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## Ecological crisis and green capitalism: toward a climatization of extractive industries?

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# Review of Agricultural, Food and Environmental Studies

## Ecological crisis and green capitalism: towards a climatization of extractive industries?

--Manuscript Draft--

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<b>Abstract:</b>	<p>The European mining revival strategy is correlated with the agendas for transition to a "green" and "climate-friendly" economy. We focus in this article on the climatization of extractive discourses and practices in Europe, France and Andalusia in order to show the variations in discourses while noting the continuity of practices. The registers of justification of the mining revival circulate in the European area, but the operationalization of extractive reindustrialization is expressed in different ways in the member states, revealing specific constraints and dynamics at the regional level. In Spain, for example, more than a dozen mining projects have been launched since the end of the 2000s, particularly in Andalusia, where greening and climatization are integrated into the reindustrialization issue. In France, where ecologization and reindustrialization are integrated into register for securing sovereignty, none of the projects submitted during the last decade have been successful, which highlights the difficulty of articulating greening, climatization and extractive reindustrialization. We show that the climatization of the extractive industries in Europe remains largely a discursive process that does little to transform mining practices and activities - except that it contributes, under certain conditions highlighted here, to legitimizing their redevelopment.</p>	
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<b>Author Comments:</b>	This article is a contribution to the Special issue "The politics of decarbonisation. Investigating the carbon-related transformations of production activities, organizations and sectors".	
<b>Response to Reviewers:</b>	We thank the reviewers once again for their helpful comments, which we have taken fully into account.	

Regarding one of the reviewer's final criticism of section 1.1: the first paragraph explains, indeed, how these notions came about in initial response to the criticism; while the second paragraph shifts the argument to the way in which these notions have been institutionalized by international pro-mining coalitions. Therefore, the second paragraph does not attempt to demonstrate any 'intention', but rather the dynamics of institutionalization.

Furthermore, the following sentence seems to us to make it clear that we are not passing judgement one way or the other in this respect (which also seems to us to address the criticism made by the reviewer): "The Milos Declaration, produced by an international coalition of mining academics and trade associations in 2003, echoed these principles and stated the imperative of mining becoming more responsible in order to ensure a sustainable future. These alliances and initiatives emphasized the need to better align societal and environmental needs with business purposes, linking together companies' financial, social and environmental performance".

Finally, we have also carried out a linguistic revision of the article.

## Title

Ecological crisis and green capitalism: towards a climatization of extractive industries?

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## Abstract

The European mining renewal strategy is correlated with the agendas for transition to a “green” and “climate-friendly” economy. We focus in this article on the climatization of extractive discourses and practices in Europe, France and Andalusia in order to show the variations in discourses while noting the continuity of practices. The registers of justification of the mining renewal circulate in the European area, but the operationalization of extractive reindustrialization is expressed in different ways in the member states, revealing specific constraints and dynamics at the regional level. In Spain, for example, more than a dozen mining projects have been launched since the end of the 2000s, particularly in Andalusia, where greening and climatization are integrated into the reindustrialization issue. In France, where ecologization and reindustrialization are integrated into register for securing sovereignty, none of the projects submitted during the last decade have been successful, which highlights the difficulty of articulating greening, climatization and extractive reindustrialization. We show that the climatization of the extractive industries in Europe remains largely a discursive process that does little to transform mining practices and activities - except that it contributes, under certain conditions highlighted here, to legitimizing their redevelopment.

## Keywords

Mining revival; Ecologization; Climatization; Decarbonization; France; Andalusia

## Statements and Declarations

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- The authors have no other relevant financial or non-financial interests to disclose.
- The authors have no competing interests to declare that are relevant to the content of this article.
- All authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.
- The authors have no financial or proprietary interests in any material discussed in this article.

## **Conflicts of interest/Competing interests**

no conflicts of interest

## **Ethics approval/declarations**

not applicable

## **Consent to participate**

not applicable

## **Consent for publication**

not applicable

## **Availability of data and material/ Data availability**

Data and supplementary material are available on request to the corresponding author.

## **Code availability**

not applicable

## **Authors' contributions**

All authors contributed to the study conception and design. The preparation of the material, the collection and analysis of the data were carried out by each of us and pooled collectively for this article. The manuscript was written and approved collectively. That is why we are signing this article in alphabetical order.

[Click here to view linked References](#)

# Ecological crisis and green capitalism: towards a climatization of extractive industries?

## Abstract

The European mining revival strategy correlates with the agenda of transition to a “green” and “climate-friendly” economy. In this article we focus on the climatization of extractive discourses and practices in Europe, France, and Andalusia in order to show the changes in discourses while noting the continuity of practices. While discourse justifying the mining revival is circulating within Europe, the operationalization of extractive reindustrialization is materializing in different ways across the Member States, revealing specific constraints and dynamics at regional level. In Spain, for example, more than a dozen mining projects have been launched since the late 2000s, particularly in Andalusia, where reindustrialization has been associated with greening and climatization. In France, where ecologization and reindustrialization have been integrated into discourse on securing sovereignty, none of the projects submitted over the last decade have been successful, which highlights the difficulty of reconciling greening, climatization, and extractive reindustrialization. We show that the climatization of the extractive industries in Europe largely remains a discursive process that does little to transform mining practices and activities – other than by contributing to legitimizing their redevelopment, under certain conditions which we highlight.

## Keywords

Mining revival; Ecologization; Climatization; Decarbonization; France; Andalusia

## Introduction

Despite the growing perception of a climate and ecological crisis, the extraction of raw material from the soil and subsoil and of natural resources in general remains a central driver of contemporary capitalism. The development of IT and digital technology since the late 1990s, together with the more recent combined agendas of the digital and energy transitions, are leading to an increase in the extraction of materials on a scale now unprecedented in human history (Abraham & Murray, 2015). The European strategy for adaptation to global warming (European Commission, 2021) and its ecological transition pact (European Commission, 2019) place particular emphasis on the production of renewable energy and on the “digital revolution”, which is claimed to allow for more efficient management of networks and resources<sup>1</sup>. Despite the promise of dematerialization, digital technologies are requiring more and more minerals – solar panels and wind turbines alike require increasingly complex alloys –, which represent considerable volumes of energy and materials, from lithium-ion batteries to the rare earth elements in the alloys of new technologies (Bazilian, 2018; Pitron, 2018). Hence the quest for new resources and the renewed interest in subsoils that until

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<sup>1</sup> The current elaboration of a “Regulation of the European Parliament and of the Council establishing a framework for ensuring a secure and sustainable supply of critical raw materials” (which was in the process of being adopted by the European Commission between March and June 2023) confirms this trend: [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_23\\_1661](https://ec.europa.eu/commission/presscorner/detail/en/ip_23_1661)

1 recently were considered unprofitable to exploit, but also the economic, legal, and political reframing  
2 of materials and territories (Buu-Sao, 2021; Chailleux et al., 2022).

3 The World Bank now forecasts that this extraction boost will increase the demand for metals –  
4 aluminum, cobalt, iron, lead, lithium, manganese and nickel – tenfold by 2050 (World Bank Group,  
5 2020). Herein lies the paradox: the “transition” agendas require ever more extraction, yet the  
6 extractive sector is a decisive driver of the contemporary ecological and climate crisis. The United  
7 Nations’ Global Resources Outlook estimates that extraction and processing activities account for 53%  
8 of the world's carbon emissions and 20% of the health effects of air pollution (UN Environment and  
9 International Resource Panel, 2019). To what extent does referring to climate change contribute to  
10 legitimizing this paradoxical revival of mining? In this article, we focus on the climatization of extractive  
11 discourses and practices in Europe, France, and Andalusia to identify changes in discourse while noting  
12 the continuity of practices. We show that the European mining renewal strategy is directly correlated  
13 with the agendas of transition to a “green” and “climate-friendly” economy. While these justifying  
14 discourses are circulating within Europe, the operationalization of extractive reindustrialization is  
15 materializing in different ways across the Member States, revealing specific constraints and dynamics  
16 at regional level. In Spain, for example, more than a dozen mining projects have been launched since  
17 the late 2000s, particularly in Andalusia, where reindustrialization has been associated with greening  
18 and climatization, whereas in France, none of the projects submitted over the last decade have been  
19 successful. This is a clear indication of the difficulty of reconciling greening, climatization, and  
20 extractive reindustrialization.  
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27 We first present our analytical framework, followed by our material and methodology. The paper is  
28 then organized into three sections, focusing on the climatization of the extractive industries at  
29 European (1), French (2) and Andalusian (3) level. We conclude by describing and discussing the main  
30 characteristics of the climatization of the extractive industries in Europe over the last 20 years.  
31

