IMERYS
EMILI Project

PUBLIC DEBATE
SUMMARY OF THE PROJECT OWNER'S FILE

11 MARCH
TO 7 JULY
2024

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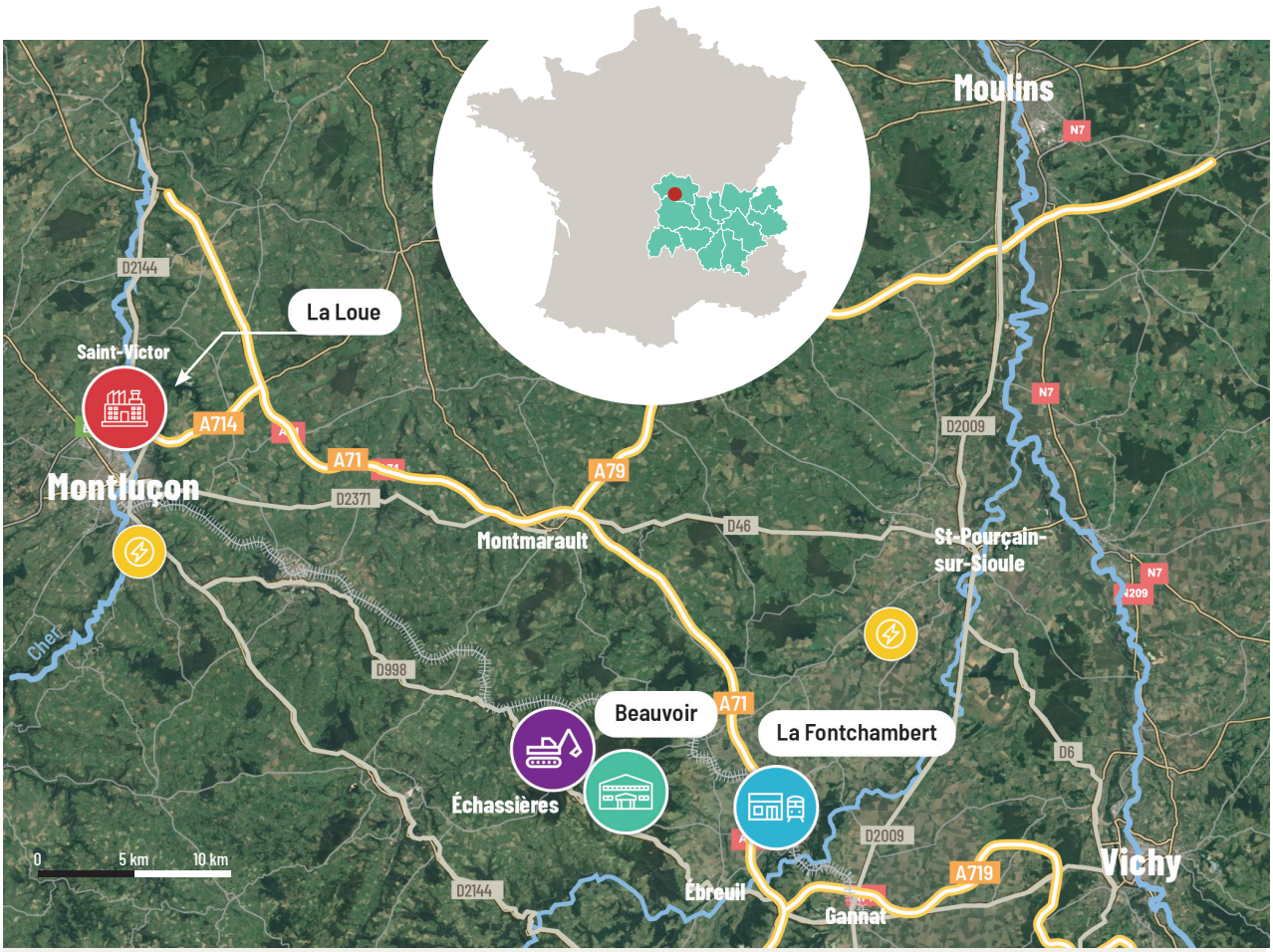
**→ The purpose of this overview is to summarise the Project Owner's File (DMO), the reference document for the public debate.
It presents the project to both insiders and the general public in order to provide context for general and specific discussions.**

EMILI
A LITHIUM MINING AND PROCESSING PROJECT IN ALLIER, FRANCE

At present, lithium processing is largely dominated by China (57% of global production), Chile (29%) and Argentina (9%). This quasi-monopoly means that Europe is dependent on imports of this metal, which is of strategic importance for the energy transition - lithium is one of the main components of the lithium-ion batteries used in electric vehicles. Studies carried out by Imerys since 2015 have confirmed the presence of a major deposit under the Beauvoir Kaolin Quarry site in the Allier department. Imerys proposes to seize this opportunity for France and Europe through the EMILI project (EMILI stands for Exploitation de Mica Lithinifère par Imerys), the first mining project of this scale in France for over half a century.

INTEGRATED PRODUCTION OF **LOW-CARBON LITHIUM**



TARGET SITES FOR THE VARIOUS COMPONENTS OF THE EMILI PROJECT

The EMILI project comprises four components:

- **An underground mine,** under the Beauvoir Kaolin Quarry on the Bosse massif (already the location of an open-cast mine);
- **A concentration plant** to separate the minerals contained in the granite, the lithium mineralised rock. This plant, also located on the Beauvoir site, would have an annual processing capacity of around **2 million metric tons of ore**;
- **A rail loading platform** that would be located in La Fontchambert, near Saint-Bonnet-de-Rochefort. The mineral concentrate known as mica would then be brought in via **pipelines** and filtered before being loaded onto trains;

- **A conversion plant** in La Loue (municipality of Saint-Victor, in the Montluçon conurbation), accessible by **rail** and with an annual processing capacity of approximately 330,000 metric tons of lithiniferous mica (producing approximately 34,000 metric tons of lithium hydroxide per year).

From extraction to conversion within the same geographical area, this choice of short supply chain management contributes to **a reduction in the project's carbon impact,** while supporting regional development. **In addition, the group aims to direct its production to the European battery production sector.**

"Once the EMILI project is successfully underway, it should provide a sustainable and competitive local supply of lithium for French and European carmakers, and would make a major contribution to meeting the challenges of the energy transition. Throughout the process, Imerys will engage with all stakeholders, from local communities to policymakers, in a spirit of openness and transparency."

ALESSANDRO DAZZA, MANAGING DIRECTOR OF IMERYS

ANNUAL PRODUCTION OF 34,000 METRIC TONS OF LITHIUM HYDROXIDE TO EQUIP 700,000[1] ELECTRIC VEHICLES PER YEAR

KEY PROJECT FIGURES

2028
Planned start of production of the site

116.7 million metric tons at 0.90%Li_2O
Metal oxide content: 1.1 million metric tons Li_2O
Ore resource (material in the soil)

Between **500** and **600** direct jobs

2.5 years
before target production

2.1 million metric tons of granite mined annually
Maximum production level

At least **1,000** indirect jobs

25 years
Minimum mine life (including start-up time)

0.716 million metric tons LHM
Product (lithium hydroxide for the battery market)

700,000
Electric vehicles equipped every year with Beauvoir lithium production

PROJECT OWNERS

Imerys, the EMILI project owner, is a French company with sales of €4.3 billion and operations in more than 40 countries. A specialist in performance minerals, the Group aims to position itself as a key player in the energy transition through the EMILI project. With the same objective in mind, Imerys also has another lithium mining project on one of its UK sites (in Cornwall) and already produces carbon black and graphite, both used in batteries for electric vehicles.

RTE is the project owner for the two high-voltage electric connections in the EMILI project. As operator of the public electricity transmission grid, the company has a public service mission: to guarantee the supply of electricity at all times, throughout France. Working to ensure access to low-carbon electricity, RTE is pursuing three aims to make a success of the energy transition: optimising the French power system, driving the energy transition through innovation and the transformation of industrial infrastructure, and informing the decisions of public authorities.

[1] Calculation based on the estimated share of lithium hydroxide in the batteries of electric vehicles (including hybrid vehicles) in 2026, i.e. 45.2 kg of LCE, corresponding to approximately 663,000 vehicles equipped (rounded to 700,000).

WHY DEVELOP **A LITHIUM MINE?**

AN ESSENTIAL METAL FOR OUR ENERGY TRANSITION

Sometimes referred to as "white gold", lithium has characteristics that make it an essential metal for the construction of electric vehicle batteries. Lithium is the lightest solid metal in the periodic table of elements, has a low melting point (180°C) and high thermal conductivity. Its major application is energy storage in the form of lithium-ion batteries.

These batteries have a number of advantages: they charge quickly, last longer than other types of batteries and have a higher energy density, which means that they are lighter and last longer.

THE CHALLENGES OF DECARBONISING MOBILITY

The transport sector alone accounts for 24% of global greenhouse gas emissions. In 2019, 31% of emissions in Europe came from transport. Decarbonising this sector is therefore not only a necessity but an obligation if the European Union is to achieve its aim of carbon neutrality: as part of the European Climate Package ("Fit for 55"), the European Union voted in 2022 to ban the sale of new internal combustion vehicles from 2035.

Against this backdrop, the French government is keen to support the decarbonisation of the automotive sector and has set itself the target of producing two million electric vehicles a year in France by 2030. As a result, investment plans have been launched (France Relance, France 2030), various schemes have been put in place to subsidise the purchase of more sustainable vehicles (zero-rate loan, conversion bonus) and social leasing at €100 per month has been introduced to "*enable the most modest households to switch to electric*".

