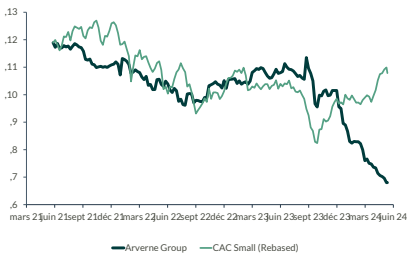
Arverne Group

Outperform ➔ | Target price : 9.00 €
Price (10/06/2024) : € 6.80 | Upside : 32%

A first-class player to make the most of subsoil energy and play lithium growth across Europe

Publication date 11/06/2024 17:51
Writing date 11/06/2024 17:43



Sources : ODDO BHF Securities, SIX

Share data	
ARVEN FP | ARVEN.PA	
Market Cap (€m)	271
Enterprise value (€m)	206
Extrema 12 months (€)	6.80 - 12.29
Free Float (%)	18.4

Performance (%)	1m	3m	12m
Absolute	-4.8	-18.0	-36.8
Perf. rel. Country Index	-5.0	-20.9	-44.3
Perf. rel. CAC Small	-7.1	-26.1	-39.3

P&L	12/24e	12/25e	12/26e
Sales (€m)	16.0	35.3	65.8
EBITDA (€m)	-7.9	-5.4	7.2
Current EBIT (€m)	-18.1	-25.2	-53.0
Attr. net profit (€m)	-17	-24	-49
Adjusted EPS (€)	-0.35	-0.50	-1.02
Dividend (€)	0.00	0.00	0.00
P/E (x)	ns	ns	ns
P/B (x)	1.8	2.2	3.7
Dividend Yield (%)	0.0	0.0	0.0
FCF yield (%)	ns	ns	ns
EV/Sales (x)	12.90	8.98	10.89
EV/EBITDA (x)	ns	ns	99.5
EV/Current EBIT (x)	ns	ns	ns
Gearing (%)	-38	34	ns
Net Debt/EBITDA (x)	7.8	-8.6	61.7

Positioned in the high-potential geothermal energy and lithium extraction markets and leveraging a breakthrough direct lithium extraction (DLE) technology and a sharp competitive edge acquired after the integration of the drilling unit, Arverne offers a compelling, disruptive profile. After two years of structuring in 2023 and 2024, the group is now on track to produce heat in 2025 and extract lithium in 2027, upscaling its business operations with a 19-fold increase in revenues between 2023 and 2027. We are initiating coverage of the stock with an Outperform rating as we see significant upside, particularly if the price of lithium goes up (c. 20% increase would lead to c. 50% increase in the target price). Target price set at € 9.

A geothermal and lithium specialist

Arverne was created in 2019, initially to provide consultancy services in the drilling sector, but the group took on an operational dimension in 2020 when it acquired Entrepose Drilling (drilling rigs). The group leveraged its drilling expertise to create Lithium de France (lithium and geothermal energy) in 2020 and develop geothermal energy (acquisition of Géorhin in 2023). Arverne is looking to give Europe greater sovereignty in the production of energy and lithium (local production), while reducing environmental costs.

Booming markets across Europe

Both these markets are expected to grow at a rapid pace. On the geothermal front, the Russian gas crisis and the fight against global warming propelled this energy source back into the spotlight. France is funding the development of geothermal energy through the € 520m Heat Fund (Fonds Chaleur). The French market could reach 100 TWh by 2040, i.e. more than 15 times the production of 2022. Driven by a booming EV market, global demand for lithium is set to jump 60% by 2025 to 1.6m tonnes. In Europe, demand is expected to exceed 300kt by 2026, marking two-fold growth.

A pure player with ESG impact?

Geothermal energy and lithium extraction are two key drivers behind energy transition. Due to the very nature of its business, the Arverne Group is having a significant positive impact on the overall decarbonisation of the economy. That said, environmental risks (pollution) and working conditions can also have a negative environmental and social impact - albeit much less significant than the positive impact of the group's activities. The company mobilised resources and safeguards to reduce societal, pollution and governance risks.

Revenue CAGR of 56% out to 2032

After a year of structuring in 2023, including investment and recruitment, the group stands ready to rev up and roll out its 2032 plan. We expect average annual revenue growth to stand at 56% by 2032, with € 871m in revenues and 65% in EBITDA margin, driven by lithium sales.

Coverage initiated with Outperform rating, TP set at € 9

We feel Arverne offers strong growth potential. Its drilling expertise, reorganisation in 2023 (going public, acquiring Géorhin, consolidating the drilling fleet, etc.) and the expected increase in lithium prices over the next few years should enable the group to meet its production targets. The risk profile remains high (the stock's low liquidity and very early-stage status), but the fall in the share price in recent months appears to offer a good entry point to play the medium-term strategy. Our DCF valuation suggests a target price of € 9. We are initiating coverage of the stock with an Outperform recommendation.

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Arverne Group

Outperform

Renewable Energies | France
Market Cap: € 271m

Target price : 9.00 €
Price (10/06/2024) : € 6.80

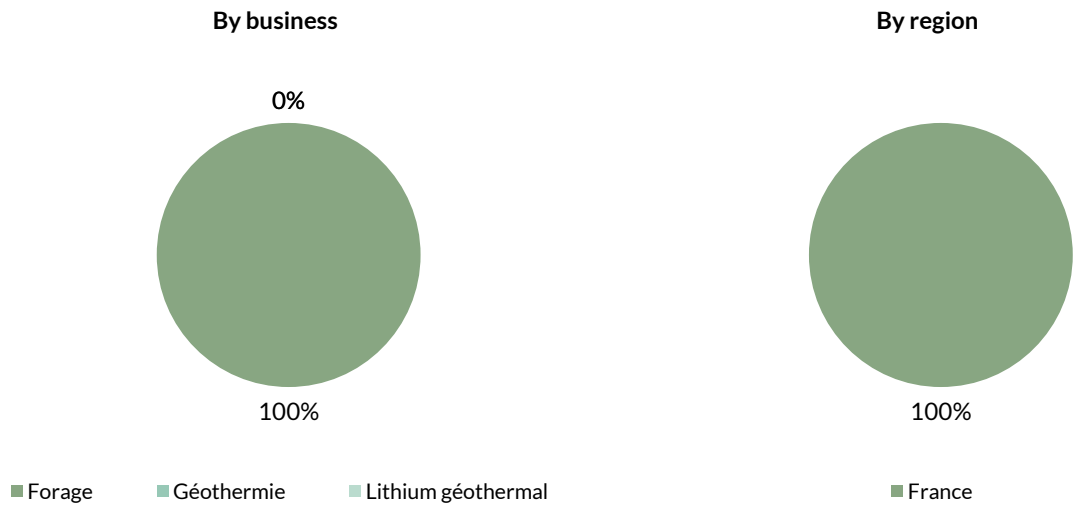
Company profile

Founded in 2018 by Pierre Brossolette, Arverne Group is a mission-driven company focused on drilling, geothermal energy, and geothermal lithium extraction. The company is drawing on its drilling expertise to expand into deep and surface geothermal energy and lithium extraction based on DLE technology, offering local sources of energy and lithium at a lower carbon cost.

Shareholders

Arosco SARL	21.45%
Autres ex-associés d'Arverne Group SAS	18.89%
Flottant	18.40%
Eiffel Essentiel SLP	9.92%
ADEME Investissement SAS	9.30%
Renault SAS	8.25%
Concert Crescendissimo SAS et Crescend'Green	7.38%
Schuman Invest	4.83%

Sales breakdown (2023)



Investment case

Positioned in the high-potential geothermal energy and lithium extraction markets, leveraging the breakthrough direct lithium extraction (DLE) technology, and benefiting from a sharp competitive edge thanks to the integration of its drilling unit, Arverne offers a compelling, disruptive profile. After two years of structuring in 2023 and 2024, the group is on track to produce heat in 2025 and extract lithium in 2027, upscaling its business operations with a 19-fold increase in revenues between 2023 and 2027. We are initiating coverage of stock with an Outperform rating as we see significant upside, particularly if the price of lithium rises (c. 20% increase would lead to c. 50% increase in the target price). The target price was set at € 9.

SWOT

Strengths

- Strong expertise in drilling
- Exclusive Exploration Permits covering the largest surface area in France
- Partnerships with major players (Equinor, Hydor, Herrenknecht)
- First lithium supply contract signed

Weaknesses

- DLE technology not yet chosen
- The story is still in its infancy (no geothermal energy or lithium produced)
- Looking for industrial players to buy geothermal energy on a continuous basis
- An extremely capex-intensive business

Opportunities

- Geographic expansion (other European countries)
- Europe's desire to reduce its dependence on lithium and energy sources
- Increase in the price of lithium
- Signing new lithium contracts

Threats

- Faster competitors becoming leaders in the lithium market
- Falling gas prices
- Difficulty in raising funds after 2025
- EVs take longer to develop

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ESG

Geothermal energy and geothermal lithium extraction offer a real opportunity to ensure the energy transition (in Europe in this case). In this respect, the Arverne Group plays a major in the overall decarbonisation of the economy. That said, environmental risks (pollution risks) and working conditions can also have negative consequences - albeit much less significant than the positive impacts of its business operations. Lastly, Arverne is naturally exposed to corporate governance risks (like all companies). To address these risks, the company mobilised resources and safeguards to minimise societal, pollution and governance risks.

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COVERAGE INITIATED WITH OUTPERFORM RATING, TP OF € 9

Arverne has seen its share price fall since its IPO in September 2023, probably due to the fall in the price of lithium. Lithium is set to become the group's main source of revenue by end-2027. We expect the price of lithium to rise over the next few years, since demand is expected to outstrip supply, as the EV market expands and the number of gigafactories grow, among other drivers.

As the company's size remains limited and our vision of the stock is part a long-term perspective, we opted for a DCF valuation. Based on a scenario where lithium will cost $ 17,000 per tonne, and a high risk premium (WACC: 13.6%), our equity valuation points to € 361m, i.e. € 9 per share.

This target price represents 63% potential upside. Our various scenarios suggest even more significant upside in the event of a higher-than-expected rise in the price of lithium (at $ 20,000/t, the target price would stand at € 17.2). We are therefore initiating coverage of the stock with an Outperform recommendation.

Stock thrown into turbulence since despacking

The Arverne group was floated on the stock market in September 2023, following a tie-up with SPAC Transition.

Arverne's share price since September 2023 (€)

Chart 1 - Sources: FactSet, ODDO BHF Securities

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The group was floated at a price of € 10, raising more than € 150m. Since then, the share price has fallen by more than 25%, probably due to the fall in the price of lithium, which is set to become the group's main source of revenue in 2027.

DCF valuation: TP at € 9, reflecting long-term potential upside

The main assumptions underpinning our DCF valuation are:

- A discount rate of 13.64% (75% equity, risk-free rate of 3.29% and risk premium of 5.41%; Beta of 2.5 due to high risk), which takes into account the very early-stage nature of the project.
- A lithium price of $ 17,000 per tonne.
- Average growth of 56% over nine years and an EBITDA margin of 65% over this period, followed by zero growth.
- A perpetual growth rate of 0.0%.
- 25% normative corporate tax rate until 2033.
- Normative WCR representing 5% of revenues and over € 2.4bn in capex over 2023-30 (€ 356m a year on average), followed eventually by maintenance capex representing 0.4% of tangible fixed assets, with no new investment.

FCF 2023-35

€ m	2024e	2025e	2026e	2027e	2028e	2029e	2030e	2031e	2032e	2033e	2034e	2035e
Sales	**16.0**	**35.3**	**65.8**	**122.1**	**228.5**	**387.9**	**612.8**	**741.8**	**870.8**	**870.8**	**870.8**	**870.8**
Change	*58.5%*	*120.5%*	*86.4%*	*85.7%*	*87.2%*	*69.7%*	*58.0%*	*21.1%*	*17.4%*	*0.0%*	*0.0%*	*0.0%*
EBITDA	**-13.3**	**-11.5**	**0.0**	**33.6**	**99.9**	**221.8**	**377.1**	**472.2**	**567.3**	**567.3**	**567.3**	**567.3**
% of sales			*0.0%*	*27.5%*	*43.7%*	*57.2%*	*61.5%*	*63.7%*	*65.1%*	*65.1%*	*65.1%*	*65.1%*
EBIT	**-23.5**	**-31.3**	**-60.2**	**-75.4**	**-65.1**	**0.8**	**124.1**	**219.2**	**314.3**	**319.5**	**328.1**	**334.1**
% of sales					*10.6%*	*20.3%*	*28.5%*	*36.8%*	*36.8%*	*37.4%*	*38.4%*	*39.1%*
NOPAT	**-13.1**	**-17.9**	**-37.2**	**-15.3**	**28.8**	**80.2**	**152.4**	**241.6**	**241.6**	**245.5**	**251.9**	**256.4**
(WC change)	-0.6	-5.5	-1.4	-2.7	-5.1	-7.8	-11.2	-6.8	-7.0	0.0	0.0	0.0
Capex	**-62**	**-96**	**-404**	**-488**	**-560**	**-560**	**-320**	**-18**	**-18**	**-18**	**-18**	**-18**
% of sales	*-388%*	*-272%*	*-614%*	*-400%*	*-245%*	*-144%*	*-52%*	*-2%*	*-2%*	*-2%*	*-2%*	*-2%*
FCF	**-70.1**	**-105.2**	**-390.3**	**-438.2**	**-448.9**	**-346.2**	**14.9**	**394.9**	**463.3**	**469.0**	**466.8**	**465.3**
% of sales	*-438%*	*-298%*	*-594%*	*-359%*	*-196%*	*-89%*	*2%*	*53%*	*53%*	*54%*	*54%*	*53%*
Discounted FCF	**0**	**-95**	**-310**	**-306**	**-276**	**-187**	**7**	**166**	**171**	**152**	**133**	**117**

Table 2 - Source: ODDO BHF Securities

DCF

€ m	Value
Period of 1-10 years	-429
Terminal Value	758
Enterprise value	**329**
+ Financial assets	0.0
+ Loss carry-forward	2.2
- Provisions	0.0
- Net financial debt (excl. leasing)	-61.0
- Minorities	31.5
= Equity value	**360.8**
Number of shares (m)	39.8
Value per share (€)	**9.1**

Table 3 – Source: ODDO BHF Securities

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The table below outlines the sensitivity of our equity valuation to the discount rate, perpetual growth, and normalised underlying operating margin assumptions:

Sensitivity table

€		Perpetual growth				
		-0.50%	-0.25%	0.00%	0.25%	0.50%
WACC	14.6%	6.0	6.2	6.4	6.7	6.9
	14.1%	7.2	7.4	7.7	8.0	8.3
	13.6%	8.5	8.8	9.1	9.4	9.8
	13.1%	10.0	10.3	10.7	11.0	11.4
	12.6%	11.7	12.0	12.4	12.8	13.2

Table 4 - Source: ODDO BHF Securities

Based on DCF, we came up with a target price of € 9 representing more than 30% in potential upside.