### 32 Theoretical framework

34 Over the last 20 years, climate change has become institutionalized, and global climate governance  
35 has developed and put the transition towards low-carbon economies on the agenda (Aykut &  
36 Maertens, 2021). This transition agenda sets a new horizon for the public regulation of industry, but  
37 also for industrial opportunities and the valorization of natural underground resources in particular.  
38 This is highlighted by works on “green capitalism”, which evidence the way that different industries  
39 leverage calls for action in the face of climate change by turning them into new markets (Buller, 2022;  
40 Prudham, 2009). We posit capitalism as a social and economic regime in which workers do not own  
41 the means of production that constitute the main revenue source of the owners of capital, whose main  
42 goal is to generate profit through value added derived from the workers and “cheap nature” (Moore,  
43 2016). Capitalism, a global phenomenon, unfolds in national and continental contexts with distinctive  
44 forms of participation of the State apparatus. Green capitalism does not involve concrete change in  
45 the mechanisms and dynamics of industrial capitalism; it appears above all as a narrative of “transition”  
46 of productive models, based on decarbonization and better environmental integration of their supply,  
47 production, and market chains (Combes, 2010). The concept of climatization, which refers to a social  
48 process of redefinition of issues with climate change as the frame of reference, helps us to understand  
49 these trends of redefinition and selective appropriation of the various dimensions of the climate crisis,  
50 particularly within specific industries. In line with Aykut and Maertens (2021), we consider  
51 “climatization” as an on-going dynamic process of change, which leads us to pay attention to the  
52 articulation between discourse and practice: we consider strategies, communication, and concrete  
53 practices together. The emerging literature on the subject shows not so much how climate change  
54 issues help transform social, political, or economic activities, but rather how practices and activities  
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1 are reframed in the light of climate change in order to relegitimize them. In other words, climatization  
2 is above all a process of redefining pre-existing issues, and of prioritizing problems according to a  
3 selection of dimensions of climate change. In this article, we consider both the climatization of  
4 discourses and that of industrial activities in order to highlight the role of political, economic, and  
5 technical promises, their (in)capacity to give rise to the redeployment of extractive activities, and the  
6 discrepancy between these promises and the practices of stakeholders in the sector.  
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8 We study this process of climatization within the extractive industries in Europe. We analyze the  
9 mobilization of discourses (Fischer & Forester, 1993; Zittoun, 2013) to revive mining on global,  
10 European, national (French), and regional (Andalusian) scales, in order to highlight their  
11 transformations and association with multiple environmental, climate, and decarbonization issues. A  
12 comparative analysis of the climatization process sheds light on its inclusion in constraining routines  
13 of action, within both public policy and economic activities. The trajectory of this process over time  
14 and its territorial differentiation should not be neglected. Moreover, we do not consider government  
15 and the resource industry separately or as a dichotomy: on the contrary, we aim to understand them  
16 in articulation, through the prism of their interdependence. While these climatizing statements are  
17 drawn from a range of sources (see methodology), we focus on the transformations of extractive  
18 activities within the framework of mining projects as well as regional and national mining policies. In  
19 this article, we show that the extractive industries are reconfiguring their industrial frameworks and  
20 their mode of governance (Bebbington et al., 2018), emphasizing an ethical and ecological  
21 modernization of their practices and productive models (Cayre & Pierron, 2016).  
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## 27 [Materials and method](#)

28 Our research protocol is based on a mixed method, combining quantitative and qualitative approaches  
29 (Aguilera & Chevalier, 2021). We draw our material from investigations that were conducted under  
30 different conditions, creating an asymmetry in the data collected, both in terms of the nature of the  
31 data and the spaces and scales of their collection. Given the variability of the research settings, we  
32 make cross-use of apparently distinct approaches and methods, in order to navigate the challenge of  
33 an asymmetrical and multi-scale comparison (Sa Vilas Boas, 2012) of the discourses, practices and  
34 strategies of the promoters of the extraction revival. Hence the choice of a mixed  
35 qualitative/quantitative approach, first because of the asymmetry of the research settings and of the  
36 material, and second, in order to overcome the incompatibility between monographs, variable-based  
37 comparisons (i.e. quantitative), and case-based comparisons (i.e. qualitative). Our intention here is  
38 thus to articulate statistical quantification with social configurations, following a small-n approach.  
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43 The first section of the article draws on a corpus of documents collected, the statistical and thematic  
44 analysis of which highlights the evolution, over time and across different protagonists, of a narrative  
45 of greening and climatization of mining frameworks. Several search engines were mobilized: Google  
46 Scholar, Scopus, Web of Science, and Wiley online Library. This first part of the documentary corpus is  
47 therefore mainly comprised of academic articles, although some also fall within the scope of Applied  
48 Research or even Research & Development. The publications were collected, selected, and analyzed  
49 using three successive and progressive queries<sup>2</sup>. This led to the design of a narrative chronology of  
50 these frameworks, complemented with a qualitative content analysis of the corpus and institutional  
51 documents, in order to study the differences in this global trajectory depending on institutional levels,  
52 the public or private nature of sources, and the interests of producing organizations. The second part  
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57 <sup>2</sup> First: Mining and Climate. Second: Responsible mining; Social license to operate; Social acceptability; Corporate  
58 social responsibility; Sustainable mining; Climate-smart mining. Finally: Climate; Climate action; Climate change;  
59 Climate crisis; Ecological crisis; Decarbonization; Low carbon; net zero emission; net zero carbon;  
60 Decarbonization & low carbon; Climate & Decarbonization; Ecological modernization; Climate mitigation.  
61



1 of the documentary corpus is made up of reports, initiatives and roadmaps from public institutions:  
2 the European Commission (the Innovative, Non-Invasive and Fully Acceptable Exploration  
3 Technologies (INFACT) and Vision and Roadmap for European Raw Materials (VERAM) initiatives, The  
4 European Green Deal and The EU Strategy on Adaptation to Climate Change); the United Nations (the  
5 “Global Resources Outlook” and “Sustainability Reporting in the Mining Sector” reports); and the  
6 World Bank (the report on “The Growing Role of Minerals and Metals for a Low Carbon Future and  
7 Minerals for Climate Action”). These public documents were selected because they dealt explicitly with  
8 issues surrounding subsoil governance – and mining in particular – and the adaptation of the extractive  
9 industries to climate issues (decarbonization, support for transitions, Climate-Smart Mining guidelines,  
10 etc.).  
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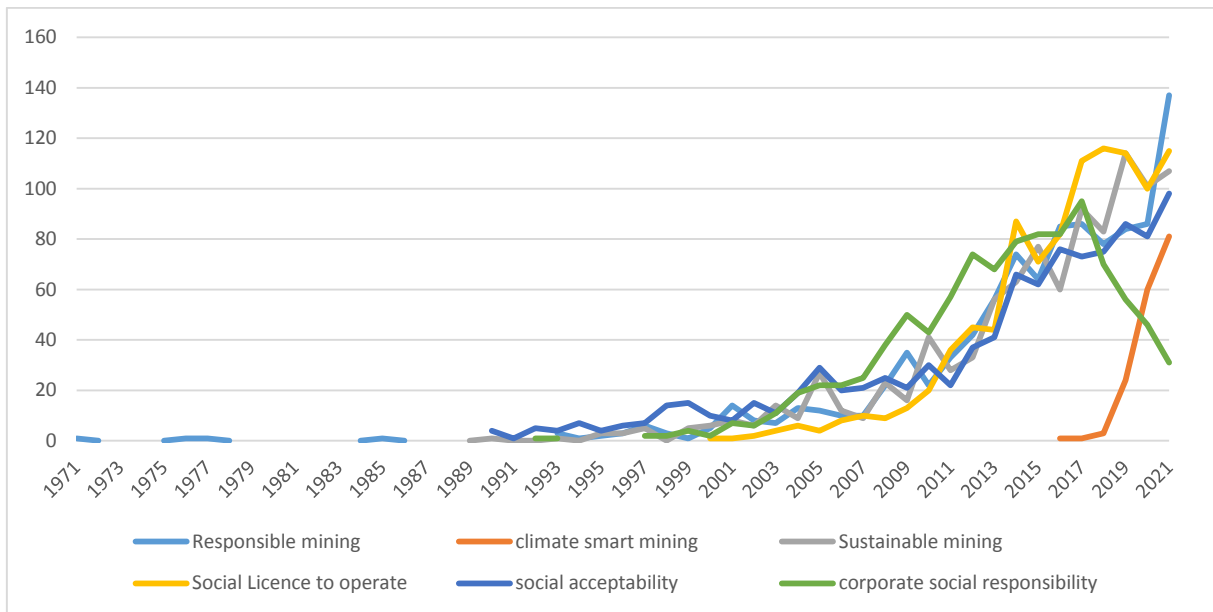
12  
13 The second and third parts of the article follow a qualitative and comparative approach, in France and  
14 Andalusia. The comparative material stems primarily from a series of semi-structured interviews with  
15 public and private actors involved in industrial policy for the mining sector in France and Spain since  
16 2018. These interviews focused on actors who took part in various interactions in the mining sector  
17 and their recollections of actual situations of negotiation or coalition building, in order to study the  
18 mobilization of discourse in action. We also analyzed discourses and practices by studying a series of  
19 reports, institutional documents, and regional and national press articles. In this press analysis, we  
20 analyze the actors and their arguments as a whole, which means identifying enunciators, their  
21 discourse and the spaces of debate in which they interact in order to link who speaks from where so  
22 as to identify changes in the arguments made over time and across different actors. Finally, we carried  
23 out *in situ* observations. In the French case, this consisted of participant observation of meetings and  
24 forums for debate on mining renewal and the subsoil, carried out between 2017 and 2022. For the  
25 Andalusian case, between 2019 and 2022 we conducted ethnographic observations of the practices  
26 surrounding the mining revival, including industrial conferences, public events with representatives of  
27 the Region of Andalusia, and productive processes in a copper mine. Our goal was not to conduct a  
28 comparison of variables defined *ex ante*, but to develop “comparative monographies” (Pinson, 2019)  
29 aimed at inductively shedding light on the dynamics of convergence and divergence between the case  
30 studies.  
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## 37 1. The growing ecological and climate storytelling of mining 38 frameworks 39 40