PLANS FOR BATTERY MANUFACTURING PLANTS (GIGAFACTORIES) IN FRANCE

To meet the demand from French carmakers for lithium-ion batteries, gigafactory projects are springing up across Europe. In France, the first plant was inaugurated in Douvrin, Nord-Pas-De-Calais, in 2023, the first of four sites planned for the future electric "battery valley" in this former mining region of northern France.

LITHIUM SUPPLY

Over the past decade, global demand for lithium has doubled. **As a result of the transition to electric vehicles, the global consumption of this metal is expected to increase 42-fold by 2040 compared to 2020, according to the International Energy Agency (IEA).**

Lithium production is increasing significantly globally, yet market pressure for lithium remains high. In addition, a number of phenomena need to be taken into account:

- Although batteries are beginning to be produced in Europe, the continent is still dependent on imports (79% of batteries come from China);
- The need for lithium is growing exponentially and, by 2030, supply may not be able to meet global demand;

- Lithium production is highly concentrated in three non-European countries: Australia, Chile and China.

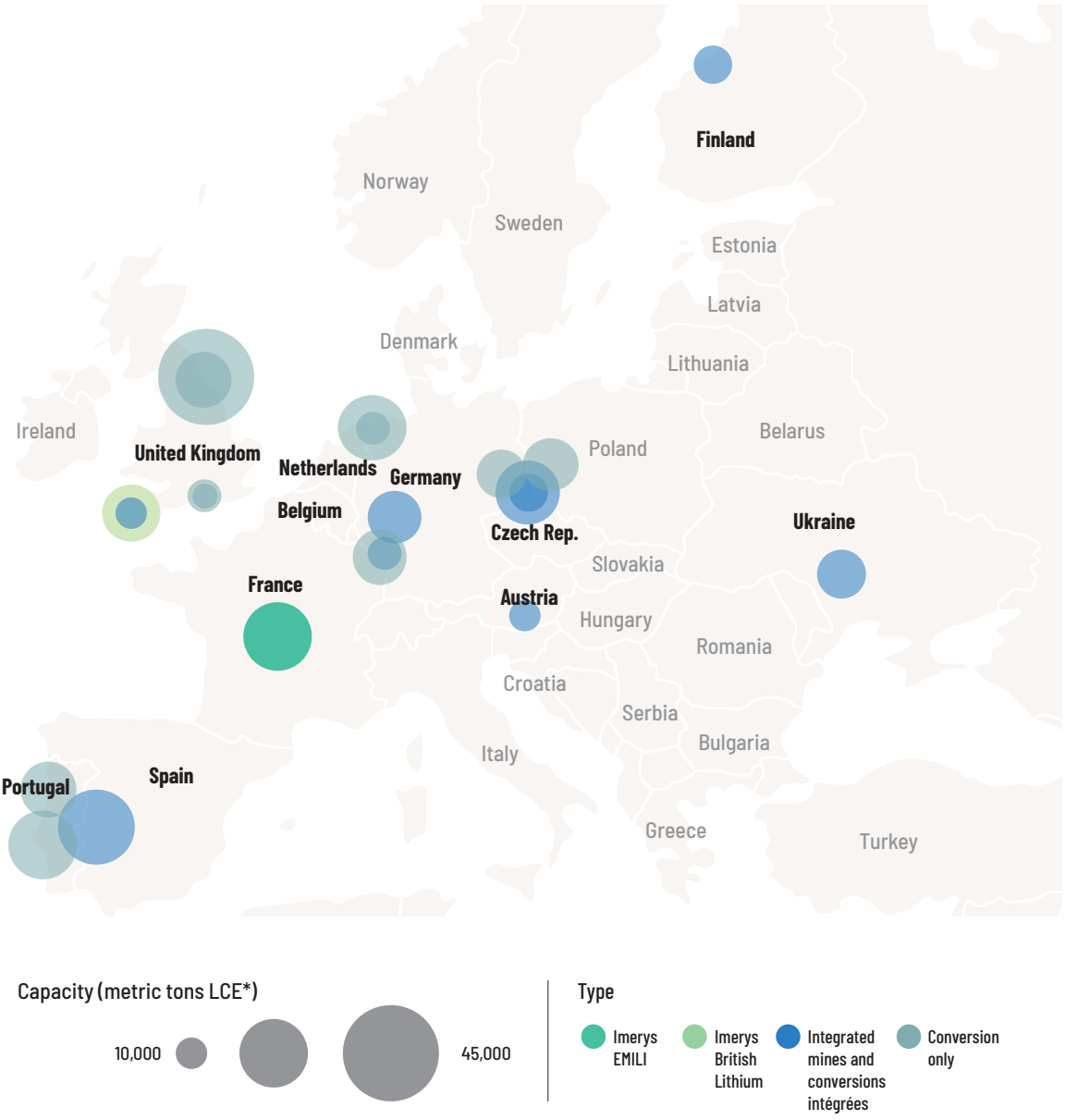
This situation poses risks for manufacturers, who are in a situation of dependence. Environmental issues also need to be taken into account in order to implement more respectful practices when opening new mines.

In France, exploration of lithium resources has begun. As of 1 January 2024, no fewer than seven exclusive research permits for mines including lithium have been issued:

- The exclusive research permit known as the "Beauvoir Permit" (EMILI project);
- Three exclusive research permits for the Bas-Rhin area ("Outre-Forêt Lithium Permit", "Illkirch Lithium Permit" and "les sources alcalines");
- Three exclusive research permits for Haute-Vienne ("Douillac", "Fayat" and "Pierrepinet").

Eight other exclusive research permits involving lithium are currently under review. Note also that the extraction techniques are not the same for these different exclusive research permits.

MINING AND CONVERSION PROJECTS IN EUROPE



Source: https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/metals/121123-new-lithium-mining-refining-projects-set-to-strengthen-europes-battery-supply-chains

METAL ON **THE EUROPEAN LIST OF CRITICAL RAW MATERIALS**

In 2023, the European Commission updated the list of critical raw materials (European Critical Raw Materials Act). This criticality is expressed in two ways: **the likelihood of disturbances to the supply chain** of the substance and the **vulnerability of the system** to such contingencies.

Lithium is affected by both of these criteria. European legislation on critical raw materials thus aims to guarantee secure and sustainable supplies for the European Union by strengthening all stages of the European critical raw materials value chain. Two targets for 2030 in the future European Regulations illustrate this commitment in particular:

- **Extraction in the European Union must produce at least 10% of its annual consumption of strategic raw materials;**
- **And processing in the European Union must produce at least 40% of its annual consumption.**

These European initiatives, backed up by substantial support from the French government, demonstrate, in particular, the importance of local lithium supplies.

Lithium hydroxide sample, battery quality.

THE EMILI PROJECT: INTEGRATED SHORT SUPPLY CHAIN PRODUCTION OF LOW-CARBON LITHIUM

UNDERGROUND EXTRACT BEAUVOIR GRANITE

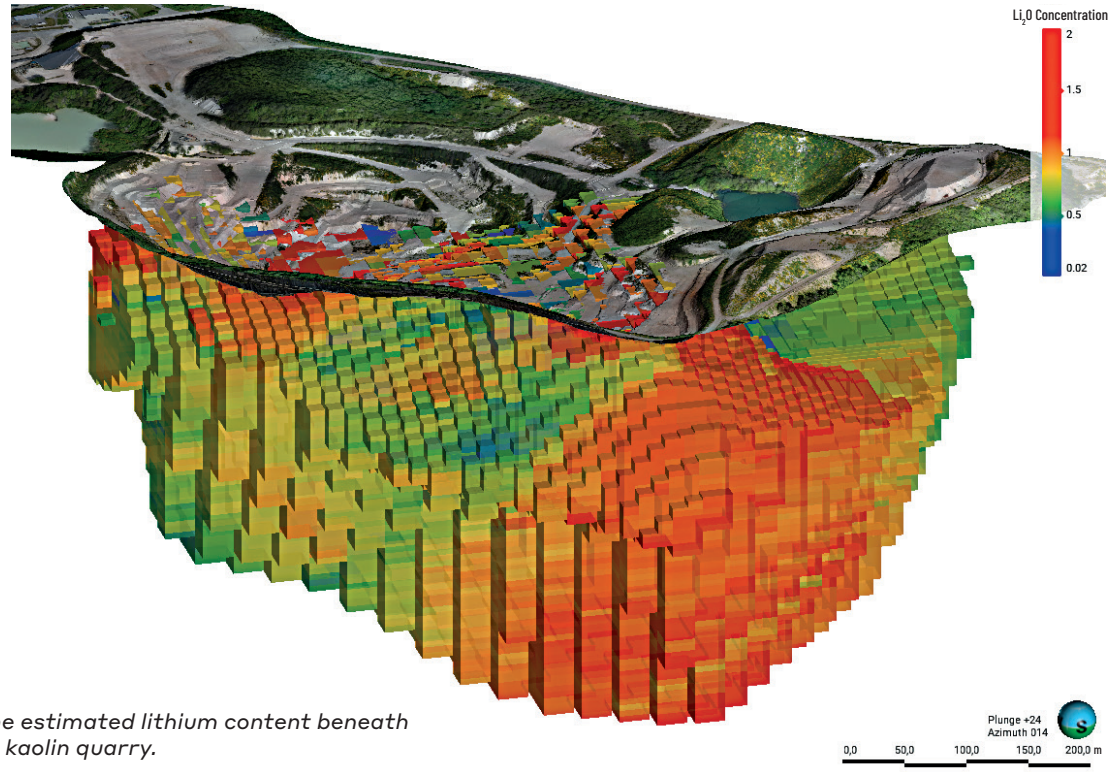
In the 1980s, the French Geological Survey (Bureau de Recherches Géologiques et Minières, BRGM) conducted a nationwide search for metal alloys for the aerospace industry. At Échassières, a 900-metre-deep borehole revealed a rock particularly rich in lithium, with a lithium oxide content of 0.9% (Li_2O): this rock is the Beauvoir granite, which Imerys proposes to mine underground.

