

RESEARCH ARTICLE

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Politicizing the future: on lithium exploration in Portugal



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Abstract

This text explores the meaning of the expression “mined future,” which has been used by local populations who oppose lithium production in Northern Portugal. We argue that the expression encapsulates the existence of a conflict for the “ownership” of future, unfolding a battle of visions of the future between local populations and governments. The local population sees the exploitation of lithium as a takeover of future. In contrast, the governments justify the project by promising a sociotechnical future in convergence with European green energy rhetoric. This article follows a grounded theory approach. It relies on information collected about the lithium exploration in Portugal, mainly through journalistic pieces and opinion articles disseminated between 2019 and 2020. In particular, the paper proposes that political action that involves large sociotechnical ventures with the potential of contamination needs to consider the local collective perceptions of the future.

Keywords: Lithium, Time, Temporality, Participation

Introduction

This article aims to reflect on the confrontation of temporal perspectives, which are part of the debate about lithium mining in the North of Portugal. The purpose is to unravel the opposing visions of the future from the perspectives of local population, government and the extractive industry and to capture the sense of the expression “mined future.” The local populations and other organizations and movements use this expression to demarcate their position against the venture. We aim to show that perspectives about the future are as critical as a spatial landscape in planning significant disruptive sociotechnical developments that impact communities and territories. On the line with Levenda and Richter [1], we aim to stress that politics, and especially science and technology policies, need to consider different perceptions and experiences of future, and better correspond to population aspirations, when taking decisions that affect time perspectives.

The policy agenda for green energy in Portugal and Europe is underway, thereby generating a vast diversity of sociotechnical imaginaries [2]. Jasanoff and Simmet’s [3] define imaginaries as “collectively realized, institutionally stabilized and publicly held visions of desirable futures, animated by shared understandings of attainable forms of social life and social order and supporting advances in science and technology” (p. 120). Unlike other sociotechnical objects, lithium is concentrated in soils. Its extraction demands a complex process that inevitably alters the landscape. For this and other reasons, it is a source of great controversy in health and environmental studies, which point out its potential adverse effects, as Shahzad et al. state [4]. In fact, Kszos and Stewart [5], Qin et al. [6], and Oliveira [7] say that among the main consequences of mining are dust clouds and water pollution, which significantly impact agriculture, food, and health.

Javiera Barandiarán [8] explains that governments need to legitimize political programs based on science and technologies. Therefore, new totalizing imaginaries around the undertakings can emerge, bringing about disputes and debates about time ahead. Despite several discourses around the path toward green energy

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expenditure, it is usually the proximity (or anticipated proximity) to potential adverse impacts that explain how the local population receive and react to technical undertakings. For example, Eaton et al. ([9], p. 227) stress the role of “social movements that coalesce around competing for collective memories of place.” As stated, and aligned with Hajer and Pelzer [10], we argue that the implementation of undertakings requires rethinking the political use of future.

Indeed, in the case of lithium mining in the North of Portugal, the expression “mined futures” has gained momentum to mark how the local population has understood the disruptive effects of lithium exploitation on what they consider to be “their” future. The expression, identified in the media, positions the local population’s perspective on the project. It also translates the discontent at a national and international level through the mobilization of international organizations, such as UNESCO and recourse to various widely recognized newspapers and TV Channels in Portugal and abroad. Notwithstanding such discontent, EU policy and the national government have continued to take an interest in the project, stating that job growth and economic dynamism outweigh the potential environmental impacts.