41 Since the 1990s, promoters of the extractive industry have been increasingly communicating on new  
42 practices that are more respectful of local communities and the environment, more recently  
43 presenting them as contributing to the effort to reduce global warming. “Green mining” and “climate-  
44 smart mining” approaches differ depending on the arenas in which they are formulated and the scales  
45 and institutions in which they are circulated and reformulated.  
46  
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### 48 1.1. Growing references to the environment and climate in mining R&D 49 publications 50

51 The chronological analysis of the academic and applied research corpus illustrates an increase in  
52 references to the environment and climate in the field of mining (Figure 1).  
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**Figure 1. Evolution of responsibility and mining-greening frameworks in academic and applied research. Source: Google Scholar, 2022.**

The first publications calling for responsible mining practices appeared in the early 1970s. Allen Overton spoke of “responsible mining” as early as 1976. His article, however, was more concerned with sustaining the growth of extraction than with supporting “environmentalists”, whom he accused of wanting to deprive future generations of prosperity<sup>3</sup>: it was aimed less at greening productivity and more at making it as long-lasting as possible. In the late 1980s, the term “social acceptability” emerged. Laufer was one of the first to mention it, in response to growing criticism of the social and environmental degradation caused by mining practices (Laufer, 1984). The concept was then used more persistently from the late 1990s (Boissonade et al., 2016), in response to the identified limitations of legal frameworks – i.e., the legal license to operate – for containing protests (Raufflet, 2014). The same meaning was captured by the concept of “social license to operate” (SLO) (Thomson & Boutilier, 2011), first used in 1997 by Jim Cooney, then Director of International and Public Affairs for the mining company Placer Dome, at a meeting with the World Bank in Washington D.C. (Lacey et al., 2012). Cooney presented SLO as a way to go beyond the simple *legality* of mining projects, to endow them with *legitimacy* through the involvement of the populations concerned (Thomson et al., 2012). This approach was therefore less concerned with democratizing mining practices than with limiting the social risk that opposition from the affected populations represents for companies. As the global sustainable development framework grew at the turn of the 1990s, the terms “responsible mining” and “sustainable mining” started to be mentioned more frequently (Drebenstedt, 2014; Franceschi & Kahn, 1999). The main driver of these concepts was the desire to reconcile productivity and sustainability, that is, preserving natural resources and the environment while supporting economic growth. Whether it be social acceptability, sustainable mining or SLO, their purpose was not so much to make mining projects *acceptable* as to make them *accepted by* the populations concerned (Fortin & Fournis, 2014). Faced with growing protests in the 1990s following several major ecological accidents caused by mining activity, the public affairs managers of mining companies thus contemplated the need to go beyond the legal framework and engage in social dialogue with the populations affected by

<sup>3</sup> “But we can do all this and still engage in responsible mining. It’s high time the environmentalists also give some thought to our material inheritance and recognized that we must try to enhance it, lest we bequeath to future generations poverty along with beauty”. In Allen Overton JR, J. (1976). Governmentally Imposed Limitations on Mining in the United States. *Nat. Resources Law*, 9, 541.

1 extractive projects, in order to reduce the protests that could block projects. These concepts emerged  
2 at a time when the great productivist narrative was no longer sufficient to ensure acceptance of major  
3 land-use and industrial development projects (Chailleux & Arnauld de Sartre, 2018).

4 The turn of the century was a decisive time for the translation of these different academic and applied  
5 research concepts into industry best-practice charters and, therefore, for their institutionalization as  
6 industry frameworks as such. At international level, the major mining groups of the time, including  
7 Anglo American, BHP Billiton, Newmont, and Rio Tinto, came together to draft and adopt the Global  
8 Mining Initiative program in 1998 (Jenkins & Yakovleva, 2006). They commissioned a policy research  
9 institute called The International Institute for Environment and Development (IIED), to begin  
10 collaborative work aimed at formulating a plan to improve mining and metals' contribution to  
11 sustainable development. This work, which culminated in the Toronto Declaration, gave rise both to  
12 the creation of the International Council on Mining and Metals (ICMM), in 2001, and to the Mining,  
13 Minerals and Sustainable Development (MMSD) project in 2002 (Tost et al., 2018). The Milos  
14 Declaration, produced by an international coalition of mining academic and trade associations<sup>4</sup> in  
15 2003, echoed these principles and stated the imperative of mining becoming more responsible in order  
16 to ensure a sustainable future. These alliances and initiatives emphasized the need to better align  
17 societal and environmental needs with business purposes, linking together companies' financial, social  
18 and environmental performance (Han Onn & Woodley, 2014). The Milos Declaration led to the  
19 publication of the Framework for Responsible Mining in 2005, which explicitly laid out the concept of  
20 "responsible mining" as a framework for the extractive industries for the coming decades. This concept  
21 has both a social and an environmental dimension. Seven common principles, derived from  
22 international agreements such as Agenda 21 and the Rio Declaration<sup>5</sup>, inform the framework's  
23 recommendations. The late 2010s saw the appearance of a new concept referring to the climate crisis  
24 and the mining industry's effort to decarbonize: climate-smart mining (it was first mentioned in 2016).  
25 Its sudden proliferation (Figure 1) is evidence of the significant circulation of this concept in recent  
26 years. This can be explained by the fact that, in the context of the climate crisis becoming a key issue  
27 from the mid-2010s onwards, mining started to be discussed in terms of its contribution to climate  
28 disruption. The extractive industry's proponents have adapted by promoting new practices that are  
29 supposedly more respectful of local communities and the environment and that help fight global  
30 warming: the climate-smart mining framework.

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### 1.2. The climate-smart mining narrative: between a new regulatory framework, market opportunity, and industrial sovereignty strategy

In the late 2010s, the ICMM and the World Bank set up a working group to define a new reference  
framework to structure the reallocation of private investments and public subsidies around the future  
mining industry, in other words to adapt to the issue of global warming. This initiative was launched  
with the support of the United Nations (UN) and key producer States, as well as certain economic  
powers that consume significant subsoil resources: it served each of these parties' interests in some  
way, whether it terms of sovereignty, governance, support to emerging markets, etc. The initiative led  
to the publication of the report "The Growing Role of Minerals and Metals for a Low Carbon Future"  
in 2017 (World Bank Group, 2017), coordinated by the World Bank and the ICMM with close support

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<sup>4</sup> The Australasian Institute of Mining and Metallurgy; The Canadian Institute of Mining, Metallurgy and  
Petroleum; The Society for Mining, Metallurgy and Exploration; The Society of Mining Professors; The South  
African Institute of Mining and Metallurgy; and The Asociación Iberoamericana de Enseñanza Superior de la  
Minería.

<sup>5</sup> Sustainable development, equity, participatory decision making, accountability and transparency, the  
precautionary principle, efficiency, and polluter responsibility.

