



LITHIUM AND BATTERIES

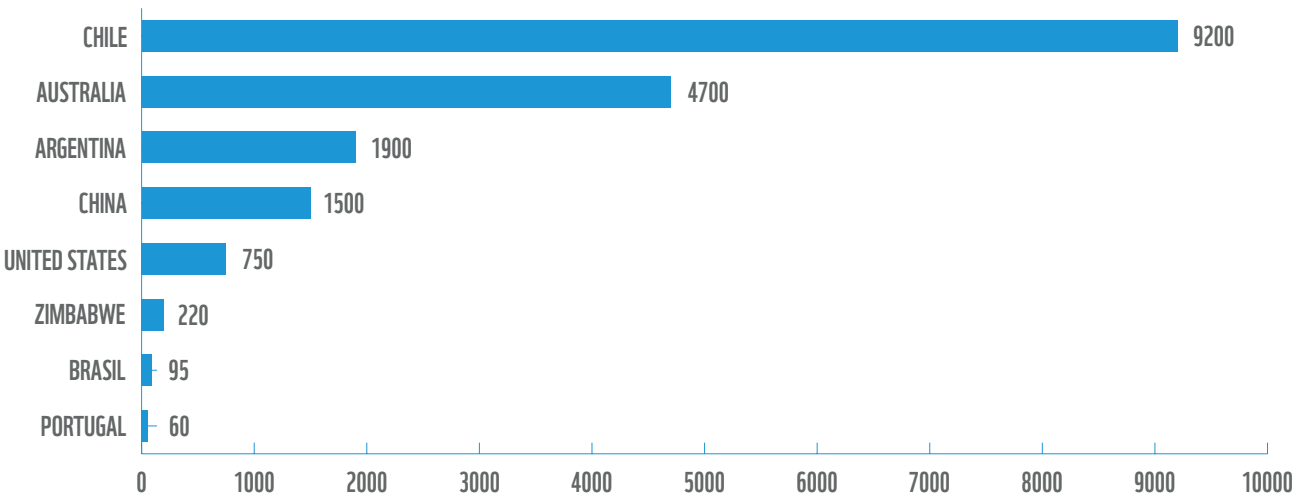
SUPPLY CHAIN IN PORTUGAL

Portugal and lithium

In the era of decarbonisation of world economies, Portugal intends to create a lithium and battery manufacturing industry in the border areas between Portugal and Spain, in order to meet the growing demand for batteries for electric vehicles. Portugal is currently the main lithium producer in the European Union and has the largest known reserves in the continent, occupying the 8th position worldwide.¹

The lithium industry in Portugal is still in its early stages. Currently, the metal is extracted in mines in association with quartz and feldspar, and used in the ceramics industry. With this new race for “white gold”, Portugal hopes to assume the leading position in world extraction, attracting foreign investment to have in national territory the five necessary steps of the lithium value chain: extraction, refining, transformation into cells, manufacture of batteries, and the recycling and reuse of batteries. This is a unique opportunity for Europe to increase its autonomy and reduce imports of this mineral, classified as critical raw material by the EU² while raising the bar for good practice in this new industry.

BIGGEST LITHIUM RESERVES (TONS)



Source: Mineral Commodity Summaries 2021, U.S. Geological Survey.

¹ [Mineral Commodity Summaries 2021, U.S. Geological Survey](#)

² [Critical Raw Materials Resilience: Charting a Path towards greater Security and Sustainability](#).

Companies that currently have lithium-related contracts in Portugal:

| Company | Municipalities | Type of contract | Signature date |
|--|---|--------------------------|----------------|
| PANNN - Consultores de Goeciências, Lda. | Covilhã and Fundão | Exploitation | 28/10/2021 |
| Portugal Fortescue, Unipessoal, LDA. | Macedo de Cavaleiros, Mirandela and Vinhais | Prospecting and research | 28/10/2021 |
| Lusorecursos Portugal Lithium, S. A. | Montalegre | Exploitation | 28/3/2019 |
| Felmica Minerais Industriais, S. A. | Covilhã and Fundão | Exploitation | 24/3/2017 |
| Savannah Lithium, Lda. | Boticas | Exploitation | 22/2/2017 |
| Sociedade Mineira Carolinos, Lda. | Guarda | Exploitation | 5/10/2015 |
| Felmica Minerais Industriais, S. A. | Ponte de Lima | Exploitation | 10/10/2012 |
| Felmica Minerais Industriais, S. A. | Boticas | Exploitation | 27/6/2008 |
| Felmica Minerais Industriais, S. A. | Covilhã and Fundão | Exploitation | 25/5/2007 |
| Felmica Minerais Industriais, S. A. | Cabeceiras de Basto, and Boticas | Exploitation | 25/5/2007 |

Source: Energy and Geology Directorate-General (www.dgeg.gov.pt)

Prospecting and research contracts allow for activities aiming at the discovery of mineral deposits, determination of their characteristics and the existence or not of value for economic exploitation. Such activities involve remote information collection and less invasive operations on the ground, such as sampling of soils, rocks, water, while activities at the subsoil level are carried out only in small areas, if and when a mining potential is identified.

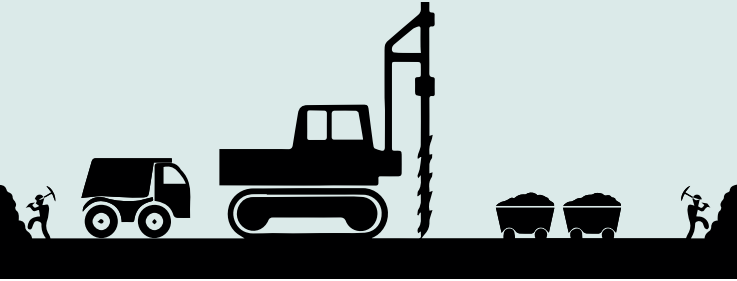
Only **exploitation** contracts give the right to carry out mineral exploitation activities (i.e., mining), allowing open-pit mines (in the case of lithium in Portugal) and mineral extraction for commercial exploitation.