In addition to its lithium concentration, Beauvoir granite has the advantage of being easy to access (the deposit containing the lithium is located at a shallow depth and its lateral extension is reduced to the existing site footprint). In addition, the underground mine would preserve the landscape and minimise the environmental impact of the project.

WHAT IS LITHIUM CONTENT?

The lithium content of a mine refers to the concentration of lithium in the ore extracted. It is a key factor in assessing the potential profitability of a lithium mine and its environmental impact. The higher the lithium content, the greater the concentration of lithium in the ore. The lithium content of the Beauvoir deposit is around 0.9% Li_2O, while many other deposits in Europe are around 0.6%. Today, elsewhere in the world, some projects are being undertaken with a much lower content, of the order of 0.2%, meaning that much more energy has to be expended and more ore extracted to obtain the same quantities of lithium.

Mining of the deposit would begin at its lowest point at a depth of around 400 metres and continue upwards, in stages, to 75 metres below the surface. The granite would be extracted by opening galleries and excavating chambers measuring 25 metres high and across. Up to eight chambers would be mined simultaneously before being backfilled with non-recyclable materials. The granite would be crushed underground before being brought to the surface.



3D view of the estimated lithium content beneath the Beauvoir kaolin quarry.

A PLANT **TO CONCENTRATE THE ORE** AS IT LEAVES THE MINE

After extraction comes the concentration stage, which consists of **separating the minerals contained in the granite:** lithiniferous mica, quartz, feldspar and other accessory minerals. In the case of the EMILI project, concentration would be carried out in a plant on the Beauvoir site.

The concentration plant would produce:

- 330,000 dry metric tons of lithiniferous mica;
- 420,000 dry metric tons of feldspar for the European ceramic or feldspar sand market.

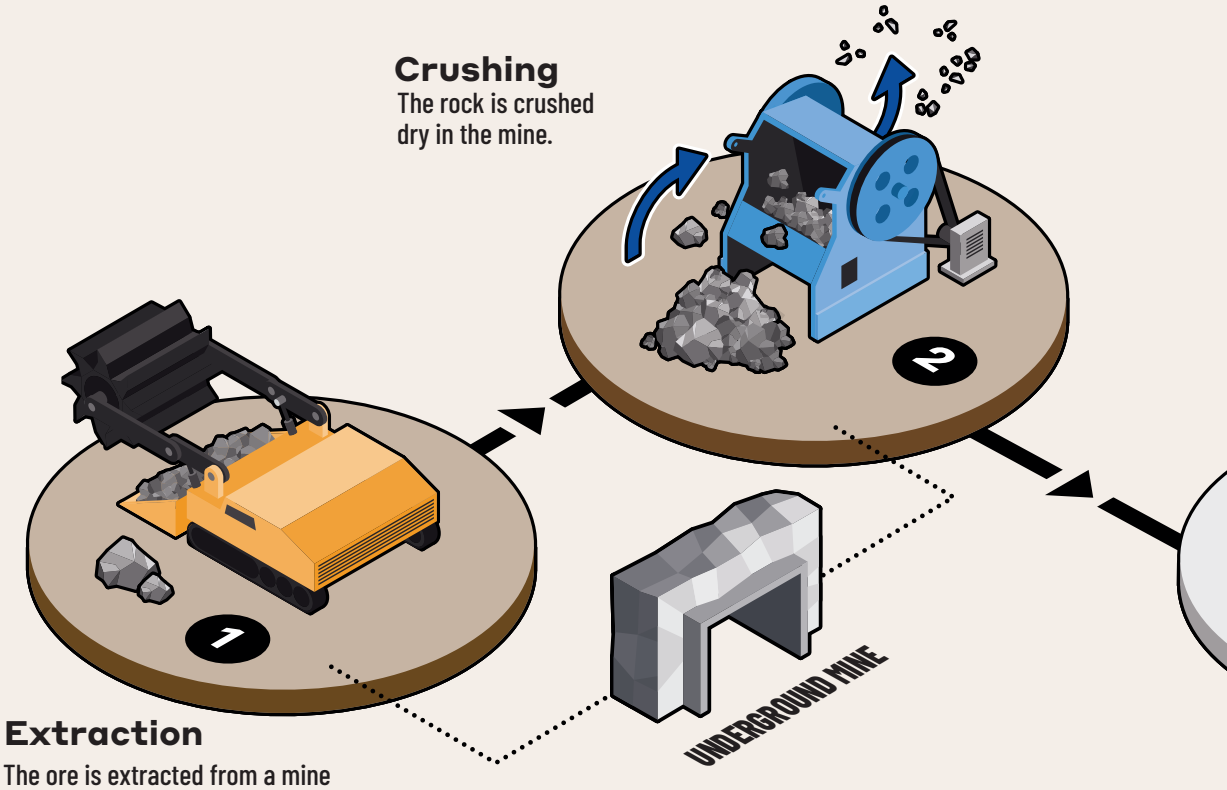
The Beauvoir site

Electrical connection of the mine and plant by RTE

As co-project owner, RTE, the public electricity transmission system operator, will be responsible for routing the electricity to the mine - which will require the creation of a 63,000 volt underground link between two substations, around 14 kilometres apart and spanning four municipalities: Bellenaves, Coutansouze, Lalizolle and Échassières. Although the final route has not yet been defined, the use of the road network (tracks, local and departmental roads) seems to be a suitable solution. The land in the study area, which is crossed by departmental road 987, is mainly covered with forest, in particular, the Colettes national forest.

CONCENTRATION

The stages of the concentration process (from extraction to filtration)

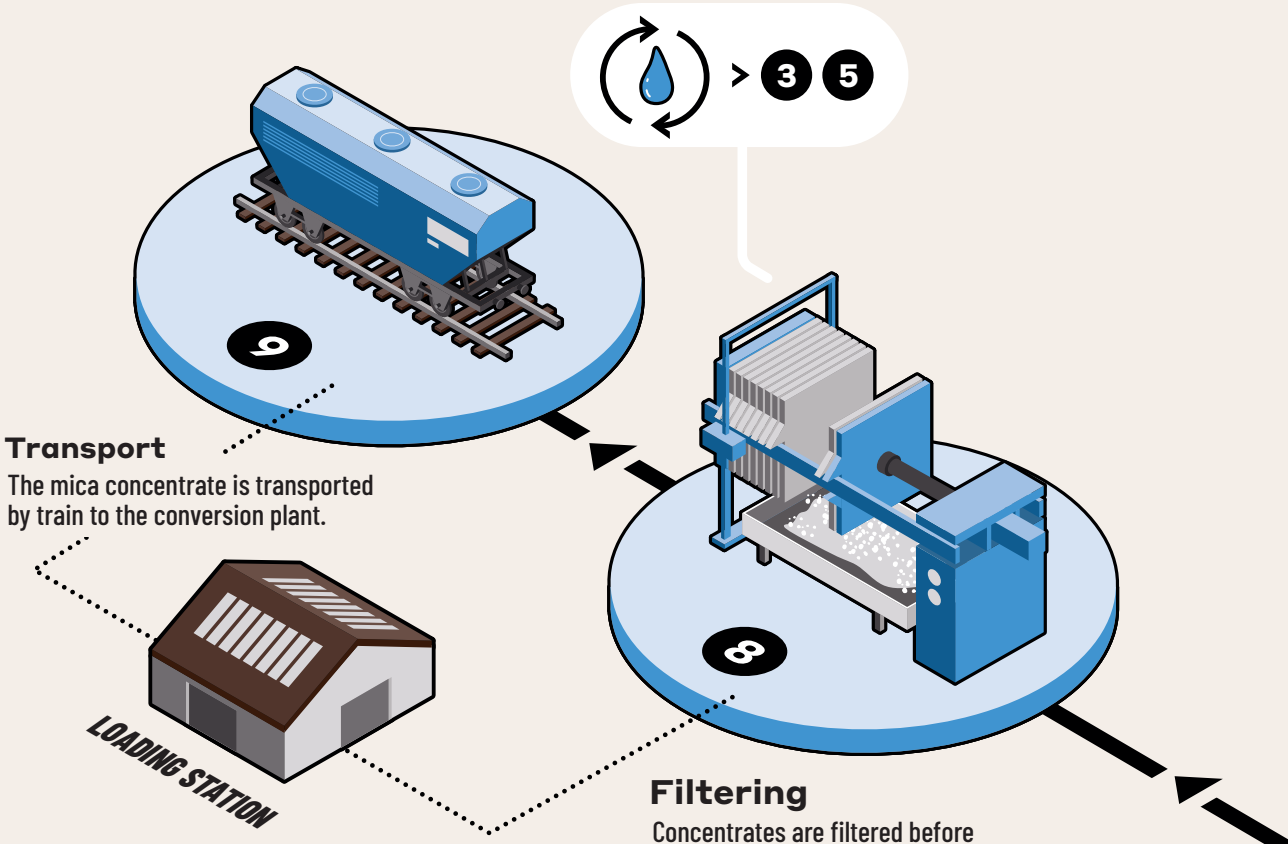


Crushing

The rock is crushed dry in the mine.

Extraction

The ore is extracted from a mine underground to avoid nuisance and preserve the landscape.

