses, parks, a steel museum, for an economy that is diversified compared to that of heavy industry. Within the Ilva area there are many warehouses that could be used differently, for example for concerts, exhibitions, children's parks, universities*" (Interview 9).

Other interviews point to the danger of talking about CE and how CE cannot be implemented without closing down the factory:

"*It is a double-edged argument, because it is also used in the steel industry to reuse its products that should go to landfills and instead they are re-introduced into the production cycle […] With effects that have created enormous critical issues, including the emission of radioactivity. Ilva is exactly this type of circular economy*" (Interview 12).

"*Today, in Taranto, you cannot talk about the circular economy. Or rather, talking about the circular economy in a city that has a 30 km radius around the factory which inhibits agriculture, grazing, seafood cultivation in one of the sea sections of Mar Piccolo… It is mere utopia. What circular economy should we talk about if the primary sector, therefore agriculture, seafood farming, fishing, are inhibited? The goal of the Taranto Plan was to dismantle the paradigm according to which Taranto was a city with an industrial vocation. Cities are not born with any vocation*" (Interview 4).

4.3. The claim for justice, a women voice in a masculine environment

The social and environmental injustice suffered by Taranto's population is right at the heart of the Taranto Plan. Based on what emerges from the previous findings, we can say that injustice is what motivates the idea of transition towards a restorative economy capable of facing environmental and social challenges and distributing benefits among all population. Egalitarian principles are traceable both in the Plan and in the interviews. For instance, the Plan begins by stating that the objective is to "*think about a new, radical alternative, democratic model, with the interests of the communities at the centre, where it is possible to think about quality work, good employment and what, how, how much and for whom to produce. […] putting the right to life above everything else […] Taranto is the emblem of a model that has failed, the one linked to the coal and fossil fuel cycle that has done so much damage to our planet, which is putting it at risk with the drama of climate change underway*. […] *The processes of economic, ecological, and social reconversion implemented elsewhere are the beacon that illuminates our path, aware of the fact that there is no single recipe for each territory*" (Taranto Plan, 2018, p. 6). A representative of the social/community union supporting the Plan claimed "*if the Plan was applied, it would bring well-being to everybody. By giving work alternatives that everyone would have benefited from a general development at social and cultural level could be brought in Taranto. Sure, it takes time. Environmental justice can only be created by human beings, who are guests of nature and as such they must respect it and not deteriorate the environment and the landscape"* (Interview 9).

What is unclear, or only partially inferable from the document and from the interviews, is whether this intention has been fully analysed in all its implications, whether justice concerns – who benefits and who is left behind, who is included or excluded, what impacts and cost brings the economic activities preferred over steelmaking – have really been tackled and discussed. It seems to us that beyond the willingness to achieve a "just" transition, the approach remains naïve at times: considerations about future economic scenarios are often driven by a desire to demonstrate economic and employment opportunities. So, paradoxically, the growth imperative sometimes prevails. For example, the Plan calls for a regenerative economy, freed from fossil fuels and not polluting; but it emphasises the economic opportunities of Taranto as touristic destination and port, without taking into considerations negative socio-environmental impacts or how benefits would be distributed (Taranto Plan, 2018, pp. 56-61 and pp.76-79). However, some interviews reveal a more critical approach towards tourism, highlighting the potential environmental negative impacts of cruises, the likely increases in rents and prices and the related risk of gentrification and displacement of local inhabitants (interviews 1, 3, 7, and 10). From the Plan's document and from interviews, it appears that a proper discussion on the challenges posed by the envisaged transition to a new economy in terms of social and environmental impacts and labor market transformations, was not carried out during the participatory process. One of the reasons could be the fact that "*in Taranto, most of the organisations, practically all of them, look only at Ilva, although in the city there are establishments such as the refinery, the Navy, the cement factory, and other landfills. The movement in Taranto is flattened on the Ilva question and does not deal with the entire network of exploitation that pervades the city*" (Interview 9).

The diverse social composition of the organisations and individuals who have contributed to the Plan, in terms of class, age, gender (also, both ex-Ilva workers and non-workers participated), created an interconnection between environmental and social justice, bridging the divide of the job vs environmental blackmail. This allowed seeing land remediation as a way out to toxic industrialisation and significant job loss due to shutting down the steel plant. However, it was not sufficient for including more considerations about the specific kind of transition to be aimed.

The issue of gender justice, most notably, deserves further attention. The Plan does not appear to engage with women's work, or to interrogate the fact that the steel industry is traditionally male-dominated, and Taranto is no exception. Moreover, domestic activities and care work in general fall upon women's shoulders. On the one hand, exactly because

women are in charge of reproductive work, they emerged as fundamental voices for reporting the social impact of pollution and of degraded environments, not only about the health of their children and families but also about the unliveable daily life in Tamburi, and therefore for linking social and environmental care. Women in Taranto have played a prominent role in the struggles against environmental pollution and public health risks provoked by the ex-Ilva, especially in the Tamburi neighbourhood, since the early 2000s. Among the most significant organisations was *Donne per Taranto* [Women for Taranto], funded in 2009, raising awareness about the health impacts of ex Ilva, promoting campaigns and petitions for more protection measures and epidemiological maps, and advocating for environmental justice: "no blast furnaces in the city". More recently, women – especially mothers and representatives of social and environmental organisations – have been leading the protest about the living conditions in the Tamburi neighbourhood, particularly severe due to the proximity of the plant. For instance, protests were made against the "ecological hills" - erected near the Tamburi school complex for providing an environmental barrier between the ex-Ilva and the neighbourhood – denouncing how they were built using toxic materials and waste coming from the plant. Recurrent sit-ins, petitions and demonstrations were made about children's living conditions, the restrictions on the school during "wind days" – characterized by intense winds with specific directions and absence of precipitation – which negatively impact air quality in the Tamburi, with particular reference to PM10 and benzene. Tamburi inhabitants, especially mothers, repeatedly claimed the right to freely live the neighbourhood every day, to take their children to school and to allow them to safely play outside.

A paediatrician we interviewed, who has started with a colleague to collect data on the potential correlation between neurocognitive effects in children and the place of residence of the mother during pregnancy, after noting a number of cases among their patients, has pointed out that Taranto's women are at the heart and the head of the struggle for the right to health.

"*The emotional experience of the mothers and the treatment through women doctors draw an important mark in the history of the rebellion against pollution. The greater sensitivity, and a particular organisational capacity, has allowed the female population of Taranto to promote events, write articles, testify before the institutions. Women were the motivators of conscience and gave life to scientific data. Perhaps it would have been worthwhile for the political decision-makers to pay more attention to this part of the population, who has been exposed to pollution and has fought against it for a long time"* (Interview 11).

On the other hand, this valuable lens for understanding the world and identify justice as a fundamental driver for protesting, contesting, claiming an alternative future, is not taken up at a design level and it does not really enter in the imaginary and planning endeavour.

4.4. The genesis of the plan: from 'barricades 'to participatory planning

The idea of a Plan emerged in 2017 to demonstrate that "an alternative is [was] possible", as many interviews reported.

The social composition of the groups of activists and citizens involved in the process is very broad in terms of age, social class, neighbourhood of residence, occupation, education, and prior experience in environmental justice movements. CCLLP is the group who took the initiative and launched the participatory process. Nowadays, the movement is composed by a group of Taranto citizens, some of them current or former ex-Ilva workers, who are engaged in building a different future for their city . Beside CCLLP, the participatory process saw the consistent contribution of other organisations. First of all, Giustizia per Taranto (Justice for Taranto), a political-cultural association based on the values of environmental justice, social advocacy and democratic participation as tools to promote inclusion, funded in 2017 by former members of CCLLP (https://www.giustiziapertaranto.org). A contribution was also given by Tamburi Combattenti (Tamburi's fighters) a group of inhabitants of the Tamburi neighbourhood, established after the ordinance No. 39 of 24.10.2017 of the municipality of Taranto, which imposed the closure of nursery, primary and secondary schools in the neighbourhood during wind days (https://www.facebook.com/TamburiCombattenti/). Two local movements, Taranto Respira (Taranto Breathes) and Tutta mia la città (The Whole City is Mine, reference to a popular song), actively participated. The former started in 2012

as a civic movement, however in the last administrative election presented a list together with the green party Europa Verde, supporting the centre-left candidate Rinaldo Melucci (being re-elected as Mayor of Taranto), and electing a municipal councillor (http://www.tarantorespira.it). The latter, funded also in the early 2010s, but recently less active, is a movement inspired to the values of municipalism, ecologism and feminism, social and environmental justice, economic reconversion and direct democracy. Another organisation took part continuously: the ISDE Massafra, an Association of doctors for the environment (Massafra is a small city near Taranto).