1 from the UN. Following the recommendations of this report, in May 2019 the World Bank and the  
2 ICMM launched a new initiative called The Climate-Smart Mining Facility, with its launch event  
3 reportedly bringing together nearly 200 public-private partners. The initiative is aiming to raise a multi-  
4 donor fund of US\$50 million by 2024, supported by the World Bank (which provided the first US\$2  
5 million) as well as multinational mining companies such as Anglo American and Rio Tinto (each of which  
6 donated US\$1 million) that were the first private contributors, via The International Copper Association  
7 (ICA). The initiative also receives support from States such as Germany, the Netherlands (which is said  
8 to have contributed US\$5 million to the fund), India, Colombia, Peru, Chile, Zambia, and Nigeria. The  
9 aim of this public-private initiative is to support mining projects that are deemed to meet the four  
10 criteria defined by the World Bank and its partners: mitigating climate change, adapting to the effects  
11 of climate change, reducing material impacts, and creating market opportunities.  
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14 What is the discourse of the climate-smart mining promoters? What brings together UN agencies,  
15 World Bank working groups, mining industry alliances, and governments to support the development  
16 of extractive industries as part of the global promotion of a climate framework? First, these actors are  
17 striving to provide new support for strategic industries that will help secure supplies for emerging  
18 markets as part of the energy and digital transition. Second, there is a drive to establish a reference  
19 framework for adaptation and mitigation for an industry which all stakeholders consider to be central  
20 to current climate and ecological problems: both the UN (UN Environment Programme, 2020) and the  
21 World Bank (World Bank Group, 2017, 2020) identify the ecological and climate crisis as a political,  
22 techno-economic and environmental problem that we will collectively have to face in the future. The  
23 solution they put forward is the necessary adaptation of productive models, defined as the transition  
24 to a low-carbon economy in line with the 2015 Paris Climate Agreement, focusing on the energy and  
25 digital transitions. This solution mainly relies on a technological approach: new so-called “climate-  
26 friendly” technologies are needed (World Bank Group, 2017: X). These are defined as digital  
27 technologies (which enable the rationalization of production and consumption while accelerating  
28 exchanges and reducing distances) and low-carbon energy technologies (which enable the  
29 rationalization of energy production and consumption in a renewable way). However, these climate-  
30 friendly technologies, presented as the basis for the “switch to a low-carbon economy”, require  
31 exponential quantities of minerals and metals (World Bank Group, 2017: XVI; 2020: 7; UN Environment  
32 Programme, 2020: 19). In short, the low-carbon and climate transition necessitates more minerals and  
33 metals, and therefore more support for extractive industries.  
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41 Nevertheless, this “extractive” solution to the climate crisis has not gone unquestioned. These  
42 international organizations recognize the paradoxical role of the mining sector, which is presented as  
43 necessary though also problematic on a social, environmental, and climate level (UN Environment  
44 Programme, 2020: 20; World Bank Group, 2020: 7). This is where the climate-smart mining initiative  
45 supported by the World Bank and its partners comes in:  
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48 *The Climate-Smart Mining Initiative addresses these challenges by working together with*  
49 *governments, development partners, industries, and civil society to minimize the new*  
50 *emissions from a low-carbon transition and work closely with resource-rich developing*  
51 *countries to responsibly supply these strategic minerals for clean energy technologies.*  
52 *(World Bank Group, 2020: 17).*  
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55 This global initiative aims to better integrate the actions and interests of “climate stakeholders”, “clean  
56 energy stakeholders”, and “minerals stakeholders” through three cross-cutting processes:  
57 technological innovation, adaptation to change, and the transition of models and practices (World  
58 Bank Group, 2020: 17). The extractive industries are therefore expected to adapt by better taking into  
59 account the issues of democracy, governance, and technological innovation, so as to reduce their  
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1 social, ecological and climate footprint (World Bank Group, 2020: 7). This adaptation is presented as a  
2 global regulatory issue for both public actors (UN Environment Programme, 2020: 28, 57; World Bank  
3 Group, 2020: 16) and private actors (UN Environment Programme, 2020: 31). Hence the climate-smart  
4 mining initiative, which is designed as an approach that brings together public and private actors  
5 around shared interests and objectives. The initiative is particularly targeted at developing countries  
6 with rich mineral resources, though not exclusively<sup>6</sup>. Its political ambition is to structure the multi-  
7 partner governance of mining projects by mining operators and governments, to support the mineral  
8 production required by the energy transition. The Climate-Smart Mining Initiative defines climate  
9 adaptation as the structuring of decarbonized and sustainable mineral and metal extraction value  
10 chains, in collaboration with producing countries. The fund and the collaborations established provide  
11 co-financing and technical support for projects integrating the use of renewable energies in mining  
12 operations, using digital methods to produce geological data, promoting the circular economy of  
13 minerals and metals, and preserving the environment.  
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17 This adaptation is primarily presented as a constraint for the industry. But it is also framed as a new  
18 opportunity for growth in extractive industries and, for both producing and consuming States, as a  
19 political and economic opportunity to position themselves in highly strategic markets (World Bank  
20 Group, 2017: XIII). The climate adaptation of mining is also systematically defined by the industry as a  
21 political and economic opportunity to support the growth of the renewable energy and new  
22 technology markets. Rio Tinto claims that this initiative should enable them to make “our business  
23 safer and more productive”<sup>7</sup>. In its article titled “7 things we need for a decarbonized future”<sup>8</sup>, the  
24 company points to five mineral resources – which it already produces – to be further exploited: copper,  
25 lithium, aluminum, borates, and titanium. In other words, for companies, supporting the Climate-  
26 Smart Initiative means supporting the interests of their own operations and the development of  
27 markets in which their products have strategic value.  
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32 How is this climate narrative in the mining sector translated by European authorities? Two initiatives  
33 driven by the European Commission refer to mineral development and climate adaptation: the  
34 Innovative, Non-Invasive and Fully Acceptable Exploration Technologies (INFACT) project<sup>9</sup>, which took  
35 place between 2017 and 2020, and the Vision and Roadmap for European Raw Materials (VERAM)  
36 project<sup>10</sup> launched in 2018. Like their UN and World Bank counterparts, these European initiatives are  
37 intended to serve as reference frameworks for future private investment and public support for  
38 research and innovation within the European Union. While these two strategies incorporate the  
39 framing of the climate adaptation of the mining industry as formulated by the UN and the World Bank  
40 at international level, it is reformulated to justify a mining reindustrialization strategy in the name of  
41 European economic sovereignty. Regarding the strategies’ ecological dimension, the INFACT framing  
42 makes only marginal reference to the climate (it is only mentioned once), whereas the Roadmap is  
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48 <sup>6</sup> To date, climate-smart mining initiatives have been launched in Guinea and Côte d’Ivoire (Forest Smart mining  
49 Pilots), Mali and Burkina Faso (RE Integration into Mines), the Democratic Republic of Congo (Cobalt Value chain  
50 assessment), South Africa (elaboration of a CSM Roadmap), Madagascar (CSM Roadmap and pilot), Indonesia  
51 (CSM Pilot), Serbia (CSM Pilot), Georgia and Armenia (Tailings retreatment), within the framework of a “South-  
52 south knowledge exchange” program between South American and African partners, in Chile (Anglo’s Los  
53 Bronces mine, El Soldado and Chagres projects), in the United States (Rio Tinto’s Kennecott project in Utah), in  
54 Finland (Anglo’s “Forest Smart” Mining), and in Canada (Rio Tinto’s airborne survey over northern  
55 Saskatchewan’s Wollaston Copperbelt).

56 <sup>7</sup> <https://www.riotinto.com/about/innovation/smart-mining>

57 <sup>8</sup> <https://www.riotinto.com/news/stories/five-things-low-carbon-future>

58 <sup>9</sup> Innovative, Non-Invasive and Fully Acceptable Exploration Technologies: <https://www.infactproject.eu/>

59 <sup>10</sup> Vision and Roadmap for European Raw Materials. Research and Innovation Roadmap 2050. A Sustainable  
60 and Competitive Future for European Raw Materials: <http://veram2050.eu/>  
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1 explicitly geared towards the ecologization of technological innovations in the extractive and  
2 transformative sectors (Expert Stakeholder Survey. The Barriers to Mineral Exploration in Europe,  
3 2018: 27). The VERAM project further develops the climate action component of the initiative by  
4 establishing a roadmap for a sustainable and circular mining economy (VERAM, 2018: 03). This  
5 “sustainable” and “circular” mining reindustrialization is defined as both a challenge of leadership for  
6 Europe in the field of technological innovation, and one of industrial sovereignty (VERAM, 2018: 04).  
7 The climate-smart mine is presented as a forward-looking model and an adaptive solution, ushering in  
8 technological modernization<sup>11</sup> while also securing supplies of strategic resources for European  
9 industries through the revival of mines in a way that is claimed to better integrate them into their  
10 social and environmental environment (VERAM, 2018: 11, 17). Besides the call to simplify  
11 administrative procedures in Member States in order to facilitate mining investments, the European  
12 Commission is echoing the representation of the climate mine found in World Bank documents: the  
13 European mine of the future would necessarily be climate friendly, thanks to the promises of  
14 technological progress (VERAM, 2018: 22).

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18 Thus, while the image of the climate-smart mine is circulating in a standardized manner between the  
19 different strategic forums of the mining sector, it appears that the meaning conferred to this  
20 framework changes depending on the different actors’ interests and positions in the field. Finally, the  
21 climate-mine mine appears less as a framework for change than as a regulatory statement, mainly  
22 geared towards adapting to change and harnessing it to maintain growth in the extractive industries.  
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## 26 2. Relocating mining activities in the name of the low-carbon 27 transition: the limits of a pale green justification for the French 28 mining revival 29 30

31 In France, the opportunity to revive mining arose in the late 2000s, but mining had been in sharp  
32 decline since the 1980s for both economic and environmental reasons, and due to disinvestment by  
33 the French government (Chailleux, 2022). While the opportunity to revive mining activities in France is  
34 now justified on the grounds of facilitating decarbonization, analysis of the sector shows that the  
35 “climatization” of mines above all supports national sovereignty over resources and provides an  
36 economic opportunity for reindustrialization, in line with “green capitalism”.  
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### 39 2.1. Putting the issue of securing supplies on the agenda 40

41 Mining experts all tell a similar story: 2006 was undoubtedly the pivotal year that heralded a new  
42 chapter for mining policy. China’s monopoly on many strategic metals reached unprecedented levels,  
43 and digital development multiplied the types of minerals needed by industry (Galin & Gaillaud, 2020;  
44 Pitron, 2018). Using its monopolistic position, China imposed its agenda on importing countries,  
45 turning an economic weapon into a diplomatic and strategic one (Niquet, 2011). This sparked  
46 awareness of Europe’s dependence on China and led to the establishment of the Raw Materials  
47 Initiative by the European Commission in 2008. The stated aim of relocating the extraction of critical  
48 metals was coupled with an environmental argument made by Guillaume Pitron in a 2018 essay: the  
49 production of rare metals in China amounts to an “irresponsible” relocation of pollution, and morally,  
50 the “burden” of extraction should be better distributed. The French reporter also criticized the new  
51 geopolitical dependencies and advocated the relocation of mines to France. The strategic dimension  
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58 <sup>11</sup> Among the 13 “Research & Innovation” measures for the minerals and metals industries, eight  
59 recommendations are based on a promise of technical or technological improvement, and four on improving  
60 knowledge and the ability to produce and evaluate data.  
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1 of this policy turn was thus accompanied by a moral and ecological argument for relocating extraction,  
2 in the name of European environmental standards.