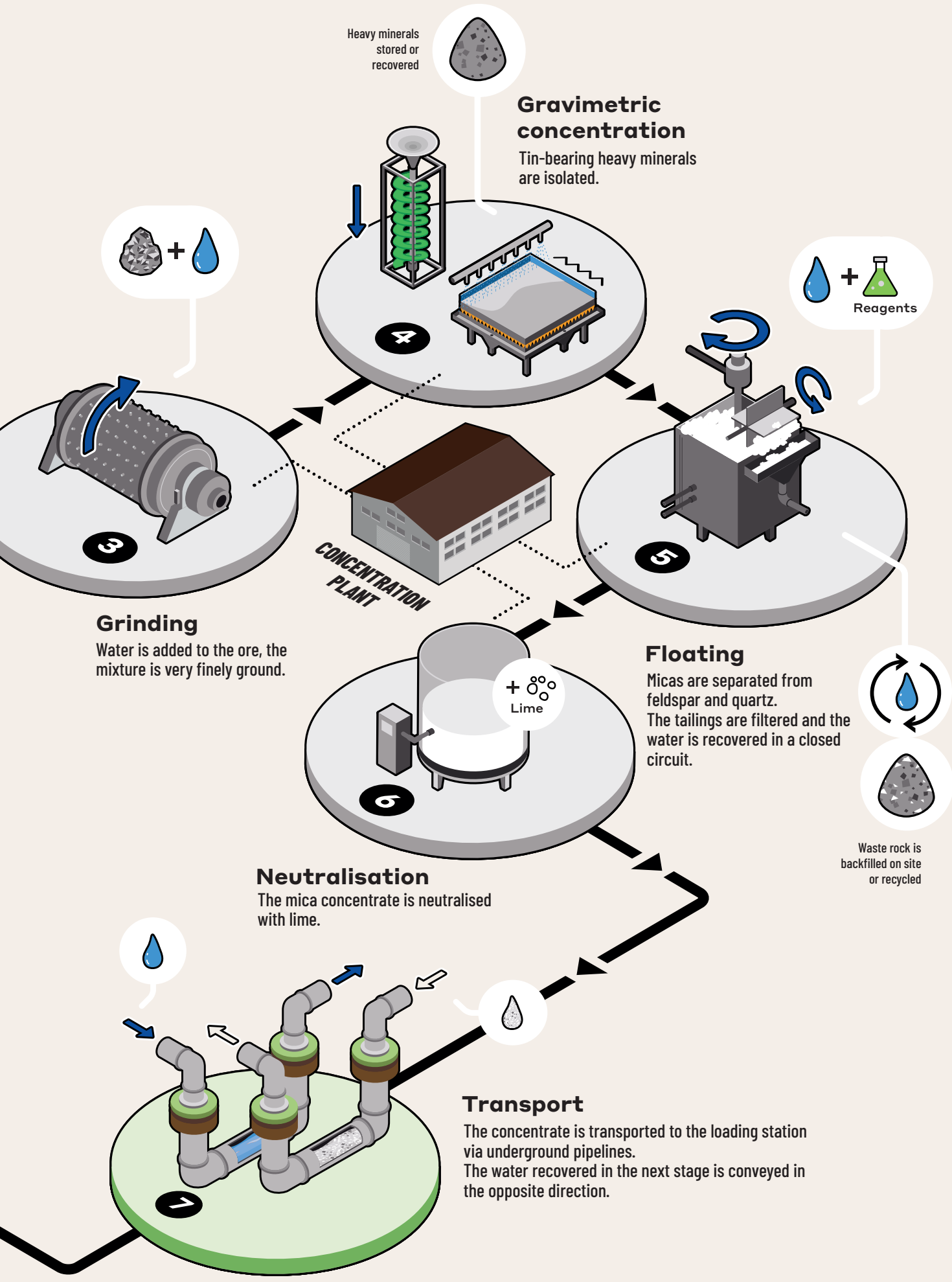


Transport

The mica concentrate is transported by train to the conversion plant.

Filtering

Concentrates are filtered before transport. Water is recovered for grinding and flotation.

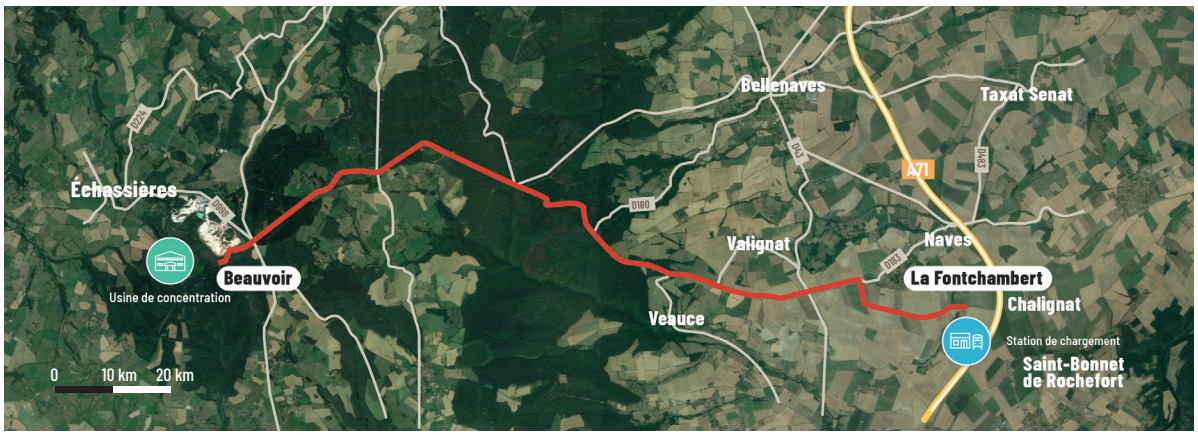

Heavy minerals stored or recovered
Gravimetric concentration
Tin-bearing heavy minerals are isolated.
Reagents
CONCENTRATION PLANT
Grinding
Water is added to the ore, the mixture is very finely ground.
Floating
Micas are separated from feldspar and quartz.
The tailings are filtered and the water is recovered in a closed circuit.
Lime
Waste rock is backfilled on site or recycled
Neutralisation
The mica concentrate is neutralised with lime.
Transport
The concentrate is transported to the loading station via underground pipelines.
The water recovered in the next stage is conveyed in the opposite direction.

LOW-CARBON TRANSPORT INFRASTRUCTURE

To reduce greenhouse gas emissions, as well as the risks and nuisances associated with road transport, Imerys has chosen to implement **low-carbon methods of transport.** After mixing in water, the lithiniferous mica and feldspar concentrates would be transported by pipeline to a train loading platform.

The route envisaged (below) for the pipelines linking the concentration plant to the loading platform would follow the existing departmental roads (D987, D118, D183) and local roads or rural tracks downhill (with an approximate difference in height of 470 metres). Three parallel pipelines, buried about one metre underground, would be laid: the first for the lithiniferous mica concentrate, the second for the feldspar concentrate, and the third for the water that would return to the concentration plant.

PROPOSED ROUTE FOR THE PIPELINES LINKING THE PLANT TO THE TRAIN LOADING PLATFORM



The loading platform has a dual function as a **storage site** and a loading area. As the frequency of trains depends on SNCF Réseau allocation, it will be necessary to provide space to store products while they are waiting to be loaded. The lithiniferous mica can be transported by train to the conversion plant, and the feldspar to customers.

Of the sites studied, "La Fontchambert" best meets the technical requirements and is the most favourable solution in terms of environmental integration.

CHOICE OF SHORT SUPPLY CHAIN TO PROCESSING: THE **CREATION OF A CONVERSION PLANT** IN LA LOUE

The final stage of the EMILI project, the conversion of lithiniferous mica concentrate into lithium hydroxide, involves separating the various elements of lithiniferous mica (iron, aluminium, silicates, potassium and lithium oxide). To achieve this, a combination of processes is envisaged: a thermal process, calcination, then a succession of processes: **leaching, purification and crystallisation.**

As with the loading platform, a number of sites were studied to determine the location of the conversion plant. A number of technical criteria had to be met for the site to be approved, including good access to the national rail network, sufficient land for the facilities, particularly the rail terminal, and the possibility of setting up industrial activities on the site. However, the proximity of the two sites is a definite advantage in terms of helping to revitalise the area.

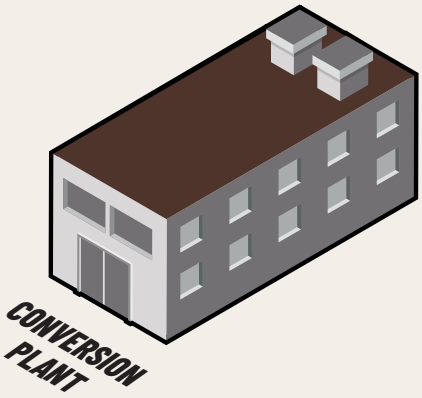
The conversion plant also requires an electrical connection to the public electricity transmission grid, provided by RTE, and access to the motorway network.

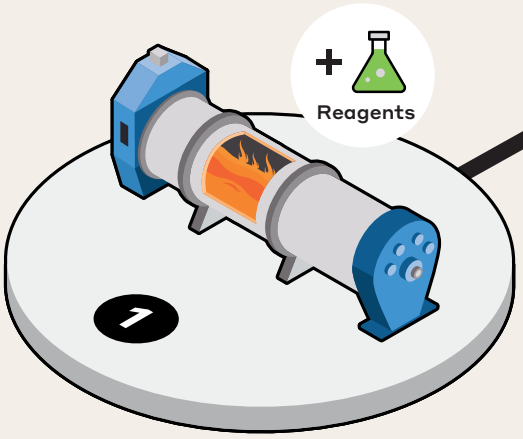
SPOTLIGHT ON INDUSTRIAL PILOT PLANTS

Prior to financing the EMILI project, Imerys would build pilot concentration and conversion plants (a small-scale replica of industrial plants) to demonstrate the project's technical and economic feasibility. The concentration pilot project would be located on the Beauvoir kaolin site. The conversion pilot project would move to the La Loue site where the conversion plant would eventually be located. This pilot plant would be designed to process the concentrate from the concentration pilot plant and produce battery-grade lithium.