In line with what STS researchers have proposed for several other areas in Europe and in the world [10], lithium in Portugal is part of a broad political project for energy transition and the development of the electric car industry, which is currently underway and full of controversies. Most of the areas targeted for lithium exploitation are located in low population density regions in the Northern and Center-East areas of the country (Serra d’Arga, Barro/Alvão, Seixo/Vieira, Almendra, Barca Dalva/Canhão, Argemela, Guarda, Segura e Maçoeira). The geological surveys carried out over the last 10 years had the support of national governments and the EU, who considered the added value lithium would represent for fostering energy transition, as exemplified in the document “Competitiveness of Portuguese Lithium” [11, 12]. In the media, there has been much discussion about the topic, involving politicians, the local population, specific NGOs (such as QUERCUS), and other organizations that are opposed to or intend to monitor the process, such as Miningwatch [13]. Politically and economically, the process is ongoing, and new plans for creating industries for lithium conversion associated with traditional oil companies [14] were made public in 2022 [15, 16], when infrastructures began to be built, particularly in the Montalegre region (in the Northern part of the country).

This paper draws on data collected until the end of 2021. It is based on a grounded theory approach [17], and closely follows the theoretical and critical alignment of

authors on the sociotechnical and politicized visions of the future presented by Aykut [11], Kropp and Scheele [15], Chateau et al. [18], and Marquardt and Delina [19]. It discusses the hypothesis that the exploitation of lithium is anticipated as having effects on the communities’ timescapes forever, fueling the emergence of pessimistic expectations: fear of the extraction impacts, and fear of regions and landscapes structural reconfigurations on time ahead.

Building on the visions of D’Angelo and Pijpers [20], our paper develops two leading structural discursive positions:

- i) Lithium exploitation is a sociotechnical phenomenon which constitutes one of the main axes of energy transition supported by sociotechnical imaginaries which become embedded in politics;
- ii) Lithium exploitation imposes critical questions about how to deal with the effects brought by the temporalities of contamination to regions and places and their imagined and desirable futures.

The article’s title intends to show how this temporal horizon is the *locus* of confrontation between different ways of valuing, experiencing, and perceiving the time ahead (of individuals, communities, and the country). Thus, the text follows a comprehensive methodological path inspired by the grounded theory approach aligned with Charmaz’s [17] interpretative approach. Finally, the article suggests that policy should reflect on the future, avoid single narratives, and instead deploy the future’s diversity.

We divide the paper into three main sections. The first presents a methodological note that clarifies the information used throughout the article and its implications. The second makes a short systematization of the object of study. Next, it is proposed a problematization focusing on the concept of the future and on its relations with sociotechnical imaginaries. Then, we make the presentation of a primary empirical evidence that anchors the conclusions into the need to include the future as a specific object of political action for large sociotechnical infrastructures.

Methodological note

The paper has an exploratory character that considers the principles of a grounded theory approach in line with Charmaz [17], based on Glaser and Strauss [21]. As said, it aims to contribute to a theory of time and temporality on lithium. This purpose fosters the understanding of lithium as a sociotechnical phenomenon underpinned by the idea that the researcher is able “to give meaning to data, understand what the

data says,” as argued by Noble and Mitchell ([22], p. 1). In other words, we aim to “observe and describe” [14] the lithium exploration process by analyzing the sequence of events with expression in the public space. These events include political decision-making and the opposition movement from the populations and local governments.

As Venturini points out [23], the analysis of technological controversies deploys a diversity of voices, arguments, and places where discussions take place. In this case, we use various content published by different media from when the first lithium exploration plans became public until 2021 when we started writing this article. In addition, we draw on an essential official policy paper that expresses policy options and legitimation processes for lithium exploitation as a way for Portugal to respond to the demands of the energy transition. We also consider Portuguese radio, television and press, as well as several international media, including Euronews, for they stand out for how they have dedicated themselves to the subject. Taking a documental perspective, they reveal political positions from the government, ministries and the main Portuguese parties, and live aspects of resident populations. On the one hand, media sources such as TV and the press constitute traceable sources of the conflict that are easily accessible for a researcher; on the other hand, they make it possible to retrace the situations where actors disagree and thus map the plurality of conflicting pieces. Moreover, they enable observation of how collective life at specific moments is represented and circulates through the public space, enabling support for a theoretical perspective on the role and status of time and temporality.