Additional upside if lithium price goes up

The price of lithium has had a roller coaster profile in recent years. From $ 10,000 per ton in June 2020 it went up to $ 80,000 per tonne in early 2022 due to EV manufacturers' rush to secure their lithium supply, before it collapsed in 2023 to $ 13,000 per tonne. The lithium price plunged after demand slackened due to a decline in the Chinese EV market alongside massive destocking by Chinese manufacturers. It has remained stable at $ 14,000 to $ 15,000 per tonne since March 2024.

Lithium price since June 2020 ($/t)

Chart 5 - Sources: Bloomberg, ODDO BHF Securities

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As the price of lithium is extremely volatile, it is difficult to come up with estimates for the coming years. Currently our target price is based on a long-term lithium price of $ 17,000 per tonne (based on estimates from groups such as Eramet, Rio Tinto, etc.). However, the price of lithium can swing due to several factors: 1/ demand for lithium is expected outpace supply in the coming years 2/ Arverne belie a premium will be introduced for lithium produced locally and at a lower CO2 cost and 3/ currently lithium markets depend heavily on China and the group believes a European lithium market will be created, making it possible to decorrelate lithium prices from prices in China.

We put together a number of scenarios including these uncertainties.

Valuation scenarios (DCF-based)

€ m	Current share price	ODDO BHF	Between Arverne and ODDO BHF	Arverne Group
Price of lithium ($/t)	**15,000**	**17,000**	**20,000**	**25,000**
2031 revenues	810.8	870.8	960.8	1 110.8
Target EBITDA	*62.6%*	*65.1%*	*68.4%*	*72.7%*
Capex (% revenues)	*-2%*	*-2%*	*-2%*	*-2%*
WACC	*13.64%*	*13.64%*	*13.64%*	*13.64%*
Target price (€)	**5.8**	**9.1**	**14.2**	**22.6**

Table 6 - Source: ODDO BHF Securities

Sensitivity analysis

€		Price of lithium ($/t)				
		15,000	**17,000**	**20,000**	**22,500**	**25,000**
WACC	**14.6%**	3.4	6.4	10.9	14.7	18.4
	14.1%	4.5	7.7	12.5	16.4	20.4
	13.6%	5.8	9.1	14.2	18.4	22.6
	13.1%	7.1	10.7	16.0	20.5	24.9
	12.6%	8.6	12.4	18.1	22.8	27.5

Table 7 - Source: ODDO BHF Securities

If the price of lithium were to rise, Arverne's revenues would increase sharply, as would its margin. If the price reaches $ 25,000 per tonne, as forecast by the Arverne group, we estimate the share price at € 22.6.

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GEOTHERMAL ENERGY AND LITHIUM: TWO MARKETS WITH HIGH POTENTIAL AND GEOPOLITICAL AND ENVIRONMENTAL CHALLENGES

Arverne group is positioned in two high-potential markets: 1/ geothermal energy, which is emerging as a prime alternative to shore up the energy transition and make each region more independent in its heat production, and 2/ lithium, where demand will continue to rise sharply over the next few years, but which France and Europe currently depend on other continents for. Arverne Group's solution, based on extracting lithium from aquifers (mainly in Alsace), meets the challenge of sovereignty and ecology with low-carbon, low-cost lithium. As a reminder, Europe and France are backing the development of geothermal and brine lithium projects by financing up to 35% of their capex, and geothermal lithium projects through a subsidy mechanism that can represent up to 35% of the capex incurred.

Geothermal energy, sovereign solution in full swing

Ecological and local source of heat

Geothermal energy is still underused in France, but it should play a bigger role in supporting nergy transition. This is the conviction of France and Europe, shared by Arverne.

According to a report by the French Ministry for Energy Transition on geothermal energy (February 2023) heat accounts for around half of energy consumption in France, 75% of which comes from fossil fuels that emit large quantities of greenhouse gases (natural gas, fuel oil, etc.). At end-2022, geothermal energy accounted for only 4% of the energy entering district heating networks (DHNs), i.e. 6.7 TWh compared with 2 TWh in 2021.

Geothermal energy recovers the heat contained in the subsoil or groundwater and uses it to produce heat, cold or electricity.

It is therefore an energy source with many advantages. It is:

- **Renewable and carbon-free** (inexhaustible resource with minimal greenhouse gas emissions).
- **Local** (heat produced is used as close as possible to its source).
- **Non-intermittent** (the temperature of the earth's crust remains stable.
- **Sovereign** (contributes to France's energy independence).

At a depth of around 10 metres, the heat in the subsoil is stable almost everywhere, with an average temperature of 15°C whatever the season. The temperature then increases as one goes deeper. The geothermal gradient (the rate of increase in ground temperature as one moves away from the surface) averages 3°C every 100m.

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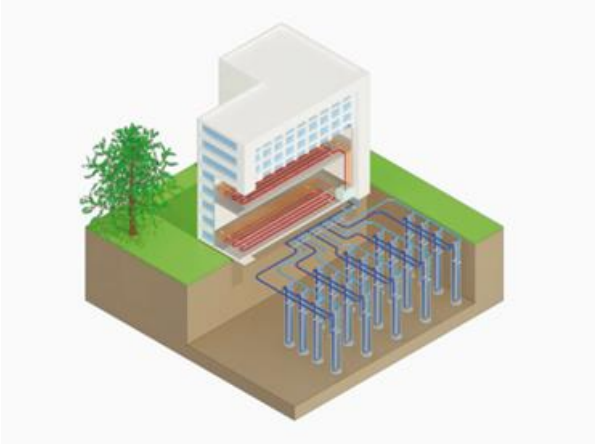
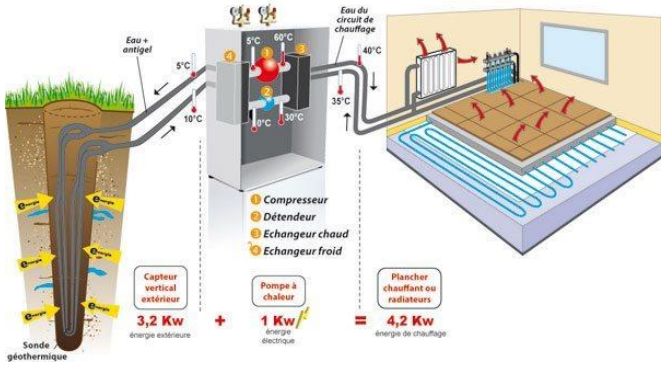
There are two categories of geothermal energy: 1/ surface geothermal energy, from 0 to 200m and 2/ deep geothermal energy, from 200m to 3,000m.

Surface geothermal energy generally uses a system of heat pumps to adjust the temperature of the water coming from underground. Probe fields are installed in which water circulates. This water loop captures the heat from the subsoil by thermal exchange (without any exchange of matter) and transfers it to the heat pump system (HPS). The HPS will then adjust the temperature of the water and send it to the heating network.

Geothermal heat pump on a probe field



Principle of geothermal heating + HPS



Charts 8 - Sources: ADEME-BRGM, Drill-i

Deep geothermal energy involves exploiting water deposits (aquifers) located at depths of between several hundred and 3,000 metres, where the water temperature can exceed 100°. This works with a doublet system that pumps the hot water, transmits it to the district heating network and returns the cold water to the subsoil once the calories have been used.

Diagram of the geothermal doublet

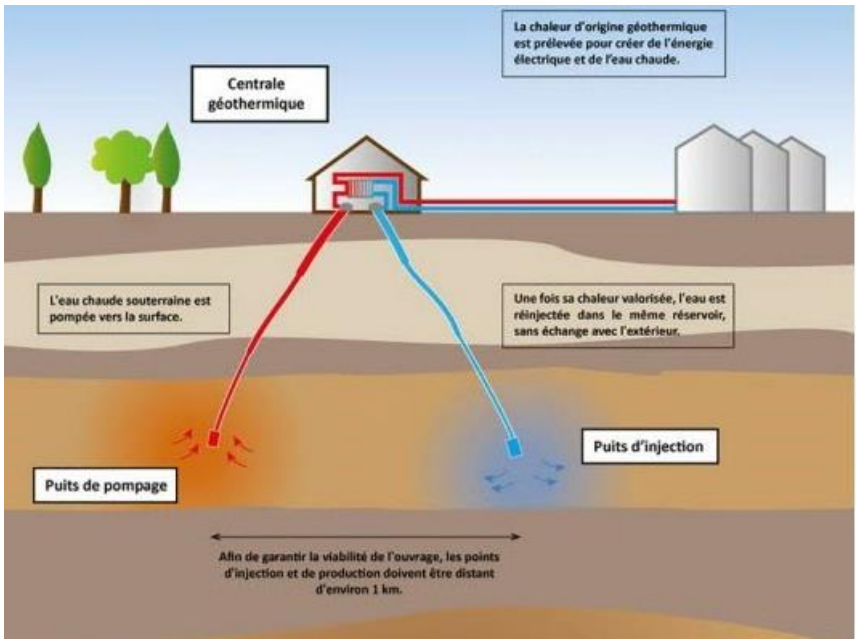


Chart 9 - Source: L'Alsace

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Rapidly expanding solution

According to the Heat Fund set up by the French Ecological Transition Ministry, 100% of France has the potential for surface or deep geothermal energy.

Surface geothermal energy accounts for most of France's geothermal potential, as it can be installed almost anywhere in the country. In its report on geothermal energy published in February 2024, French renewable energy trade association (SER) put the potential for surface geothermal energy at 100 TWh by 2040, provided the drilling industry is up to the task.

As for deep geothermal energy, the deep aquifers needed are located in the Paris and Aquitaine basins, the Rhine Graben, the Rhone corridor, Limagne and Hainaut.

Deep aquifers in mainland France

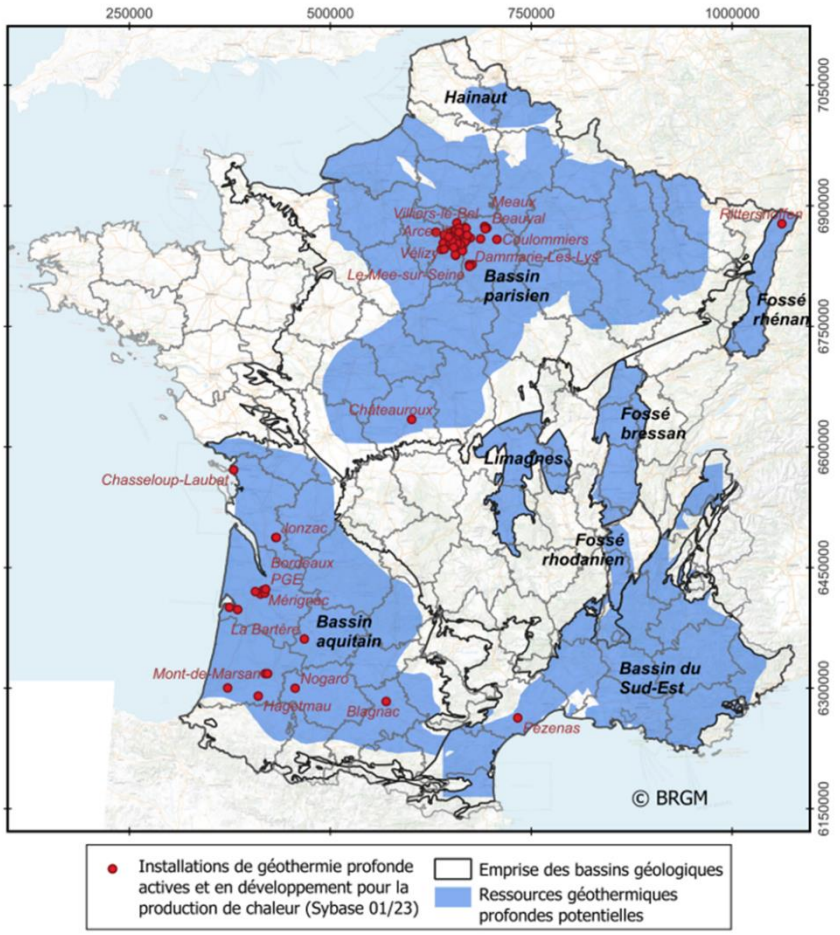

Chart 10 - Source: BRGM

To speed up the energy transition, the French government has set targets for geothermal development. A pluriannual energy programme dubbed 2019-28 PPE2 set the following targets for final consumption of heat from geothermal energy:

- For surface geothermal energy: 5 to 7 TWh in 2028, with an intermediate target of 4.88 TWh in 2023.
- For deep geothermal energy: 4 to 5.2 TWh in 2028, with an intermediate target of 2.9 TWh in 2023.

The figures for 2022 are in line with this trajectory: geothermal energy contributed 6.7 TWh, split between surface geothermal energy (4.6 TWh) and deep geothermal energy (2.1 TWh).

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According to SER, it is possible to reach the upper end of the target set by the PPE2 for 2028 for surface geothermal energy, i.e. 7 TWh. For deep geothermal energy, the upper end of the 2028 target, at 5.2 TWh, is also achievable, provided rapid and effective measures are implemented.

SER then sees the following increase in geothermal heat production:

- 16 TWh by 2030: 10 TWh surface, 6 TWh deep.
- Between 22 and 28 TWh in 2035: between 14 and 18 TWh from surface geothermal energy, between 8 and 10 TWh from deep geothermal energy.