3 In France, this supply issue is being put on the agenda not so much by French mining players as by  
4 certain ministerial departments. France has three main mining operators: Orano Mining, Eramet, and  
5 Imerys, the extraction activities of which are mainly located abroad (with the exception of a few  
6 quarries such as the Imerys talc mine in Luzenac). While each group has its own strategy for securing  
7 supply, few collective actions have been undertaken, and the same is true in the processing industries.  
8 In 2010, the *Comité Stratégique de Filières "Mines et métallurgie"* (CSF, strategic committee for the  
9 mining and metallurgy industries) brought together heterogeneous actors from industries ranging  
10 from mining to metal recycling and processing (industrial actors, government services and trade  
11 unions) with a view to developing vertical cooperation between disconnected industries. The COMES  
12 (Committee on Strategic Minerals), created in 2011, was the main tool mobilized to structure future  
13 mining policies around three pillars: risk awareness, resource development, and raw materials  
14 diplomacy. Under the leadership of a mining engineer from the General Council of Industry, the COMES  
15 brought together manufacturers from the automotive, energy and aeronautics industries to discuss  
16 the issue of security. By defining the "critical importance" of certain metals and minerals for the French  
17 economy, COMES highlighted the dependence of industrial actors. Issues regarding supply, not  
18 extraction, dominated this field of debate (Homobono & Vignolles, 2019).

19 In mainland France, the mining issue therefore initially resurged not in the name of climate mitigation,  
20 but in articulation with the strategic issue of securing supplies and resource sovereignty.

## 21 2.2. A relocation policy that is more sovereign than ecological and climatic

22 The COMES and CSF came into action under Eric Besson's Ministry of Industry (2010-2012). The  
23 implementation of this new French mining policy was based on a strategy for securing supplies  
24 disconnected from greening/climatization/decarbonization.

25 Securing supplies entailed strengthening raw materials diplomacy and direct investment in projects  
26 abroad. This policy involved not only the Ministry of Industry but also the Ministry of Foreign Affairs,  
27 and even the Prime Minister and the President himself. It was therefore a major policy that was  
28 informed not only by sectoral considerations but also, more broadly, by international relations,  
29 national sovereignty, and economic development. Although the French government seemed mostly  
30 focused on uranium in Kazakhstan at the time, it also showed interest in northern Canadian mines.  
31 Securing supplies was initially envisaged by company and by sector, with supply contracts being signed  
32 as early as the exploratory phase. Under Arnaud Montebourg's ministry (2012-2014), this policy  
33 became more markedly interventionist. The new Minister of Industry attempted to nationalize the  
34 supply-securing effort through the *Compagnie des Mines de France* (CMF) in 2014. The CMF would  
35 have been set to be in charge of conducting exploration operations abroad and then partnering with a  
36 local operator for the extraction phase. As an investor from the exploratory phase, the CMF would  
37 have gain priority to buy minerals, thus ensuring secure supplies<sup>12</sup>. However, the project, which was  
38 set up by the national geological survey organization (BRGM), failed and disappeared when  
39 Montebourg left office.

40 The supply-securing policy also translated into a drive to re-explore the subsoil of mainland France.  
41 However, the State's reinvestment remained symbolic and unstable, with successive contradictory  
42 definitions and short-lived political support. Based on existing data, the BRGM identified a hundred or  
43 so potential targets, but the actual exploration work had to be carried out by private operators. Even

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44 <sup>12</sup> "The idea was never to be an operator, it was an exploration company" (Interview, BRGM).

1 before Montebourg’s speech on a “mining renewal”, in July 2011 the junior exploration company  
2 Variscan Mines applied for a license in Tennesse (Sarthe). Variscan, founded by former BRGM geologists,  
3 owned the majority of the exploration licenses that gave substance to the French mining revival. This  
4 exploration dynamic was guided by a particularly speculative liberal economic model, namely the  
5 model embraced by the junior companies (Laurent & Merlin, 2021). A dozen exploration licenses were  
6 issued between 2012 and 2015, a first in France after 30 years of decline. The size of the deposits of  
7 potential interest in France did not mobilize the major mining companies (Gunzburger et al., 2022).  
8 Initially, the re-exploration of the French subsoil was therefore primarily pursued as an economic  
9 opportunity before being associated with an ecological and/or decarbonization issue. Like other  
10 industries, mining is bound by the French climate targets. With the exception of quarries, however,  
11 the mining industry is almost absent from these roadmaps. Most debates about mining revival  
12 occurred prior to COP21 and, despite existing climate policies, GHG emission accountability was not a  
13 topic covered in the French debate on mining, though wider environmental considerations soon  
14 emerged.  
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### 18 2.3. Mining relocation facing criticism

19 Mining projects sparked the mobilization of local opponents, who highlighted the environmental risks  
20 and led the government and the industry to try to address these environmental criticisms, without  
21 success.  
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24 The French mining revival was a policy without teeth, facing criticism from opponents. From 2012, it  
25 found a prominent political sponsor in Arnaud Montebourg, who incorporated it into his grand  
26 narrative of deglobalization (Montebourg, 2013), redefining the mining revival to integrate it into his  
27 policy of economic patriotism and industrial reinvestment<sup>13</sup> by the State (Rodriguez, 2016, p. 35). This  
28 framing fit perfectly with the Minister’s promotion of “made in France”. However, Montebourg’s  
29 support remained rhetorical and committed neither new public policy instruments nor new budgetary  
30 resources. In 2014, a decree to simplify procedures changed the rule of “silence amounts to rejection”  
31 to one of “silence implies agreement”. Beyond this decision, the mining revival remained “a policy on-  
32 paper”, as one actor we interviewed put it (interview, Variscan), or a political objective without teeth  
33 (interview, senior civil servant).  
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38 While private actors saw the re-exploration of the French subsoil as an economic opportunity, they  
39 soon came up against an environmental critique of their projects from 2014 onwards (Schrijen, 2022).  
40 The opposition to mining projects, mainly concentrated in Brittany, primarily focused on the  
41 environmental disaster they represent, pointing to a wide range of risks, particularly river pollution,  
42 groundwater pollution, and air pollution. Opponents also criticized the regulatory framework  
43 governing mining, the weakness of public debate, and the “democratic denial” of the communities  
44 (licenses were granted without prior local consultation). These narratives dominated the general press  
45 between 2013 and 2017 (Chailleux, 2021). Mining projects were thus redefined as an environmental  
46 and political problem, thereby undermining the communication strategies mobilized by the operators,  
47 in part because their economic arguments were unreceivable in the face of environmental arguments.  
48 Opponents took action to block exploration (legal opposition, protests, occupation), making it very  
49 hard to work under most permits. Local consultative committees were held at the initiative of both  
50 mining companies and the State, but they came late in the decision-making process (after the  
51 exploration permit had been granted) and failed to address the demand for wider democratization  
52 coming from the people protesting as well as local elected officials. They also failed to tame criticism  
53 of the global commodities value chain, which their opponents labelled as “extractivist”, denouncing  
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60 <sup>13</sup> Ministère du Redressement productif (2013). *Une nouvelle France industrielle*.



not only local pollution but also a global economic and political system of extraction based on speculation and short-term profits (a growing argument in the press).

#### 2.4. Greening attempts and failures

From the moment that mining renewal was put on the public agenda as an ecological and democratic public problem, the desire to make mining sustainable, responsible or green was publicly asserted by both mining operators and the government.

Emmanuel Macron succeeded Arnaud Montebourg as Industry Minister (2014-2016) and then decided on mining renewal policy as President of the Republic (2017-2022). He redefined the mining renewal in terms of European sovereignty, while nuancing the risks on the supply reduced by the decline in global prices<sup>14</sup>. In line with what was being promoted at European level, Macron developed an environmental and transparency benchmark and promoted administrative simplification, which led to the introduction of standards for mining activities (Laurent & Merlin, 2021; Massé, 2021). As part of this, in 2015 he launched the “Responsible Mining” initiative, which crystallized into a non-binding policy encouraging best practices while developing a framework for environmental dialogue. Far from the image of *Germinal*, the ideal of the responsible mining industry of the 21<sup>st</sup> century aims for “clean” mine. However belief in the possibility of a “clean” mine was in no way unanimous. In fact, environmental organizations left the negotiating table. Although the concept of responsible mining was ultimately not institutionalized, it nevertheless spread to various professional spaces, which then sought to integrate sociological tools to operationalize the “social acceptability” of projects (Massé, 2021). The aborted 2017 mining code reform again failed to reconcile the contradictory demands for more transparency and environmental preservation, on the one hand, and fewer administrative constraints on the other. From 2017, most permits were canceled or abandoned, thus putting an end to the mining renewal. Some permits were abandoned due to social protests, others due to technical or financial issues. While social protests had an impact, cancelations of licenses were dealt with during an electoral bargain in Brittany: this case certainly shows the “veto power” of organized citizens, but it is hardly evidence of the rise of environmental activists’ influence on the government, the actions of which were guided solely by the electoral context.