Since 2012, when the CCLLP was born and the protests against the ex-Ilva's toxicity arguably reached the most intense peak of the history of Taranto's environmental justice movement, struggles continued in many forms. However, as one activist recalls:

"it felt like struggles had little impact; the opposite sides [the ex-Ilva's management and the Italian government] kept replying to our claims with discourses related to economic growth and the sacrifice Taranto has to make to that end" (Interview 4).

Therefore, during the public meetings in 2017[8], an idea emerged: "*to respond with our own proposal for Taranto's future, as the city demanded an alternative solution to the steel-based economy to those, like us, who asked for the dismantling of the ex-Ilva"* (Interview 2, April 2022). It became clear, as recounted in the interview, that a change in strategy was necessary to demonstrate to Taranto's citizens first, and then to local and national institutions, that the demand for closing the facility was grounded, feasible and realistic:

"Who should the workers believe? Us, who said to close the factory, the government, the company, and the unions who said that improvements were in the process and the production could continue?" (Interview 4).

On 27 November 2017, CCLLP called a meeting "open to all non-profit organisations, committees, groups, and individual activists in the area for undertaking a unitary path" (CCLLP, 2017). The participatory process that followed had the objective *"to bring together all the intelligences that care about the present and the future of the city of Taranto, aware of the fact that only a broad and participatory process of activation from below, starting from the local but involving the whole country and beyond, can allow us to reclaim a destiny that others think they have already written for our tormented land, and that we cannot longer delegate to anyone*" (Taranto Plan, 2018, p. 5) An interesting element emerged from the interviews: Taranto Plan was originally conceived as an "agreement" for engaging local and national institutions towards specific and timely commitments, including regulative instruments. A sort of statutory program of actions and commitments to be undertaken by a number of public institutions and other stakeholders, such as unions. The precedent is to be found in the Program Agreement for the Ilva of Cornigliano (Genoa), which was signed by 5 ministries, local authorities and port authorities in 2005, and aimed at the environmental protection of the territory of Cornigliano, while providing resources to ensure the continuity of employment and income following the closure of the "hot area". It had to be implemented through an industrial plan that strengthened the "cold area" activities related to steelmaking and reclaimed brownfield sites for an infrastructural corridor, port-logistic functions and urban redevelopment. This protocol was not considered an example in terms of transition strategies, but "a practical tool for negotiating conditions and making institutions accountable" (Interview 4). Some workers and CCLLP's activists had already studied this protocol and met Cornigliano activists too, whose protest led to the drafting and signing of the Agreement. People in Cornigliano won their battle over a polluting steel plant belonging to the same owner as ex-Ilva, therefore the Agreement raised lots of interests and questions:

How had they managed to obtain the closure of the "hot area"? What kind of contract was made to safeguard jobs? Even today there are people on layoffs who receive 100% of their salary by doing socially useful jobs. We studied the Program Agreement and started bringing these things to union assemblies. We began to ask why that agreement stipulated in Genoa

[8] A number of formal and informal public meetings, called by CCLLP through the social networks and leafleting, took place in 2017 in the city and also outside the ex-Ilva with the aim to discuss the on going developments on ex-Ilva affairs but also the claims put forward by other communities affected by steelmaking pollution and ideas on what could be done in Taranto.

could not also be made in Taranto. They told us that it was not possible. Well, the hot area of Genoa had been transferred to Taranto. I found myself working with ovens from Genoa with asbestos because they were from 1979" (Interview 3).

However, some activists questioned that the closure of the "hot area" in Cornigliano and the improvement of their living conditions was at the expense of Taranto, which contributed to develop the reasoning around issue of justice: *"Ilva should be shut down, not relocated; the improvements of our conditions should not be at the expenses of others"* (Interview 1).

The participatory process lasted about five months, during which a number of assemblies took place regularly, almost every week. A number of people were involved in collecting scientific data, facts and figures concerning the status quo, thesis, institutional reports like the one by Confindustria, gathering materials concerning innovative economic sectors and activities, and drafting chapters. As the preparatory groundwork was compiled little by little, the texts were then discussed and adjusted during the public assemblies. However, not all topics were discussed in the same manner and depth (Interview 1 and 7).

The *Plan B for Taranto*, prepared by the association Peacelink (2014) few years earlier, was particularly useful as the basis for developing a bottom-up proposal. It was conceived as a guideline for "a transition program to a sustainable environment". Like Taranto Plan, it was based on the closure of ex-Ilva, considered environmentally and economically unsustainable. It is interesting that Plan B puts steelmaking, ex-Ilva and Taranto against the background of global climate and environmental crises, identifying eight principles on which to base the transition. These were not entirely included in Taranto Plan. Some of them certainly influenced the development of the proposal, but the actual list of principles or the idea of clearly identifying a set of general guiding values was left out. In this respect, one of the activists participating in the process criticizes the fact that

"the Plan focuses too much on what we knew already, data, facts and numbers and less on how to configure the future […] We should have said more about the urban and infrastructural changes to be made if a different economic development had to take place and engage with engineers, economists and other experts. We wanted to do it, as well as a proper conference, but we did not manage to do it, somehow we were unable to engage more on the vision and design" (Interview 8).

Taranto Plan was announced to the public on 20 April 2018 with a press conference: institutions at all levels, unions and citizens were invited to the public debate to be held on the morning of the 1 May 2018, on occasion of the annual May Day event, organised by CCLLP since 2014. The presentation was also attended by politicians and institutional representatives – including Michele Emiliano, president of Apulia Region since June 2015 – unionists, and elected members of the Italian Parliament in 2018 in the lists of the 5 Star Movement in the Apulia/Taranto constituency. All activists involved in the process pointed out that the document was to be considered a draft, a working process initiative, open to further ideas and developments. It was supposed to become as much a ground for discussion as a tool for promoting institutional change. Since its inception, Taranto Plan has been presented and disseminated through a series of public initiatives and meetings with ministries, politicians, unions and environmental justice actors at local, regional and national levels. While the Plan did not receive the envisaged attention by institutions and unions, as we discuss further in the following paragraph, after the public presentation on May 1 2018, the Plan obtained further memberships and support[9].

[9] Taranto Plan was officially signed also by the following organisations: *ACLI Taranto* (ACLI is an influential Italian Christian Workers' Association founded in 1944, with thousands of members, clubs and structures); *Associazione Giorgio Forever* (a charity organisation based in Taranto, founded in memory of Giorgio di Ponzio - a child who died from sarcoma in 2019 at only 15 years of age from - involved in paediatric oncology research and social support to families); *Comitato Legamjonici* (a movement which took over, in 2011, the objectives of Taranto Libera, the first city movement supporting the total closure of large polluting industries and the promotion of alternative, clean economic development of Taranto); *Collettivo Morricella* (a collective funded in memory of Alessandro Morricella, a young worker ex-Ilva's worker died on 12 June 2015, hit by a violent jet of cast iron); *FLMUniti CUB* (a Community Union now called LMO - Lavoratori Metalmeccanici Organizzati Nazionale, a new metalworkers' trade union organisation that joins the General Class Union); and *Comitato Niobe* (a collective bringing together the parents of children who died because of causes linked to pollution).

4.5. Impact, influence and future of Piano Taranto

In order to reflect on the socio-political impacts of Taranto Plan and understand the elements that today prevent the adoption of the Plan by relevant actors, and more generally to identify pathways for its future as a tool for transitioning towards a restorative economy, here we analyse the most crucial responses and reactions by governmental institutions and unions, as well as the complex relationships among the different movements involved. We do this by focusing on some fundamental moments of Taranto's political life and its relationship with the institutional dimension, also making use of the outputs provided by the interviews.

4.5.1 The 'betrayal 'of the 5 Star movement

The first relevant moment, chronologically, corresponds to the metamorphosis of the relationship between city activism and the 5 Star Movement phenomenon[10]. The 2018 national elections are repeatedly reported within the interviews as a moment that sanctions yet another betrayal by politics towards the city. A large part of Taranto's activism in the 2018 electoral round openly and clearly supported the candidacy of the 5 Star Movement (M5S), as the Movement's repeatedly emphasized critical stance towards the steel plant and its continued production. In a post published on the M5S Blog on 5 May 2018 it is clearly stated: "Time has not yet run out to turn the tide: planning is needed through a Program Agreement that envisages the gradual closure of polluting sources, land reclamation [*bonifiche*] with the employment of the plant's workforce and an economic reconversion of the area" (Movimento 5 Stelle, 2018).