Geothermal heat production and forecasts for the coming years (TWh)

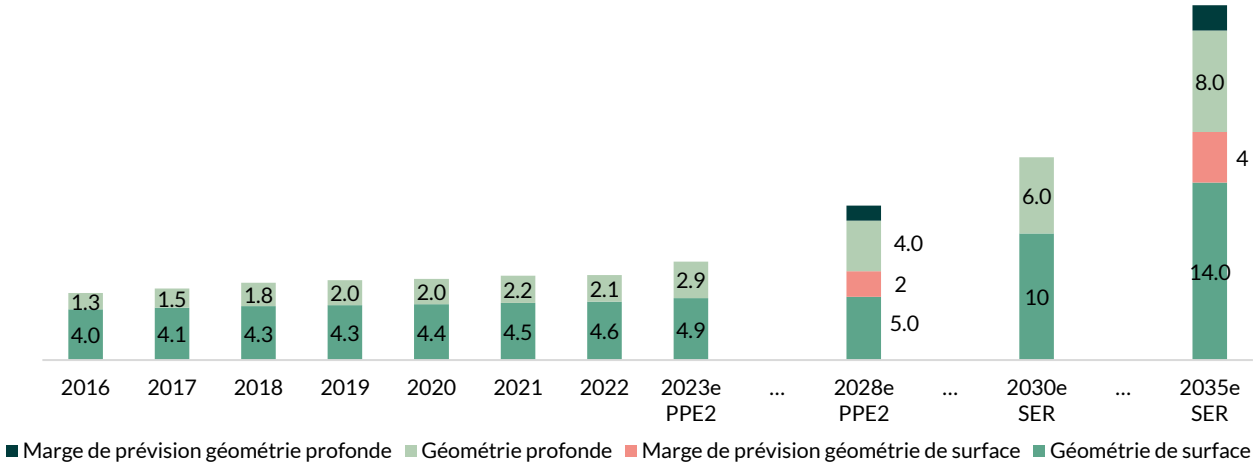

Chart 11 - Sources: SER, French Energy Transition Ministry

At European level, in its 2022 report, The European Geothermal Energy Council (EGEC) said 25 geothermal power plants for electricity production were under development (new constructions or extensions) and more than 100 projects were under study.

Geothermal energy represents indeed significant potential for producing heat and electricity in the years ahead and is backed by French and European authorities.

Lithium: the white gold of the 21st century

Europe dependent on other continents

Lithium is an essential component in energy storage, thanks to its light weight and high heat capacity. This strategic market is currently in its full swing. Some 71% of lithium production is intended for batteries and 6% for energy storage systems, compared with 23% for traditional uses such as glass or ceramics.

Two main methods are used to produce lithium:

- **Mining**, as in Australia. Mining companies extract the spodumene concentrate using traditional mining techniques. Almost all of this is then refined in China to produce lithium. This process uses harmful products and requires large quantities of water, with a significant impact on the environment.

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- **The use of brine, as in South America.** Conventional methods involve, after pumping, spreading the brine in the open air for 12 to 18 months, the time needed for the excess water to evaporate, in order to increase the lithium concentration, which is initially very low. This method drastically dries out the soil because the water that evaporates (from the brine) cannot be kept and returned to the subsoil.

There is therefore an ecological issue associated with lithium extraction at a time when lithium production is exploding.

Global lithium extraction by country

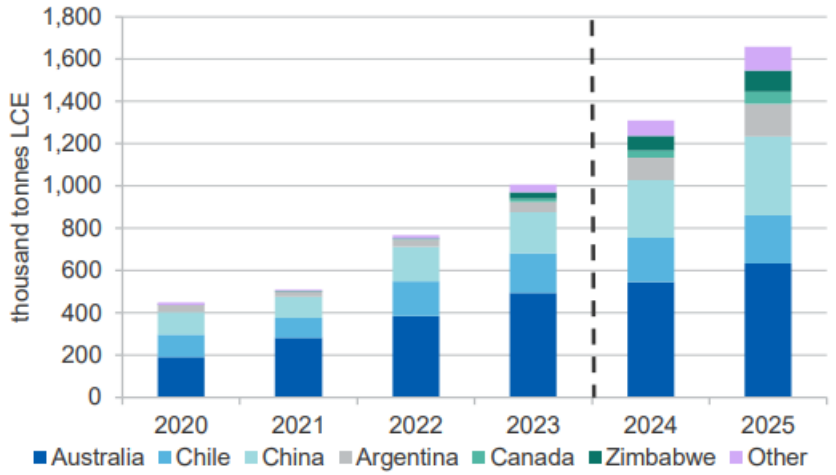

Chart 12 - Sources: Department of Industry, Science and Resources (2023), Wood Mackenzie (2023)

In 2022, Australia mined 386 kt LCE, representing around 50% of world production. The largest lithium producers include China and Chile, with 166 kt LCE and 162 kt LCE respectively. Argentina, Canada, and Zimbabwe account for 5.1%, with the remaining countries accounting for less than 1%. China accounts for 60% of lithium refining capacity, half of which comes from Australia.

Europe currently has to import almost all its lithium. China supplied 98% of Europe's rare earths between 2012 and 2016, Le Monde claimed. In the wake of Covid-19 and the war in Ukraine, Europe realised it was not only overdependent on Russian hydrocarbons, but also on critical metals, without which the energy transition is impossible.

Drawing on its expertise in drilling and the proven presence of lithium, mainly in the subsoil of the Rhine basin, Arverne is looking to meet the challenges of building Europe's energy sovereignty by producing lithium, as well as the challenges of decarbonisation by producing it locally and with low carbon emissions.

Lithium production set to expand further

Mining and metal specialist CRU Group said demand for lithium was set to continue rising over the next few years at an average rate of 15% out to 2030, representing more than a 2.5x increase vs current demand. Based on SER estimates, 96% of lithium supply in Europe currently comes from imports.

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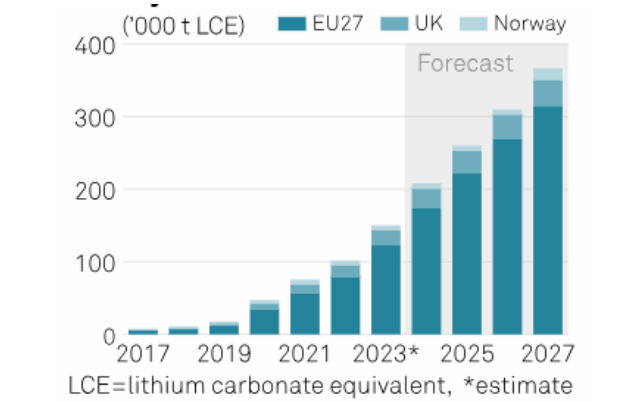
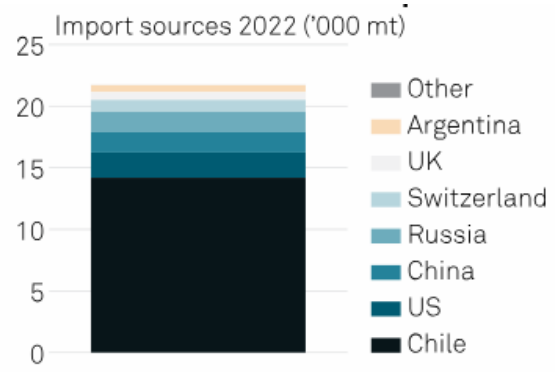
Strong growth in demand for lithium across Europe



Europe is heavily dependent on imports



Charts 13 – Source: S&P Global

Europe is aiming to produce 25% of the world's batteries by 2030 (compared with 3% in 2020), and a large number of gigafactories are being built or are under construction in Europe with this goal in mind.

Map of gigafactories across Europe

Chart 14 - Source: CIC energiGUNE

To meet its targets and reduce its dependence on other continents, Europe needs to extract lithium from its own subsoil.

Through deep geothermal energy, Arverne group will be able to respond to this necessary development. It is in fact possible to extract lithium from aquifers when the concentration of lithium is sufficient. And lithium is abundant in aquifers in Alsace. The lithium content varies between 150 and 200 milligrams per litre. Other geothermal sites, such as the Pyrenees, Massif Central and Trias in the Paris Basin, also have significant levels.

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With practical support from France and Europe

Dedicated funds to subsidy geothermal energy development

To develop geothermal energy, the French Ecological Transition Ministry published in February 2023 an action plan with six main thrusts, three of which focused on surface geothermal energy and three on deep geothermal energy:

Surface geothermal energy:

- enhancing drilling capacity (increasing the number of drillers, creating and subsidising training courses).
- fine-tuning the regulatory framework to encourage development (wrapping up regional mapping).
- encouraging the installation of geothermal heat pumps in the residential and commercial sectors (to double the number of geothermal heat pumps installed in private homes by 2025 thanks to grants: Coup de pouce chauffage, MaPrimeRenov'...).

Deep geothermal energy:

- improving knowledge of the subsoil to encourage the launch of projects.
- reorganising the geothermal guarantee fund for deep aquifers.
- raising awareness and skills among local players and supporting project developers in deploying geothermal solutions (Ademe could fund geothermal studies to the tune of 50% to 70%).

To support this action plan, the French government set up a number of funds:

- **Ademe Heat Fund:** in 2022, the Ademe Heat Fund budget was increased by € 150m to € 520m. This budget was extended to 2023. During the 2009-20 period, the Heat Fund was allocated € 2.6bn to back more than 6,000 projects representing € 9.4bn worth of work. This fund can subsidise up to 35% of the capex incurred on geothermal projects.
- **SAF Environment/Geothermal Fund**, managed by SAF-Environment, for deep aquifers It covers the short-term risk of the absence or insufficiency of hot water resources, and the long-term risk with a 20-year guarantee on the sustainability of the resource and the risks of drying up, as well as damage to installations. This guarantee can cover up to 90% of the capital outlay.

At European level, stepping up the development of geothermal heating and cooling systems is part of the strategy to speed up the energy transition. Programmes such as NER300 and H2020 were set up to support R&D and reduce CO2 emissions.

More recent but just as effective support for lithium

The so-called green industry tax credit (C3IV) was set up for strategic projects. This recent mechanism allows eligible projects to be subsidised by up to 35%.

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DRILLING TO SUPPORT THE TWO MAIN ACTIVITIES: HEAT AND LITHIUM EXTRACTION

Arverne's drilling expertise is essential to its geothermal and lithium aquifer activities and gives the group a competitive edge. Most of Arverne's geothermal and lithium aquifer rivals come from the energy sector or lithium extraction (from salars or mines) and have no specific drilling skills. In a market where demand for drilling outstrips supply, there is a risk they will have to wait longer for their projects to be developed and the technical risks involved will be less well controlled (e.g. the earthquake caused by Fonroche). Lastly, Arverne's integrated know-how should enable the group to keep drilling costs under control.

A linchpin, drilling at the service of geothermal energy and lithium

Group presentation

Group organisation chart

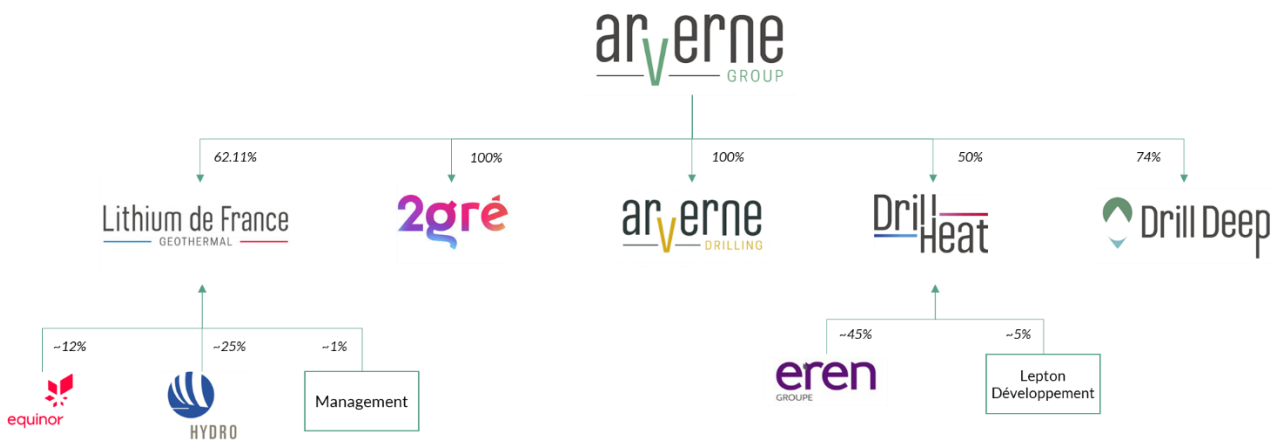

Chart 15 - Source: Arverne Group

Arverne is engaged in three main activities:

- Surface drilling (DrillHeat) and deep drilling (Arverne Drilling Services and DrillDeep.
- Production and sale of heat using deep geothermal energy throughout France (2gré).
- Production and sale of heat using deep geothermal energy and production and sale of lithium from geothermal brine in Alsace (Lithium de France).

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Arverne was created in 2018. It started off as an exploration and consultancy company specialising in land development for mining, geothermal and water activities. In February 2020, the company took on an operational dimension with the acquisition of Entrepose Drilling, a drilling company belonging to the Vinci group. Entrepose Drilling subsequently became Arverne Drilling Services.

In October 2020, Arverne Géothermal, which became Lithium de France in April 2021, added Equinor, a world-class Norwegian energy company, to its share capital. Lithium de France exploits aquifers to extract heat and lithium.

In March 2022, DrillHeat was created for shallow drilling requirements. Arverne holds a 50% stake in the company.

In February 2023, Arverne Group expanded its geothermal energy business by acquiring Géorhin (formerly Fonroche Géothermie), which was renamed 2gré. As a result of this acquisition, the Arverne Group laid its hands on six valid mining permits and four exclusive research permits under instruction in three different regions (Nouvelle Aquitaine, Auvergne-Rhône-Alpes, Grand Est).