Both types of contracts may require an Environmental Impact Assessment (EIA) to begin operations, depending on the extension and localization or whether authorities deem it necessary. However, according to the recent European Parliament report on an European Strategy for Critical Raw Materials, Member States should revise their EIA legislation to ensure such an assessment in mining projects of any size³.

³ https://www.europarl.europa.eu/doceo/document/A-9-2021-0280_PT.html

European Strategic Plan on Critical Raw Materials

In the Strategic Plan on Critical Raw Materials published in September 2020⁴, the European Commission predicted that Europe would need 18 times more lithium in 2030 than the EU’s current supply in order to meet its demand for electric vehicles batteries. The strategic plan was crucial for the mining industry, as for the first time it placed lithium on the list of critical raw materials, getting special treatment in the EU’s industrial strategy. For example, it can be subsidised beyond the levels normally allowed under EU state aid law. This extension of the list was prompted by the huge disruptions in global supply chains as a result of the Covid-19 pandemic. Added to this are growing geopolitical tensions, notably with China, fuelling further fears about supply chains.



However, if on the one hand the importance of this mineral for the energy transition is recognised, the environmental implications of lithium mining and the lack of transparency in the promotion of this sector have strongly contributed to the fact that there are no local communities groups defending this new industry in any region in Portugal where lithium mining could start. They are legitimately concerned about the damage caused to the landscape and biodiversity, the exploitation of huge amounts of water and its contamination, and the foreseeable air degradation in the areas adjacent to the exploitation, in addition to the impacts of this exploitation on the ways of life and usual economic activities of the local population.

A “GigaEurope”

The EU needs to decarbonise its transport sector, which produces around a quarter of its CO2 emissions, to meet its goal of climate neutrality by 2050. With this aim, it intends to have 30 million electric vehicles on its roads by 2030. But lithium mining, indispensable for mobile phones, computers and electric mobility, is far from peaceful.

The EU is heavily dependent on lithium imports (78% comes from Chile, 8% from the US and 4% from Russia), so to maintain its strategic autonomy from major producers like Chile and China, the EU’s plan is to exploit some of the many reserves in its own territory by developing new mines. The result is a panoply of mining projects emerging across Europe, where the question is: in the midst of the lithium euphoria, how will Portugal position itself and what consequences will that positioning have?

In addition to Portugal’s sources, it is estimated that there are lithium reserves in other European countries⁵ such as Spain, France, Germany, Serbia, Austria, Ukraine, Finland, Czech Republic, Ireland and the United Kingdom, where lithium exploration projects are at different stages of development.

The EU, Portugal included, must safeguard the origin of this mineral and many European Member States argue that it is better to extract in Europe, establishing strict sustainable criteria, than in countries where the environmental and social standards are not so clear. On the other hand, for reputational reasons and internal sustainability policies, large battery buyers, such as automotive companies and mobile phone manufacturers, are increasingly working closely with battery suppliers

to ensure that sustainable principles are implemented in the lithium supply chain.

Further, more than 1.9 million tonnes of battery waste is generated annually in Europe⁶. Global electric vehicle manufacturers such as Volkswagen, Tesla or Renault are aware of this problem which could hit their “green company” image, and are currently investing billions of euros in battery manufacturing and recycling value chains. In this same movement of awareness of their responsibilities towards the environment, several companies such as BMW, Volvo, Samsung, Philips and Google, have already pledged not to source any minerals from the deep sea, to refrain from using these resources in their supply chains and not to finance deep seabed mining activities.