The 2018 elections, which took place right in the middle of the Taranto Plan participatory process, saw the 5 Stars Movement obtaining 47% of the votes in Taranto, and the election of a few local activists. However, less than five years later, many point to the "betrayal" of the promises made during the electoral campaign. Indeed, on 6 September 2018, the agreement for the sale of the steel plant to Arcelor Mittal was signed by the national Union Confederation CGIL-CIS-UIL and the USB rank-and-file union. Economic Development Minister Luigi Di Maio, at that time also president of M5S, was one of the architects of what many activists consider the great defeat of the key mobilizations started in 2012.

Several discussions in the following years, during the three visits of PM Giuseppe Conte in Taranto, were of no use. Instead, they denoted a clear continuity of the 5S-driven government with its predecessors. The recollections of one activist echo all the disillusionment of the perceived betrayal:

"*[Giuseppe] Conte, the first time, came on the catwalk. The second time, on 24 December 2019, it was election propaganda. We were all there protesting. They welcomed us at the hospital's paediatric oncological department. There he told us that there was no money to do what we are proposing. But that is not true. The money is there – for example, the PNRR money – but it is being squandered. And we are the lures. As long as there are workers in ex-Ilva, they can continue to do these things here with the usual alibi: what will happen to the workers if we close?*" (Interview 3).

4.5.2 A deep fracture in the movement

The second relevant element is the increasing proximity of one of the organisations promoting the Plan, *Giustizia per Taranto*, with the main actor (Democratic Party) of the Tarantine centre-left coalition, who manifested an ambiguous position towards ex-Ilva. This proximity, which culminated in the direct support during the June 2022 local elections by some activists to the lists of the coalition supporting Rinaldo Melucci, the Democratic Party's mayor candidate who ended up being re-elected, sanctioned the definitive fracture within the front that had found a united line in Taranto

[10] Founded in 2009, as an internet-based movement, by Beppe Grillo, already known to the large public as a comedian, the 5 star movement was meant to be a civil association. As Urbinati (2018) describe it, 5S "is part of a broad phenomenon called anti-establishment ideology, which is the backbone of populism […] to overcome particracy and create a non-partisan democracy". Two types of forum were devised for direct participation, the physical and the virtual piazza, "not so much in the attempt to increase participation, but in bypassing parties and traditional media, thus transforming Italian democracy into a bottom-up and outside-in type of government." (Urbinati, 2018)

Plan[11]. The mayor's ambiguity, as recalled by most interviewees, is based on the fact that on the one hand he declares that Taranto needs a transition towards a sustainable future, agrees to speak with the groups fighting against the plant and appears supportive of their claims as he often attacks central government about ex-Ilva; on the other hand, though, he does not stand for the dismantling. His approach and statements had given the environmental justice movements hope at some point.

Some activists felt that the fracture appeared when the organisation *Giustizia per Taranto* begun to talk about the closure of the "hot area only" (Interview 1,2, & 10). This "betrayal", as it is viewed by those who maintained the necessity of dismantling, is seen to be strictly connected with the above-mentioned administrative elections. A CCLLP's activist, talking about the future of the Plan, says:

"What is Piano Taranto today? A memory. What were the causes? Certainly, the lack of a strong stand for Piano Taranto by local politicians and elected representatives in Taranto. And then the need on the part of some associations to create a political career for themselves, within the institutions, by conforming to what were the ideas and programs of the parties that have always governed in Taranto" (Interview 4).

Another activist adds:

"there is discouragement, one cannot believe in anything. We have been betrayed by so many people. On social media, you see those same people who used to support the Plan now saying it is just a dream. They justify themselves by saying that it is easier to foster changes by being inside the institutions; that is why they compromise, even deny the Plan [...] The most serious thing is that they infiltrated the organisations and drove people away by accusing us [CCLLP] of impetuosity" (Interview 3).

A *Giustizia per Taranto* activist confirms these words, highlighting an obvious political friction and a difference in vision within the team promoting the Plan:

"The breakup between the organisations that gave birth to this Plan was dramatic and left wounds. We do not believe that there were real reasons to drive apart. We are more inclined to believe, differently from the criticism levelled at us, that there were external forces working on the breakup. Often [political] representation is the source of these ruptures. At this point in time, it is impossible to pursue collaborations" (Interview 6).

4.5.3 Unions 'skepticism towards the Plan

Our fieldwork included interviews to all major unions[12] operating in Taranto, to give account of their positions and approaches towards the Plan and offer further insights on working-class environmentalism (see D1.2). At the ex-Ilva the UILM/UIL is the first union in term of representation, followed by FIM/CISL and FIOM/CGIL; all three belong to the national Union Confederation. In 2019, the three confederal unions held over 80% of memberships (Greco, 2021). They consider the maintenance of employment (and thus of production) a prerequisite for bargaining with management and governmental institutions. These are followed by the USB rank-and-file union, which entered ex-Ilva in 2013 and gradually acquired recognition by attempting to resist the job blackmail. In addition, there are other minority unions, among which LMO, which account for a few dozen of members. Although all unions were invited to participate in the drafting of Taranto Plan, only LMO endorsed it.

Our interviews focused on two main issues: (1) the reason(s) for supporting (or not) the Plan and/or the participatory process; (2) the position towards environmental justice and just transition in the context of Taranto.

With regards to the first issue, a CGIL senior affiliate (Interview 14) states that he had not read the document and knew it only through the newspapers; during the conversation, however, it became clear that he knew it quite well, but

[11] The political campaign saw the repositioning of a consistent number of politicians who "moved from left to right and viceversa" (Palmiotti, 2022 c).

[12] Only CISL, one of the three unions belonging to the national Union Confederation, were not interviewed due to their unavailability within our fieldwork timeframes.

refused to acknowledge its value due to a history of resentment between CGIL and environmental movements in Taranto. Similarly, he also complains about setting of the process itself: "*If it were a bottom-up proposal involving of all trade union organisations, perhaps we would have contributed*", when actually all unions were invited to take part to the process. In addition, he accused environmental organisations of "*seeing ex-Ilva workers as enemy number one"*. Clearly, the key point of fracture between CGIL and Plan Taranto is the closure of the plant:

Saving jobs and salaries is my first responsibility […] Taranto Plan fails to address how to do so […] demanding to move 8000 workers into land reclamation makes little sense, there are too many uncertainties" (Interview 14).

The point about the Plan being naïve is shared by all three main union representatives, who do not challenge steel production, since:

the continuity of production is decided elsewhere, what we can do is to obtain the best conditions also in environmental and health terms, ensure that environmental protection is taken up".

Finally, the CGIL representative claimed that it was easy for LMO to endorse the Plan, as it only represents few people, so do not have the responsibility to maintain a constant relationship with workers, with management, or with the government.

The UILM representative we have interviewed took a more diplomatic approach, welcoming the effort, and never saying they oppose the Plan:

I read it […] we have taken note of the expectations and studies contained in the Plan […] we cannot avoid sharing the reasoning, the Plan is a moment of synthesis, of a will to change the city pathway. (However) *A plan for Taranto must take into account national issues […] steel as a sector of national importance, as the government says, but Taranto has already given a lot, so it is necessary to ensure that all the best available technologies are adopted"* (Interview 15).

The USB unionist we interviewed gave a somehow contradictory statement:

the plant in these conditions must be stopped. There is no point in speaking about the willingness towards an ecological transition and of greening" the plant […] *the national government clearly envisages to use even more coal* (so) *whatever comes to guarantee a different scenario, we agree.* […] *As for the fate of the factory, this is not a USB issue. We made some proposals to make workers safer, in terms of health risks exposure and incentives to move away for those workers who have been harmed*" (Interview 13) .

As a CCLLP activist recalls, there was a direct contact with USB at the beginning of Taranto Plan process and at some point they appeared to be willing to sign it; however "*this never materialized because in the end what matters for USB is the number of members*" (Interview 4).

As for the LMO (once FLMUniti-Cub), their representative reported a simple reason for signing Taranto Plan:

without health there is no work, there is no income and the family is destroyed. The close bond between workers and citizens lies precisely in this. The worker must be protected, dignified, and have all the security. Without this we cannot speak of work and industrialization" (Interview 9).

Overall, the interviews made clear that a debate about the ecological transition is completely absent within all major unions, USB included. At the Confederal level, environmental concerns appear to be addressed, but they are seen as someone else's responsibility. All the unions, but LMO who signed the Taranto Plan, see their mission confined to safeguarding workers – not only jobs, but health and safety as well. UILM underlines that: "*When we talk about the protection of the worker, it also means his life, the right to life*" (Interview 15) and for them this is what a just transition means. The environmental claim is generally recognized as important, and no longer avoidable; hence, measures to address environmental problems within the factory are said to be welcome. They all showed a degree of criticism and skepticism – USB was certainly more loudly and explicit about what is promised by the management and government

in terms of addressing an ecological transition. However, none of them, in the role of unionists, feel that they should have a say in Taranto's future. Rather, their job is really confined within the plant's future.