Since the failure of the Responsible Mining initiative, the low-carbon rationale has become increasingly central to bringing about a second mining revival based less on “traditional” resources (gold and silver), which accounted for the bulk of projects in the 2010s, and more on new resources (lithium and helium, for example), presented as strategic for completing the transition to low-carbon production models. This decarbonization discourse has taken two main forms in French policy in the early 2020s. First, since 2019, the government has commissioned a series of mineral-resource programming plans to identify industrial needs and opportunities for the low-carbon transition, particularly surrounding recycling. Two initial reports on photovoltaics and power grids were published in 2020, supplemented with another report in 2022<sup>15</sup>. Second, as part of the mining industry’s drive to reduce its pollution, in 2019 the CSF signed a strategic contract (2018-2022) to build reference standards for mining and responsible procurement and for the development of “connected mines and quarries”. The purpose of these standards was to enable the traceability of raw materials: by promoting the labeling of ores and metals, it would allow for the development of “responsible” industries concerned with advertising the respectability of their products, and ultimately for the promotion of mining operations in Europe

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<sup>14</sup> “L’avenir de la France dans l’industrie minière, selon Emmanuel Macron”, *Les Echos*, August 23, 2015.

<sup>15</sup> <https://www.ecologie.gouv.fr/investir-dans-france-2030-remise-au-gouvernement-du-rapport-varin-sur-securisation>

1 and France under environmental constraints<sup>16</sup>. The 2022 reform of the mining code should establish  
2 social and environmental guarantees surrounding the issuance of mining permits. It provides for more  
3 upstream public participation and requires a socio-environmental study to be conducted prior to a  
4 permit being issued. These provisions, however, have not yet been put to the test. This reform of the  
5 mining regulatory framework seems to be characterized above all by a social acceptance-based  
6 approach, and is ultimately more of an effort to make the French mining code “catch up” with  
7 international and European standards than a real innovation in terms of greening the industry.  
8 Although the reform does not directly refer to the issue of climate change in the articles relating to  
9 mining, it does allow the French government to refuse a mining project on the grounds of  
10 environmental incompatibility, which was not previously possible.  
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13 The relocation of mining activities in France, defined successively as a strategic necessity, an  
14 opportunity for re-industrialization and a model for sustainable development, is hardly going hand in  
15 hand with a direct decarbonization of the sector. Greening and decarbonization in the French mining  
16 industry is still limited. While the low-carbon transition is an important justification for mining  
17 relocation, it is mainly a new external constraint and a discursive tool. The mining industry is thus  
18 justifying its own expansion in the name of the low-carbon transition, which is necessitating the  
19 exploration and exploitation of new resources. Rather than supporting challenging new actors, this  
20 low-carbon future is the continuation of existing mining activities (although with new targets)  
21 endowed with a new legitimacy. In other words, the low-carbon transition is driving the creation of  
22 new markets for existing mining players, which is the very definition of green capitalism. (Cavanagh &  
23 Benjaminsen, 2017; Dunlap & Jakobsen, 2020). Analysis of attempts to relocate mines in mainland  
24 France shows that this is primarily a matter of securing supplies, with the greening of the sector  
25 remaining an industrial and political promise at this stage.  
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### 31 3. The strategic climatization of “sustainable mining” in Andalusia

32 On the other side of the Pyrenees, a contrasting scenario is unfolding in the south of the Iberian  
33 Peninsula, with the multiplication of exploration projects to mine metals identified as “critical”, “rare”,  
34 or “strategic”. Unlike in France, where this process remains a State affair, Spanish decentralization has  
35 led to the issuing of mining permits, along with the core of mining policy (with the exception of the  
36 enactment of the mining code, the current version of which dates from 1973), being devolved to the  
37 regional authorities. In the northern regions, which have the most diversified economies, several  
38 projects have sparked local mobilizations (del Mármol & Vaccaro, 2020), as in France. In Andalusia,  
39 however, both the government and mining companies are claiming that the mining revival has been a  
40 success. The region has long been characterized by the “extractive” nature of its economy (Arenas  
41 Posadas, 2016), particularly due to its millennia-old metal mines that closed at the turn of the 21<sup>st</sup>  
42 century. Since 2009, six mines – five of copper, one of iron – have (re)opened. Eight more are under  
43 development and there are hundreds of exploration areas. Andalusia has become the leading mining  
44 region in the country, and in 2020 Spain was the second largest copper miner in Europe behind Poland  
45 (18<sup>th</sup> worldwide)<sup>17</sup>. Environmental, anti-extractive protests have very little hold in the impoverished  
46 rural areas where these mines are being developed and fueling locals’ hopes of employment and  
47 economic revival. At the same time, public and private actors are celebrating the contribution of the  
48 mining revival to the “Green Revolution of Andalusia”<sup>18</sup>. The analysis of these promises and their  
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56 <sup>16</sup> National Council for Industry, Press kit: signing of the strategic contract for the Mining and Metallurgy Sector  
57 2018-2022, French Government, January 18, 2019.

58 <sup>17</sup> International Copper Study Group, *The World Copper Factbook 2021*, 68 p., <https://icsg.org/>

59 <sup>18</sup> Junta de Andalucía, “El resurgimiento de la minería andaluza (II): claves locales que transforman nuestra  
60 filosofía de vida”, *Noticias*, 06/06/2021.  
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1 materialization reveals that this climatization of mining is mainly strategic and discursive, and that it  
2 contributes above all to sustaining energy-intensive and polluting industries.

### 3 3.1. The late climatization of Andalusian mining policy

4 Unlike in France, where the issue of sovereignty was central to the mining renewal agenda, the  
5 Andalusian administration's primary challenge in the early 2010s was reviving economic activity in a  
6 region in crisis. An official from the Mining Department of the Region of Andalusia dates the start of  
7 the regional mining revival policy back to 2013. "We were coming out of the crisis and an important  
8 political decision was made: [...] to take advantage of the mining resources<sup>19</sup>". Andalusia was among  
9 the regions most deeply impacted by the crisis<sup>20</sup>, and the mining revival of the region appeared as a  
10 pathway to economic recovery. In 2013, the Region therefore began drafting the *Mining Strategy of*  
11 *Andalusia 2020*. The text ultimately approved in 2016 is the keystone of the mining recovery policy. It  
12 reflects the primary concern for finding a way out of the crisis. Far more than the development of  
13 activities necessary for the "energy transition" (mentioned once in the strategy) or the fight against  
14 "climate change" (mentioned three times), the creation of "jobs" (mentioned 55 times) by an  
15 "innovative" sector (also mentioned 55 times) appeared to be the main reason for supporting the  
16 mining recovery. The strategy identified five objectives: promoting the potential of mining, improving  
17 the industry's entrepreneurial network, modernizing the administration of mining, taking into account  
18 the environment and mining heritage, and developing human capital. The actions put forward to  
19 achieve these objectives included the "improvement of the social perception of the mining industry",  
20 by collaborating with the relevant authorities "in education so that primary school textbooks give a  
21 better image of the mining industry<sup>21</sup>". The *Mining Strategy of Andalusia 2020* thus reflects the  
22 regional executive's explicit commitment to the mining recovery. In the following years, the adoption  
23 of a series of measures echoed the European injunction to "modernize" the administration of mining  
24 to boost the industry (Buu-Sao, 2021). For example, Decree-Law 4/2019 allows for expediting the  
25 processing of permits for mining projects considered of "strategic interest", in the same way as for  
26 solar or wind power projects: the priority is to make Andalusia an attractive territory for transnational  
27 capital.  
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29 The year 2021 marked a turn towards the discursive climatization of the mining sector. In the midst of  
30 managing the pandemic and its economic impact, the Region approved the drafting of a new  
31 framework document for mining policy to be titled *Strategy for the Sustainable Mining of Andalusia*  
32 *2030*, on the grounds that "the extractive industry is now strategic in the fight against climate change  
33 and the decarbonization of the economy, which Andalusia aspires to lead<sup>22</sup>". Within the context of  
34 Spain, this text – the drafting of which was entrusted to a consulting firm specializing in the engineering  
35 of subsoil resources – converged with the adoption of a *Roadmap for the sustainable management of*  
36 *mineral raw materials, fundamental for the success of the ecological and digital transition* in August  
37 2022<sup>23</sup>. The discursive patterns of these reforms have been increasingly inspired by the global Climate-  
38 Smart Mining frame of reference. At the same time as they promote the (mostly voluntary) adoption  
39 of tools to calculate and reduce greenhouse gas emissions, these reforms are also leading to the  
40 reorganization of the administration's work to support the development of new mining projects. The  
41 Interdepartmental Commission for Sustainable Mining, established by the Region of Andalusia in June  
42 2022, illustrates this twofold ambition. However, this belated climatization of mining recovery policy  
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55 <sup>19</sup> Interview with a representative of the Region of Andalusia, October 2019.