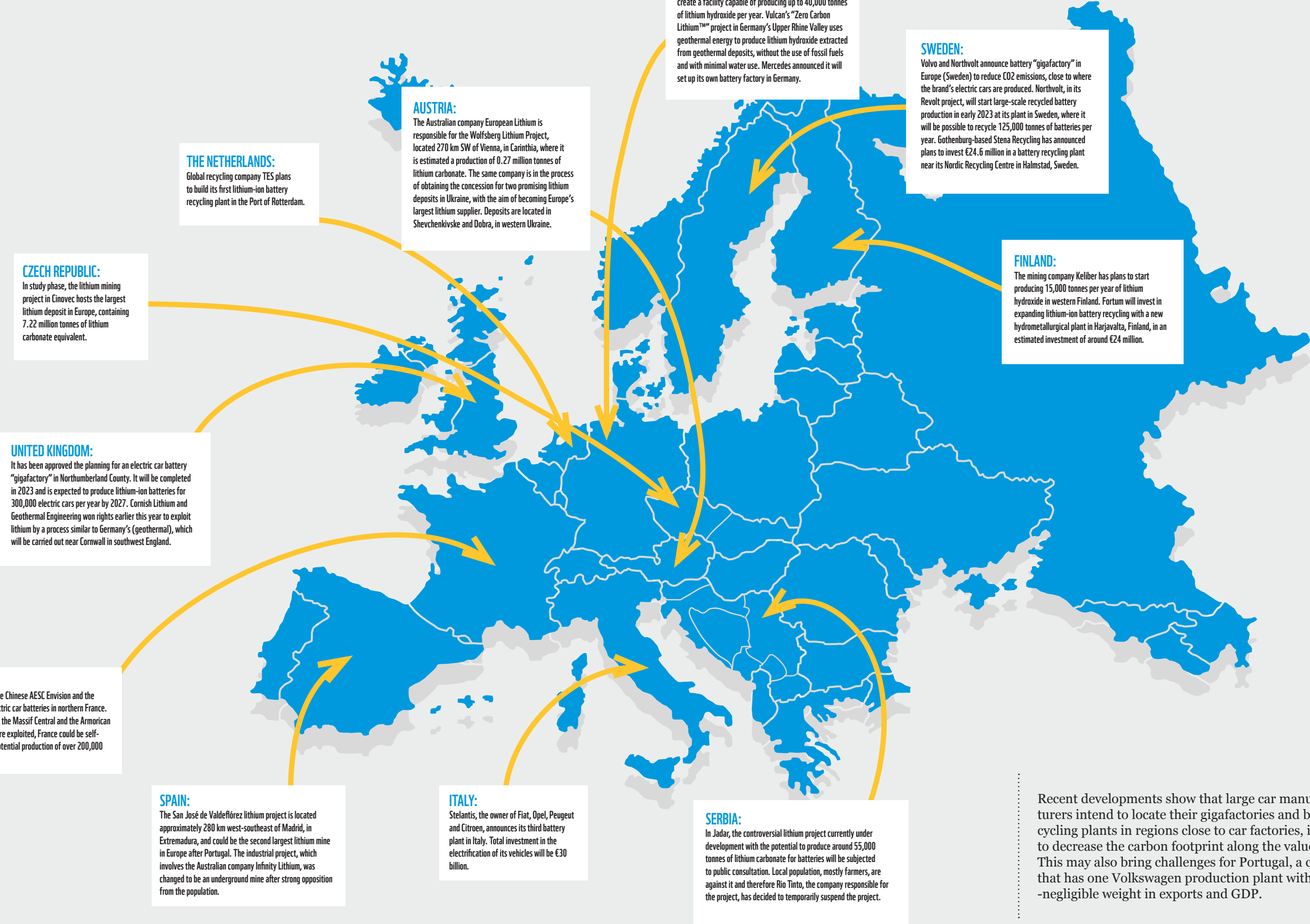


⁴ [Critical Raw Materials Resilience: Charting a Path towards greater Security and Sustainability.](#)

⁵ [Global lithium \(Li\) mines, deposits and occurrences \(November 2021\).](#) British Geological Survey.

⁶ [European Environmental Agency. Waste electrical and electronic equipment \(WEEE\) briefing 2021](#)

MONOLITHIUMPOLIO



GERMANY:
Tesla's first gigafactory in Europe, located in Berlin, remains on plan despite bureaucratic setbacks and local protest; Volkswagen has set up a plant in Salzgitter, Germany, where it will recycle up to 90% of its models' batteries. An economic feasibility study has been approved in Germany for Vulcan Energy Resources to create a facility capable of producing up to 40,000 tonnes of lithium hydroxide per year. Vulcan's "Zero Carbon Lithium™" project in Germany's Upper Rhine Valley uses geothermal energy to produce lithium hydroxide extracted from geothermal deposits, without the use of fossil fuels and with minimal water use. Mercedes announced it will set up its own battery factory in Germany.

AUSTRIA:
The Australian company European Lithium is responsible for the Wolfsberg Lithium Project, located 270 km SW of Vienna, in Carinthia, where it is estimated a production of 0.27 million tonnes of lithium carbonate. The same company is in the process of obtaining the concession for two promising lithium deposits in Ukraine, with the aim of becoming Europe's largest lithium supplier. Deposits are located in Shevchenkivske and Dobra, in western Ukraine.

THE NETHERLANDS:
Global recycling company TES plans to build its first lithium-ion battery recycling plant in the Port of Rotterdam.

CZECH REPUBLIC:
In study phase, the lithium mining project in Cinovec hosts the largest lithium deposit in Europe, containing 7.22 million tonnes of lithium carbonate equivalent.

UNITED KINGDOM:
It has been approved the planning for an electric car battery "gigafactory" in Northumberland County. It will be completed in 2023 and is expected to produce lithium-ion batteries for 300,000 electric cars per year by 2027. Cornish Lithium and Geothermal Engineering won rights earlier this year to exploit lithium by a process similar to Germany's (geothermal), which will be carried out near Cornwall in southwest England.

FRANCE:
Renault has partnered with the Chinese AESC Envision and the French Verkor to produce electric car batteries in northern France. France has lithium reserves in the Massif Central and the Armorican Massif. If these resources were exploited, France could be self-sufficient for lithium with a potential production of over 200,000 tonnes.

SPAIN:
The San José de Valdeflórez lithium project is located approximately 280 km west-southeast of Madrid, in Extremadura, and could be the second largest lithium mine in Europe after Portugal. The industrial project, which involves the Australian company Infinity Lithium, was changed to be an underground mine after strong opposition from the population.

ITALY:
Stelantis, the owner of Fiat, Opel, Peugeot and Citroen, announces its third battery plant in Italy. Total investment in the electrification of its vehicles will be €30 billion.

SERBIA:
In Jadar, the controversial lithium project currently under development with the potential to produce around 55,000 tonnes of lithium carbonate for batteries will be subjected to public consultation. Local population, mostly farmers, are against it and therefore Rio Tinto, the company responsible for the project, has decided to temporarily suspend the project.

SWEDEN:
Volvo and Northvolt announce battery "gigafactory" in Europe (Sweden) to reduce CO2 emissions, close to where the brand's electric cars are produced. Northvolt, in its Revolt project, will start large-scale recycled battery production in early 2023 at its plant in Sweden, where it will be possible to recycle 125,000 tonnes of batteries per year. Gothenburg-based Stena Recycling has announced plans to invest €24.6 million in a battery recycling plant near its Nordic Recycling Centre in Halmstad, Sweden.

FINLAND:
The mining company Keliber has plans to start producing 15,000 tonnes per year of lithium hydroxide in western Finland. Fortum will invest in expanding lithium-ion battery recycling with a new hydrometallurgical plant in Harjavalta, Finland, in an estimated investment of around €24 million.

Recent developments show that large car manufacturers intend to locate their gigafactories and battery recycling plants in regions close to car factories, in order to decrease the carbon footprint along the value chain. This may also bring challenges for Portugal, a country that has one Volkswagen production plant with a non-negligible weight in exports and GDP.

The “White Gold” rush in Portugal - A (not very) transparent process

There is still a great distance between what the Portuguese State promises and what it is doing. The Government promised that no project would go ahead without an environmental impact assessment (EIA) and a favourable or conditioned decision for them. However, there are projects that have already signed contracts, which causes great scepticism in local populations and civil society about EIA credibility.

One of the projects already under concession is in Covas do Barroso, Boticas, which is in the EIA phase, having received more than 170 contributions in the public consultation, including from ANP|WWF. The totality of the contributions denotes multiple environmental concerns, in an area that is FAO Globally Important Agricultural Heritage Systems. However, local leaders and groups representing the local community fear that the project is irreversible and that the contributions submitted will not be duly taken into account.