Two types of text anchor the analysis: (i) policy discourses provided by public statements made by government and public institutions, and (ii) direct excerpts of comments made by residents of the targeted areas, experts, and visitors, reproduced in several media. The database is built on articles from the following newspapers online: *Público*, *Jornal de Notícias*, *Sol*, *Económico*, *Correio de Manhã*, *Observador*, *the New York Times*, *Sábado*, *Daily News* and *The Guardian*; press agencies: *Reuters* and *Lusa*; the magazine: *National Geographic*; radio stations: *TSF Radio Notícias* and *Radio Renascença*; and the television channel: *Euronews*. The database covered the period of controversy over the last 2 years, from 2019 to 2021. We searched with the expression “Lithium Portugal” (in Portuguese). We collected 78 news items, of which 17 were from 2019, 7 from 2020 and 54 from 2021, when the mobilization of local governments and populations intensified. The visibility of the controversy in national and international media, the circulation of the chosen media, their sizeable political scope, and the ease

of access through the digital archives of these newspapers were the main criteria used to select the materials.

In summary, given the embryonic state of knowledge about the process, the aim here is to provide a snapshot of the lithium controversy, focusing on temporal dimensions, thus uncovering imaginaries of the future within this new possibility of lithium mining. The longitudinal data collection, despite exploratory, allows us to map the various entities and actors that appear in the controversy and inspect the events not in a sequential line but through semantic bridges established between them. The analysis of the themes follows the main criterion of grounded theory and not that of categorical discourse analysis with universal categories. Hence, we analyzed each article independently and built unique sheets of the themes treated in each piece, aligned with Jacobsen [24].

Theoretical context of the problem

Sircova et al. [25] asserts that time perspectives are antecedents and consequences of societal sustainability and growth. Koselleck [26] clarifies that experience shapes temporal expectations and visions of the future, understood as a “description of what could occur in the near-term, mid-term, or long-term future. While shaped by ideological constraints, visions reveal alternative narratives or futures, thus inviting contestation within themselves, and between alternative perspectives” ([2], p. 645). These respond to the abilities that social actors believe they have to face any kind of event that suggests change or rupture. Thus, temporal disruption becomes even more intense when the introduction of large sociotechnical ventures comes accompanied by visual changes in landscapes and entails effects perceived as harmful, implicit and uncertain, both on human groups and the natural world: land, air, and water.

According to Sorokin and Merton [27], a relationship continues insofar as there is an agreement between the parties involved regarding its “socially expected duration.” In this case, the relationship between local populations, governments, and companies is uncertain in the case of developments requiring extraction from the soils. It leaves room for mistrust on the part of the population because no one can provide certainty about the potential effects of the exploitation on the community and the environment, not even the law, since the consequences may be invisible and difficult to relate to the intervention actions required in the present [27–29]. This is the case of contamination—primary source of uncertainty and threat [30, 31]. As Fent and Kojola propose, “many of the resulting damage of contamination are latent from the outset and develop over a long period without being detected” ([32], p. 44). Analyzing the effects of technological development, Martins [33] warns of the need

to take precautions against long-term effects and forms of contamination. Contamination refers to a continuous process. It opens up an endless temporality, mainly made via technological objects and waste. Studies on water contamination stemming from industrial and technological development, for example, attest to this timeless nature of the contamination, showing that, after contamination, it becomes practically impossible to determine for how long water remains unusable for drinking, irrigation, and bathing [34]. Nature and society are intrinsically related to each other. Science tells that contamination affects the temporalities of natural resources, especially the soil, in unnoticeable, albeit irreversible ways. It also affects the temporal prospects of communities and their inhabitants. As a result, it can trigger massive movements of exodus and abandonment.

In addition, sociotechnical imaginaries have a solid capacity to persuade. For example, the existence of energy sources [10] emerges within a “green energy” rhetoric through which governments and industries are portrayed as makers of the future. This institutional power is pervasive and can bind social actors’ visions, demanding their adhesion.