Interestingly, all union representatives pointed out that some level of participation, mobilization and institutional willingness is needed. According to the UILM representative

A plan from Taranto is welcome, but only if it is strong enough to be shared and implemented […] Ilva s phasing out in Taranto cannot turn out to be a failure like in Bagnoli, it is necessary a local, national and above all an economic will […] all various segments of society, from the institutional to the citizens need to be involved." (Interview 15)

The USB representative highlighted the lack of economic alternatives, which strengthens the occupational blackmail that pushes people towards the plant: "*if there was an alternative, workers would not show an attachment to the ex-Ilva*". The CGIL representative gives a different perspective, though not entirely contradictory:

nowadays workers are less attached to the plant; about the attitudes of the government and the management, workers let it go; once upon a time, back in 2012, they would have defended it." (Interview 13).

He adds that:

there is no dialogue between citizens and workers, the environmentalist bourgeoisie does not know the needs of the working class: how can both needs coexist? […] this polarization around the plan closure favours the stand for profit and multinationals, which affect most of the workers and the most disadvantaged people." (Ibid)

4.6. Planning the future of Taranto

The construction of a new economic image for Taranto has only come forward in recent years, at the same time as the gradual decline of steelworks set in. Far from coinciding with an effective abandonment of the industrial paradigm, the various levels of institutions have produced various plans for the city, in the name of an economic and cultural redevelopment of the area. While institutional planning aims at building economic diversification processes in the area, generally in cohabitation with a project for the innovation of the steel plant, there has been no shortage of projects oriented towards the modernization of the general industrial set-up as an element of economic revival and ecological transition. In the following chapters we identify the main planning experiences developed for Taranto, with which the Taranto Plan has come into dialogue.

4.6.1 Cantiere Taranto (national planning)

In the same years in which Plan Taranto was being written and then launched, the municipal administration, the Apulia region and the State itself drew policy documents, often in connection with each other, with the intention of creating a "program for the economic, social and cultural reconversion of the Taranto area". These words appear on the website of the national Department for Planning and Coordination of Economic Policy to present *Cantiere Taranto (*Taranto Building Site*)*, which was published in October 2019.

Far from being an *organic* document, *Cantiere Taranto* is a series of policy guidelines for the government's operational agenda. These concern the areas of economic, cultural and social development, infrastructures, the university, the environment, and urban regeneration. The actions put in place during 2020 mostly coincided with an approach that combined the presence of a heavy and strong industry with a vision of Taranto as a university city and a frontier of green innovation.

The promoters of Plan Taranto are disappointed by the insistence that *Cantiere Taranto* puts on the continuity of steel production. However, as claimed by one Plan Taranto activist:

"The planning experiences concerning the city of Taranto, like that of the port, with all the funds coming along, are to be counted among the successes of environmentalist battles. Even the palliative projects are due to the ferment of

environmentalist justice mobilizations. We tried to bring our ideas into that institutional plan as well, always in opposition steel production, but this did not prevent us from participating to the meetings called for discussing Taranto's future." (Interview 6).

4.6.2 Taranto Futuro Prossimo (Regional planning)

The planning horizon with which Taranto Plan promoters seem to have been most in dialogue, according to some interviewees, is the regional one. *Taranto Futuro Prossimo (*Taranto Near Future*)*, activated by Regional Law no. 2 of 25 January 2018, and promoted by the Apulia Region through ASSET (Strategic Regional Agency for the Eco-sustainable Development of the Territory) together with the city of Taranto, represents an attempt to build a vision for Taranto oriented towards community planning of economic restructuring (Asset Puglia, 2020). Taranto Futuro Prossimo attempts to contextualize the negative effects of the steel plant within the need for economic diversification of the territory: "The first 'key issue' presupposes an obvious need for diversification and productive redevelopment. But it also presupposes – as a necessary pre-condition – the establishment of new models of governance, and different capacities for aggregating economic sectors, to be corroborated by a business approach capable of sustaining proactivity at the local level. It is well known that companies that have relationships with other companies innovate more than the average, and perform better, and that companies that work in supply chains and groups are much more productive than those that work in 'isolation'" (Asset Puglia, 2020, p. 47).

However, two elements of discontinuity with Taranto Plan emerge. Firstly, the regional plan considers the presence of a 'de-carbonized' ex-Ilva compatible with the possibility of triggering virtuous processes of diversified economic development. Secondly, *Taranto Futuro Prossimo* is deeply entrenched with pure economic growth considerations, based on competitiveness and investment attractions, while Taranto Plan is geared on a claim for environmental justice, placing restorative economies at the center stage (on "restorative justice", see D1.2).

4.6.3 Ecosistema Taranto (local planning)

In an attempt at building an image of Taranto far from the polluting industrial vision of the ex-Ilva, the new Melucci administration has put together its own platform, under the name of *Ecosistema Taranto* (Taranto Ecosystem). It envisions a transition away from the "city of steel" towards a "endogenous and self-sustainable ecosystem", and consists in "overcoming a urban system conceived as stand-alone parts towards a system of accessibility and connection, and the construction of environmental and strategic networks based on the real needs of the city, as emerged from the participatory process" (Comune di Taranto, Ecosistema Taranto, p. 12). It is conceived as a tool for governing the urban regeneration of Taranto, in addition to the local urban planning framework, investing primary in capacity building in order to sustain projects and companies with a high social and environmental positive impact. The ultimate objective is "to build a community" inspired by the governance of the commons and actions directed to recognize emerging local dynamics, turning the current paradigm upside down: make Taranto's social and environmental vulnerability the material for social cohesion and circular economies, by governing the transition from small active groups to "communities of change" (Comune di Taranto. Ecosistema Taranto, p. 6-7). Circular economy is mention in that sentence only, instead the discourse focuses around "micro economies", understood as emblems of an alternative approach to neoclassical economy, capable of remodelling from scratch the entire chain of production, distribution and consumption. However, the proposal does not go beyond these vague statements, and community involvement remains, so far, limited and not accurately designed.

Like *Taranto Futuro Prossimo*, so *Ecosistema Taranto* envisions coexistence between the steel industry (albeit reformed and innovated) and new territorial "micro-economies". At the same time, both plans deploy programmatic lines characterized mainly by scattered punctual interventions. On the one hand, they speak about economic transition at the local level; on the other, they struggle to highlight how this transition can actually take place, benefit all, or how these plans address concrete impediments to basic needs such a healthy environment. The preoccupation, beyond the rhetoric, rests on fulfilling the rules of a market system based on competitiveness and the attraction of capital. Both documents suffer from a vague language, incapable of connecting citizens with planning bodies beyond consultation mechanisms.

4.6.4 Planning the industrial transition: a third revolution?

The most comprehensive effort at economic planning for Taranto is represented by the document "Taranto TRI.0. Future is now" (CETRI – TIRES, 2017a) commissioned by European MP and former environmental activist Rosa D'Amato. Tri.0 starts from the concept of a 'third industrial revolution' largely inspired by Jeremy Rifkin, who elaborated a proposal for the transition of Nord Pas de Calais towards a totally post carbon economic scenario for the whole region, including its three coal fields and its seven steel mills. As stated in the document, the study analyses how the world economy has evolved, in particular from the first to the second industrial revolution, at the economic, social and energy level. Against this background, it describes how Taranto can be reborn without the ex-Ilva, without steel and without fossil fuels: "This is not science fiction or unrealistic hypothesis, but, as the study shows, the only realistic and viable concrete possibility to get out of the structural and now endemic crisis that grips the second industrial revolution and those cities that have sacrificed their natural and human resources more than others. Just like Taranto" (CETRI – TIRES, 2017a, p.7).

Taranto TRI.0 proposes "an economic model capable of creating employment and wellbeing" where the latter is declined as respectful of the environment and health, "high in employment and low in capital intensity", based on renewable energies and capable of introducing "a more democratic, truly open society, with widespread active participation, which wants the happiness of the human being rather than the maximization of profit". As stated by Rosa D'Amato during the interview, Tri.0 could be considered an attempt to grant a technical realization of Plan Taranto's principles*, "inspired by an ecological vision, a business plan"*. As she explained:

"We have actually prepared simulations, that is, we give the numbers of how to invest in specific sectors, particularly in the green economy, which represents the future, especially for a city like Taranto, which is still working with coal, oil, fossil fuels" (Interview 18).