In June 2023, Arverne Group and SPAC Transition, which is listed on the professional segment of Euronext, entered into a merger agreement with a view to an IPO. This took place in September 2023.

On 21 March 2024, together with Herrenknecht AG, the group created DrillDeep, a unit controlled by the group and dedicated specifically to the deep drilling of geothermal wells.

Complementary business

Drilling is the backbone of the group, supporting the operations of Lithium de France and 2gré. Drilling is not an end in itself for the group, but rather an integrated expertise to produce the doublets required for geothermal energy. It should be remembered that the exploitation of aquifers by 2gré and Lithium de France is used in both cases to produce and sell heat through deep geothermal energy (in addition to extracting lithium in the case of Lithium de France).

Greenfield geothermal projects are long-term endeavours with a project preparation and construction phase lasting three to four years. The various stages are:

Project development (8-18 months)
In a first step, the company seeks to obtain an Exclusive Research Permit (PER) to acquire exclusive rights to search for geothermal sources in a given area. This makes it possible to carry out a site (3D, technical, geological, environmental, political, etc.) survey to produce a model. If the model is conclusive, a drilling permit application must then be submitted.

The drilling permit process (12 months)
Once the drilling permit has been granted, the material, financial and contractual structure needed to carry out the project must be put in place (the equipment is purchased, the financing structured, etc.).

Drilling (3-6 months)
It is during this stage that the actual drilling is carried out. A doublet is dug with a well to bring the water up from the aquifer and a well to reinject it afterwards. Each well takes around 45 days to complete.

Commissioning (3-12 months)
When the doublet is ready, production tests are carried out and then the power station is installed. The doublet is connected to the grid via an exchanger, and the transfer of heat enables MW to be supplied to the grid.

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Operation and maintenance (20 - 30 years)
Sale of heat to networks and/or end consumers (e.g. manufacturers) under long-term contracts.

Drilling is necessary for the well construction and maintenance during the preparation and the operation phase of the geothermal project.

Stages of a geothermal project

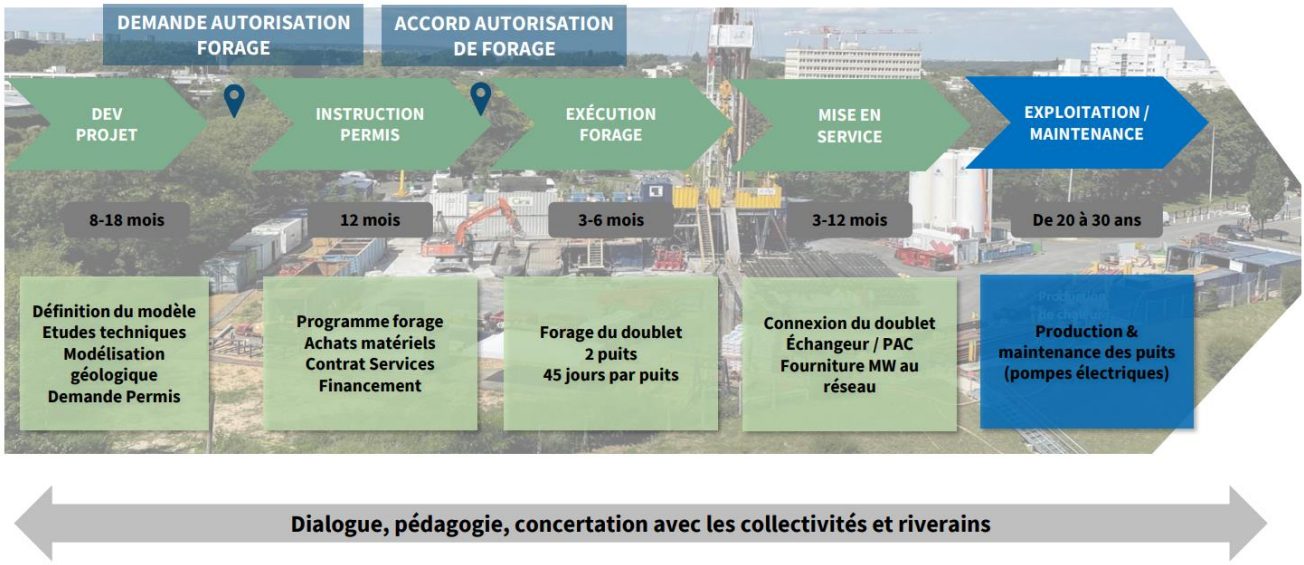

Chart 16 - Sources: Arverne Group, presentation of 2023 results

Lithium extraction is a more complex process than geothermal projects, for which there are no technological barriers (proven production techniques). In addition, lithium extraction plants need to be installed to filter and recover the lithium from the brine once the heat from the brine has been recovered.

Diagram of a project supported by Lithium de France

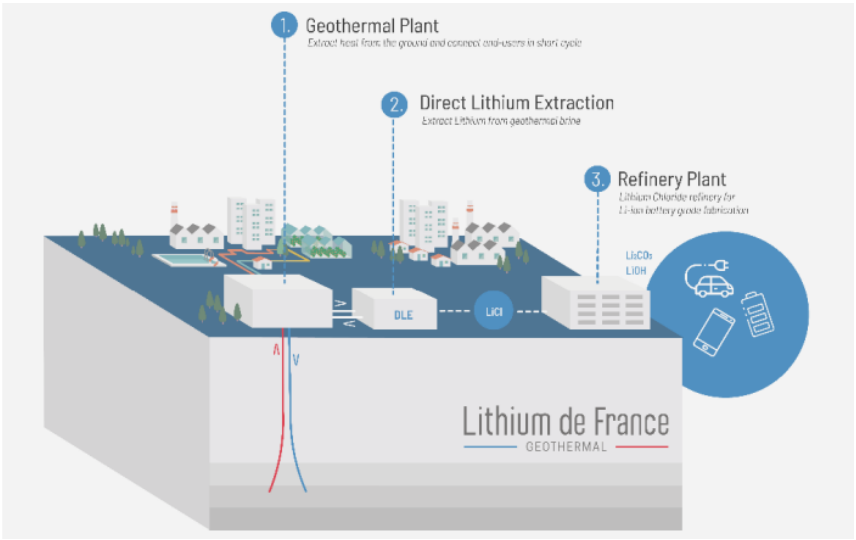

Chart 17 - Source: Arverne Group

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It is important to note that Lithium de France will be extracting lithium using Direct Lithium Extraction (DLE) technology, which offers the advantage of chemically extracting lithium from underground brines more efficiently and more cheaply than traditional methods (evaporation or mining). As a result, production times and environmental impact are greatly reduced.

Comparing lithium extraction methods

Lithium extraction method	Mining	Salar	DLE
Production time (order of magnitude)	Weeks/ Months	Months/Years	Days
Costs	Significant	Low	Medium
Energy consumption	Significant	Low (sun)	Medium
Water consumption	Significant	Significant	Low
CO_2 emissions	Significant	Low	Low

Table 18 - Source: GSIR

There are three main types of DLE:

- DLE by Adsorption.
- DLE by ion exchange.
- DLE by solvent extraction.

The advantages and disadvantages of each DLE technology depend on the brine from which the lithium will be extracted. The Arverne group is currently in an advanced testing phase to select DLE technology and hopes to announce the technology to be used by the end of 2024.

On the drilling front, the group has the technical and human resources to carry out :

- Surface drilling with DrillHeat (installing probes on behalf of third parties at depths of up to 200 metres) for probe installation. At present, DrillHeat only acts as a drilling and sinking contractor.
- Well maintenance by Arverne Drilling Services.
- DrillDeep carries out deep drilling on behalf of third parties, which will enable the teams to hone their skills so that they can subsequently drill wells for 2gré and Lithium de France.

Drilling: expert know-how

A complex business handled with expertise by Arverne

Drilling can be divided into two categories: surface drilling and deep drilling.

Surface drilling in low-temperature geothermal energy refers to boreholes less than 200 metres deep, but can also be carried out at greater depths, up to 250 metres or even 300 metres, subject to authorisation. Arverne, via its 50%-owned subsidiary DrillHeat. Through its DrillHeat unit, Arverne drills and installs geothermal probes at depths of between 50 and 200 metres. The installation of geothermal probes involves drilling a well inside which a glycol-water circulation loop (water + antifreeze) is cemented from the bottom to the surface. DrillHeat carries out this type of drilling for residential buildings or professional premises (offices, industry, public buildings, etc.).

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Deep drilling is an extremely complex process. Drilling a well in the Paris dogger (between 1,500 and 2,000 metres) by 2gré takes between a month and a month and a half, during which several dozen employees work in round-the-clock shifts. *Drilling a doublet for Lithium de France takes around six months, due to the greater depth involved (up to 3,000 metres). Drilling takes place in three stages: 1/ installing the drilling rig (~1 week), 2/ drilling the well (~15 days), 3/ removing the rig (~1 week).

The well is drilled following a very precise methodology:

- An initial shallow hole is dug. A large-diameter casing (50-60cm), often called a conductor pipe or conductor casing, is inserted. The conductor pipe is then solidified with cement.
- A second hole is then dug along the same line as the first, with a smaller diameter. A casing is then installed in this second hole and reinforced with cement.
- The operation is repeated until the depth of the water table is reached.

Well diagram

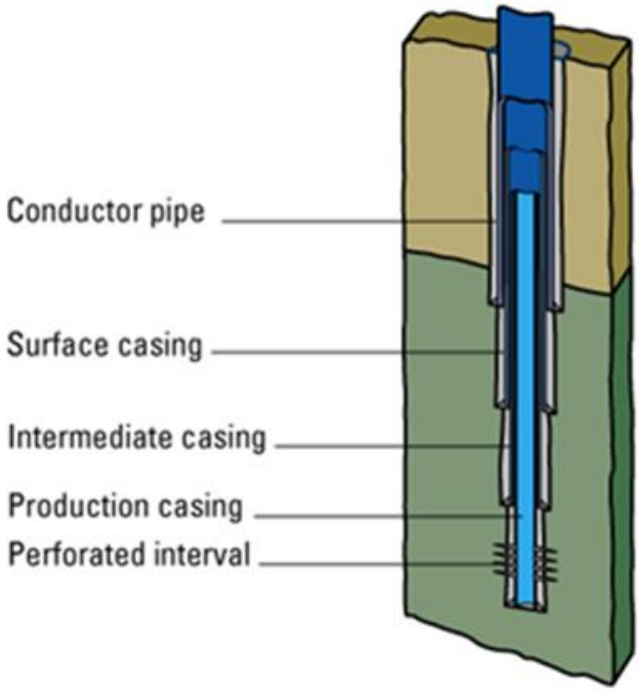

Chart 19 - Sources: Northern Oilfield Services, Schlumberger

Throughout the drilling process, the well will need to be filled with a fluid called “drilling mud”. This drilling mud has several technical functions: 1/ reinforcing the hole by exerting pressure on the edges to prevent the hole from collapsing until the casing has been installed, 2/ cleaning the bottom of the hole and 3/ bringing up and evacuating the dug materials by density effect. The drilling mud must therefore comply with a number of very precise parameters (pressure, density, etc.), which can vary depending on the depth of the hole and the characteristics of the rocks dug.

Once drilling is complete, the hole is connected to a pump that recovers the fluid from the bottom of the hole.

Drilling can be vertical or directional, depending on the location of the natural resource.

Drilling a well is a complex process that requires supervision throughout the drilling process and total control over numerous parameters (drilling mud, speed of rotation of the drilling head, etc.).

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Experienced management team

Arverne's entire management team has extensive experience in drilling. All heads of Arverne's operating units have more than 20 years' experience in the industry, having previously worked for companies such as Maurel&Prom, Total Energies, Institut Français du Pétrole, Perenco and Schlumberger.

Experienced management team

Chart 20 - Sources: Arverne Group, presentation of 2023 results

Moderate competition

The group operates in four different markets: deep drilling, surface drilling, geothermal energy, and lithium extraction.

In deep drilling, there is virtually no competition. The two French players are Arverne and Société de Maintenance Pétrolière (SMP). Arverne will be drilling mainly for 2gré and Lithium de France. Only at a later stage, will the group offer its services to third parties if some of its drilling rigs are available. With demand outstripping supply and Arverne's expertise widely recognised, it should be easy for the group to expand.

The surface drilling market is made up of a multitude of small players which are not consolidated or are backed by large non-agile groups. In this market, where demand is rising sharply, a structured player such as Arverne has extremely significant potential. The group drilled more than 30 km of wells in 2023 and has a full order book for the first 6 months of 2024.

Competition in geothermal energy remains weak. The group is positioned in a segment with few players. It complements the operators of heating networks (Dalkia, Engie Solutions, Idex, Coriance). 2gré operates on the primary circuit (pumping + heat exchange with the secondary circuit), while players such as Dalkia are network operators that recover heat from the exchanger and send it through their pipes to the end consumer.

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Heat exchanger system

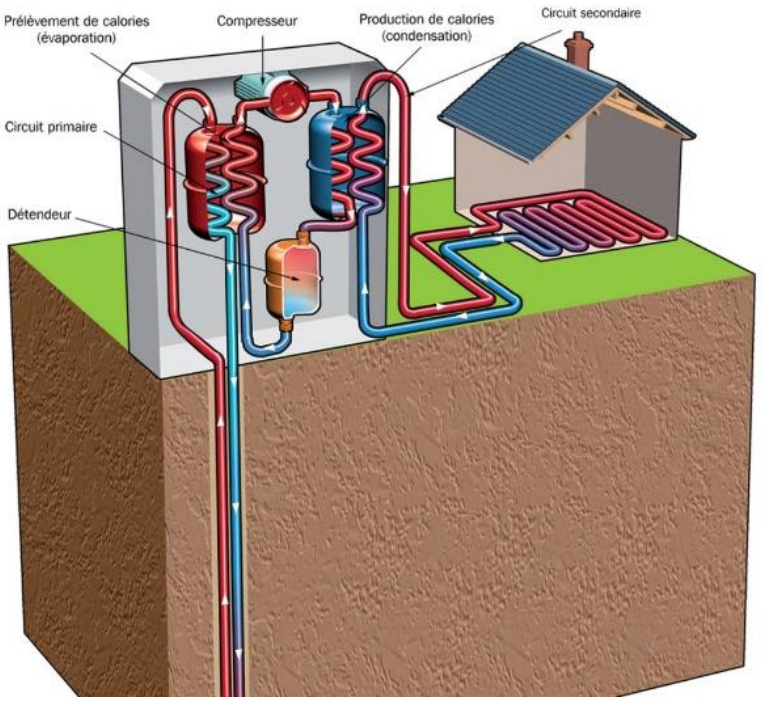

Chart 21 – Source: BRGM

In the lithium segment, Arverne has a number of competitive advantages: i/ the use of DLE technology will enable it to extract lithium at a competitive cost with a much lower environmental impact than existing solutions, ii/ producing European lithium will reduce transport costs and geopolitical risks, iii/ the expected strong growth in demand should provide a favourable market for Lithium de France and iv/ its drilling activity gives it the flexibility to deploy its projects. Lastly, in 2023, Renault Group signed a five-year supply contract for 25kt of LCE with Lithium de France, demonstrating the Group's interest in the LCE market.