→ **For further information, please refer to Chapter 3 of the Project Owner's File (DMO) "EMILI project characteristics".**

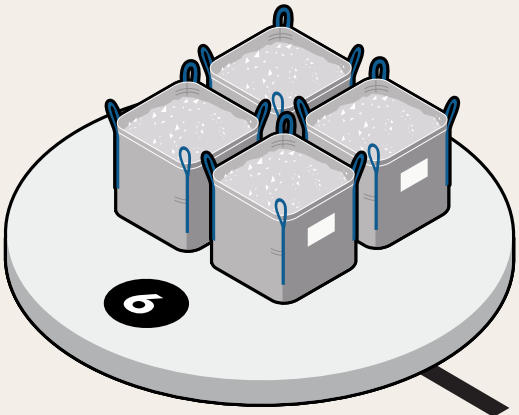
CONVERSION





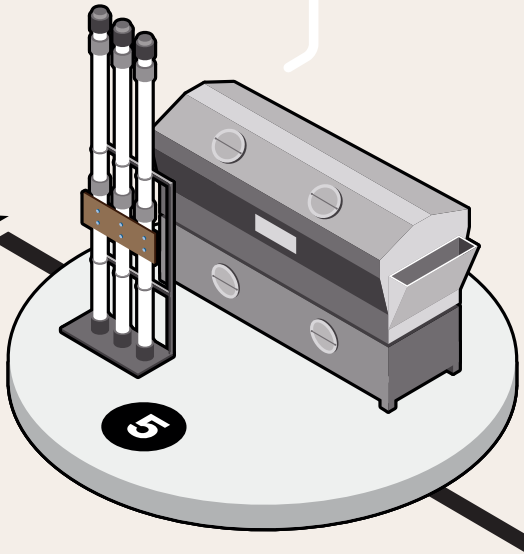
Calcination

The mica concentrate is heated with reagents to modify its structure and allow the solubilisation of lithium.



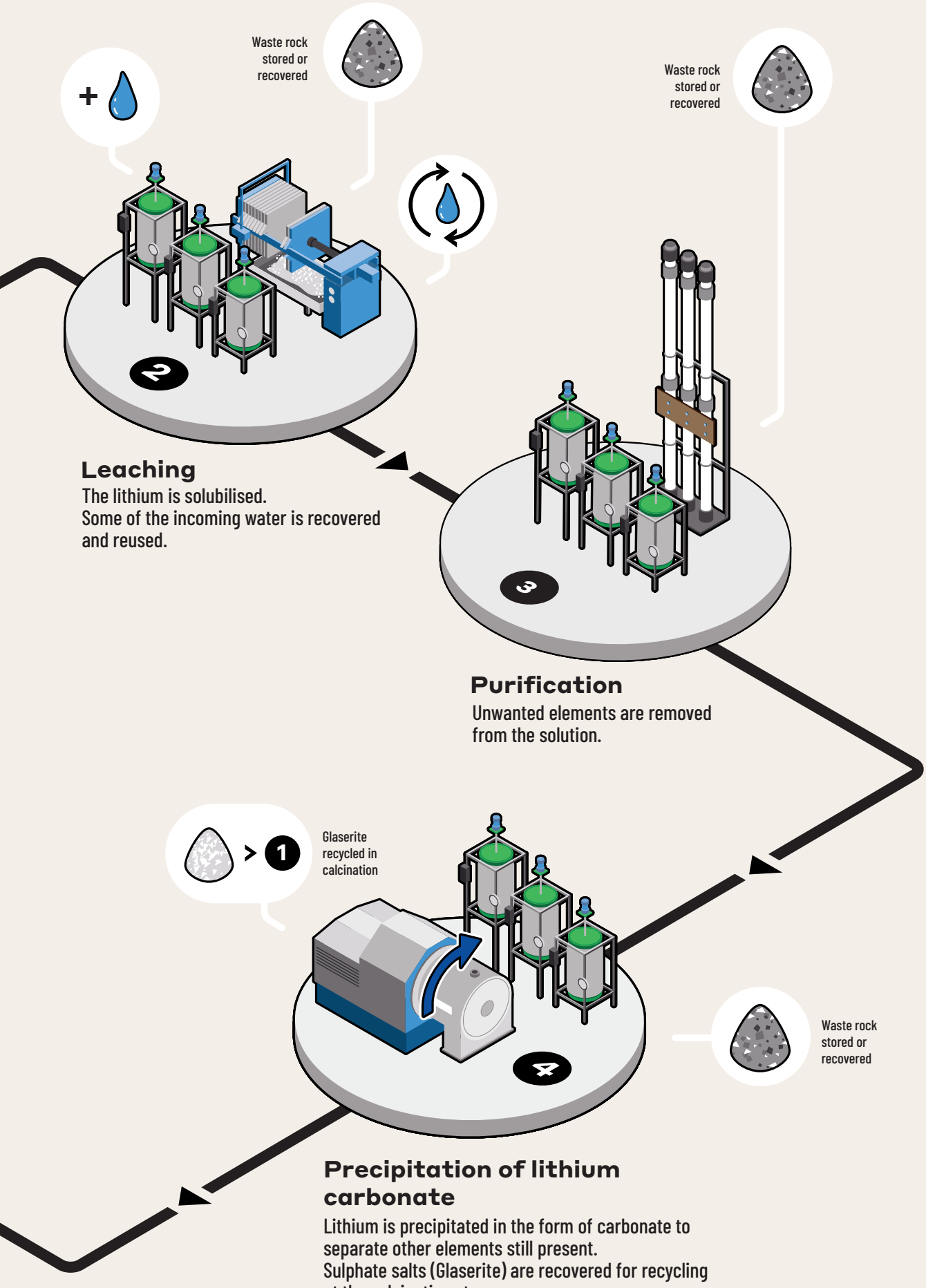
Storage

The finished product is stored in large bags.



Conversion to lithium hydroxide

Lithium carbonate is converted into a hydroxide solution which is precipitated as lithium hydroxide, the finished product.



Leaching

The lithium is solubilised.
Some of the incoming water is recovered and reused.

Purification

Unwanted elements are removed from the solution.

Precipitation of lithium carbonate

Lithium is precipitated in the form of carbonate to separate other elements still present.
Sulphate salts (Glaserite) are recovered for recycling at the calcination stage.

CONSIDERATION OF ENVIRONMENTAL ISSUES: A PRIORITY FOR IMERYS

While access to lithium resources is a major issue for the European Union, the impact of its extraction also needs to be taken into account, from both an environmental and a social point of view. If the project goes ahead, further detailed studies will be carried out to supplement the impact assessments currently underway. Imerys estimates that at least 20% of the cost of the investment is linked to structural choices to take account of environmental and social issues.

MANAGEMENT OF WASTE ROCK AND TAILINGS: A FACTOR TAKEN INTO CONSIDERATION FROM THE OUTSET OF THE PROJECT

If the EMILI project goes ahead, it will generate mine waste rock and concentration and conversion tailings. Managing these materials is a real technical and economic challenge. Technical, because solutions have to be found to prevent these materials from accumulating and to ensure that they are properly stored and treated. Economic, because managing these products can be costly.

Reducing the volume of concentration tailings at the source

Mine tailings are the products made up of soil and rock excavated during the operation of a mine, after extraction of the commercially recoverable part of the ore (in this case, the lithiniferous mica). With the EMILI project, Imerys is seeking to reduce the volume of waste rock at source by:

- Recovering some of the ore and elements contained in the Beauvoir granite, in particular, feldspar and tin;
- The use of waste rock and tailings to gradually backfill the mine's extraction chambers. However, due to the increase in volume of mine rock[2], it is not possible to put everything that has been extracted back underground (a rock takes up more volume once it is extracted than in its original form).

Imerys plans to use the remaining 510,000 metric tons per year of waste rock and tailings to backfill the Beauvoir Kaolin Quarry.

Recovering conversion co-products and tailings

Conversion enables lithium to be recovered in the form of lithium hydroxide. To achieve this, it must be dissociated from the other constituents of the mica (iron, aluminium, silicates, etc.) using reagents. These different elements react with each other to form new products.

Some of them could be recycled. Calcium carbonate (limestone), for example, is one of the most widely used minerals in the industry and could find new outlets. Another example is sodium chloride, which is generally used to remove snow and ice from roads.

However, some elements are not yet commercially viable. Leaching and neutralisation tailings make up the bulk of these and could be used to backfill old quarries. However, discussions between manufacturers are continuing in order to find as many solutions as possible for the majority of the tailings.

WASTE ROCK

Waste rock is the soil and rock excavated during the operation of a mine, while the commercially valuable part of the ore is being recovered. Waste rock is the rock left over from mining operations that has no commercial value. This waste rock is used to backfill the mine or to restore the site.

TAILINGS

Tailings are the solid products that remain after processing the ore to extract the relevant substances. Tailings may include unrecovered substances and/or chemicals used in the ore processing process.

[2] The increase in volume of the mine rock also known as the "expansion rate" or "expansion factor" refers to the increase in volume of the rock when it is extracted as a result of its fragmentation. In other words, not everything that has been extracted can be backfilled.