Marquardt and Delina [19] highlight the importance of “investigating the power relations behind emergencies or calls for urgent policies” (p. 4). Indeed, following Jasanoff and Simmet [3], sociotechnical ventures may be putting at risk the imaginary of local needs in favor of the global imaginary of future renewable energy and innovation. In other words, in the wake of Hajer and Pelzer [10], we can say that futures that impose themselves as hegemonic and undisputed visions present themselves as extremely attractive and persuasive, shaping individual negotiations, decisions and practices [28, 35]. Ultimately, they are self-explanatory, disregarding experience, knowledge, and personal and social aspirations, as Marquardt and Delina argue [19]. In this way, the normative and critical view argues that these sociotechnical can be integrated into desirable futures, rather than being planned futures [3, 9, 36], which seem predetermined by economic or technological needs, says Kelz [37].

Jasanoff and Simmet emphasize that in processes of “discovery” or “rediscovery” of economically valuable minerals underground, the inhabitants may witness an invasion of outsiders [3] who are usually organized in “power constellations.” Following Aykut [11], these processes are incredibly typical in the area of energy due to the easy association between energy transition and the idea of an open future, full of possibilities driven by scientific and technical progress, following Shahzad [4], Hagerstrand [38], and Knappe and Schmidt [39].

Hence, the politicization of the future can take various forms, depending on the types of actors, interests,

and objectives in question [37, 39]. Based on this theoretical position, we argue that plans and projects aimed at extracting natural resources from territories affect both the temporal perspectives of the population and that of the natural resources themselves, such as soil, water, and air, in a continuous, persistent, and perennial way, and also disrupts the expectation of the future as stable [40, 41].

Appadurai [42] argues that the “future is a cultural fact.” We are going through moments characterized by a remarkable “(re-)politicization,” says Kelz [37]. That is why literature emphasizes that politics must take the future as a central conceptual and methodological concern, as problematized by Kenis and E. Mathijs [43]. Therefore, we also suggest normatively combining community aspirations with economic development is necessary because anticipating the future is not error-free. It is, thus, essential to act with caution in a constructive and shared way about the “desirable future” (see Jasanoff and Simmet [3], Eaton et al. [9], Bai et al. [36]).

Understanding the “mined future”

Oomen et al. [44] state that imagined (sociotechnical) futures are socially performative. We will deepen the controversy about the future by taking into consideration the information gathered around two discursive positions:

- i) Exploitation of lithium is one of the main hallmarks of the energy transition and it is associated with different sociotechnical imaginaries.
- ii) Lithium mining imposes critical questions concerning the ways to deal with the effects brought about by the temporalities of contamination to regions and places, as reports Sanchez-Lopez [45].

The problematization presented above anchors one central idea: there is a need to reflect in the way politics envisions sociotechnical undertakings and values methodologies for constructing scenarios and visions of the future.

Discursive positions

Discursive position 1: lithium and the sociotechnical imaginary of the energy transition As Aykut notes [11], “the effects of predictions and scenarios depend on the uses that actors make of them, the practices associated with them and the political struggles in which they are embedded” (p. 120). In the case of lithium mining in Portugal, we can also propose that the sociotechnical imaginary of Portugal buoys these debates as a modernized country capable of contributing to the imagined

European energy future while fueling increased investment in economic rewards, job creation, and regional development.