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ESG: BETWEEN THE POSITIVE IMPACT OF GEOTHERMAL ENERGY, LITHIUM (GEOTHERMAL) AND THE IMPACT OF OPERATIONS

Geothermal energy and the extraction of geothermal lithium represent a clear opportunity to ensure Europe's energy transition. Due to the very nature of its business, the Arverne Group is having a significant positive impact on the overall decarbonisation of the economy. However, environmental risks (pollution) and risks associated with working conditions can also have negative consequences. Lastly, Arverne is naturally exposed to corporate governance risks. The company has therefore put in place resources and safeguards to reduce societal, pollution and governance risks.

Materiality analysis: what are the ESG impacts, risks and opportunities for geothermal energy, geothermal lithium, and drilling?

Impacts, risks and opportunities of geothermal energy

The use of renewable energy is essential for the long-term development of net zero energy systems. Geothermal power plants differ in the technology they use to convert the geothermal source into heat or electricity (dual, single flash, dual flash, back pressure, and dry steam) as well as the cooling technology they use (water and air cooling).

The environmental consequences vary depending on the conversion and cooling technology used. Environmental consequences of geothermal energy exploration, development and production may include land use and visual impacts, flora, fauna and biodiversity, air emissions, pollution soil, noise, micro-earthquakes, induced seismicity and subsidence.

- Moreover, it can impact social and economic communities. As geothermal activity progresses from exploration to development and production, these effects become more significant. Before undertaking a geothermal activity, the positive and negative aspects of these effects should be taken into account. According to the results, to reduce the environmental and social impacts of geothermal power plants, resource conservation and development, production sustainability and operational issues should be continuously monitored.[1]

[1] *Ozcelik M. Environmental and social impacts of the increasing number of geothermal power plants (Büyük Menderes Graben-Turkey). Environ Sci Pollut Res Int. 2022 Mar;29(11):15526-15538. doi: 10.1007/s11356-021-16941-5. Epub 2021 Oct 9. PMID: 34625903.*

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The impacts, risks and opportunities of geothermal lithium

❖ Utility of geothermal energy

Geothermal energy is heat stored underground and is a renewable resource that can be harnessed sustainably. This energy source causes no direct greenhouse gas emissions. Geothermal energy can be used directly for a variety of thermal applications, including space heating and industrial heat generation, or converted to electricity depending on the temperature of the source. The mismatch between potential and developed geothermal resources is due to high upfront costs, decentralised geothermal heat production, lack of uniformity among geothermal projects, geological uncertainties, and geotechnical risks.

In the latest IPCC reports, in addition to a positive contribution to SDG 13 (climate change), geothermal energy is considered to have synergies with SDG 1 (no poverty) due to access to energy, and mixed synergies and trade-offs with SDG 3 (good health and well-being) due to reduced air pollution, but with some risks from water pollution and SDG 6 (clean water and sanitation), if not well managed.[2]

❖ Utility of lithium in the energy transition

According to IPCC Group 3, the supply of many metals and minerals (e.g. cobalt, copper, lithium and rare earths) is essential to support the transition to a low-emission energy system. This will increase the demand for these minerals (but not the overall demand for minerals, contrary to popular belief) which will be used in technologies such as wind turbines, photovoltaic cells and especially batteries. Reliance on these minerals has raised questions about possible constraints in transitioning to a low-carbon energy system, including supply chain disruptions. The extraction of these materials has also raised concerns, as it often has serious environmental impacts, and the production of metals itself is energy intensive and difficult to decarbonise.[3]

Regarding lithium specifically, the IEA predicts in its Announced Pledges scenario (in which States respect their Net Zero commitments, aligned with a warming of approximately 1.7°C), that the demand for lithium will increase approximately seven-fold between 2022 and 2030.

[2] *https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_FullReport.pdf*
[3] *https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_FullReport.pdf#page=650*

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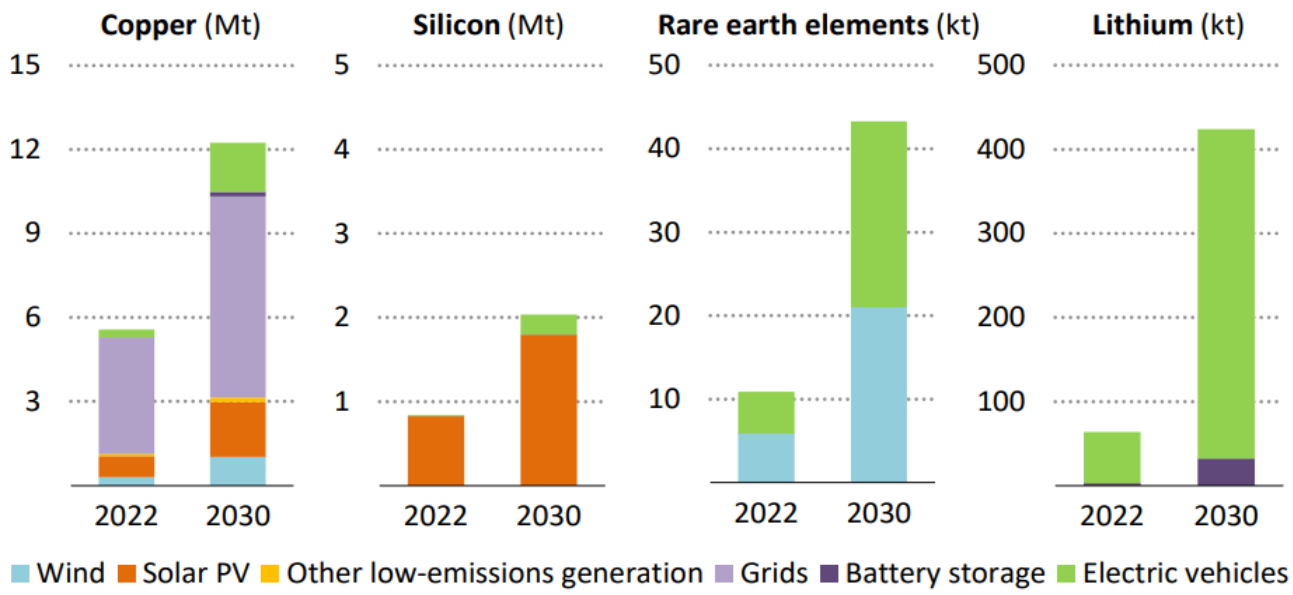
Demand for critical minerals for clean technologies the IEA "APS" scenario, 2022 and 2030



Note: APS Scenario = Announced Pledges Scenario: scenario set up by the IEA within the framework of which States respect their Net Zero commitments, aligned with a warming of around 1.7°C.

Chart 22 – Source: IEA

Thus, lithium is a critical mineral, particularly for the development of electric mobility as part of the energy transition. Furthermore, the issues of sovereignty and independence call for the development of sovereign lithium extracted in France. However, conventional procurement methods have significant environmental impacts. This is the whole point of using the direct extraction technique.

❖ The specific usefulness of geothermal lithium

According to a study published in September 2023 in the journal "Advances in applied energy"[4], geothermal power plants are becoming even more competitive with lithium extraction. Indeed, geothermal power plants, which combine heat production from deep geothermal energy with low-carbon direct lithium extraction (DLE), constitute a promising sustainable extraction option that involves a reduced footprint on water and soil.

According to a study published in the journal "Nature" in February 2023[5], geothermal lithium's extraction has a double advantage: it exploits renewable energies while providing a source of lithium, essential for the production of batteries. The process, illustrated by a pilot project in the north-east of France (Alsace), displays a recovery rate of 90% of the lithium contained in geothermal brines, thanks to patented ion exchange resins. According to the study, this method is environmentally friendly, because the lithium-depleted fluid is reinjected, which preserves the integrity of the geothermal system.

Additionally, geothermal lithium's extraction has the advantage of being located close to populated areas in Europe, providing local economic benefits and reducing the environmental footprint linked to transportation. Despite technical challenges related to high temperature and pressure, as well as seismic risks, the successful extraction of lithium from geothermal sources marks an important step towards sustainable lithium production.

[4] *https://www.sciencedirect.com/science/article/pii/S2666792423000276*
[5] *https://www.nature.com/articles/s43017-022-00387-5#Fig5*

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In short, direct lithium extraction has many advantages compared to conventional extraction. On the contrary, evaporation technology for the extraction of lithium from brines can also have potentially negative impacts due to its intensive use of water, its prolonged duration and its exclusive application to continental brines.

A study published by Vera et al. in Nature Reviews earth & environment in February 2023, analysed the environmental impacts of evaporite and alternative technologies, collectively known as DLE, focusing on freshwater needs, chemicals, energy consumption and production of waste, including spent brines.[6]

DLE technologies aim to remedy the environmental and technical-economic inadequacies of current practices by avoiding brine evaporation. A selection of DLE technologies achieved Li+ recovery greater than 95%, Li+/Mg2+ separation greater than 100, and chemical-free approaches.

Some DLE technologies involve changes in brine pH or heating the brine up to 80°C to improve Li+ recovery, which requires energy, fresh water and chemicals that must be taken into account during environmental impact assessments. Future research should focus on performing tests on real brines and achieving competitiveness for multiple performance indicators simultaneously. The environmental impact of DLE should be assessed from the pumping of the brine to the production of pure solid lithium.

It is this type of data that investors must insist on from the company as part of their shareholder engagement.

The impacts, risks and opportunities of drilling activities

Drilling operations can have negative impacts on land by requiring clearing, installation of drilling rigs and creation of waste pits during work. Once drilling is completed, the visual impact is minimal. Land disturbance can, in some cases, create conflicts with landowners and local communities. Mining engineers can reduce land disturbance and minimise the footprint of drilling operations, by using existing infrastructure, restoring land after drilling and consulting with stakeholders.

Drilling operations generate solid and liquid wastes, such as drilling cuttings, muds, brine and produced water. This waste may contain dangerous substances. If not properly managed, this waste can leak, spill or overflow, causing environmental and health risks. Waste management can also be costly and complex and requires compliance with regulations and public acceptance. Mining engineers implement waste management procedures at each drilling site. They improve this waste management by minimizing its production, reusing, and recycling it, disposing of it safely and conducting audits and inspections.

Finally, drilling operations can have positive and negative social impacts on local communities. On the positive side, they can create jobs, income, infrastructure, and development opportunities. On the negative side, they can result in displacements. Social impacts may also vary depending on the gender, age, ethnicity, and vulnerability of the groups concerned. Mining engineers can improve social impacts by conducting social impact studies, engaging with stakeholders, respecting human rights, and supporting local development.

[6] *https://rdcu.be/dEdZZ*

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Arverne: management of societal impacts, risks and opportunities

Arverne Group became a mission company in April 2022. Its reason for being, enshrined in its statutes, is: “through its unique know-how, the Arverne Group unlocks the potential of geo-resources and develops them sustainably for a pragmatic energy transition serving the prosperity of territories. “

Two social and environmental objectives arise from this purpose:

- “Act as a bold energy company to defend a pragmatic energy transition.
- “Encourage a virtuous society by relying on women and men within the company and the territories. “

In 2023, the Group set up its Mission Committee (made up of two members from outside the company and two employees) and defined 10 operational targets. These extra-financial commitments are structured around three pillars on which Arverne Group is concretely committed to strengthen its actions: the climate and the environment, the well-being of its employees and the development of the territories where the group operates.

The application of Arverne Group's purpose as well as the deployment of its operational targets in 2023 were assessed by an independent third party. The latter concluded in its audit report, which will be annexed to the company's annual report, that all social and environmental objectives have been respected.

The initiatives put in place by the group to limit pollution risks

To mitigate the aforementioned pollution risks, the group is taking several measures:

- well design: protection of aquifers from the design of wells and during the application for authorisation to open mining works (DAOTM/AENV).
- Double casing: use of double casing in wells to limit pollution, in accordance with DREAL regulations.
- Cementation control: verification of the quality of the cementing behind the casing by CBL logging, with repeated checks every five years.
- Drilling fluids: choice of drilling fluids adapted to the geological layers crossed to avoid contamination.
- Compliance with regulations: compliance with the rules of the Order of 25 June 2015 for shallow drilling and maintaining the Qualiforage RGE qualification.
- Brine treatment: implementation of brine treatment processes and quality control before reinjection, in compliance with ICPE regulations.
- **Environmental risks:** carrying out impact studies to identify environmental risks linked to projects and implementing the necessary protection/compensation measures upstream.
- **Control of accidental spills:** anti-spill management procedure, installation of anti-pollution kits, training and awareness of accidental spills for employees.
- **Waste management:** waste and hazardous substance management plan in compliance with current regulations (REACH, WEEE, etc.)

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- **Employee accident risk:** digital application (Sequoia) for dissemination and feedback of observations regarding safety, monitoring of safety corrective actions, safety displays on construction sites, holding safety talks.
- **Seismic risk:** continuous monitoring before, during and after drilling via the installation of seismic measuring stations.

Furthermore, it should be noted that the deep drilling activities of Arverne Group (Arverne Drilling Services) obtained, at the end of 2023, triple ISO certification on safety, quality and the environment.