In the main document there are useful pages demonstrating the unsustainability (economically, socially and environmentally) of the current linear and monocultural economy of the ex-Ilva. Whereby the "new economy" will be based on the following pillars: circular economy (understood as reuse and promotion of new consumption models), sharing economy (such as supply chain recycling, food and toolsharing, time banks), distributed renewable energy (mainly solar and photovoltaic energy), shared and low-impact mobility, digital economy (like alternative currency, free software,"Open Source"), sustainable agriculture and sea related activities (such as bio-districts, organic fishery, garden and sea therapy), tourism and culture, education and training, and health (prevention practices, zero emissions, food education) (CETRI – TIRES, 2017b, p.7). In Tri.0 CE is defined as "a system in which all the activities, starting from extraction and production, are organised in such a way that someone's waste becomes resources for someone else" (CETRI – TIRES, 2017a, p.), with a focus on technocratic aspects such as vvirtuous closure of the waste cycle, mandatory returnable empty systems, creative waste recycling, promotion of bulk and short-chain products and social organization inspired by the Zero Waste strategy (re-use banks, markets dedicated to second-hand products, repair laboratories, barter centres, in short, through the creation of a reuse culture, supply chain and community).

The proposal contains occupational and GDP hypotheses for the 2020/2030/2040/2050 scenarios. The optimistic scenario, higher employment and GDP, predicts 138,000 jobs by 2050. The choice of language reveals a business approach, where productive growth and "abundance" is the fundamental goal, while the social and environmental dimensions are taken in. For instance, it assumes as indicators the BES – the model of fair and sustainable well-being[13] to evaluate the progress of a company not only from an economic point of view, as for example the GDP, but also the social and environmental ones and accompanied by measurement of inequality and sustainability.

Unfortunately, Tri.0 and Taranto Plan did not dialogue. Taranto Plan identifies in land reclamation a major step to be taken, while Tri.0 does not address this aspect, since it is much more projected to define non polluting economies

[13] It is an index developed by the Italian National Institute of Statistics (so called ISTAT - Istituto nazionale di statistica) and the Italian National Economic and Labor Council (so called CNEL - Consiglio Nazionale dell'Economia e del Lavoro.

"*in our opinion it was not feasible to invest 30-50 years and 8 billion on an area which was not yet fully characterized […] there is very little to reclaim in those lands, a good "capping" for securing from pollution spilling over would be better*" (Interview 18, March 2022).

The MP considers Taranto Plan "a bottom-up proposal, important for understanding the living conditions on the ground, (…) and a base from which to depart, which requires other skills and analyses". When asked why she did not sign the Plan, she sustained that the Plan was supposed to be a bottom-up effort, belonging to civil society organisations.

On the question of Ilva's closure, Tri.0 is ambivalent: while the intention of moving beyond Ilva is clear and the need to build on a completely different set of economies and energies is proven, it insists on how this transition will take a long time, during which the new and the old will coexist: "It is important to emphasize that the transition from the Second to the Third Industrial Revolution will not be an instantaneous process; it will take thirty to forty years. Many of today's multinational corporations will successfully manage the transition with the adoption of the new distributed and collaborative business model of the Third Industrial Revolution, while continuing their traditional commercial practices of the previous revolution" (Ibid, p.15).

5. Discussion

Our research analyses an experience of grassroots planning aimed at a veritable transition from a linear economy to a regenerative economy, in a city deeply marked by the presence of a highly polluting industrial monoculture, with a history of job blackmailing and protracted environmental and health crises. Our main objective was to explore how working-class communities can articulate their own imaginary of transition, engaging with both CE and environmental justice (see D1.2). The ultimate objective, as established by JUST2CE, is to reveal the factors enabling or hampering a just transition to CE in Taranto.

We acknowledge four main limitations to our study. First, we do not assess current plans for the transition of the ex-Ilva plant towards less impactful production processes, nor do we conduct a systematic analysis of justice implications of individual economic sectors such as tourism or renewable energies; rather, we look at the interdependence between industry and broader territorial trajectories of transition, and ultimately with society, in which steelmaking is one of the many elements of the system. Second, as the case study concerns a Plan yet to be implemented, our assessment does not concern its implementation but focuses on the narrative and imaginary dimension ex-ante. Third, our study allows us to draw a number of lessons and policy implications at local level – but it is not intended as a general theory of transitions to CE in monoindustrial towns. Finally, the interviews with institutional actors – hence their direct evaluation of Taranto Plan – were limited. We think that this last element cannot be traced back simply to time incompatibility. In many cases, the choice not to be interviewed seems to conceal the political choice not to expose oneself to statements regarding the Plan and its proposals.

In the following, we discuss our finding against the backdrop of the existing specialized literature on the ex-Ilva case, highlighting the converging and diverging hypotheses, and further questions that remain to be investigated.

We have grouped the barriers to a just transition in Taranto in three typologies:
1. those linked to the historical development of the ex-Ilva plant and its social and territorial impact;
2. those related to competing models of transition (from technocratic to convivial approaches);
3. those concerning the planning process, more specifically actors and democratic procedures.

(1) Stakeholders see Taranto's historical path-dependency on steel production as the greatest impediment to a just transition. This finds confirmation in the study by Bez and Virgillito (2022) on fifteen European "left-behind places", which include Taranto. They argue that certain forms of heavy polluting industry, including steelmaking, become drivers

of degradation, which endure severe impacts and negative effects on the possibility of developing new environmentally sustainable economies (see also Swennenhuis, Gooyert, and Coninck, 2022).

(2) Piano Taranto's approach can be defined as convivial, i.e. designed to "satisfy needs and achieve survival, justice, and creative autonomy" (Bobulescu and Fritscheova, 2021), in a way that "would not only enable the shift towards environmentally sustainable modes of production, but also a social transformation towards a more just and classless society" (Genovese and Pansera, 2020). Other plans, proposed by public institutions, private companies or local political actors, express a technocratic approach, i.e. "a refurbished version of market-oriented capitalism, which looks at industrial waste and environ- mental degradation not as "system failures" but as opportunities to relaunch a new season of (possibly "green") economic growth" (Genovese and Pansera, 2020, p. 2). This approach applies a narrow spectrum of justice considerations, becoming an impediment to a regenerative transition to CE, or to a "just" transition *tout court*. In contrast, the literature on just transitions, innovation studies, sociotechnical transitions and planning participation is keen on broadening justice considerations (Upham, Sovacool, and Ghosha, 2022).

A *strong technocratic approach* in Taranto is represented by transition trajectories that focus on identifying the most efficient pathways to decarbonize the steelmaking industry, without targeting societal injustices of any sort: this is the approach currently adopted by Acciaierie d'Italia. Basically, climate change and GHG emissions are treated in a sectoral and market-driven manner, specifying how to reduce emissions in specific timelines. As an abundant literature (Leonardi and Novati, 2021; Greco, 2022; Rugiero, 2022; Swennenhuis, Gooyert, and Coninck, 2022; Vogl, Rootzén, and Svensson, 2019; Rechberger et al, 2020) has made clear, the steel industry urgently needs radical transformations: the potentials for the improvement of traditional steelmaking, like ex-Ilva, have nearly been exhausted and the sector is heavily responsible both for pollution and excessive GHS emissions – according to Paris Agreement goals. However, structural changes are complex, onerous and lengthy; the longer and more difficult the process, the more results in terms of emissions reduction are expected to be worthy, depending on the technological routes to be taken. It is widely recognized that among the available technological routes, only the transition to green hydrogen-based steelmaking would allow a drastic reduction of GHG emissions (Swennenhuis, Gooyert, and Coninck, 2022; Rechberger et al, 2020). This solution can be implemented at a large scale only in the medium term (ten year minimum), and it largely depends on reliable and extensive supply of renewable electricity (Swennenhuis, Gooyert, and Coninck, 2022). As a consequence, intermediate steps are envisaged for maintaining production and economic gain.

The *soft technocratic approach*, i.e. preserving existing jobs and creating new employment (Upham, Sovacool, and Ghosha, 2022) is the most widely adopted in Taranto. This version addresses what Mandelli and Novelli (2022) call the "eco-social-growth trilemma" where social mainly stands for employment. This finding is consistent with Swennenhuis et al's (2022) argument that economic distribution issues matter most where steelmaking is the prevalent sector, compared to places where industrial development is more diversified. Although most of the "soft technocratic" proposals foreseen "a future beyond ex-Ilva" – not necessarily beyond industrial development – *we found that only one of the transition plans put forward in Taranto, namely Taranto Plan, envisions the full dismantling of the steel manufacture in the short or mid-term.* This reflects the prevalent approach towards the steelmaking sector adopted at global and European levels, where the continuation of production is assumed as the unavoidable scenario. This is justified either because steelmaking will continue to play an important role in industrial development and society due to constant demand (Rugiero, 2022; Swennenhuis, Gooyert, and Coninck, 2022) or because the interruption of significant industrial structures would disproportionally penalize certain social groups (Vogl, Rootzén, and Svensson, 2019). This approach takes into little consideration contextual factors such as the long-term sacrifice of Taranto's public health and territory, caused by the Italian State's failure to both remediate and prevent damage, which is the basis for claiming, by the Taranto environmental activism movement, that ex-Ilva is infringing upon human rights.