Lithium mining operations came to Portugal following extensive exploration for the mineral worldwide. The sector is seen by politicians and some energy experts mainly for its “potential” to contribute to a desire for self-sufficiency, in a scenario where lithium batteries are the “Batteries of the future,” and “Iberia” will perhaps be the land of this new future [46]. When the first evidence of the discovery of large lithium deposits in Portugal was released in 2017, some of the political elite and private sector celebrated with great enthusiasm, presenting the discovery as a path to a different future. In the media, the first news in 2019, lithium is perceived mainly based on its positive potential and wealth that can be generalized for the future. This idea of the future is expressed with a particular assumption of its role in energy production and economic development. It is presented as something that requires a “race,” a certain “speed” to take advantage of the “abundance.” A “treasure” and “millions” are expected to come from the “lithium potential,” that is to say, from the “white gold” or the “oil of the future” [47]: “Lisbon’s actions will also have repercussions beyond its borders. Its reserves may be modest compared to Australia and Chile, the world’s top lithium producers, but

Portugal is central to Europe’s bid to cut reliance on lithium imports” [48] (Table 1).

According to Smallman, “the machinery of government shapes how public perspectives can be heard and accommodated in policy” ([49], p. 14). As the political discourse unfolded in Portugal, it connected lithium to the future of Portugal assuming that it contributes directly to potentiating the “green energy.” The words used in this narrative point to this meaning. It is said that “Portugal is among the countries with great potential in the extraction of this ore” [50]. They point to Portugal’s contribution to producing the “oil of the future.” The international discourse, especially in the context of the European Union, shows this dazzle and reinforces the sociotechnical perspective of the future. A research article published by Reuters [51] even classifies Portugal as the “poorest country in Western Europe,” that now has a “bright future” due to its ability to “exploit” the precious metal for batteries. The EC’s political representatives maintain the same narrative that the Portuguese government espouses.

In March 2021, Euronews broadcast a report stating, “One of the keys to unlocking Europe’s energy transition to carbon neutrality is hidden in the mountains of northern Portugal. The region is rich in lithium, an essential component for the growing electric vehicle sector” [31]. The content highlights that lithium is central to Europe’s

Table 1 News in 2019

Source	Title
Reuters	UPDATE 1-Portugal plans to open lithium licensing auction in May—minister
Jornal de Notícias/daily newspaper	What you need to know about the controversial lithium rush in Portugal O que precisa de saber sobre a polémica corrida ao lítio em Portugal
Público/daily newspaper	Lithium, a metal for Portugal’s future? Lítio, um metal para o futuro de Portugal?
Público/daily newspaper	Company says Boticas lithium mine is a \$500 million investment Empresa diz que mina de lítio em Boticas é um investimento de 500 milhões
Radio Renascença/Radio station	Boticas ground hides treasure. Lithium is wealth for some but disgrace for the villages Chão de Boticas esconde tesouro. Lítio é riqueza para uns mas desgraça para as povoações
National Geographic—Portugal	Lithium may be the energy of the future—and there is abundance in Portugal O lítio pode ser a energia do futuro—e há abundância em Portugal
Sol/newspaper	The lithium potential in Portugal O potencial do lítio em Portugal
Económico/newspaper	Where is there lithium in Portugal? Onde há lítio em Portugal?
Jornal de Notícias/Daily News	There is lithium underneath a Portuguese natural treasure. And that’s a problem Há lítio debaixo de um tesouro natural português. E isso é um problema
Público/daily newspaper	Does lithium jeopardize emission reductions? Quercus (Portuguese Environmental NGO) says yes, Government rejects O lítio põe em causa redução das emissões? Quercus diz que sim, Governo rejeita
Reuters	Portugal’s Lusorecursos in talks to fund 400 mln euro lithium project
Jornal de Notícias/Daily News	Researcher says lithium could be Portugal’s oil Investigadora diz que lítio pode ser o petróleo de Portugal
TSF/Radio station	Lithium: the element that change people’s lives Lítio: o elemento que mudou a vida das pessoas

Source: authors’ elaboration

energy transition, which is committed to the widespread use of lithium batteries. Portugal is referenced as a country with the technical and logistical capacity to contribute to this effort. Further on, it states that “Lisbon’s action will also have repercussions beyond its borders” and that “Portugal is central to Europe’s attempt to reduce dependence on lithium imports” [48].