Working conditions: accident risk management

The group employs 142 employees as of 31 December 2023 (160 employees including those of DrillHeat). The Group's exposure to risk linked to working conditions is explained by the nature of the group's activities (continuous work on site for Arverne Drilling Services workers) and by the composition of its workforce. In fact, 51% of employees are workers and employees, technicians, and supervisors (ETAM).

To control the risks inherent in drilling activities, the group provides mandatory safety training (CACES, Wellcontrol, SST, etc.). Arverne Drilling Services is ISO45001 certified. In addition, to adapt to the pace of a drilling site and reduce the number of days actually worked in the year by site personnel, the group sets up work in shifts and in cycles alternating periods of work and rest periods, involving frequent travel over several weeks. In 2023, the group recorded two accidents with work stoppage (two in 2022).

Respect for local communities: the initiatives in place to manage risks associated with acceptability

The acceptability risk refers to the possibility that the group's activities cause nuisance and pollution for local populations, as well as risks of seismicity. These problems can lead to opposition from communities and local authorities, manifested in demonstrations and legal actions. The risk of nuisance from Arverne's activities includes visual and noise impacts, effects on biodiversity, as well as radioactivity risks due to geothermal fluid.

To mitigate this risk, the group deploys regular awareness-raising actions to transparently inform those affected and residing near the projects. These actions include information meetings and educational presentations, aimed at explaining projects, discussing concerns, and building acceptance of the group's initiatives. Furthermore, the group indicates that it is renewing its tools with electric, compact, and soundproof drilling equipment, carrying out impact studies to identify and prevent environmental risks, and developing emergency plans to react in the event of an emergency. incident.

Corporate governance: focus on shareholders and the board of directors

Arverne is an uncontrolled group (previously controlled by the current DG). The group's shareholding is fragmented with key shareholders from various backgrounds (Co-founders of the SPAC Transition, group associates, ADEME Investissement, Renault).

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Shareholding of Arverne

Shareholders	On a non-diluted basis (1)					
	Ordinary shares	Founders' Shares	Total / share	% of share capital	Shares with voting rights (8)	% of voting rights (7)
Arosco SARL (2)*	8 545 293	-	8 545 293	21,45 %	8 545 293	24,56 %
Stokka SARL (3)	628 947	-	628 947	1,58 %	628 947	1.81%
Other former Arverne Group SAS partners (4)	7,526,003	-	7,526,003	18.89%	7,526,003	21.63%
former Arverne Group SAS partners	16,700,243	-	16,700,243	41.92%	16,700,243	48.01%
Crescendissimo SAS and Crescend'Green concert (5)	1,482,063	1,455,902	2,937,965	7.38%	1,482,063	4.26%
Schuman Invest (6)	468,946	1,455,900	1,924,846	4.83%	468,946	1.35%
Eiffel Essentiel SLP (7)	2,495,177	1,455,900	3,951,077	9.92%	2,495,177	7.17%
Founders of SPAC Transition	4,446,186	4,367,702	8,813,888	22.13%	4,446,186	12.78%
ADEME Investissement SAS*	3,364,358	340,037	3,704,395	9.30%	3,364,358	9.67%
Renault SAS*	2,944,736	340,037	3,284,773	8.25%	2,944,736	8.47%
Free float	7,330,994	-	7,330,994	18.40%	7,330,994	21.07%
Bonus share allotments	-	-	-	-	-	-
Total	**34,786,517**	**5,047,776**	**39,834,293**	**100.00%**	**34,786,517**	**100.00%**

Table 23 - Source: ODDO BHF Securities

In terms of respecting the interests of minority shareholders, no shareholders' agreement has been established. On the date of the Arverne Groupe Universal Registration Document, the Company's Articles of Association opt for the exemption from the allocation of double voting rights provided for in Articles L. 225-123 and L. 22-10-46 of the Code of business. In this regard, it will be submitted to the vote of the Combined General Meeting to restore the application of the provisions relating to double voting rights in the new Articles of Association of the Company, it being specified that the restoration of double voting rights will only benefit ordinary shares having been held in pure registered form or administered in the name of the same shareholder for at least two years from the Combined General Meeting of 7 June 2024.

In terms of governance, the group refers to the AFEP-MEDEF code. The group has adopted a monist governance. Pierre Brossollet serves as CEO. The board of directors is made up of 10 directors including an observer. The council houses 3 specialised committees: 1/ audit committee, 2/ nomination & remuneration and 3/ strategy, risks and CSR. The audit and nomination & remuneration committees are chaired by independent directors.

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Deviation from the code of governance		
Code recommendation	**Company practices and justifications**	**Rating**
Succession of executive corporate officers (recommendation 17.2.2.)	As of the date of the Universal Registration Document, the Company's Appointments and Remuneration Committee has not established a succession plan for its executive corporate officers. The governance of the Company was completely reviewed and modified following the Merger and the Nominations and Remuneration Committee and the Board of Directors have not yet had the opportunity to study this issue. This is why the Board of Directors believes it needs more time to comply with this recommendation. The Board of Directors will ask the Nominations and Remuneration Committee to begin a reflection on the establishment of a succession plan for executive corporate officers during the 2024 financial year.	The development of a succession plan is important to guarantee a flexible transition, ensuring stability of the company with its various stakeholders (shareholders, employees, customers, etc.). Although the group is quite new, the concentration of executive and control powers makes the implementation of a succession plan necessary, in our opinion.
Departure of executive corporate officers (recommendation 26.5.1)	Payment of termination benefits granted to the Chairman and Chief Executive Officer (as described in section 13.1.1.1 "Compensation policy for the Chairman and Chief Executive Officer" of this Universal Registration Document) and to the Deputy Chief Executive Officer (as described in section 13.1.1.2 "Remuneration policy of the Deputy Chief Executive Officer" of this Universal Registration Document) is not subject to performance conditions. The Board of Directors of the Company allocated these compensations on a temporary basis in order to compensate for the lack of GSC coverage during the waiting period set at 12 months of affiliation and these are not intended to continue after this time. In order to reproduce the logic of compensation in the event of involuntary loss of employment of executive corporate officers that the coverage associated with the GSC allows, the Board of Directors did not wish to subject this compensation to performance conditions. In accordance with recommendation 25.6.1 of the AFEP-MEDEF Code, if this compensation were to be combined with non-competition compensation, the accumulation must not exceed two years of compensation (fixed and annual variable).	The company's transparency on the subject is to be welcomed. Performance conditions serve to align the interests of managers with those of shareholders. Although the CEO is already a major shareholder of the group, the payment of this type of compensation generates a cost to the company and can raise questions of fairness of remuneration internally, in our opinion.

Table 24 - Sources: Company, ODDO BHF Securities

Since the AGM of 2024, the group has been meeting the recommendations of the AFEP-MEDEF code in terms of independence (50% required for non-controlled groups).

The board of directors is distinguished by a diversity of profiles (five engineers, three business school graduates, a lawyer and a technical profile). We note that two directors have experience on the executive committee of a listed company. The board's experience in administration of listed companies is weak (2/10) but understandable considering the size of the company. Sectoral experience is an area for improvement, particularly among independent directors (2/5). The board's rate of feminisation should be highlighted (50% required by the Copé-Zimmermann law).

The composition of the executive committee is limited (8 members). This is distinguished by high sectoral expertise (energy sector) In addition, we highlight the presence of an impact & engagement director (formerly ESG IR manager at TotalEnergies). The committee respects gender parity.

The CEO is one of the group's key shareholders, de facto aligning his interests with those of the shareholders. The integration of CSR into remuneration should be highlighted. The CEO's compensation is composed of a fixed element, an annual variable element and a multi-annual variable element. In 2023, the allocation of annual variable compensation was conditional on the achievement of extra-financial objectives (60%) including the establishment of a mission committee during 2024, an opinion from the OTI without major reservation within the framework of the status of mission company (40%) and an objective relating to the frequency rate of accidents leading to work stoppage (20%). In 2024, the following criteria apply:

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CEO compensation criteria		
Social issues: a)10% on the training policy: •define training plans, •creation of at least one partnership to help with recruitment, and •achievement of an average number of training hours in the Group at least equal to 110% of the 2023 average. b)10% on gender equality: •implement actions to promote diversity in the Group's professions in order to encourage female candidates in the drilling professions, •Implement professional equality indicators at Group level in order to identify areas of progress for 2025.	Extra-financial	20 %
Safety: Frequency rate: number of lost-time work accidents multiplied by 1 million, divided by the total number of hours worked ("tf1") less than or equal to 11. In the event of a fatal work accident, this criterion will be considered not to have been met in its entirety.	Extra-financial	20 %
Environment: •establish a report on greenhouse gas emissions on scope 1 (direct emissions) and scope 2 (indirect emissions linked to the consumption of electricity, steam, heat or cold); and •define a trajectory for limiting greenhouse gas emissions in scopes 1 and 2.		

Table 25 - Sources: Company, ODDO BHF Securities

Déviations au code de référence

Name	Gender	Position	Education	Former CEO of another company	Sen. mgmt exp	Dir. exp	Industry exp	Audit & fin. exp	International exp	CSR/ESG exp
Pierre Brossollet	M	Chair & CEO	EESTP | IFP School				x		x	
Tiphaine Auzière	F	Lead Indep. Dir.	Sorbonne							
Xavier Caïtucoli	M		Ponts ParisTech | Polytechnique	x	x		x			
Karine Charbonnier	F		Lille University | HEC					x		x
Jérôme Gouet	M		Grenoble INP | IAE Paris						x	
Frédéric Houssay	M		N/A							
Colette Lewiner	F		ENS | PhD Paris Cité University		x	x	x			
Françoise Malrieu	F		HEC			x		x		
Karine Mérère	F		Dauphine					x		x
Bruno Gerard	M		ENS, Univ Laval, HEC	x						

Note: Sen. Mgmt. exp = past experience on the Executive Committee of a listed company. Dir.exp = experience on the board of directors of a listed company. Industry exp. = experience in Arverne's sector of activity (i.e. geothermal energy, mining, drilling). Audit & end. exp = significant experience in finance or audit (in a financial institution or an audit company), important experience for the audit committee in particular. Inter'l exp = past international experience (exercise of an executive function outside France); important aspect with a view to expanding activities abroad.

Table 26 - Sources: Company, ODDO BHF Securities

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AFTER A STRUCTURING 2023, A LONG-TERM MODEL OUT TO 2030

The year 2023 allowed the group to structure itself and put itself in working order to achieve its growth targets in the coming years (listing on the stock market, raising more than € 160m, strengthening of its drilling systems' fleet, increasing its workforce, finalisation of the acquisition of Géorhin, development of its P/E, etc.).

We have modelled a P&L per entity (Drilling, Geothermal and Lithium) which we then consolidated. It should be noted that DrillHeat, only 50% owned by the group, is not consolidated and that Lithium de France is 36.3% owned by Hydro and Equinor.

While today the group's revenues stem solely from drilling, those linked to geothermal energy are planned for 2025 and those linked to lithium for 2027. Based on the long-term lithium price of € 17,000 per tonne, we obtain sales for 2031 of € 874.8m (growth of 77% over seven years) and an EBITDA margin of 65.7% for this horizon.

The year 2023, a turning point for Arverne

2023 was a year of transition for Arverne which allowed it to consolidate the foundations necessary for its growth in the next few years.

Several milestones have been reached in the group's various businesses, including:

in the field of drilling:

- strengthening industrial tools, teams and skills: € 50m spent to develop the drilling fleet (Arverne has at the end of 2023 3 surface drilling rigs, 3 deep drilling rigs and has 142 employees, +70% y-o-y).

In the field of geothermal energy:

- finalisation of the acquisition of Géorhin, renamed 2gré.
- Finalisation and interpretation of a first 3D seismic on the Pau-Tarbes PER.
- Increase in the surface area of PER (geothermal and lithium) from 171 km² to 2852 km² (Partly thanks to the takeover of 7PER held by GéoRhin).

In the field of lithium:

- launch of the prefeasibility study carried out by Technip EN.
- Advanced tests on the choice of DLE (Direct Lithium Extraction) technology.
- Finalisation and interpretation of a first 3D seismic survey on the Pau-Tarbes PER.
- Signature of a first supply contract for 25kt lithium over 5 years with Renault Group.

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At group level, Arverne also carried out two major financial operations during 2023, including an IPO on Euronext Paris (total gross amount raised of approximately € 160m) from strategic financial and industrial partners and the completion of a series B at Lithium de France (€ 44m in total, including € 20m subscribed by Arverne Group, € 7m by Equinor, and € 17m by Norsk Hydro, a new entrant to the capital).

At the end of 2023, Arverne therefore has a strengthened team, recent technical tools, major financial and industrial partners and a net cash level of € 131.5m.

A long-term vision out to 2030

During the presentation of 2023 results, the group reaffirmed its ambitions:

- revenue of between € 200 and € 350m for 2027 and € 800 and € 1,150m for 2030. The first sales of heat by 2gré and Lithium de France are respectively planned for 2025 and 2026 and the first sales of Lithium for 2027. From 2030, geothermal energy will represent a total of 4.8 TWh sold per year and lithium a total of 30 kt LCE per year.
- An EBITDA margin of between 60% and 70% by 2030.
- Gross capex of € 2,400m over 2023-2030. These will be distributed mainly between 2gré for € 600m (before subsidies) and Lithium de France for €1,800m (before subsidies and shareholders' share of Lithium de France).

They will be financed initially by 1/ money raised during the IPO, 2/ project financing (debt), 3/ subsidies up to 35% of capex and 4/ from 2025, the gradual ramp-up of CF coming from the sale of heat. At the end of 2023, the group had gross cash flow of € 144m associated with net debt of –€ 131.5m. As the company announced during its presentation of 2023 results, fundraising will be necessary during 2025.

For the construction of sales, we have taken assumptions close to those proposed by Arverne management.