We found that the major unions represented in the ex-Ilva's plant, although showing some differences, endorse a technocratic approach, oriented towards the continuation of production, as already pointed out by previous research (Greco 2020; Greco 2022; Mandelli and Novelli). Accordingly to Greco and Bagnardi (2018) this industrialist position contrasts with the environmentalist one, which claims the dismantling of the ex-Ilva, creating a strong polarization in the debate. Adopting a discourse analysis perspective they find that this contraposition hides an unsuspected affinity linked to the refusal to fully politicize the ecological crisis and the attempt to guarantee social legitimacy through the use of an «over-technical language». An original result, also in line

with our distinction between technocratic and convivial. However, our study reveal that the environmentalist front is much more variegated, and less compact in its articulations and positions towards a just transition.

Some authors have argued that the government's "*Salva Ilva* decrees" represented a "utopian ideal" in that they were aimed at making environmental and social remediation compatible with steel production, against the 2012 and subsequent judiciary's sentences (Lai, Panfilo and Stacchezzini, 2019). Nevertheless, we find that the expectations of recovery and of a transition capable of overcoming the environmental emergency are higher in contexts of long-term crisis. As several studies have pointed out, a just transition cannot avoid addressing this sacrifice and expectations, by applying not only distributional, but also procedural, recognition and restorative justice (see D1.2). Since toxic pollution becomes a device through which territories and inhabitants are considered intentionally expendable, banning pollution is fundamental in order not to aggravate or perpetuate inequalities and marginalities (Bez and Virgillito, 2022). Another valuable consideration brought about by distributional concerns in terms of justice is that those who have already been marginalized should not carry further burdens (Swennenhuis, Gooyert, and Coninck, 2022). In this respect, as Velicu and Barca argue (2020), an analysis of the process through which subjects become subaltern and endure unequal positions should be included in understanding what a just transition is about. In addition, *we find that the spatial injustice produced by the polluting industry, impairing the living conditions in the areas closer to the facility, where less affluent neighbourhoods are located, appears severely underestimated. This factor does not enter in the transition proposals and is scarcely addressed by scholarly research on Taranto's transition.*

All approaches, but the "strong technocracy" one, consider diversification of the economy and the enhancement of sustainable economic activities as fundamental tools for abandoning a linear economy in favour of a circular one, by prospecting additional jobs, environmental remediation, health improvements, and the end of jobs-blackmailing, which are all indispensable to envision a future beyond steelmaking. Nevertheless, *we found that this emphasis on diversification tends to set aside critical considerations regarding problematic forms of economic development, such as large-scale tourism*.

Although employment retention and/or conversion have a prominent role in all the transition approaches, *we found that labour transformations are severely underestimated*. On the one hand, decarbonisation plans seems to underestimate the employment factor, if fact this transition is not free from problematic aspects and risks for workers (Vogl, Rootzén, and Svensson, 2019; Rugiero, 2022; Swennenhuis, Gooyert, and Coninck, 2022). On the other hand, Taranto Plan tends to be mostly quantitative – mainly enumerating the financial benefits and employment opportunities of the various sectors identified as potentially suitable for Taranto – occupational safety and health remain well-rooted issues. In contrast, all other plans tend to fail in providing justice-based arguments to labour transformations. *We find that a paradigm shift is required to avoid both noxious deindustrialization and displacement due to labour-saving effects of environmental/decarbonisation technologies, such as hydrogen-based steelmaking*. What kind of jobs (in terms of salary, protection, environmental and health impacts) will be offered? How will they be distributed? How to ensure gender/class inclusivity? In addition, replacing industrial with non-industrial jobs is by no means a trivial endeavour, especially in a context where factory work has been culturally instilled and socially projected as a model at all levels. Taranto's contradictions call for a new analysis of the very concept of *work*, which can overcome the modern conception of development as always integrated into a specific image of industrial investments and capitalist division of labour[14].

Moreover, *we found that the transformation of work is envisioned as a neutral productive dimension, untied from all reproductive social aspects with their peculiar elements. In this sense, interrogating spatial and gender/class aspects of the transformation of work could be useful to understand and plan the role of care work for a newly shaped just transition.* Although the transition process is mostly oriented to address problems raised by predominantly male industries, it is fundamental to address the interdependence between industry and broader territorial trajectories, aligning the goals and rights to all actors, including women. The transformation of industrial work inevitably impacts the sphere of social reproduction. In the heavy industry model, productive work is explicitly masculinised, while the additional burden of

[14] For a critique of the concept of development cf. A. Kothari, A. Salleh, A. Escobar, F. Demaria, A. Acosta, *Pluriverse: A Post-Development Dictionary,* Tulika, 2019

care work associated with public-health and environmental costs is typically feminized at both domestic and institutional levels (Barca and Leonardi 2018). *In the transition to a regenerative economy, the transformation of labour, spatial justice and gender justice are thus inseparably interconnected*.

From the analysis carried out, it is problematic to consider the just transition in Taranto as a process that can be achieved through dialogue with the large trade union components as claimed by some scholars. According to Rugiero (2022, p. 35) a crucial prerequisite for the realization of just transition paths is the involvement of workers and the role of the trade unions as a proactive rather than simply reactive agent, that take anticipatory positions in the negotiation of changes. Certainly this is a step forward compared to other approaches, but is not sufficient to enable a just transition, because 1) not all workers are represented by existing unions, and 2) communities which are deeply affected by the transition would remain excluded from the decision-making process. On the role of unions also Greco (2021) intervenes, affirming that there is the need to re-weld the link between the city and the unions in favor of a technological and more "ecological" conversion of the plant and, consequently, more dignified living conditions for the citizens. In contrast, the author confirms that on the ground there is actually a substantial distance between the trade unions visions and the requests of the environmentalist front - to which the CCLLP would also belong (pp. 253-254). In her opinion, this distance depends on the environmentalist's belief that the closure of the plant is the only way forward for a just transition of the territory. The results of our research highlight two important elements in direct contrast to the picture posed by Greco:

a) the mobilizations materialized in 2012 in Taranto had the merit of seeking the construction of a new discourse, that started precisely from the convergence between a worker component, unionized but unsatisfied by the claims put forward by major unions and the claim to environmental justice. It is therefore no coincidence that the claims of environmental justice coincide within the Taranto Plan with the desire to plan an economic and employment future based on the direct participation of the working-class;

b) we disagree on placing the responsibility for the irreconcilability between union demands and environmental demands on the second front. Our study points out how the narration of a purely technological transition, based on the principle of productive continuity and on that of economic development, is impermeable to a broader and necessary vision of environmental justice and just transition.

(3) The point discussed above, on the role of relevant stakeholders such as unions, opens for further considerations on actors in the planning process. Seeing the transition process from the grassroots perspective, the importance of procedural and recognition justice – i.e. making sure that all those affected by decisions have an equal voice (see D1.2; see also Bullard, 1990; Farrell, 2012) – becomes paramount. Building on this perspective, our research focused on how grassroots movements could influence the direction of just transition, create durable institutions and impact on social habits.

The available literature highlights how grassroots initiatives are key to expressing the visions of disadvantaged and negatively impacted communities, responding to their needs, aspirations and rights, crafting distributive and regenerative systems that depart from profit-first approaches, therefore contributing to the transition towards more just societies. The necessity of establishing and enacting a participatory process for enabling a transition capable of embracing social, environmental and gender justice perspectives is widely recognized (Farrell, 2012; Upham, Sovacool, and Ghosha, 2022; Bez and Virgillito, 2022; Belda-Miquel, Pellicer-Sifres and Boni, 2020; Mercier, 2020; Raj, Feola, Hajer, and Runhaar, 2022; Malin and Kallman, 2022: Banerjee and Schuitema, 2022). In bottom-up processes, inhabitants, organisations, movements and representatives of everyday life interests are involved as leading subjects alongside institutional, private and economic actors; this means that they are considered as capable of coherently expressing the means and needs of a territory, as opposed to a purely external, top down and governmental approach. Accordingly, a growing literature is paying attention to public engagements and participatory processes for governing just transition plans. The results are not encouraging. Weller (2018), for example, points out that in the case of Victoria's coal-dependent Latrobe Valley (Australia) the multilevel governance ended up excluding affected local constituencies, exacerbating the pre-existing local sense of injustice, and redistributing funds to unaffected adjacent areas. However, this helped to generate local political engagement. None of the three case studies analysed by Upham, Sovacool, and Ghosha (2022) showed significant public engagements. The analysis of a transition process in the Irish Midlands by Banerjee and Schuitema (2022) reveals that, in order to translate justice principles into practice, justice principles must

be analysed, discussed and agreed upon among stakeholders, and this process should include short-term and long-term planning, safeguarding the equal treatment of all stakeholders and their needs to avoid power imbalances.