This narrative highlights Portugal’s lithium wealth and the opportunity to use the metal to promote “neutral” energy. Thus, keeping alive the dream of “being a European, and perhaps world power” ([37], p. 4), the political investments were supported by several reports containing information on the existence of lithium in northern Portugal and the interest in its exploitation.

Throughout this process, there is a gamble on the temporality of convergence with European interests and with the idea of modernization, supporting approaches that ensure the reduction of the risk of contamination because “the extraction methods use the most modern technologies”, and there is a chance, say the Portuguese representatives, to count on “highly efficient recycling processes and technologies, aiming at the maximum recovery of batteries and components, to allow the reduction of EU dependence on raw materials and circular economy in Europe” ([37], p. 6).

There were several demonstrations of resistance and caution from environmentalists and academics concerned about the certainty of the need for lithium. A representative of the environmental movement, Quercus, asked a fundamental question about contamination [52] “Lithium is necessary, but then what will be done with these batteries and how will this lithium be transformed?” Other voices entered the conversation, bringing into the debate the uncertainty around contamination: “Our very existence implies pollution, and no green energy is truly clean because of the materials needed to obtain it through dirty processes. But that can’t be free for everyone. That needs to be controlled” [53].

Nevertheless, the arguments made by politicians remained firm, with one promise made: in its revised the Circular Economy Action Plan, the European Commission is clear: we need to boost the circular potential of all batteries, namely by modernizing the Batteries Directive, establishing rules to ensure: (1) all batteries are produced sustainably—low resource consumption, little waste generated, easy repurpose, disassembly, and recycle; (2) rules on recycled content, measures to improve collection and recycling rates, and ensure recovery of materials; (3) any

batteries used in the growing market for EV are sustainable ([37], p. 7).

The immediacy of the project took over the political discourse, which reacted against more resistant positions, particularly those established by academics such as geologists [54]. Nevertheless, the government affirmed future safety. They say that “the European rules are clear: whoever takes responsibility for a certain area must guarantee that the environmental impact is reduced, compensated for and therefore there is a whole range of European legislation that frames these mines” (Portuguese commissioner) [55]. Thus, the future is portrayed as “an inevitable path,” embodied in the “twenty-first-century gold.” Lithium is emphasized as a solution, capable of shaping the future. In this sense, political and media discourses emphasize the imaginaries that invoke lithium as a “fable” of decarbonization, as the “fuel of Europe’s electric vehicle revolution” [56].

In line with our first idea, this short version of the story illustrates the duration of the trajectory of lithium’s discovery in northern Portugal’s territories. It also discloses the definition of a political agenda for its exploration and commercialization in Portugal. When, in 2017, the news reached the public space, local communities were surprised. The moment was marked by a discourse that carved an open temporality, with the future offering different choices and alternatives.

Lithium exploration in Portugal is still a project (*potentia*). As we have pointed out, this perspective of an open future, typical of societies which value science and technology, is marked by an emphasis on the possibility that the exploitation of lithium facilitates the imaginary of convergence with Europe in areas associated with the development and an increase in options (scientific and technological) to conquer the future. However, as the vision of a “bright future” spreads into the public space at the hands of politicians, industrial companies, and some experts in the field, a conflicting perspective of a mined and destroyed future is unleashed in public by local communities who vociferously demonstrate against lithium exploration.

Discursive position 2: the mined future Fent and Kojola argue that [32] “various temporal aspects—such as history, memory, speed, delay and epistemologies of time—play a central role in how struggles and controversies over extractivist development manifest themselves in certain places” (p. 819). This idea is essential for understanding the case of lithium mining in Portugal, given that the local populations who manifest themselves live

on or own land and dwell in regions which have suffered over the years from an intense exodus of the people to metropolitan areas. In addition, they are quite unprotected regarding access to essential public services, having remained classified as “interior,” which is associated with a slow pace of life, less economic development, and deficient industrial activity.