Group ambitions reaffirmed during the presentation of 2023 results

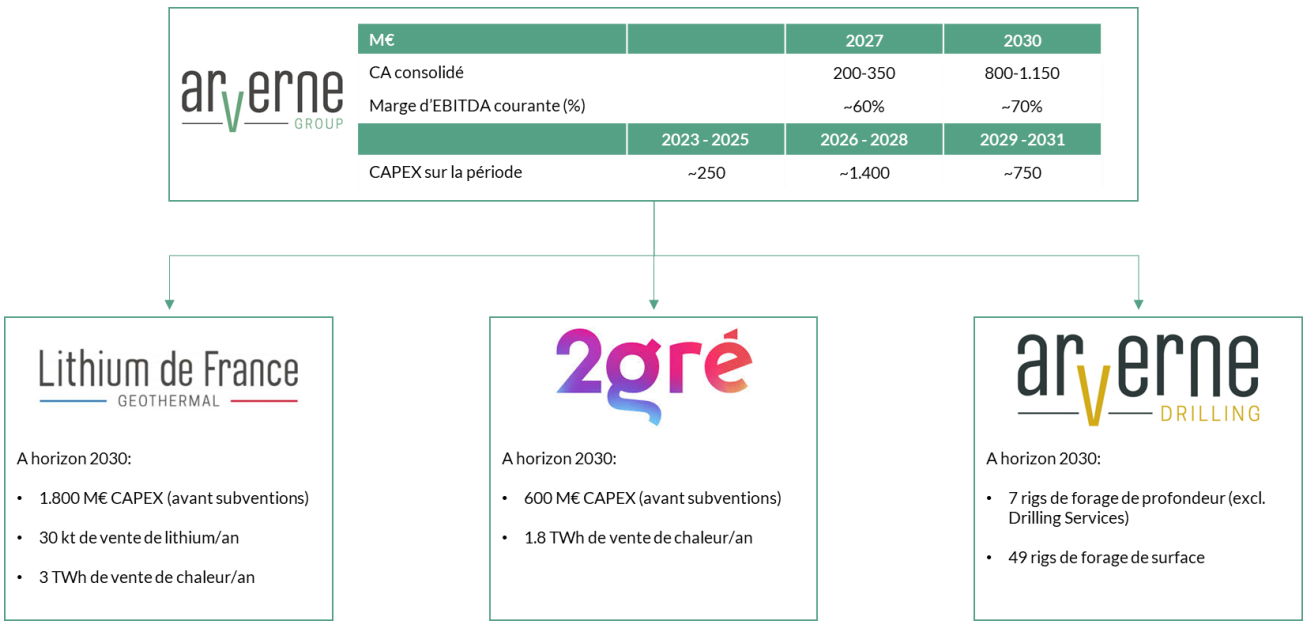

Chart 27 - Source: Arverne Group

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In 2023, the group's revenue was € 10.1m, slightly lower than that of 2022 (€ 10.7m). However, the volume of activity, which includes 50% of DrillHeat's sales, increased by 9% to € 11.9m. Currently Arverne's revenue only stems from the drilling activity.

Drilling: the group's first brick

The drilling activity (2023 revenue of € 9.8m) monitored by Arverne Drilling Services is based on three components: DrillDeep, for deep drilling, DrillHeat, for surface drilling and Arverne Drilling Services for servicing storage wells. As a reminder, DrillHeat is 50% owned by the group and is accounted for using the equity method. And Drill Deep is 26% owned by Herrenknecht. We have therefore separated the P&L of DrillHeat and DrillDeep to be able to take into account equity accounting and minority investments.

DrillHeat (surface drilling):
DrillHeat's revenue is tied to the number of rigs the company owns. Each rig digs on average 10,000m per year the first year to more than 17,000m at a later stage for a price of € 115 per metre. The number of operational rigs is 3 at the end of 2023 and 6 at the end of May 2024. It is expected to reach 49 by the end of 2030. Opex should reach 70% of sales from 2029. The price of a rig for DrillHeat is € 1m.

DrillHeat forecasts

€ m	2023	2024e	2025e	2026e	2027e	2028e	2029e	2030e	2031e	2032e	2033e	2034e	2035e
# rigs	*3*	*6*	*13*	*20*	*27*	*36*	*42*	*49*	*49*	*49*	*49*	*49*	*49*
Sales	**3.7**	**9.3**	**19.8**	**33.5**	**47.2**	**63.1**	**77.3**	**90.2**	**95.8**	**95.8**	**95.8**	**95.8**	**95.8**
Chg.		*151%*	*112%*	*69%*	*41%*	*34%*	*22%*	*17%*	*6%*	*0%*	*0%*	*0%*	*0%*
Opex	-6.7	-18.9	-28.9	-37.0	-46.9	-58.7	-68.5	-72.8	-72.8	-72.8	-72.8	-72.8	-18.9
Central costs		-2.8	-4.1	-5.5	-7.1	-8.1	-9.0	-9.8	-9.8	-9.8	-9.8	-9.8	-2.8
EBITDA		**-2.0**	**0.5**	**4.7**	**9.1**	**10.4**	**12.6**	**13.2**	**13.2**	**13.2**	**13.2**	**13.2**	**-2.0**
D&A		-1.7	-2.4	-3.3	-3.9	-4.6	-4.6	-4.6	-4.3	-3.6	-2.9	-2.9	-1.7
EBIT	**-2.4**	**-3.7**	**-1.9**	**1.4**	**5.2**	**5.8**	**8.0**	**8.6**	**8.9**	**9.6**	**10.3**	**10.3**	**-3.7**
Cost of debt		-0.2	-0.3	-0.4	-0.5	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	-0.2
Taxes		0.7	0.1	-0.2	-1.4	-2.5	-3.4	-3.6	-3.7	-3.8	-4.0	-4.0	0.7
Net Income	**-2.8**	**-2.9**	**-1.7**	**0.7**	**3.5**	**4.1**	**5.8**	**6.4**	**6.7**	**7.2**	**7.7**	**7.7**	**-2.9**
Capex		**3.0**	**7.0**	**7.0**	**7.0**	**9.0**	**6.0**	**7.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Table 28 - Source: ODDO BHF Securities

DrillDeep:
this subsidiary will carry out the majority of its drilling for 2gré and Lithium de France.

In the case of DrillDeep, we assume that after a ramp up period, from 2027 each rig performs 3 doublets per year for 2gré type drilling and 2 doublets per year for Lithium de France type drilling.

The revenue per doublet carried out for the companies is on average € 8m for 2gré type drilling and € 6m to € 7m for those of Lithium de France because the drilling is more complex but does not include the service part. The opex for each of the entities amounts to 85% of sales. We assume that in total the number of DrillDeep rigs will increase from 1 at the end of 2023 to 5 at the end of 2030 (2 dedicated to drilling for Lithium de France and 3 to other drilling).

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Arverne Drilling Services (well maintenance):
This activity is currently carried out mainly for the maintenance of Storengy gas storage wells. The contract with Storengy will last until 2027 for an amount of € 6m to € 8m per year. A second phase should then be initiated based on an annual invoicing of around € 14m. Opex for Arverne Drilling Services are of 85%. Currently Arverne Drilling Services has one rig and aims to double the number of rigs in 2025.

Arverne Drilling top line forecasts

€ m	2024e	2025e	2026e	2027e	2028e	2029e	2030e	2031e	2032e	2033e	2034e	2035e
DrillDeep (excl. LdF)												
# rigs	1	1	1	1	2	2	3	3	3	3	3	3
Sales	4.0	16.0	24.0	24.0	48.0	48.0	72.0	72.0	72.0	72.0	72.0	72.0
Chg.		*300%*	*50%*	*0%*	*100%*	*0%*	*50%*	*0%*	*0%*	*0%*	*0%*	*0%*
DrillDeep (LdF)												
# rigs	1	1	2	2	2	2	2	2	2	2	2	2
Sales	5.0	10.0	20.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
Chg.		*100%*	*100%*	*30%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Arverne Drilling Services												
# rigs	1	1	1	2	2	2	2	2	2	2	2	2
Sales	7.0	7.0	7.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
Chg.		*0%*	*0%*	*0%*	*100%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Total												
# rigs	3	3	4	5	6	6	7	7	7	7	7	7
Sales	16.0	33.0	51.0	64.0	88.0	88.0	112.0	112.0	112.0	112.0	112.0	112.0

Table 29 - Source: ODDO BHF Securities

Capex and D&A:
Capex is € 20m per new rig for deep drilling. Each rig is amortised over a period of 10 years. For surface drilling, the price of a rig is at around € 1m.

After distribution between the different entities, central costs are € 2m for Arverne Drilling Services, stable over the next few years due to the maturity of the company, implying an EBITDA of 13% from 2028.

Arverne Drilling and DrillDeep forecasts

€ m	2024e	2025e	2026e	2027e	2028e	2029e	2030e	2031e	2032e	2033e	2034e	2035e
# rigs	3	3	4	5	6	6	7	7	7	7	7	7
Sales	**16.0**	**33.0**	**51.0**	**64.0**	**88.0**	**88.0**	**112.0**	**112.0**	**112.0**	**112.0**	**112.0**	**112.0**
Chg.	*59%*	*106%*	*55%*	*25%*	*38%*	*0%*	*27%*	*0%*	*0%*	*0%*	*0%*	*0%*
Opex	-13.6	-28.1	-43.4	-54.4	-74.8	-74.8	-95.2	-95.2	-95.2	-95.2	-95.2	-95.2
Central costs	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
EBITDA	**0.4**	**3.0**	**5.7**	**7.6**	**11.2**	**11.2**	**14.8**	**14.8**	**14.8**	**14.8**	**14.8**	**14.8**
% of sales	*2%*	*9%*	*11%*	*12%*	*13%*	*13%*	*13%*	*13%*	*13%*	*13%*	*13%*	*13%*
D&A	-6.0	-6.0	-8.0	-10.0	-12.0	-12.0	-14.0	-14.0	-14.0	-10.0	-8.0	-8.0
EBIT	**-5.6**	**-3.1**	**-2.4**	**-2.4**	**-0.8**	**-0.8**	**0.8**	**0.8**	**0.8**	**4.8**	**6.8**	**6.8**
Cost of debt	-0.8	-0.8	-0.7	-0.6	-0.3	-0.2	-0.1	-0.1	0.0	0.0	0.0	0.0
Taxes	1.6	1.0	0.8	0.7	0.3	0.2	-0.2	-0.2	-0.2	-1.2	-1.7	-1.7
Net income of equity-accounted companies	**-4.8**	**-2.9**	**-2.3**	**-2.2**	**-0.8**	**-0.7**	**0.5**	**0.5**	**0.6**	**3.6**	**5.1**	**5.1**
Net income	**16.0**	**33.0**	**51.0**	**64.0**	**88.0**	**88.0**	**112.0**	**112.0**	**112.0**	**112.0**	**112.0**	**112.0**
Capex	**20.0**	**0.0**	**20.0**	**20.0**	**20.0**	**0.0**	**20.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Table 30 - Source: ODDO BHF Securities

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2gré the subsidiary dedicated to deep geothermal energy

2gré is the Arverne subsidiary specialising in the sale of heat. Once the doublet is dug and the plant installed, 2gré sells the heat at the outlet of the exchanger between the primary circuit (operated by 2gré) and the secondary circuit (operated by the Urban Heat Network operator). 2gré's customers are the RCU operators such as Dalkia, Coriance, IDEX, etc. The sale price of calories is modelled at € 65 per MWh, in line with current prices. 2gré's activity is therefore driven by the number of dug doublets. Our assumptions are based on a production per doublet of 35 GWh.

The first heat productions should take place in 2025 with a dug doublet. Then the number of doublets is expected to grow strongly: 4 in 2026, 11 in 2027, 20 in 2028, 35 in 2029 and reach the level of 50 in 2030.

On this basis, sales should reach € 25m in 2027 for a production of 0.4 TWh and € 114m in 2030 for a production of 1.8 TWh.

Opex is estimated at €6.5/MWh, therefore implying an operating result for 2gré of 90% of sales. Central costs are expected at -€ 2.7m in 2024 and should reach -€ 4.2m in 2030 (stable from this date).

The EBITDA margin should reach 86% from 2030, when the company will finish its period of strong growth.

Finally, the gross capex (before subsidy from the ADEME heat fund which can reach 35%) is at € 12m per doublet, implying total gross capex of € 600m for the 50 doublets drilled.

2gré forecast

€ m	2024e	2025e	2026e	2027e	2028e	2029e	2030e	2031e	2032e	2033e	2034e	2035e
# geothermal doublet (end of year)	0	1	4	11	20	35	50	50	50	50	50	50
GWh produced	0	35	140	385	700	1 225	1 750	1 750	1 750	1 750	1 750	1 750
Sales	**0.0**	**2.3**	**9.1**	**25.0**	**45.5**	**79.6**	**113.8**	**113.8**	**113.8**	**113.8**	**113.8**	**113.8**
Chg.			*300%*	*175%*	*82%*	*75%*	*43%*	*0%*	*0%*	*0%*	*0%*	*0%*
Opex	0.0	-0.2	-0.9	-2.5	-4.6	-8.0	-11.4	-11.4	-11.4	-11.4	-11.4	-11.4
Central Costs	-2.7	-3.0	-3.3	-3.5	-3.8	-4.0	-4.2	-4.2	-4.2	-4.2	-4.2	-4.2
EBITDA	**-2.7**	**-1.0**	**4.9**	**19.0**	**37.2**	**67.7**	**98.2**	**98.2**	**98.2**	**98.2**	**98.2**	**98.2**
% of sales			*54%*	*76%*	*82%*	*85%*	*86%*	*86%*	*86%*	*86%*	*86%*	*86%*
D&A	-1.2	-4.8	-13.2	-24.0	-42.0	-60.0	-60.0	-60.0	-60.0	-58.8	-55.2	-55.2
EBIT	**-3.9**	**-5.8**	**-8.3**	**-5.0**	**-4.8**	**7.7**	**38.2**	**38.2**	**38.2**	**39.4**	**43.0**	**43.0**
% of sales						*9.6%*	*33.6%*	*33.6%*	*33.6%*	*34.6%*	*37.8%*	*37.8%*
Cost of debt	0.0	-0.3	-1.1	-2.7	-4.4	-7.0	-8.6	-3.7	0.0	0.0	0.0	0.0
Taxes	1.0	1.5	2.4	1.9	2.3	-0.2	-7.4	-8.6	-9.5	-9.8	-10.7	-10.7
Net Income	**-2.9**	**-4.6**	**-7.1**	**-5.8**	**-6.9**	**0.5**	**22.2**	**25.9**	**28.6**	**29.5**	**32.2**	**32.2**
Capex	**12.0**	**36.0**	**84.0**	**108.0**	**180.0**	**180.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Table 31 - Source: ODDO BHF Securities

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Lithium de France for lithium and heat

Lithium de France will have a dual activity: heat production on the one hand and lithium extraction on the other. The first heat productions are planned for 2026 and lithium production for 2027.