56 <sup>20</sup> In 2013, the unemployment rate reached 35% of the active population, and 65% for those under 25 years of  
57 age (compared to 25% and 55% respectively on a national scale). Source: National Institute of Statistics.

58 <sup>21</sup> Junta de Andalucía, *Estrategia minera de Andalucía 2020*, 2016, p. 56.

59 <sup>22</sup> Agreement of June 1, 2021 of the Government Council of the Region of Andalusia.

60 <sup>23</sup> The text was eventually approved on the 31<sup>st</sup> of July of 2023.

1 must be grasped in connection with the main public policy objective at European, national and regional  
2 level, namely economic recovery in the face of the impact of the Covid 19 pandemic and now the war  
3 in Ukraine. In this context, labelling investments as “climate-smart” mainly seems to facilitate  
4 obtaining European subsidies. In Andalusia, this is exemplified by the Region supporting mining  
5 companies’ application to the Next Generation fund for European Union recovery<sup>24</sup>, the stated purpose  
6 of which is to “make Europe greener, more digital and more resilient<sup>25</sup>”.

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8 For regional officials and private investors alike, claiming the sustainability of mining projects appears  
9 to constitute an opportunity to capture resources. Depending on the perspective, this is perceived as  
10 a way to revive the regional economy or to enter this new market of the Andalusian mining sector.

### 11 3.2. “Sustainable mining” as an opportunity for private investment

12 In March 2010, mining companies based in Andalusia created AMINER, the association of exploration,  
13 extraction, mining-metallurgical processing and services companies. Metal extraction had resumed a  
14 year earlier in the region and a growing number of mining permits were being issued. AMINER, the  
15 role of which is to “publicize the benefits of sustainable mining development for the economy<sup>26</sup>”, now  
16 counts about 50 companies. When the association was created, one of its first missions was to  
17 “improve the administration’s vision of the sector” in order to obtain “good regulation<sup>27</sup>”. AMINER  
18 offers training to the Region’s civil servants, includes them in its technical commissions and, with the  
19 Region of Andalusia, organizes a bi-annual mining conference in Seville. On a day-to-day basis, the  
20 association thus establishes collaborative relationships with members of the regional administration.  
21 Such collaboration is made easier by the social proximity between executives who have received the  
22 same mining engineering training and often move between the administration and mining  
23 companies<sup>28</sup>. The chronology of entrepreneurial initiatives (prospecting, permit applications, the  
24 creation of AMINER) prior to the emergence of the mining recovery policy is indicative of the private  
25 sector’s power of influence on the public administration<sup>29</sup>. The 2008 crisis partly fragmented the  
26 Spanish economic elite, whose cohesion has become increasingly underpinned by transnational capital  
27 at the expense of historically structuring political and social connections in sectors such as finance,  
28 telecommunications, or energy (Juste de Ancos, 2023). But in Andalusia, revolving-door dynamics  
29 remain prevalent, especially in the mining industry (Rodríguez Illana, 2021).

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31 AMINER’s spokespersons prefer to speak of a “21<sup>st</sup>-century mine” rather than a mining revival, thus  
32 stressing its innovative nature, at the service of the fight against climate change. AMINER’s  
33 participation in the Iberian Sustainable Mining Cluster, a network of companies that claim to  
34 contribute to the energy transition, reflects its commitment to the discursive climatization of the  
35 sector<sup>30</sup>. Since the introduction of the European Commission’s Raw Materials Initiative in 2008 and the  
36 public-private innovation support programs for “sustainable raw materials supply” (Buu-Sao, 2021),  
37 investors who claim that innovations in the mining sector reduce its environmental impact while

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49 <sup>24</sup> Press release by the Region of Andalusia: “La Junta presenta a los Next Generation un proyecto minero de  
50 3.100 millones para la Faja Pirítica”, 04/04/2021.

51 <sup>25</sup> [https://ec.europa.eu/info/strategy/recovery-plan-europe\\_en](https://ec.europa.eu/info/strategy/recovery-plan-europe_en)

52 <sup>26</sup> <https://www.aminer.es/>

53 <sup>27</sup> Interview with a member of the board of AMINER, April 2022.

54 <sup>28</sup> Interview with a civil servant of the Mining Department of the Region of Andalusia, October 2021.

55 <sup>29</sup> AMINER has contributed to the creation of a national association that has for instance participated in the  
56 discussions around the *Roadmap for Sustainable Management of Mineral Raw Materials* (see above). In the  
57 spring of 2020, AMINER obtained the status of an “essential” activity in the mining industry, to protect it from  
58 the disruptions caused by health restrictions (quoted interview with a member of its board).

59 <sup>30</sup> <https://www.ismc-iberiamine.com/es/nosotros/> This cluster particularly supports the development of  
60 investment projects for "sustainable mining" in order to apply for European grants.

1 producing the metals needed for the energy transition are enjoying ever-increasing public subsidies.  
2 Andalusia is a unique laboratory for observing the adaptation of an energy-intensive sector to the  
3 economic opportunities created by the “climatization of the world” (Aykut & Maertens, 2021). Beyond  
4 companies harnessing the injunctions to act for the climate, the mining revival is the result of  
5 capitalism’s adaptation to the crises that are challenging it. Until 2008, Andalusia was the Spanish  
6 region with the most developed construction sector, which was built on a dense network of political  
7 influence and was part of a highly financialized apparatus. When construction lost its place as a “refuge  
8 [...] for the revaluation of capital” (Delgado Cabeza, 2016, p. 17) after the financial bubble burst, the  
9 mining industry became an opportunity for the reconversion of capital. For instance, Sacyr, the  
10 multinational in charge of building and maintaining the Seville metro until 2013, is now investing in  
11 mining projects, both in Spain and in Peru – where discourse on “climate-smart” mining is less  
12 prevalent. On a smaller scale, subcontractors formerly specialized in the construction of public  
13 infrastructure financed by the Region of Andalusia are reconverting their machinery, labor and know-  
14 how to enter the field of heavy-duty mining (drilling, dynamite blasting, earthmoving, etc.)<sup>31</sup>. From one  
15 energy-intensive sector to another, investors are adapting to crises, new companies are entering the  
16 mining market, and capital is accumulating, thanks to the imperative to decarbonize the economy.  
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### 21 3.3. Mining sustainability on the treadmill of production

22 The Rio Tinto copper mine in Andalusia is emblematic of this strategic climatization of the extractive  
23 industry. From 1873, the ancestral mine was exploited on an industrial scale by a British company. The  
24 latter sold the mine to a consortium of Spanish banks in 1954 and reinvested its capital in mining  
25 elsewhere in the world, laying the foundations for what would become the Rio Tinto group (Flores  
26 Caballero, 2007). In the 1980s, falling global copper prices and industrial restructuring reforms  
27 accelerated the decline of the mine, which closed in 2003 after being dormant for two years (Arenas  
28 Posadas, 2017). In 2014, a Cyprus-based junior company, soon to be renamed Atalaya Mining, obtained  
29 the permit to restart operations. The landscape had changed a lot in ten years: copper prices were four  
30 times higher than in 2003, and the Region of Andalusia was actively promoting the mining sector, after  
31 having implemented the national deindustrialization policy in the 1990s and 2000s at the expense of  
32 Andalusian mines.  
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37 Atalaya Mining’s discourse, in line with the European INFAC program mentioned above, tends to  
38 make the climate issue its own. When applying for new mining permits, the company now claims to  
39 be contributing to the energy transition:  
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41 *Copper contributes to sustainable development by allowing considerable energy savings. [...] Metal mining is essential to the energy transition model defined by the European Green Pact [...] because there is a significant demand for metals such as copper for the manufacture and use of technologies that replace fossil fuels*<sup>32</sup>.

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47 Beyond the argument that copper is necessary for the energy transition, Atalaya Mining claims to  
48 invest in decarbonized technologies. This is the case with the current construction of a solar power  
49 plant expected to cover a quarter of the energy consumption of the ore-processing plant, which the  
50 company claims will be the largest solar park for industrial use in Spain<sup>33</sup>. The climate issue, integrated  
51 with that of “sustainable” mines, is becoming increasingly formalized. Atalaya Mining’s sustainability  
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56 <sup>31</sup> Interview with the project manager of a construction and mining subcontractor in Andalusia, August 2022.

57 <sup>32</sup> Atalaya Mining (2021). *Proyecto para tramitación de concesión derivada de permiso de investigación Valverde nº14.920. Procedimiento AAU. Documento 1. Proyecto técnico ambiental*, pp. 39 and 42-43.

58 <sup>33</sup> Endesa press release: “Endesa y Atalaya Mining avanzan en su alianza con la firma de un acuerdo de suministro de energía a largo plazo para la mina de Riotinto”, 01/07/2022.