In the midst of this controversial scenario, the government carried out a Strategic Environmental Assessment of the Lithium Prospecting and Exploration Program (“*PPP do lítio*”, in Portuguese), which considered eight potential areas that will be the target of an international public tender for the concession in 2022. Initially, 11 areas were foreseen, but 3 of them were removed because they were within areas with environmental protection status, namely areas classified as Protected Areas and/or Natura 2000. The assessment mentioned that, for most of the areas, “further research is needed in order to estimate geological resources or reserves”. The document was made available for public consultation and concludes that lithium prospecting and exploration could have

negative effects on the quality of the environment, particularly regarding water: “In some areas of prospection (e.g. Arga) there are natural mineral water concessions very close to its limits and with associated protection perimeters”. It is worth mentioning that this environmental assessment took into account the impacts referring only to prospecting and exploration activities, without analysing the impacts of mining on a commercial scale, which are certainly much more relevant. In order to move forward to the exploitation phase, the projects will be submitted to the environmental impact assessment, however no longer in a strategic nor integrated dimension, only on a case-by-case basis and when necessary, according to legislation (Decree-Law No. 152-B/2017). From our perspective, if prospection activities had relevance to be submitted to a strategic analysis, so does lithium exploitation, which presents an undeniable higher potential for negative impacts. If the Strategic Environmental Assessment of the *PPP do lítio* had the objective of ensuring that environmental issues are integrated into the decision process, explaining the significant effects on the environment and identifying alternatives, these objectives will have even more value when applied to the decision process of mining exploitation. We believe that only with a strategic and integrated vision, society and government will be able to jointly decide where and how lithium mining should take place in Portugal.



The map below shows the 8 regions with lithium mining potential in Portugal that may be subjected to an international tender in 2022, as well as 3 areas that already have an exploitation contract.

1. SERRA DE ARG

Size: 247,7 km²
Region: Viana do Castelo
Municipalities: Caminha, Vila Nova de Cerveira, Viana do Castelo, Ponte de Lima and Paredes de Coura
CA⁷ within 3 km: Bertiaundos and São Pedro Lagoons Regional Protected Landscape; SPA Rio Lima; SPA Serra d’Arga; SPA Rio Minho; SPA Minho and Coura Rivers Estuaries.

Description: Serra de Arga is an area of over 10 000 hectares of which 4280 are classified as Natura 2000, which is of concern not just to the local community but also regional and national stakeholders. The 5 municipalities have emitted formal negative opinions to all requests for prospecting or exploitation for lithium and other minerals, having also proposed the area to be classified as a Protected Landscape Area of Regional Interest to ensure protection from mining.



“SOS Serra de Arga” Movement is against an open pit mine, accusing the government of not having consulted the municipalities when preparing the preliminary environmental assessment of the Lithium Prospecting and Research Program (PRP). This local movement has been one of the most committed in ensuring a new mine is not opened in the region and, last October, they mobilized over 1000 people in a demonstration against lithium mining in the region.

2. SEIXOSO - VIEIROS

Size: 243,7 km²
Region: Braga, Porto, Vila Real
Municipalities: Fafe, Celorico de Basto, Guimarães, Felgueiras, Amarante and Mondim de Basto
CA within 3 km: SAC Alvão Marão

Description: The new Mayor of Mondim de Basto, elected in municipal elections last September, already stated this to be a priority file for his team, and that a “profound analysis of the report” will be made so that “a position can be made for, above all, defend the population and the interests of the municipality”.

3. MASSUEIME

Size: 499,7 km²
Region: Guarda
Municipalities: Almeida, Figueira de Castelo Rodrigo, Pinhel, Trancoso and Mêda.
CA within 3 km: SPA Vale do Côa
Overlap with CA: Meseta Ibérica Transboundary Biosphere Reserve (33,2 km² overlap, 0,3% of CA)

Description: This small region’s history with mines goes back to the early 20th century when valuable minerals were exported between the 1st and 2nd World Wars, namely amblygonite, tin, and tungsten/wolfram and Scheelite. This valley is located in the municipality of Pinhel which through the Intermunicipal Community of Beiras and Serra da Estrela has opposed lithium exploitation close to urban areas and where it damages irrigated farming land.

4. BLOCK GUARDA-MANGUALDE, BLOCOS N E S

Size: 421,5 km²
Region: Castelo Branco and Guarda
Municipalities: Belmonte, Covilhã, Fundão and Guarda
CA within 3 km: Serra da Estrela Natural Park; SAC Serra da Estrela; SAC Gardunha
Overlap with CA: Serra da Estrela Geoparque (241 km², 10,9% of CA)

5. BLOCK GUARDA-MANGUALDE E

Size: 497 km²
Region: Guarda
Municipalities: Almeida, Belmonte, Guarda and Sabugal
CA within 3 km: SAC Malcata; NaturTejo Geopark of the Meseta Meridional
Overlap with CA: Serra da Estrela Geoparque (56,6 km², 2,6% of CA)