Among other key elements in the process, Mercier (2020) stresses the centrality of the design and planning dimension. Citing the case of Hezelwood (Victoria, Australia), it is found that the community's past demands for the closure of the coal-fired power plant were not accompanied by plans for the transition to new forms of employment and economy, preventing, initially at least, any possibility of decommissioning the plant. However, it is stressed that these plans should be backed up by a process of community's training with respect to the required new economic assets, skills and capacities, focusing on the development of knowledge clusters (universities, technological institutes) and the rediscovery of regional hidden skills and capacities.

Grassroots contributions tend to receive attention by scholars concerned with social innovation, exploring issues such as power and empowerment of grassroots innovations in sustainability transitions (Raj, Feola, Hajer, and Runhaar, 2022) and the link between grassroots innovations and justice (Belda-Miquel, Pellicer-Sifres and Boni, 2020). The available literature on places with steelmaking industries or other highly polluting facilities looks at private organisations, public authorities, or public-private partnerships, while bottom-up planning experiences are underrepresented – stressing therefore the relevance of our research. Studies focusing on community-based initiatives in governing sustainability transitions, or circular entrepreneurship in specific sectors such as energy, food, and even new forms of living, tend to involve micro-scale efforts, or to address contestation rather than imaginary-building for territorial transition.

As Farrel (2012) argues "Real public participation is more than merely providing the public a place at the table and an opportunity to comment"; instead, it "requires the resources, information, translation, and technical assistance that allow community members to participate fully in the decision-making process. Affected members of the community should have opportunities to participate early in the process, when substantive changes may be made to a policy or project, rather than at the latest legally required time for public notice. Second, meetings should take place in the affected community at a time convenient for people, and documents should be translated in order to facilitate meaningful participation by all community members" (p. 60). To trigger the inertia of left-behind places, Bez and Virgillito (2022) identify the importance of changing political structures and place-sensitive regional policies to take in local characteristics and opportunities, but also disparities and inequalities of marginal territories, whose communities should be placed at the centre of the national political agenda. Against these previous findings, *our case study revealed a perceived lack of local and community control over institutional debates and processes of planning alternatives scenarios for Taranto*. Discussions over the future of the ex-Ilva have only involved the most representative unions, as if the impact of decisions on the ex Ilva only concerned the current workforce. Territorial panning, on the other hand, has only involved a number of unstructured public meetings at the community level. However, *we also found that the experience of participatory planning has had a transformative impact on participants by providing learning opportunities and empowering their imaginative capacity*. This, in turn, has reinvigorated and enlarged the environmental justice movement, at least initially. At the same time, in not achieving the expected results, the Plan has weakened the movement itself – if understood as a mass dynamic. This tells us that though fundamental, participatory planning processes must not replace social conflict. Their articulation is key to any transformative process at the local level.

6. Conclusions

Looking at the current state of the transition to CE in Taranto, we found that a number of different visions of transition are emerging; being promoted by a variety of actors, including public institutions, they are mostly expression of a technocratic approach, which is assuming the continuity of steelmaking industry. Only Piano Taranto, a grassroots proposal that was the object of our in-depth analysis, expressed a convivial approach. The Plan combines a strong claim that the presence of the iron and steel industry is an obstacle to the development of the city with the idea that economic diversification based on new sustainable sectors and activities is needed. The Plan attempts to overcome path dependency and territorial lock-in to unsustainable development trajectories, including the job blackmailing,

through a full recognition of the environmental injustice suffered by the city of Taranto along the past decades; it represents an effort to highlight both the costs of the current model and the possible advantages of radical change. At the same time, Taranto Plan shows some naivety and limitations. It is often vague in the definition of a just transition and embraces a reductive understanding of justice – missing issues of spatial and gender justice, or the inequalities that might be brought about by the new socio-economic model. That said, our study confirms that a just transition requires sustained engagement and leadership of community organisations, informal groups and inhabitants affected by decisions, both for embracing justice principles, by broadening public debate, but also for anchoring these principles in real context and places. Rather than looking at narrow or specific objectives, communities tend to address transitions in a more convivial way, in the effort to find connections and interdependency between different needs.

Piano Taranto and, in general, the process of mobilization for environmental justice in the Apulian capital show how the broadening of the transition horizon must necessarily deal first of all with the demands of the territory and with a new awareness of the transformations needed to address historical and current social and environmental challenges. Faced with the static nature of the large trade union organisations, social mobilization and community planning attempts to lead bottom-up transition processes and becoming interpreters of interconnected forms of justice - social, environmental, spatial, gender justice. In relation to social mobilization, however, the research brings out critical elements. The unity of purpose initially claimed by the Plan hides a persistent disconnection between social groups. These remain incapable to construct a new unitary narration of the territory and to make the intersectional categories of environmental justice their own, such as gender justice and spatial justice. The politicization of the economy has thus given way to the gradual depletion of political conflict. The consequence of this is that Piano Taranto risks to become becoming the last testimony of a path of social and political struggle that lasted a decade.

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Interview 10, 02 aprile 2022

Interview 11, 05 aprile 2022

Interview 12, 04 aprile 2022

Interview 13, 08 aprile 2022

Interview 14, 08 aprile 2022

Interview 15, 08 aprile 2022

Interview 16, 04 aprile 2022

Interview 17, 06 settembre 2022

Interview 18, 01 aprile 2022

Interview 19, 29 giugno 2022

Interview 20, 07 aprile 2022

Interview 21, 07 aprile 2022

Interview 22, 02 maggio 2022

Interview 23, 02 aprile 2022

8. Appendix

Appendix 1: Taranto Plan document's summary. Source: https://www.liberiepensanti.it/home/chi-siamo-2/piano-taranto/

Linee guida per la riconversione ecologica, sociale ed economica di Taranto

PIANO TARANTO

Per la riconversione ecologica, economica e sociale del territorio di Taranto

Sommario

Appendix 2: Sample questionnaires

Questionnaire to interviewees belonging to organisations and citizens who have supported Taranto Plan			
Thematic areas	**Purpose of the questions**	**Type**	**Questions**
Taranto Plan inception and genesis	Gather the various stakeholders understanding about the territorial context, what problems and conflicts have prompted them to promote an alternative and bottom-up plan to the steel industry	Introductory	What problems affecting Taranto territory prompted the development of the Taranto Plan?
Taranto Plan genesis, development	Define the inception of the Piano	key	When and how was the Taranto Plan born?
Taranto Plan genesis and development	Define who actually contributed to the elaboration of the Piano	clarifying	Who and how contributed most to the drafting of the Taranto Plan?
Taranto Plan genesis and development	Gather the different views, visions and imaginaries about the economic transition of Taranto steel industry	key	Why did you / your organisation join the Taranto Plan?
Piano Taranto genesis and development	Specify how the different actors participated to the Piano's process	probing	How did you / your organisation contribute to the drafting of the Taranto Plan?
Goals and CE principles mobilised by Taranto Plan as opposed to the governmental account	Characterise goals and objectives of the plan	key	What does the Taranto Plan envisage?
Goals and CE principles mobilised by Taranto Plan as opposed to the governmental account	Identify the most significant constituents of economic transition articulated by the Piano and map convergences and divergences	clarify	What are the strengths of this plan?
Goals and CE principles mobilised by Taranto Plan as opposed to the governmental account	Identify the most significant constituents of economic transition articulated by the Piano and map convergences and divergences	probing	What would be the strongest impact of this plan?
Factors supporting or hindering the adoption of Taranto Plan	Identify the most conflicting elements of the Plan	key	What do you wish/think should change about the Plan?
Factors supporting or hindering the adoption of Taranto Plan	Identify the missing elements of the Plan	key	What do you wish/think should be added to the plan?
Goals and CE principles mobilised by Taranto Plan as opposed to the governmental account	Map the conceptual dimension how understandings and values are enunciated and concepts of CE appropriated.	key	What references are made on CE in the Taranto Plan that you know about?
Goals and CE principles mobilised by Taranto Plan	Map the conceptual dimension how understandings and values are	probing	What is meant by CE? Why is it important to the Taranto Plan?

as opposed to the governmental account	enunciated and concepts of CE appropriated.		
Goals and CE principles mobilised by Taranto Plan as opposed to the governmental account.	Map the conceptual dimension - how understandings and values are enunciated and concepts of environmental justice appropriated.	additional	What does the Taranto Plan mean to you in terms of justice? Does the Piano Taranto respond to a previous situation of injustice? How does it do that (in case the answer to the previous is affirmative)
Goals and CE principles mobilised by Piano Taranto as opposed to the governmental account.	Map the conceptual dimension - how understandings and values are enunciated and concepts of environmental justice appropriated.	probing	What are the elements of the Plan that contribute to the smoothing of the social, cultural and economic gap in the city?
Genesis, evolution, political impact - and future of Taranto Plan	Explain how the Piano was disseminated, identification of further stakeholders	key	How was the Taranto Plan promoted at the local and national level?
Genesis, evolution, political impact - and future of Taranto Plan	Map the consent and dissent of the Piano and understand connections and relationships between civil society and public institutions	key	What were the reactions to the Taranto Plan?
Genesis, evolution, political impact - and future of Taranto Plan	Map the consent and dissent of the Piano and understand connections and relationships between civil society and public institutions	clarify	What about the reactions of institutions, properties of the factory, workers?
Genesis, evolution, political impact - and future of Taranto Plan	Understand what happened to the Taranto Plan and possible actors that may enact circular production patterns		What is the future of the Taranto Plan?
Genesis, evolution, political impact - and future of Taranto Plan	Understand who is still supporting it and who has undermined it	clarify	Is your organisation still promoting the Taranto Plan? How?
Genesis, evolution, political impact - and future of Taranto Plan	Understand the learning process derived by the process	concluding	What have you / have you learned from the Taranto Plan?