1 officer says that she wants to go beyond “simply complying with the obligations set by law<sup>34</sup>”. She acts  
2 as an interface between the company’s departments to ensure that they follow the recommendations  
3 of the *United Nations Global Compact*, which Atalaya Mining joined in 2020 and which calls on  
4 signatory companies “to step up and commit to set science-based targets aligned with limiting global  
5 temperature rise to 1.5°C above pre-industrial levels<sup>35</sup>”.

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7 These commitments are implemented on a voluntary basis and the resulting measures, in the absence  
8 of binding obligations, show the absence of substantial change in the mode of mining production.  
9 According to Atalaya Mining’s environmental manager, “the ratio of [greenhouse gas] emissions per  
10 ton of [copper] concentrate produced has decreased significantly” between 2019 and 2020. In reality,  
11 the ratio only dropped from 0.30 to 0.29 tons of carbon dioxide equivalent (tCO<sub>2</sub>eq) per ton of copper  
12 concentrate, Atalaya Mining’s final product. Moreover, taking into account indirect emissions such as  
13 those associated with subcontracted tasks, buying and importing inputs, etc., the ratio increased from  
14 1.14 to 1.39 tCO<sub>2</sub>eq per ton produced. The company’s environmental manager himself recognized  
15 that, beyond the acquisition of more efficient equipment, increasing production is the main way to  
16 decrease this ratio: “if production increases, the denominator also increases<sup>36</sup>”. Total emissions  
17 actually rose by 38% between 2019 and 2021<sup>37</sup>. Finally, we should note that the copper concentrate,  
18 which is too impure to be processed by the nearby smelter, is mixed with other concentrates, often  
19 from Latin America, and then shipped to Chinese smelters. Atalaya Mining executives are not able to  
20 follow the copper production chain to quantify the total emissions associated with the process<sup>38</sup>.  
21 However, they acknowledge that the Rio Tinto mine contains very poor ores (less than 0.4% copper),  
22 as the richest ores have already been mined. The profitability of the project therefore hinges on high  
23 copper prices, lower production costs, and economies of scale, which imply increasing the volumes  
24 extracted.  
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30 Atalaya Mining is looking to open other mines in the region. Of the 30 or so prospected sites, one is  
31 about to start extracting ores which, when transported to the Rio Tinto processing plant, will  
32 contribute to the economies of scale sought. The extension of the extractive frontier in time and space  
33 heralds an increase in the volumes produced and, consequently, in the consumption of inputs (energy,  
34 water, etc.), the production of mining waste, and greenhouse gas emissions. The promise of  
35 “sustainable mining”, if it is to materialize in the form of competitive activities, remains caught up on  
36 what Allan Schnaiberg calls the treadmill of production, a concept capturing the environmental  
37 predation resulting from the competition and concentration of capital at the heart of the global  
38 economic order (Schnaiberg, 1980). Although the mines are described as “climate-smart”, they are still  
39 governed by the principle of profitability. This entails a continuous increase in the volumes of minerals  
40 extracted, processed, transported, and then manufactured, thus contributing to the endless  
41 accumulation of polluting materials in the atmosphere and in the vicinity of mining sites.  
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51 <sup>34</sup> Interview with Atalaya Mining’s Sustainability Officer, February 2022.

52 <sup>35</sup> <https://www.un.org/en/un-chronicle/un-global-compact-finding-solutions-global-challenges>

53 <sup>36</sup> Interview with Atalaya Mining’s Environmental Department Manager, March 2022.

54 <sup>37</sup> According to the carbon footprint public registry of the Ministry of Ecological Transition:  
55 [https://www.miteco.gob.es/es/cambio-climatico/temas/mitigacion-politicas-y-medidas/organizaciones-](https://www.miteco.gob.es/es/cambio-climatico/temas/mitigacion-politicas-y-medidas/organizaciones-proyectos.aspx)  
56 [proyectos.aspx](https://www.miteco.gob.es/es/cambio-climatico/temas/mitigacion-politicas-y-medidas/organizaciones-proyectos.aspx)

57 <sup>38</sup> “How can I be sure, even if I have made this product [copper concentrate] sustainable, that from the end of  
58 my cycle [of production], from the beginning of another cycle, these sustainability criteria are followed? [...] I’m  
59 a bit lost, I don’t know if the concentrate is sold directly to the smelter, if there is an intermediary...” (quoted  
60 interview with Atalaya Mining’s Environmental Department Manager).  
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## Conclusion

From the perspective of the long-term trajectory of extractive models on a global scale, the contemporary framework of climate-smart mining can be seen as a continuation of previous frameworks of accountability and acceptability, based on a threefold technical, economic, and political promise. The technical promise underpinning this strategic climatization is above all that of the innovative capacity of mining companies to adapt their techniques and develop decarbonized and greened technologies, in accordance with the eco-modernist narrative (Wallenhorst & Theviot, 2020). It also builds on an economic promise: the decarbonization of the mineral and metal industries is above all driven by the promise that this will contribute to the development of “low-carbon” and “green” markets and economies, making it possible for capitalism to overcome its crises. Finally, climate-smart mining is based on a political promise, in the sense that this twofold promise of climate mitigation and decarbonization is part of a new discursive repertoire of legitimization of extraction, which embeds the global political economy of resources in a form of ecologization of capitalism and democratization of governance of the subsoil.

The climate-smart mining framework circulates in a globally standardized way, at the instigation of international and community organizations such as the World Bank, the European Union, various national investment entities, international industrial coalitions, and mining companies. However, comparing the implementation, in Europe (France and Andalusia), of national and regional strategies for the relocation of extractive activities highlights the effects of different opportunities and constraints in each case. First, the UN and the World Bank are above all concerned with supporting global demographic and economic growth while structuring a new regulatory framework for the value chains of subsoil raw materials – i.e., the shared transition to a green capitalism. For industrial actors, on the other hand, this is above all a matter of associating themselves with this new framework of governance and strategic reallocation of investments in order to secure their own production and strengthen the buoyant markets where their strategic interests lie. Second, in the French case, the climate argument is secondary to supporting the national strategy for securing supplies, and its ability to defuse the strong territorial opposition to mining projects is therefore yet to be tested. By comparison, in Andalusia, the climate argument appears as a reformulation of the justification for an economic solution for a stricken region, aimed at promoting reindustrialization through the revival of mining, in a manner that is consistent with the framing adopted by the European Union and the World Bank. The comparison of these trajectories highlights the superimposition of an economic and geostrategic justification of the relocation of extractive activities in Europe with a climate-based and ecological justification of mining reindustrialization.

In conclusion, the climate-smart mining framework appears to be a late translation of sustainable development in the mining sector and in the mining policies of European countries. The climate-smart mine, circulating in a standardized manner but translated in different ways at local level, appears to be a flexible concept that adapts to the problems, arenas and audiences as well as to the interests of the actors who use it. On an even more general level, the climate-smart mine is a political device that makes it possible to translate the climate and ecological problem into a solution: decarbonization. But two dynamics are at play behind the scenes: while State actors justify mining relocation in the name of a broader decarbonization of economies, mining actors have gained a new repertoire of justification for the expansion of the extractive frontier. Earlier frameworks of acceptability and accountability did little to help defuse the politicization of the subsoil from below, as in France, where the mining revival immediately came up against strong local opposition. However, this new framework of climatization of mining reflects a form of politicization from above, formulated and institutionalized through the interlocking of international, national, and regional organizations, both public and private. Our multi-

1 scale analysis highlights the significance of the enlistment of local political and economic actors, a  
2 process that failed in France and succeeded in Andalusia. While the material conditions of the targeted  
3 territories may be more or less compatible with such a development, here again, the narrative remains  
4 key: the pollution linked to earlier extraction stayed invisible in Andalusia, whereas it was brought to  
5 light in France and contributed to the criticism of the mining revival. It is therefore probably still a little  
6 early to assess the relative success of the promises of the climate-smart and ecological mine. The  
7 concrete proof of its low ecological impact has yet to be shown, and the political showdown in the field  
8 has only just begun.  
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10 The climatization of extractive industries in Europe remains a largely discursive process that does little  
11 to transform mining practices and activities – with the exception fact that, under certain conditions  
12 highlighted here, it contributes to legitimizing their redevelopment. While this narrative dimension has  
13 already been documented (Aykut & Maertens, 2021), the case of the mining industries is exemplary of  
14 capitalism’s ability to tame criticism through the appropriation of its opponents’ vocabulary (Boltanski  
15 & Chiapello, 2011; Topçu, 2013). Like the concepts of sustainable development and energy transition,  
16 decarbonization has become central to the justification of policies and projects that precisely  
17 contribute to the climate crisis. The late penetration of the climate frame of reference in the extractive  
18 industries, which effectively sounded the end of the era of climate denial, symbolizes the opening of a  
19 new era of climate resignation in which the ends justify the means. In this sense, mining companies  
20 are using the scheduled end of the fossil fuel industries of coal, oil and gas as the opportunity for a  
21 metal age. By managing to make their climate footprint invisible, these companies are presenting  
22 themselves as essential cogs in the wheel of decarbonization and renewable energy.  
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