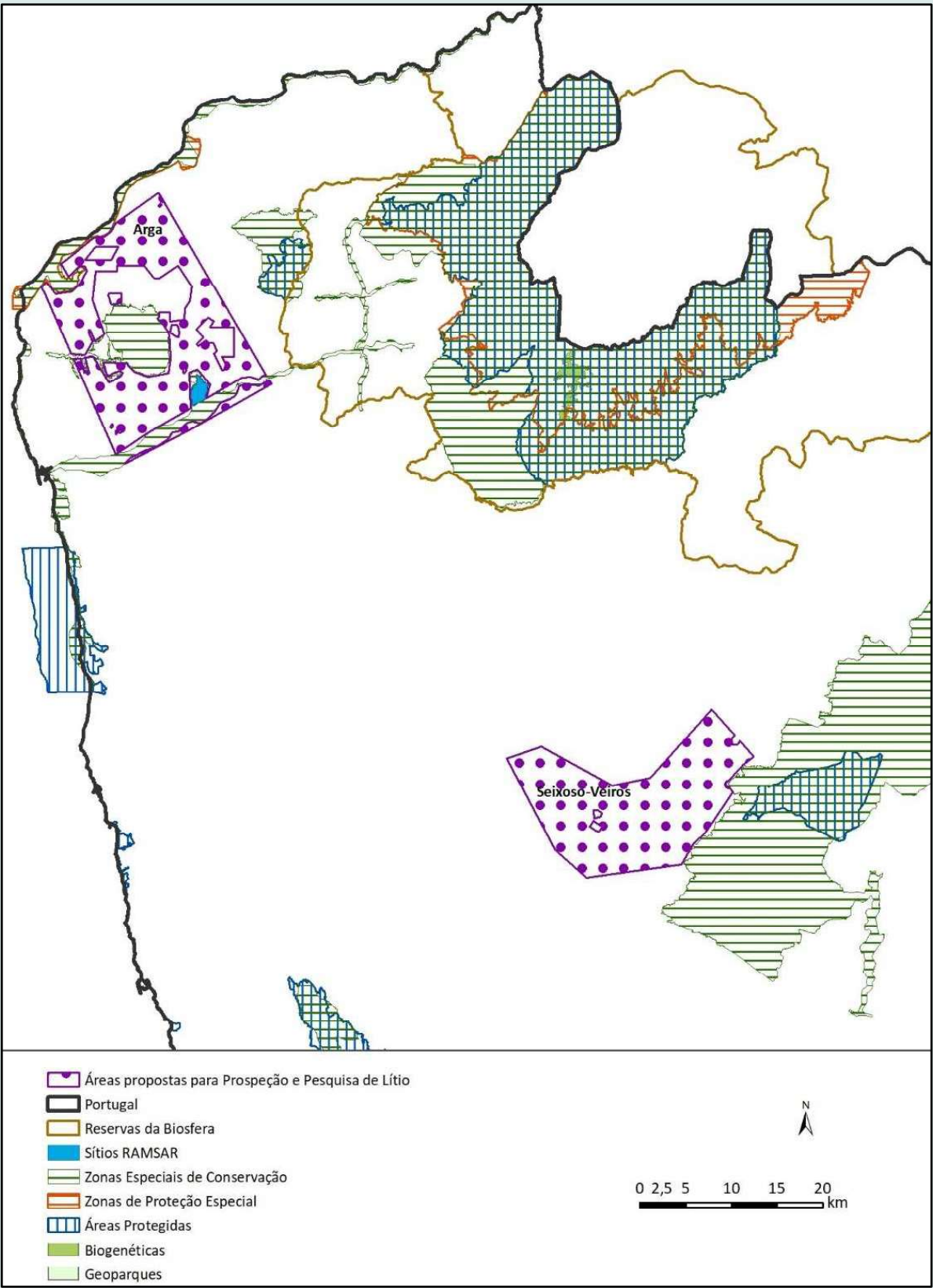


Figura 1 - Prospecting and research areas (purple), and Conservation Areas in the North Region (Source: Preliminar Environmental Report - PPP do lítio)

⁷ Conservation Areas, which includes Protected Areas (nature reserve, natural park, etc.) and Natura 2000 Network (SAC - Special Areas of Conservation, SPA - Special Protection Areas).