The exploitation of lithium is perceived as a disruptive element of this temporality. In most reports against lithium, slogans refer to it as “no to cancer, no to death, yes to the future,” with messages of slow temporality, calm, tranquility, and difference underlying these more violent protests. Lithium exploitation is represented as a significant temporal disruption because of the general contamination it means for social organization, the economy, and society.

Part of the population, supported by political parties, environmental organizations, and other local actors, protested, sought UNESCO, and shared information widely through various channels. Lisbon witnessed this demonstration with the banners chanting “no to the Mine, yes to life,” “no to a mined future,” and “no to Cancer” (Fig. 1).

The future is treated as a human rights matter and an inalienable identity mark: local communities claim “our future.” Using the metaphor of mines, typical of lithium mining, they argue that their future is now mined,

“Futuro minado”. Montalegre protestou contra exploração de lítio

26 Jan, 2020 - 00:37 - Lusa

Sob o lema ‘não à mina, sim à vida’, cerca de 300 manifestantes disseram “não” a uma mina a céu aberto na região, apesar de estudo de impacto ambiental desvalorizar impacto de uma possível exploração.



Fig. 1 Newspaper news “Mined Future”. Montalegre has protested against the exploration of lithium. Source: [57] <https://rr.sapo.pt/noticia/pais/2020/01/26/futuro-minado-montalegre-protou-contra-exploracao-de-litio/179702/>



Fig. 2 Demonstration against lithium exploration (“No to the mine/ Yes to life”). Source: [58]

not destroyed, but discounted, not retaining its original value. The analysis of this information shows that during 2019 and 2020, local communities feared lithium exploration in the territories, considering it a mine that would destroy their desirable and expected futures (Fig. 2).

For most of these regions, the pace of life has become a tacit marker of authenticity. Several media outlets have published stories of people saying that their lives had been condemned to change because of the new mines. One Morgade inhabitant describes having his entire future invested in the town; his livelihood is agriculture. The imminent threat of the mines raises red flags about “land occupation and water contamination” [57]. He says, “young people like me who could go abroad but chose to stay, who invested everything here and now this could mean the end of our dream” [57]. Another person from Morgade declares that the whole village is “worried” [57], stating that “both the old and the young are worried about our future, and we will continue to fight as long as we have the strength to do so” [57]. Perceived as an attack [58], the emergence of lithium exploration led the population to protest against the need to “give up our villages” [59] by organizing vigils and protests (Table 2).

But it was in 2021 that the dispute between the population and the political discourses increased. The people showed “total displeasure,” speaking of a “catastrophe,” claiming on posters: “They won’t get through here,” “We’re not going to let them through,” “Do you want lithium? Go and get it somewhere else,” “No to lithium, yes to life” (Fig. 3).

In sum, the discourses against lithium mining seem to highlight the criticism about who they consider outsiders and the “other,” as they say, “We refuse to accept people in Lisbon who decide to destroy parts of our villages, mountains and our quality of life.” From an initial point of view, the inhabitants and also local political

Table 2 News about lithium exploration spread in 2020

Source	Title
Newspaper Público	Vigil against lithium mine scheduled for Saturday in Montalegre Vigília contra a mina de lítio marcada para sábado em Montalegre
Newspaper Reuters	Portuguese communities lock horns with lithium miners to save their land
Newspaper Correio da Manhã	Protest against lithium mining in Montalegre brought together 300 people against 'mined future' Protesto contra exploração de lítio em Montalegre juntou 300 pessoas contra 'futuro minado'
Newspaper Observador	Viana do Castelo will do everything to avoid lithium exploitation in Serra d'Arga Viana do Castelo fará tudo para evitar exploração de lítio em Serra d'Arga
Newspaper The New York Times	Snapshots of daily life in a remote region of Portugal

Source: author' elaboration



Fig. 3 Facebook content claims, “Here they do not enter: we do no negotiate. We want to decide our future.” Source: [60]

representatives conceive the future as an identity trait, which is owned and cannot be alienated, in their opinion. Expectations—while forms of time perspectives and futures—seem to be conceived as a matter of collective identity. Locals reacted against foreign companies using the slogan “Portugal is not for sale” [54], saying they are “fighting” the destruction of the land”, as they are certain that people will not be able to live there [54].