SITE LOCATION: CHOOSING A SITE **THAT PRESERVESTHE LAND AND THE NATURAL ENVIRONMENT**

In choosing sites for the EMILI project, Imerys has endeavoured to limit the project's impact on land as much as possible. Firstly, an **underground mine** has the advantage of taking up less surface space than an open-cast operation. The proximity of the Colettes forest, part of which is Natura 2000 classified, has been taken into account by Imerys, which is committed, via its environmental and social responsibility charter, to preserving biodiversity at all its sites from mining through to rehabilitation.

The conversion plant would cover between 30 and 40 hectares of industrial wasteland located north of Montluçon in a mixed zone of commercial, sporting and industrial activities. By not locating the plant in a previously undeveloped area, the project's impact on the natural environment will be considerably reduced. As for the **train-loading platform**, the project provides for its installation in a rural environment on cultivated land, close to a few hamlets. Its surface area will be limited to around 15 hectares, and discussions will be held with landowners and farmers to define the appropriate compensation measures, and with local residents to ensure optimum integration into the landscape.

PRESERVATION OF THE LIVING ENVIRONMENT, A CONDITION FOR THE PROJECT'S LOCAL INTEGRATION

Imerys' objective is to design a project that minimises the impact on the human environment. "Various options have been identified" on each site to ensure the best possible integration of the facilities into their environment.

At the **Beauvoir site**, the choice of underground mining and underground crushing greatly reduces potential nuisances compared with open-cast mining. Imerys will ensure compliance with standards and the preservation of the living environment, as is already the case for the existing kaolin operation, in order to limit dust emissions and noise. These measures could include watering the tracks, constructing enclosed buildings, providing appropriate storage facilities for materials, etc.

Several locations were studied for the **loading platform**. Imerys chose the La Fontchambert site in the municipalities of Saint-Bonnet-de-Rochefort and Naves, where nuisances can be mitigated more easily by effective landscape integration. La Fontchambert would be partly hidden by the route of the A71 motorway. In addition, the operations would take place indoors, which would limit noise pollution for local residents.

For the **conversion plant** at La Loue, the La Fontchambert calcination furnace would be equipped with a dust and gas filtration system to comply with emission standards and protect air quality.

WATER MANAGEMENT: DECISIVE CHOICES FOR RESPONSIBLE USE

On average, 90% of the water used in the EMILI project will be recycled. Water consumption has been estimated at 1.2 million cubic metres per year (600,000 m^3 for concentration and transport by pipeline, 600,000 m^3 for conversion).

In-depth knowledge of water resources thanks to investigation campaigns

Three investigation campaigns were carried out (November 2022, April and December 2023) around La Bosse. These studies will make it possible to understand the current behaviour of groundwater and surface water, and to assess their quality. These data are essential for identifying the potential impacts of the mine, both on water quantity and local water quality. Initial results have shown that water circulates mainly in the micaschist (the rock above the Beauvoir granite), feeding nearby springs and streams. Conversely, the Beauvoir granite appears to be virtually impermeable.

Studies have also been carried out over a wide area (beyond the Bosse massif) to identify and characterise several potential sources of water supply for the EMILI project.

Withdrawal limited to what is strictly necessary, accompanied by reduction measures

In the light of these studies, Imerys has decided not to draw water from the La Bosse aquifer. The Beauvoir site would therefore be supplied from the Sioule. The flow that Imerys would like to draw from the Sioule would be around 70m^3/h, amounting to 0.6% of the flow at the lowest water level over an average of five years. However, as the Sioule is likely to be affected by droughts, Imerys is looking for ways to reduce its withdrawals, in particular by creating water reserves. Compatibility with the master plan for water development and management (SDAGE) and the water development and management plan (SAGE) will also need to be addressed. Finally, to keep water consumption to a minimum, the Beauvoir site's facilities would be designed to operate as much as possible in a closed circuit. These options are all the more valuable in that they help to reduce waste (recirculation rate estimated at over 95% for the concentration plant).

For the conversion plant, Imerys worked with the Montluçon urban community to look into the possibility of reusing treated water from the local wastewater treatment plant. This recycling of grey water, after a purification stage, would limit or even avoid any direct withdrawal from the natural environment (it would amount to approximately 10% of the treatment plant's flow).

THE ZERO LIQUID DISCHARGE APPROACH

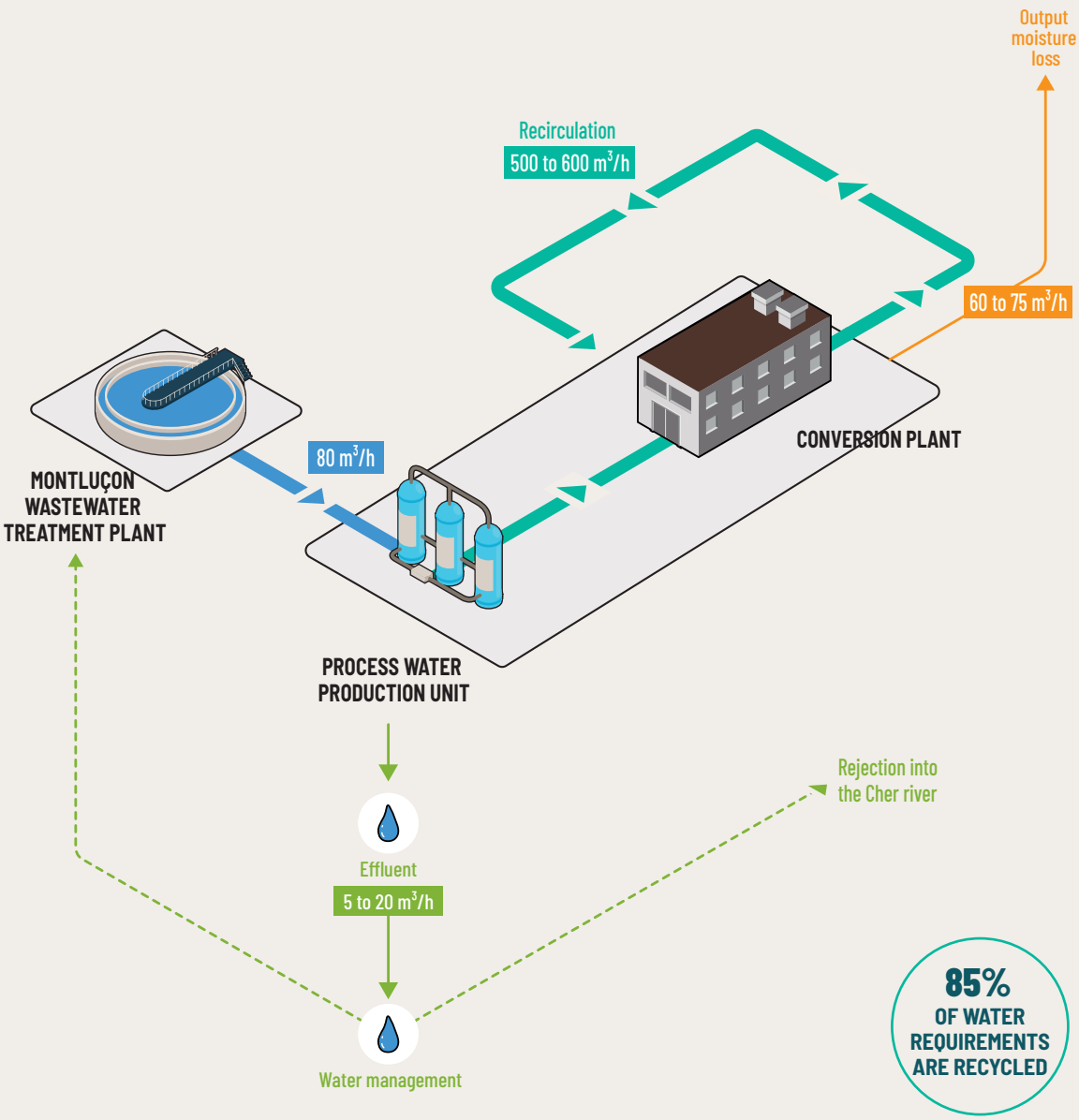
Imerys is making an innovative choice by investing in this type of installation, which is still not very widespread in France.

The term, Zero Liquid Discharge (ZLD), refers to an approach aimed at completely eliminating the liquid discharge of process water. This involves treating and recycling liquid effluent produced by processes intrinsic to industrial activity, without discharging any residual liquid into the environment.

The ZLD process involves a series of treatment steps, such as reverse osmosis, evaporation, crystallisation, and other advanced techniques, to separate dissolved solids, salts and other contaminants from the water in order to produce purified water that would be recycled and residual solids that would be disposed of safely or used in a way that minimises their environmental impact.

Facilities that implement ZLD systems aim to reduce the impact on water resources, minimise pollution and optimise the use of available resources.

SIMPLIFIED WATER BALANCE FOR THE CONVERSION PLANT



→ **For further information, please refer to Chapter 4 of the Project Owner's File (DMO) "Environmental and health impacts and industrial risks of the EMILI project", Points 1-6 and 8-9.**

ENSURING **THE INDUSTRIAL SAFETY OF THE SITE:** A PRIORITY FOR IMERYS

As with any industrial project, hazard studies will be carried out to identify the risks and determine the measures to be implemented. Imerys' experience will enable it to identify possible risks, implement best practice and provide all the necessary training for its staff.