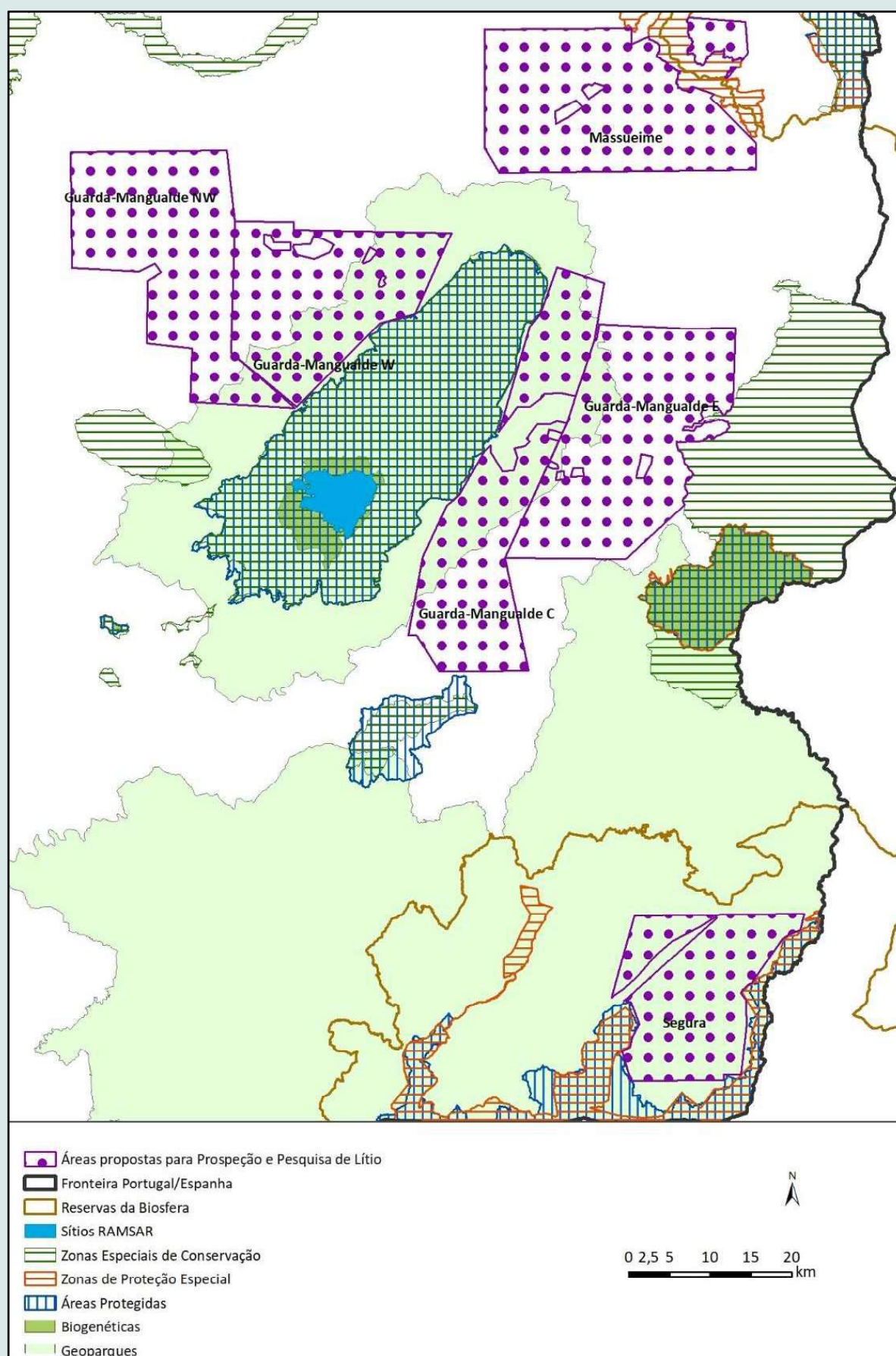


Figura 2 - Prospecting and research areas (purple), and Conservation Areas in the Central Region (Source: Prelimiar Environmental Report - PPP do lítio)

6. BLOCK GUARDA-MANGUALDE W

Size: 376,6 km²

Region: Guarda and Viseu

Municipalities: Mangualde, Gouveia, Seia, Penalva do Castelo, Fornos de Algodres and Celorico da Beira

CA within 3 km: Serra da Estrela Natural Park; SAC Serra da Estrela

Overlap with CA: Serra da Estrela Geopark (198,5 km², 9% of CA)

7. BLOCK GUARDA-MANGUALDE NW

Size: 444,9 km²

Region: Viseu and Coimbra

Municipalities: Viseu, Sátão, Penalva do Castelo, Mangualde, Seia and Nelas

CA within 3 km: Serra da Estrela Natural Park; SAC Serra da Estrela

Overlap with CA: Serra da Estrela Geopark (25,3 km², 1,1% of CA)



Association Guardians of Serra da Estrela, with support from Beira Serra Movement Against Mining and School Strike for Climate of Guarda, argues that any mining method would imply very high water consumption, unsustainable in a region systematically under severe or extreme drought. These groups highlight that, given the diversity of minerals that can be mined, used water would become an effluent contaminated with heavy metals and acid, which after treatment would generate toxic sludge with permanent environmental impacts. Lithium mining would generate also dust that would set in neighbouring areas, causing breathing problems in local communities, animals and disturbing vegetation growth. In uranium areas such as Beira Serra, there is the added risk of generating radioactive dust.

8. SEGURA

Size: 311,3 km²

Region: Castelo Branco

Municipalities: Castelo Branco and Idanha-a-Nova

CA within 3 km: Tejo International Natural Park; SPA Tejo Internacional, Erges and Ponsul

Overlap with CA: Tejo-Tajo Biosphere Reserve (311 km², 7,3% of CA); NaturTejo Geopark of Meseta Meridional (311 km², 6,1% of CA)

Description: Segura is a Portuguese parish in the municipality of Idanha-a-Nova, about 74 km² in size and with 176 residents. Already in 2019 the municipality of Idanha-a-Nova spoke publicly against prospecting and research of mineral deposits as this would harm the municipality's development strategy. Since February 2018 Idanha-a-Nova municipality is part of the International Network of EcoRegions.



There are also already 3 projects that will be excluded from the international tender and from the Strategic Environmental Assessment, as they already have concession contracts⁸:

1. BARROSO MINES — BOTICAS

The Barroso Mines can be considered the nerve center of the whole Lithium run in Portugal. Not only because it is the project that is most advanced, but also because it could create a standard for the Government's political decision in the next decade. And, for now, it can go very wrong - it is just a matter of the Portuguese Government closing its eyes to the approximately 170 negative opinions that were sent during the Public Consultation phase of the Environmental Impact Study, when several organisations and citizens warned of the impact that the project could have on risk species, such as river mussels, the Iberian desman or the Iberian wolf. The Barroso mines will have an area of 70 football fields (542 ha) located in the middle of the Barroso Agro-silvo-pastoral System, classified as a FAO Globally Important Agricultural Heritage System.



Local associations, including the People and Nature Association of Barroso and United in Defense of Covas do Barroso, presented independent opinions that technically disapproved of the expansion of the mine in Covas do Barroso⁹, with the support of Boticas City Council in opposing the project. Other opinions have shown that there will be a negative impact on the regional economy, jeopardizing more than 250 honey producers and their 120 thousand hives, and 300 producers of barrosã meat.

The promoter of the Minas do Barroso project, UK-based Savannah Resources, is strongly committed to the project's success. The company promises an investment of 110 million euros in a project that will generate 200 direct jobs and 400 to 600 indirect jobs. The Barroso mines will be used to produce spodumene concentrate, which will most likely be refined in Sines in partnership with Galp.

Will the 1st Lithium refinery in Europe be located in Portugal?

Savannah and Galp, in a consortium with another 15 entities, applied for funds provided for in the Portuguese Recovery and Resilience Plan (PRR) to move forward with a lithium refinery in Portugal. Under the motto "CVB Agenda - Lithium Batteries Value Chain in Portugal", the proposal of 981 million euros passed to the 2nd

evaluation phase and intends to create in Portugal "a lithium hub that covers the entire value chain of lithium batteries, from extraction, refining, cathode production, cells, battery assembly and battery recycling". To advance in this objective of developing the lithium value chain in Portugal, Galp announced a partnership with the Swedish company Northvolt, which together promise to invest around 700 million euros in what is intended to be the largest and most sustainable plant to convert lithium from Europe, with an initial annual production capacity of up to 35,000 tons of lithium hydroxide for batteries.

Battery cluster

In June 2021 the Battery Cluster, named "Batpower", was created in Portugal with Savannah among the group of founders. The cluster aims to maximize Portugal's potential throughout the battery value chain in areas such as refining and recycling, component manufacturing, cells, control electronics and complete batteries, applications, integration and certification. Galp and Bosch are some of the companies that make up this cluster. Savannah recently announced having joined the first International Lithium Association which will be based in London and will comprise the world's largest Lithium producers.