The right to hold and own a regional and local future that local communities can administer has served to justify their opposition to sociotechnical investment, calling for the suspension of the process (especially the Municipalities of Caminha, Ponte de Lima, and Viana do Castelo

and SOS Serra d’Arga, Montalegre com Vida, Movimento Não às Minas, among others) [60, 61]. They claim their “sacred mountain deserves to be protected and recognized.” Similar voices join reports circulating in the international arena. They claim that “The lush, green hills where Paulo Pires has for years brought sheep to graze above his picturesque Portuguese village may soon be transformed by the race to power electric vehicles [48]”. Inhabitants are aware of their contribution to achieving European and global energy goals. However, their discourses accentuate their present-day refusal to (what they perceive to be the) hand over their future to foreign companies.

Statement/discussion: the future as a policy axis

The previous controversy analysis illustrates arguments about who “possesses” the future and who can plan and/or “determine” it. Adam [27], Martins [33], and Appadurai [42] call attention to the risks coming from the dependence of development on technoscientific innovation. This paper navigated upon a central hypothesis that has been highlighted in several other studies on mining and extraction [41, 62–66]: the “extraction” inscribed in political discourse brings about a parallel temporality, which is incompatible with that desired by the population and with uncertain effects for the future (mainly those that may arise from contamination). In this perspective, the inhabitants, local governments, political parties representatives, and other opposing movements use the expression “mined future” to express their lack of confidence in sociotechnical undertakings and in the ability of public authorities to anticipate the changes, as well as the risks and threats they may bring about.

Final considerations

In 2022, the controversy goes on, with increased attention from international press. However, some areas, like Serra D’Arga were effectively removed from the lithium exploration plan [67, 68].

Based on Sewel [69], Beck et al. [41] state that “Temporality’ refers to the many different ways in which change can unfold over time.” The purpose of this paper was to reflect on the temporal perspectives inscribed in the debate about lithium mining in Portugal. Drawing on some empirical information, we seek to demonstrate that perspectives of the future are as crucial as landscapes. From the literature review, it is possible to say that lithium mining presents several challenges regarding temporality at various scales and levels. It encompasses the intervention areas’ past and imagined and/or desired futures upon populations, memories, and heritages. It also imposes broader political challenges regarding how politics can manage the contradictions and conflicts that emerge with political programs based on the belief in technoscientific development [70].

The analysis of the lithium mining case deserves further research regarding the diversity of positions adopted by the various actors involved, as it gains different contours depending on the country, or region. Notwithstanding, the information collected and analyzed allows us to reflect on the adequacy of the theoretical formulation we set out at the beginning of the text: the capacity of politics to look at social movements arising against sociotechnical enterprises, some of them currently related to the energy transition, through the prism of their temporal significance, i.e., the capacity to contain the past, present, and future of people, regions,

and territories and countries. This reflection would lead us to an even broader debate on the participation of populations in the design of the future, as advocated by Asara et al. [71] and on the role of aspirations in the political process, accommodating local populations’ needs in co-producing and co-designing the future. In other words, it must consider the concept of the future as an entity, a human right that is as important as space or any other object. This procedure implies incorporating time and the future into the everyday exercise of politics at European and global level. Hence, additional research on the socioeconomic dimension of the genesis of temporalities is central to managing the contradictions and conflicts posed in decision-making and their relationship with the law.

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Authors’ contributions

The authors read and approved the final version of the manuscript.

Declarations**Competing interests**

The authors declare that they have no competing interests.

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