Underground mines are just as safe as open-cast mines, particularly because operations are automated. Sub-level blasting, as will be practised at the Beauvoir site, is a safe and commonly used method. Explosives would be used. This is a standard practice and has already been used in the kaolin quarry. The use of explosives is reserved for specialist operators and strict safety procedures are followed.

The use of chemicals should be limited. These products are commonly used in other industries and are therefore regulated. Their handling is therefore controlled by professionals with the proper training. In addition, Imerys has chosen safe processes for the conversion plant, such as calcination, which avoids the need to use large quantities of acids.

ESTIMATING THE OVERALL CARBON FOOTPRINT OF THE EMILI PROJECT AND **ENERGY ISSUES**

Discussions about electric vehicles and their environmental advantages over internal combustion vehicles have highlighted the large proportion of their carbon footprint linked to the extraction processes for the materials that make up their batteries. Reducing greenhouse gas emissions during extraction is therefore a priority.

The production of one metric ton of lithium through hard rock mining emits an average of 15 metric tons of CO_2[3] equivalent. **Imerys estimates that, within the framework of the EMILI project, emissions per metric ton of lithium hydroxide monohydrate (LHM*) produced would be around 9.8 mt CO_2**equivalent. This performance can be explained, in particular, by the French energy mix and the modes of transport selected by Imerys. The mining fleet would be electric, ore would be transported by electric conveyors and concentrates by pipeline and then by train. These choices mean that trucks will not be used, considerably limiting the project's carbon footprint[4].

Total electricity consumption for the entire EMILI project is estimated at around 446,000 megawatt hours (MWh) per year. Measures to optimise this consumption are currently being studied.

Gas would be used to fuel the mica calcination process at the conversion plant. Gas requirements are estimated at 495 GWh/year. GRDF would be able to supply the necessary volume from its local network.

→ For further information, please refer to Chapter 4 of the Project Owner's File (DMO) "Environmental and health impacts & industrial risks of the EMILI project", Point 7.

[3] CO_2 equivalent is a metric measurement used to compare the emissions of various greenhouse gases on the basis of their global warming potential, by converting the quantities of the various gases emitted into the equivalent quantity of carbon dioxide with the same global warming potential.
[4] The project benefits in particular from the French energy mix, which is predominantly based on nuclear energy (and therefore low-carbon).

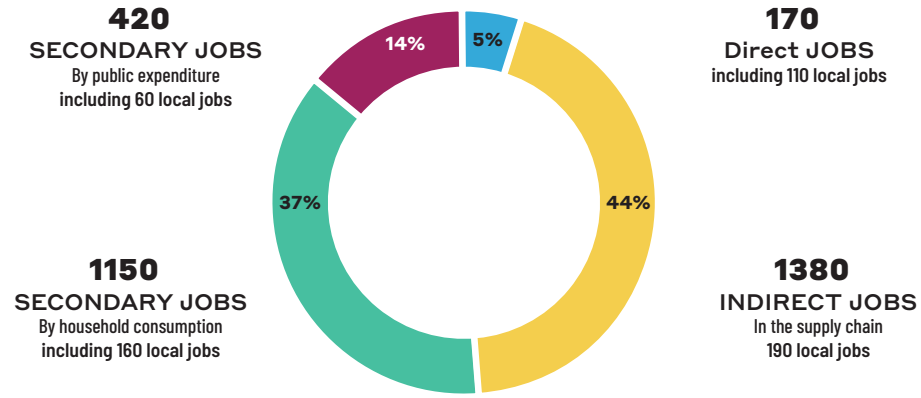
THE SOCIO-ECONOMIC IMPACT OF THE EMILI PROJECT

Imerys conducted an initial socio-economic evaluation of the EMILI project. It distinguishes two phases: work and operation. The study covers direct effects (employees, added value of the project), indirect effects (jobs supported and added value generated in the supply chain) and secondary effects (jobs supported and added value generated by household consumption and government spending).

MULTIPLE **SOURCES OF ECONOMIC IMPACT**

In its construction phase (4 years), the EMILI project is expected to support **3,120 jobs annually,** of which **520 (17%) will be in the Allier and Puy-de-Dôme departments.** These jobs would mainly be in the construction and public works sector, design offices, transport and logistics, machinery and equipment production, etc. On a local scale, some sectors would be particularly in demand, notably construction and public works, trade, service companies, the hotel industry and activities related to health, education and social services.

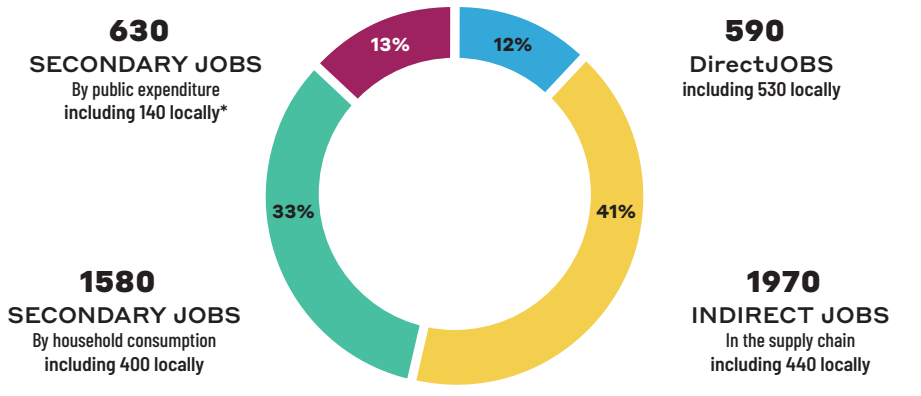
BREAKDOWN OF IMPACT SUSTAINED DURING THE CONSTRUCTION PHASE OF THE EMILI PROJECT



During its operating phase (at least 25 years), the EMILI project is expected to support **almost 4,770 jobs annually,** of which almost a third **(1,510)** will be in the Allier and Puy-de-Dôme departments. The main sectors in demand include activities linked to the operation of the facilities (mainly direct employment), but also those related to health, education, social services, construction, transport and logistics.

As a result, the EMILI project will have a definite long-term impact on the economy of the areas concerned and could **contribute to the development** of local public services.

BREAKDOWN OF IMPACT SUSTAINED DURING THE OPERATIONAL PHASE OF THE EMILI PROJECT.



AVENUES TO BE EXPLORED TO FURTHER INCREASE LOCAL SOCIO-ECONOMIC BENEFITS

Imerys wants the EMILI project to benefit the region as much as possible.
The Group could therefore take additional steps to increase the proportion of local jobs:

- Select/favour local businesses as part of a **local purchasing strategy;**
- **Encourage the installation of new activities** that are crucial to the project (logistics, chemicals and business services, for example).

Areas that will need to be addressed: the labour market, provision of training, housing and mobility

The EMILI project will create a large number of jobs, but they will be sector-specific. This situation needs to be taken into account **in order to prepare for the challenges presented by skills availability** in the region. According to existing data, some of the skills required by the project (machine operators, chemical industry production operators, maintenance, industrial analysis laboratories and environmental health and safety) **are mostly present in the Allier and Puy-de-Dôme areas within existing companies[5].**

However, recruitment remains difficult, particularly in certain fields such as chemistry, and if the EMILI project goes ahead, **a major effort will be needed to attract new people to the mining and industrial professions, and provide them with training, with the support of local stakeholders (France Travail, AURA Region, etc.).** The housing and mobility of employees are also issues that need to be given consideration, in consultation with local authorities, government departments and companies from the building sector.

→ **For further information, please refer to Chapter 5 of the Project Owner's File (DMO) "Economic and social impact and regional implications".**

[5] Analysis carried out by UTOPIES on the France Travail and INSEE database.

WHAT WOULD THE **ALTERNATIVES TO THE EMILI PROJECT BE**

OPTION "ZERO": EMILI PROJECT DOES NOT PROCEED

The Beauvoir site is home to a lithium deposit with an exceptionally high lithium content. Although other research permits have been issued in France, these relate to smaller deposits. Abandoning the EMILI project would therefore mean maintaining France's **dependence on lithium imports** and turning a blind eye to a market reality: sales of electric vehicles are booming and **French and European manufacturers, who are investing massively in battery manufacturing plants, need to be supplied with raw materials.**

Abandoning the EMILI project would also have significant environmental consequences due to the lack of visibility on environmental and social standards in many of the countries where mining activity takes place.

Having solid ESG credentials (responsible mining, carbon and environmental footprint of the project) is as essential as the issue of local sourcing.

"I welcome the launch by Imerys of the first low-carbon lithium operation in France.
This project, which is exemplary in environmental and climate terms, will drastically reduce our need to import lithium and will enable us to produce nearly 700,000 electric vehicle batteries a year. It will contribute to the target set by the French President of producing two million electric vehicles in France by 2030, and will be supported by the Government."

BRUNO LE MAIRE, MINISTER FOR THE ECONOMY, FINANCE AND INDUSTRIAL AND DIGITAL SOVEREIGNTY, 24 OCTOBER 2022[6].

LITHIUM RECYCLING, THE SOLUTION TO AVOID MINING?

Recycling lithium (and strategic metals more generally) must be one of the solutions for accessing the material. However, the maturity of the industry and the availability of the material mean that at present, demand for lithium cannot be met for a number of reasons:

- The French recycling industry is still in development and not all the projects that have been launched are fully operational. In 2019, French recycling companies were able to recycle 5,000 metric tons of batteries a year, and all European players, between 15,000 and 20,000 metric tons. According to estimates by the Comité Stratégique de Filière Mines et Métallurgie (French Strategic Committee for the Mining and Metallurgy Sector) on the development of an integrated lithium battery recycling industry, Europe will need to triple its processing capacity by 2027;

[6] Emili.imerys.com

- The quantity of batteries to be recycled from electric vehicles remains fairly small, with the electric car market not really taking off until 2020. The quantities of materials recycled are therefore "marginal", in the words of the French Environment and Energy Management Agency, ADEME;
- Furthermore, a battery from an electric vehicle is only considered to be at the "end of its mobility life" when its ageing has reduced its initial storage capacity by 20 to 30%. However, it can still be used for purposes that are less demanding than mobility in the long term (stationary storage, for example). These batteries are reused before being recycled.