2. ARGEMELA — COVILHÃ AND FUNDÃO

Argemela is located between the municipalities of Fundão and Covilhã and is another project that has been the target of criticism from various quarters, under accusations of little transparency. After the Portuguese Government rejected the exploration request by the PANN company in the beginning of 2021, the Portuguese company, which already has a prospecting and research contract, received the exploration concession in early November, even before having concluded the EIA. The exploration can last 10 to 15 years and will run 16 hours a day. The company intends to invest 50 million euros and promises to generate 120 direct jobs. The Mining Plan states that it is expected to extract up to 1 million tons per year, generating up to 19 million cubic meters of mining waste.



In this region, the Serra da Argemela Preservation Group was mobilized, which has organized several demonstrations so that the Government can hear its concerns about the negative consequences that the mine would have on their ways of life and the environment.

3. ROMAN — MONTALEGRE

Another example of a project that began badly and at the moment it is not known how it will end. In March 2021, the Portuguese Government decided not to grant the exploration license to the Portuguese company Lusorecursos, claiming that it had submitted a "clearly insufficient" EIA. However, in August, when everyone thought the project would be closed, Lusorecursos reformulated the EIA, forcing the Portuguese Environment Agency to reassess the concession process. The Montalegre Municipality has taken a neutral position, having already mentioned that it will not block lithium exploration, and that it hopes that lithium refining can also take place in the region. Lusorecursos, a company that is working on a 500 million euro project to have the mine concession in Montalegre, has been shrouded in controversy since its creation. The company was created 3 days before signing the prospecting contract for the Montalegre area and, already in the middle of the process, the Secretary of State for Energy, João Galamba, was forced to explain in Parliament the reasons for having given the concession of the exploration of the future Lithium mine in Montalegre to Lusorecursos without a public tender. The Secretary of State explained that the previous Government had already contractually committed to Lusorecursos.



In Montalegre the No to Minas-Montalegre Movement was born, which opposes having an open pit lithium mine, as well as a wolfram mine.



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Mining Law - a law tailored to whom?

At the base of the lithium rush in Portugal is Decree-Law No. 30/2021 approved in May 2021, called the "Mining Law". The law has positive aspects, as it establishes greater transparency in administrative procedures, forcing public consultations through the Participa.pt portal and holding public sessions with populations in affected areas. However, the Portuguese Government ignored the appeals of several organizations that warned that the Law fails to conserve protected areas, stipulating only that mines must be outside protected areas, internationally classified areas or Natura 2000 Network areas, "whenever possible", in addition to allowing land use plans to be amended to allow for mines, allowing contracts to be signed prior to the approval of EIAs and not making it clear that the opinions of affected municipalities must be binding for all mining projects. The Decree-Law was recently discussed in Parliament and a new legal diploma¹⁰ was approved with changes to the mining law which, fortunately, reversed some of the problems mentioned. The new legislation determines that conservation areas must be removed from the areas proposed in mining projects, in addition to defining that the concession of the right of exploration only occurs "provided that a favorable decision is obtained in the context of an environmental impact assessment".

⁸ LNEG Policy Brief 2020

⁹ Minas do Barroso - assessment report

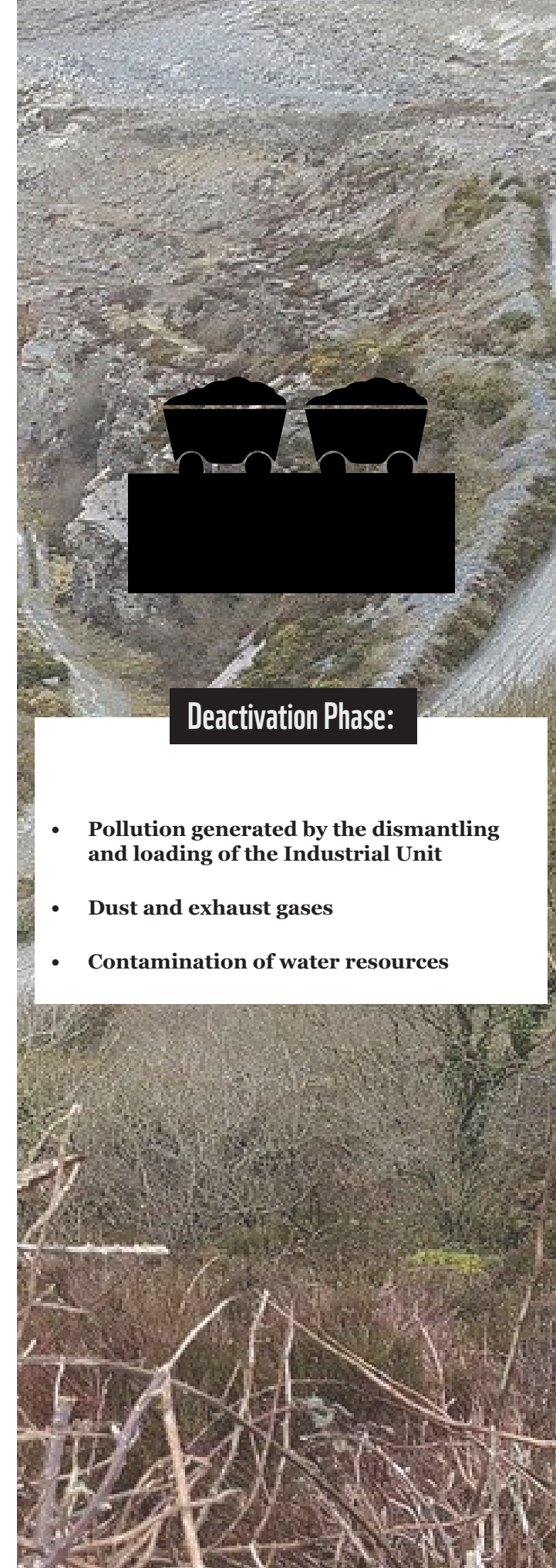
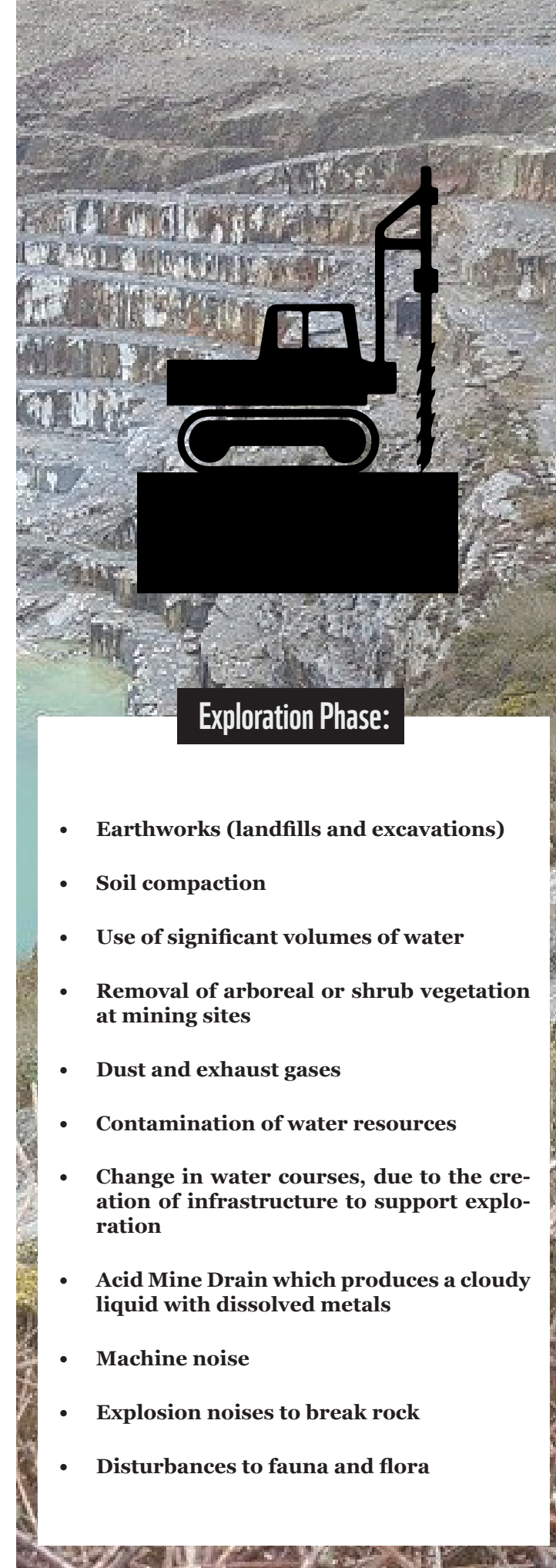
¹⁰ Law n° 10/2022