Questionnaire to interviewees belonging to organisations, trade unions, and political organisations who did not support Taranto Plan

Thematic areas	**Purpose of the questions**	**Type**	**Questions**
Factors supporting or hindering the adoption of Taranto Plan	Verify the reception and understanding of Piano Taranto outside the supporting organisations	Introductory	What do you know about the Taranto Plan?
Factors supporting or hindering the adoption of Taranto Plan	Define the positioning towards the reading of social and environmental problems affecting Taranto people life	clarifying	Why was the Taranto Plan born?

Genesis, evolution, political impact - and future of Taranto Plan	Verify the positioning towards the impact of the steel industry	probying	Taranto Plan was born in the wake of the belief that the Taranto situation is a situation of injustice. How do you think about it?
Genesis, evolution, political impact - and future of Taranto Plan	Establish the dissemination of the plan	Transitional	How did you find out about the Taranto Plan?
Genesis, evolution, political impact - and future of Taranto Plan	Gather the positioning towards the Piano by the different actors	key	How has your organisation reacted to the Taranto Plan?
Factors supporting or hindering the adoption of Taranto Plan	Specify what elements of the Plan are shared by the different organisations	claryfing	Are there any elements you share about the Taranto Plan? Which ones and why?
Factors supporting or hindering the adoption of Taranto Plan	Specify what elements of the Plan are disputed by the different organisations	key	How would you have elaborated the plan?
Factors support or hinder a transition to CE in Taranto		key	What does it mean for you CE?
Factors support or hinder a transition to CE in Taranto	Identify the most significant constituents of economic transition articulated by the Piano	clarify	What do you think about including CE principles in the economic transition/reconversion?
Factors support or hinder the adoption of Piano Taranto and prevent a veritable transition to CE in Taranto	Verify the existence of other transition plans competing with Piano Taranto	key	Does your organisation support or pursue other economic transition plans?
Factors support or hinder the adoption of Taranto Plan and prevent a veritable transition to CE in Taranto	Map the positioning of different actors towards veritable transition.	clarify	On what principles should the economic transition of the ex-Ilva be based?

Appendix 3: Informed consent

UAB Universitat Autònoma de Barcelona

JUST2CE circular economy

SCHEDA INFORMATIVA

Il progetto di ricerca "A Just transition to the Circular Economy (JUST2CE)" è finanziato da Horizon 2020, il programma quadro dell'Unione Europea per la ricerca e l'innovazione, in base alla convenzione di sovvenzione No. 101003491, ed è coordinato dall'Universitat Autonoma de Barcelona (UAB) in Spagna. Ulteriori informazioni sono disponibili sul sito del progetto: https://just2ce.eu/.

Obiettivi dello studio

JUST2CE si basa sul presupposto che non sia stata ancora condotta una valutazione critica del paradigma dell'Economia Circolare, delle sue implicazioni economiche, sociali e politiche e dei risultati della sua attuazione. Una diretta conseguenza di questo divario è che l'economia politica e la geopolitica della transizione sono state trascurate negli studi sull'Economia Circolare.
JUST2CE mira a comprendere, in modo critico e ponderato, a quali condizioni è possibile e auspicabile una transizione responsabile, inclusiva e sociale giusta verso un'economia circolare; quali fattori tecnici, politici e sociali possono consentire o ostacolare tale trasformazione e come questi aspetti possono contribuire allo sviluppo di misure di politica transitoria. La convinzione alla base del progetto è che il successo di una transizione verso un'economia circolare sostenibile non dipenda solo dallo sviluppo di nuove tecnologie - artefatti o processi - ma anche dalla riconfigurazione della governance dei processi produttivi in meccanismi più

reato potenzialmente grave. Il suo modulo di consenso sarà archiviato separatamente da tutti gli altri dati che lei ci fornirà. Solo i ricercatori del progetto avranno accesso a questi dati per la durata del progetto, il cui completamento è previsto per il 31 agosto 2024. Lei ha il diritto di richiedere in qualsiasi momento il ritiro dei suoi dati dallo studio. A tal fine, può contattare i responsabili del progetto elencati di seguito:
Stefania Barca – Ricercatrice senior - Centro de Estudos Sociais (CES): sbarca@ces.uc.pt

Per cosa verranno utilizzate le informazioni che ci darà?

Le informazioni fornite verranno utilizzate solo a scopo di ricerca. Le informazioni fornite verranno analizzate insieme alle informazioni provenienti da altre interviste con le principali parti interessate e altri tipi di dati. Queste informazioni verranno utilizzate per scrivere una serie di rapporti, direttive, post di blog e articoli accademici. Le informazioni ci aiuteranno a sviluppare e perfezionare il nostro quadro per una giusta transizione verso un'economia circolare. Stiamo anche progettando di realizzare alcuni brevi video che riassumono i nostri risultati. Molti di questi risultati saranno resi disponibili gratuitamente sul sito web del progetto. Gli output saranno prodotti in inglese e in italiano.
Le informazioni provenienti dalle interviste saranno riportate in forma anonima. Se lo preferisce o lo ritiene più appropriato può scegliere di essere nominato insieme ai dati del suo colloquio.

Cosa accadrà alle sue informazioni alla fine del progetto?

Una copia di tutte le informazioni raccolte durante il progetto sarà archiviata per un periodo di tempo determinato dopo la fine del progetto, quindi distrutta in linea con la politica dell' Universitat Autonoma de Barcelona (UAB).
Una copia dei dati dell'intervista non identificati (anonimizzati) sarà depositata nell'Archivio Dati UAB in modo che sia disponibile per i futuri ricercatori. Non sarà possibile identificarla dalle informazioni depositate.

Se desidera maggiori informazioni sul progetto oppure vuole sollevare problemi o dubbi su come viene condotto il progetto o su come tratta le informazioni che fornisce, si prega di contattare:

Universitat Autònoma de Barcelona

JUST2CE circular economy

MODULO DI CONSENSO INFORMATO

Denominazione della ricerca: A Just transition to the Circular Economy (JUST2CE)

	Si	No
1. Partecipazione allo studio		
Ho letto e compreso la Scheda Informativa datata 14 febbraio 2022, oppure mi è stata letta. Ho potuto porre domande sulla ricerca e ho ricevuto risposte che ritengo soddisfacenti.	☐	☐
Acconsento volontariamente a partecipare a questo studio e capisco che posso rifiutarmi di rispondere alle domande e posso ritirarmi dallo studio in qualsiasi momento senza dovere fornire una motivazione.	☐	☐
Sono a conoscenza che prendere parte a questo studio implica essere intervistati.	☐	☐

L'intervista sarà audio-registrata e il ricercatore prenderà appunti. La registrazione verrà trascritta come testo. Tutte le registrazioni audio verranno archiviate in modo sicuro e cancellate alla fine dello studio

2. Uso delle informazioni nella ricerca		
Sono a conoscenza che le informazioni che fornisco verranno utilizzate per produrre una serie di rapporti, direttive, post di blog, articoli accademici, e un nuovo quadro strutturale per guidare lo sviluppo dell'economia circolare.	☐	☐
Sono a conoscenza che le informazioni personali che possono identificarmi, come il mio nome o contatti, saranno custodite in modo sicuro e non verranno condivise al di fuori del gruppo di ricerca.	☐	☐
Consento che le informazioni che ho rilasciato possono essere direttamente citate nei documenti prodotti dalla ricerca.	☐	☐

JUST2CE

A Just Transition to Circular Economy