BATTERY REGULATION: EUROPEAN LEGISLATION TO PROMOTE THE USE OF RECYCLED RAW MATERIALS IN THE PRODUCTION OF NEW BATTERIES

While recycling alone cannot meet the challenge of access to strategic resources, it is part of the solution. A European regulation on batteries was published in 2023, and will gradually require the inclusion of recycled raw materials in the production of new batteries according to the following timetable:

- **2025:** Mandatory reporting of recycled content;
- **2031 :** 16% for cobalt, 6% for lithium and nickel;
- **2036 :** 26% for cobalt, 12% for lithium and 15% for nickel.

ARE THERE ANY **METHODS OTHER THAN UNDERGROUND MINING** FOR EXTRACTING LITHIUM?

There are two other possible methods of lithium extraction in France: geothermal lithium extraction and lithium extraction from pegmatites.

In Alsace, a number of companies are looking into the extraction of lithium from water used for geothermal energy. The processes used would make it possible to extract a lithium-enriched brine from thermal waters which, after filtration, concentration and purification, could be used to produce lithium hydroxide. However, technical and economic uncertainties remain.

Potential lithium-bearing pegmatites have also been identified in Limousin and Brittany, but these potential deposits are very small, raising questions about the cost-benefit balance of extraction projects in these areas, particularly with regard to the environment.

Given the scale of demand for lithium, these extraction methods could be complementary to hard rock extraction.

CAN WE **DO WITHOUT LITHIUM?**

Research is being carried out into the potential replacement of lithium with sodium, zinc, aluminium or magnesium. However, these technologies do not yet have the same degree of industrial maturity as lithium-ion batteries, and none of these options will be possible in the short term. It is worth noting, however, that sodium batteries are likely to have applications in part of the mobility market (small, short-range vehicles) and a few models have already been unveiled in China. It seems more probable that sodium batteries will coexist with lithium-ion batteries, rather than replace them.

In any case, lithium will maintain or increase its lead over other metals in terms of voltage, energy density and capacity.

SPLITTING THE EMILI PROJECT **UP**

The EMILI project could also be only partially launched, and two options could be considered: locating the conversion plant elsewhere in France or carrying out the concentration and/or conversion abroad. The conversion plant could be located as close as possible to its end customers in northern France.

Imerys has focused on limiting the geographic scope of the EMILI project as a whole for operational, environmental and socio-economic reasons. The choice of an integrated project also contributes to France's sovereignty over metals.

INCREASING THE SIZE / LIFE OF THE PROJECT

To the best of our current knowledge, the Beauvoir deposit could be mined for at least 25 years under the conditions described above. This period could be longer if the conclusions of the geological, process development and engineering studies, currently underway and to come, were to be more favourable than those of the scoping study presented in this document, such as a higher lithium content in the rock extracted, a better yield from the transformation process or a more suitable configuration of the equipment selected.

In the same way as they may influence the operating period, these studies could also influence the annual production of battery-grade lithium hydroxide, currently estimated at 34,000 metric tons, which will be retained at the end of the feasibility phases.

→ **For further information, please refer to Chapter 8 of the Project Owner's File (DMO) "Option Zero, Alternatives and Variants".**

STUDIES, COST, FUNDING: WHAT STAGE IS THE EMILI PROJECT AT?

The information available on the EMILI project at the public debate stage is based on the elements of the scoping study, particularly concerning the facilities and environmental issues. The scoping study identified the main principles of the project (provisional locations, possible techniques, environmental issues), its timetable and its risks.
Through the pre-feasibility studies currently underway, due to be completed before the end of 2024, optimisation is being sought through a number of additional studies.
These cover water, atmospheric emissions, noise, vibrations, landscapes, hazards, the project's carbon footprint, biodiversity and the economic and social context of the area.

COSTS AND FUNDING: A STRATEGY STILL UNDER DEVELOPMENT

Forecast Costs

- An investment of over **€1 billion** for the construction of the plants, including electrical connections;
- **Incremental investment** over the life of the mine;

Public support to date

- **€1 million** under the France Relance recovery plan;
- **€22 million** under France 2030.

NEXT STEPS

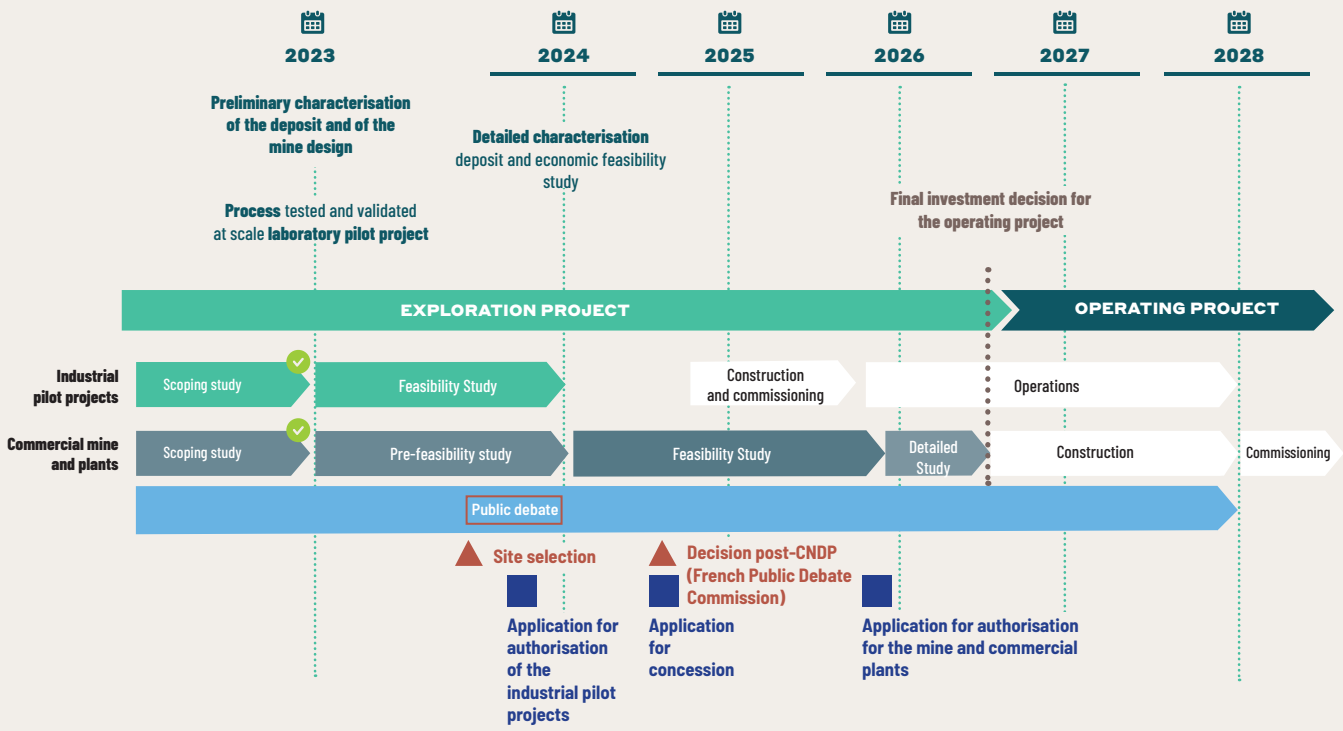
If the project continues after the public debate, authorisations will be sought under the Mining Code and the Environmental Code:

- **1st phase:** application for a mining concession;
- **2nd phase:** application for environmental permits.

As regards the electrical connections, applications will be made for authorisation under the Energy and Environmental Codes.

→ Note that the Mining Code has been reformed to ensure better coordination with the Environmental Code. As a result, changes will be made to the Mining Code between now and 1 July 2024, in particular, to strengthen the environmental and social study carried out by project developers.

PROVISIONAL SCHEDULE FOR THE EMILI PROJECT



IMERYS' EXPECTATIONS OF THE **PUBLIC DEBATE**

During this public debate, Imerys wants to share all the information about the EMILI project that is needed to carry it out as smoothly as possible. In a context of increasing scarcity of strategic resources and ecological transition requiring these resources, it is necessary for the public to understand what a mine can be in the 21st century. The public debate on the EMILI project will thus provide an opportunity to inform and discuss the appropriateness of this project, its possible alternatives, the conditions for its integration into the region and also the benefits of reviving mining activities in general in a country that has undergone significant de-industrialisation. These discussions will also enable Imerys to potentially undertake new studies.

➔ **For further information, please refer to the introduction of the Project Owner's File (DMO) "The Project Owner's Expectations Regarding the Public Debate on the EMILI Project".**

RESPONSIBLE MINING OPERATION: IMPLEMENTATION OF THE IRMA STANDARD

The aim of the EMILI project is to produce lithium in accordance with the best environmental and social practices. To achieve this, Imerys has chosen to comply with the international IRMA standard for responsible mining. This particularly demanding standard is applicable from the very outset of the project. Among other things, it provides for a high level of transparency (audit carried out by an independent third party) and regular discussions with stakeholders throughout the life of the mine, particularly with regard to impact and the management thereof.

➔ **For further information, please see Project Owner's File Factsheet No. 2**

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