Environmental Impacts of Lithium Extraction

Obtaining lithium by conventional means has its own environmental cost, at four levels: air, water, soil and biodiversity.

Among the main known impacts¹¹ are the depletion of non-renewable resources, the production of extraction residues, dust and noise, erosion, global warming/high energy consumption (thermochemical transformation at temperatures close to 1000°C) and ecological toxicity, with high risks of contamination of air, soil and surface and underground water resources, due to the use of a large volume of water (washing) to which a large number of cleaning agents and chemical products are added.

¹¹ Due to its geological characteristics, lithium in Portugal needs to be removed from rocks in open pit mines, unlike lithium extracted in South American countries, for example, which implies different environmental impacts.



Responsible Lithium Mining: Recommendations

Although Portugal got off on the wrong foot in the lithium race, ANP|WWF believes that it is still possible for the country and the rest of Europe to become a reference in the lithium supply chain worldwide. The EU, through the European Green Deal, should lead this process of responsible mining and ensure that the entire value chain meets international best practices. Even with several moves by the industry towards self-regulation and self-certification, for ANP|WWF it is essential that EU Member States create transparent and participatory mechanisms for the concession of licences for lithium mining, and at the same time create monitoring and certification processes for environmental and social issues along the lithium value chain.

ANP|WWF, looking at the first steps Portugal is taking in the development of a lithium value chain in the country, recommends the following:

1. Ensure that **mineral prospecting and exploitation activities do not occur in protected areas**, nor produce negative effects on them.
2. It is essential that a **new Strategic Environmental Assessment** is carried out to analyze not only the impacts of prospecting but also of lithium mining in an integrated manner, with all the areas currently in question. This integrated vision of impacts will not happen if mining projects are analysed only on a case-by-case basis, in traditional EIA processes.
3. Presentation by the government of a study showing the **economic-strategic viability** of lithium mining in Portugal.
4. **Establishing a dialogue** with society, especially the communities that will be affected, for clarification of all stages from prospecting to exploitation, including broad debate on the objectives of this activity and its impacts.
5. Mining companies should have a “**social licence to operate**”, which means they have the acceptance of their standard business practices and operating procedures by their employees, stakeholders, local community, and the general public.
6. All administrative steps must be followed, namely the Environmental Impact Assessment **before signing the concession contracts** for any lithium mining project in Portugal, besides the effective compliance with the measures to mitigate impacts.
7. **Full transparency** of all lithium projects in Portugal and their administrative processes, with a facilitated public access to documents and civil society participation in critical phases.
8. Ensure that **land management plans** will be respected and cannot be altered to allow mining activities.
9. **Create a fund** to receive the assets and rights for the municipalities in whose territory the concession area will be located, to be **managed in a participatory manner** with the communities and with the main objective of improving **local socio-environmental conditions**. This fund should not replace measures to compensate environmental impacts as determined in the EIA.
10. All lithium mining projects should follow the **mitigation hierarchy** approach and present **restoration plans** to be undertaken when mining activities are finished.



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 Design: Margarida Arriaga e Cunha

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ANP works in association with WWF, the largest global independent organization for nature conservation. The Portuguese NGO is focused on nature conservation and the protection of the planet, namely of fauna and flora, ecosystems, landscapes, water, soil, clean air, ecological processes and support systems, services provided ecosystems and natural resources. We stand for the fair and sustainable use of these resources and our work contributes to the well-being of current and future generations, as well as for a future in which people live in harmony with nature. To know more about ANP|WWF, please visit: www.natureza-portugal.org