Once the first heat and lithium extractions are launched, their production will be non-intermittent because the group will produce lithium continuously. It therefore needs customers who need heat permanently, such as industrialists, to sell its geothermal production. In the case of industrial customers, several differences should be noted. Arverne may be required to take charge of the secondary circuit, in order to provide heat to the entrance of its customers' factories. The supply of heat all year round, rather than only in winter, is interesting in operation but imposes additional constraints in terms of availability. This is likely to have an impact on the selling price of calories. In the case of Lithium de France, this price has been estimated at € 45 per MWh.

For both types of customers, it is envisaged to secure long-term heat sales contracts (typically 20 to 30 years) that allow long-term project financing to be set up.

Concerning revenues linked to the sale of lithium, we estimate a future lithium price of €17,000 per tonne of LCE. Our estimates are based on the forecasts of manufacturers that produce lithium (Eramet, Rio Tinto, etc.). They are lower than those of the Arverne Group, which expects the price of lithium to reach €25,000 per tonne by 2027-2030 due to 1/ demand that should be in excess of supply by 2027, the date from which Arverne Group will produce lithium (closure of unprofitable projects and cancellation of the opening of new projects below the break-even point) and 2/ a premium applied to lithium produced locally with a low carbon cost.

Our assumptions as from 2032 for Lithium de France are therefore as follows:

- annual production of a doublet: 150 GWhs.
- Average Mwh price: € 45.
- Cost of operations: € 6.5/MWh.
- Annual production of a doublet: 1.5 kt LHM.
- Price of a ton of LHM: € 17,000.
- Production cost of a ton of LHM: € 5,000.

After a consolidation period, Lithium de France's revenues will come from geothermal energy in 2026. From 2027, lithium-related revenues will make up the majority of LdF's revenue. We are expecting sales of € 645m from 2032, 80% of which will come from lithium revenues.

Geothermal opex represents 15% of geothermal revenues and lithium opex represents 20% of revenues from the sale of lithium.

Central costs should increase from € 5m in 2024 to € 14m in 2030.

Thus, Lithium de France's EBITDA should be positive from 2027, when the first lithium sales will be made, to reach a normative EBITDA of 72% from 2032.

Total capex (before subsidies and share payable by shareholders other than Arverne Group) for the various lithium extraction doublets amounts to € 1,800m spread between 2024 and 2030. These are linked to the drilling of the doublets and the installation of geothermal power plants and lithium treatment processes (extraction and refining).

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Lithium de France forecasts												
€ m	**2024e**	**2025e**	**2026e**	**2027e**	**2028e**	**2029e**	**2030e**	**2031e**	**2032e**	**2033e**	**2034e**	**2035e**
#geothermal doublets (end of year)	0	1	3	7	11	15	20	20	20	20	20	20
GWh produced	0	0	75	225	525	1 155	1 800	2 400	3 000	3 000	3 000	3 000
Lithium produced (kt)	0	0	0	1.4	4.2	9.9	18.0	24.0	30.0	30.0	30.0	30.0
Sales (geothermal)	0.0	0.0	3.4	10.1	23.6	52.0	81.0	108.0	135.0	135.0	135.0	135.0
Sales (Lithium)	0.0	0.0	0.0	23.0	71.4	168.3	306.0	408.0	510.0	510.0	510.0	510.0
Total	**0.0**	**0.0**	**3.4**	**33.1**	**95.0**	**220.3**	**387.0**	**516.0**	**645.0**	**645.0**	**645.0**	**645.0**
Chg.				*880%*	*187%*	*132%*	*76%*	*33%*	*25%*	*0%*	*0%*	*0%*
Opex (geothermal energy)	0.0	0.0	-0.5	-1.5	-3.4	-7.5	-11.7	-15.6	-19.5	-19.5	-19.5	-19.5
Opex (Lithium)	0.0	0.0	0.0	-6.8	-21.0	-49.5	-90.0	-120.0	-150.0	-150.0	-150.0	-150.0
Structural costs	-5.0	-7.0	-9.0	-11.0	-12.0	-13.0	-14.0	-14.0	-14.0	-14.0	-14.0	-14.0
EBITDA	**-5.0**	**-7.0**	**-6.1**	**13.9**	**58.6**	**150.3**	**271.3**	**366.4**	**461.5**	**461.5**	**461.5**	**461.5**
% of sales				*42%*	*62%*	*68%*	*70%*	*71%*	*72%*	*72%*	*72%*	*72%*
D&A	-3.0	-9.0	-39.0	-75.0	-111.0	-149.0	-179.0	-179.0	-179.0	-179.0	-176.0	-170.0
EBIT	**-8.0**	**-16.0**	**-45.1**	**-61.1**	**-52.4**	**1.3**	**92.3**	**187.4**	**282.5**	**282.5**	**285.5**	**291.5**
% of sales						*1%*	*24%*	*36%*	*44%*	*44%*	*44%*	*45%*
Cost of debt	0.0	-0.8	-2.3	-8.8	-16.0	-21.7	-24.8	-21.0	-2.7	0.0	0.0	0.0
Taxes	2.0	4.2	11.9	17.5	17.1	5.1	-16.9	-41.6	-70.0	-70.6	-71.4	-72.9
Net Income	**-6.0**	**-12.6**	**-35.6**	**-52.5**	**-51.3**	**-15.3**	**50.6**	**124.8**	**209.9**	**211.9**	**214.1**	**218.6**
Capex	**30**	**60**	**300**	**360**	**360**	**380**	**300**	**0**	**0**	**0**	**0**	**0**

Table 32 - Source: ODDO BHF Securities

In summary, strong growth to reach more than € 800m by 2031

We have consolidated the various entities to obtain the P&L at group level. According to our estimates, we expect consolidated revenues to reach € 871m by 2031, mainly composed of revenues from Lithium de France sales (74%). We expect positive EBITDA from 2027 thanks to the ramp-up of 2gré and Lithium de France sales (margin expected at 47% in 2027). The margin should then continue to increase and stabilise at around 65% from 2031. In terms of EBIT, the margin should reach 37% from 2031 and then increase as capex amortisation decreases (capex amortised over 10 years). Finally, attributable net profit is expected to be positive from 2030 and be close to € 160m in 2032.

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Arverne Group forecast (sum up)									
€ m	**2024e**	**2025e**	**2026e**	**2027e**	**2028e**	**2029e**	**2030e**	**2031e**	**2032e**
Drilling	16.0	33.0	51.0	64.0	88.0	88.0	112.0	112.0	112.0
2gré	0.0	2.3	11.4	25.0	45.5	79.6	113.8	113.8	113.8
LdF	0.0	0.0	6.8	96.8	225.8	354.8	483.8	645.0	645.0
Total sales	**16.0**	**35.3**	**65.8**	**122.1**	**228.5**	**387.9**	**612.8**	**741.8**	**870.8**
Chg.	*59%*	*120%*	*86%*	*86%*	*87%*	*70%*	*58%*	*21%*	*17%*
Opex	-13.6	-28.3	-44.7	-65.1	-103.8	-139.8	-208.3	-242.2	-276.1
Structural costs	-9.7	-12.0	-14.3	-16.5	-17.8	-19.0	-20.2	-20.2	-20.2
Holding costs	-6.0	-6.5	-6.7	-6.9	-7.1	-7.3	-7.2	-7.2	-7.2
EBITDA	**-13.3**	**-11.5**	**0.0**	**33.6**	**99.9**	**221.8**	**377.1**	**472.2**	**567.3**
% of sales				*28%*	*44%*	*57%*	*62%*	*64%*	*65%*
D&A	-10.2	-19.8	-60.2	-109.0	-165.0	-221.0	-253.0	-253.0	-253.0
EBIT	**-23.5**	**-31.3**	**-60.2**	**-75.4**	**-65.1**	**0.8**	**124.1**	**219.2**	**314.3**
% of sales							*20%*	*30%*	*36%*
Cost of debt	-0.8	-2.0	-4.2	-12.1	-20.7	-28.9	-33.6	-24.8	-2.7
Taxes	5.7	7.3	14.0	15.8	11.1	-7.4	-39.4	-61.0	-79.2
Consolidated Net Income	**-19.5**	**-27.4**	**-51.2**	**-71.4**	**-73.0**	**-33.5**	**54.0**	**136.6**	**235.7**
Minorities	3.2	4.9	12.4	6.2	-8.4	-23.3	-41.4	-76.4	-79.0
Attributable Net Income	**-16.3**	**-22.2**	**-37.7**	**-51.8**	**-54.2**	**-28.0**	**34.8**	**89.9**	**157.5**

Table 33 - Source: ODDO BHF Securities

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Arverne Group | **Outperform** | Price 6.80 €
Renewable Energies | France | Upside 32.35% | TP 9.00 €

PER SHARE DATA (€)	12/20	12/21	12/22	12/23	12/24e	12/25e	12/26e
Adjusted EPS	224.46	-121.26	-0.22	-1.47	-0.35	-0.50	-1.02
Reported EPS	**222.62**	**-121.26**	**-0.22**	**-1.89**	**-0.42**	**-0.60**	**-1.24**
Growth in adjusted EPS	-	ns	ns	ns	ns	ns	ns
Net dividend per share	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FCF to equity per share	190.01	-99.15	-0.82	-1.34	-1.77	-2.68	-10.00
Book value per share	237.93	159.98	-0.74	5.96	3.70	3.10	1.86
Number of shares market cap (m)	0.02	0.02	15.20	39.83	39.83	39.83	39.83
Number of diluted shares (m)	0.02	0.02	7.61	35.43	47.74	47.74	47.74
VALUATION (€m)	**12/20**	**12/21**	**12/22**	**12/23**	**12/24e**	**12/25e**	**12/26e**
12m highest price (€)		11.93	11.34	12.29	9.65		
12m lowest price (€)		10.89	9.57	9.27	6.80		
(*) Reference price (€)		11.45	10.39	10.58	6.80	6.80	6.80
Capitalization		0.2	158	422	271	271	271
Restated Net debt	6.0	4.9	2.0	-131.5	-61.0	45.9	445
Minorities (fair value)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Financial fixed assets (fair value)	5.2	3.4	3.4	3.4	3.4	0.0	0.0
Provisions	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Enterprise Value		**1.7**	**156**	**287**	**206**	**317**	**716**
P/E (x)		ns	ns	ns	ns	ns	ns
P/CF (x)		ns	ns	ns	ns	ns	37.6
Net Yield		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
FCF yield		ns	ns	ns	ns	ns	ns
P/B incl. GW (x)		0.07	ns	1.77	1.84	2.19	3.65
P/B excl. GW (x)		0.07	ns	1.77	1.84	2.19	3.65
EV/Sales (x)		0.13	14.60	28.41	12.90	8.98	10.89
EV/EBITDA (x)		ns	ns	ns	ns	ns	99.5
EV/Current EBIT (x)		**ns**	**ns**	**ns**	**ns**	**ns**	**ns**
(*) historical average price							
PROFIT AND LOSS (€m)	**12/20**	**12/21**	**12/22**	**12/23**	**12/24e**	**12/25e**	**12/26e**
Sales	4.5	12.6	10.7	10.1	16.0	35.3	66
EBITDA	-2.0	-2.2	-1.5	-14.7	-7.9	-5.4	7.2
Depreciations	-1.5	-1.6	-2.0	-1.9	-10.2	-19.8	-60.2
Current EBIT	**-3.4**	**-3.8**	**-3.5**	**-16.6**	**-18.1**	**-25.2**	**-53.0**
Published EBIT	4.3	-2.4	-2.7	-61.3	-18.1	-25.2	-53.0
Net financial income	0.0	0.0	0.8	6.5	0.0	0.0	0.0
Corporate Tax	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Net income of equity-accounted companies	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Profit/loss of discontinued activities (after tax)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Minority interests	0.0	0.1	0.2	1.8	1.4	1.4	3.5
Attributable net profit	4.2	-2.4	-1.6	-52.0	-16.7	-23.8	-49.5
Adjusted attributable net profit	**4.3**	**-2.4**	**-1.6**	**-52.0**	**-16.7**	**-23.8**	**-49.5**
BALANCE SHEET (€m)	**12/20**	**12/21**	**12/22**	**12/23**	**12/24e**	**12/25e**	**12/26e**
Goodwill	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other intangible assets	0.0	0.6	4.5	39.2	32.4	26.6	18.0
Tangible fixed assets	8.4	8.3	6.7	19.4	78.1	160	512
WCR	1.8	-1.6	-19.2	-4.6	-3.9	1.6	3.0
Financial assets	1.1	1.1	5.2	3.4	3.4	3.4	3.4
Ordinary shareholders equity	4.5	3.1	-5.6	164	147	124	74.2
Minority interests	0.0	0.1	0.7	14.3	12.9	11.6	8.0
Shareholders equity	4.5	3.3	-4.9	178	160	135	82.2
Non-current provisions	0.8	0.2	0.0	10.5	10.5	10.5	10.5
Net debt	**6.0**	**4.9**	**2.0**	**-131.5**	**-61.0**	**45.9**	**444**
CASH FLOW STATEMENT (€m)	**12/20**	**12/21**	**12/22**	**12/23**	**12/24e**	**12/25e**	**12/26e**
EBITDA	**-2.0**	**-2.2**	**-1.5**	**-14.7**	**-7.9**	**-5.4**	**7.2**
Change in WCR	0.0	0.0	0.0	0.0	-0.6	-5.5	-1.4
Interests & taxes	0.0	0.0	0.8	6.8	0.0	0.0	0.0
Others	5.9	1.9	-0.3	-7.4	0.0	0.0	0.0
Operating Cash flow	4.0	-0.3	-1.1	-15.3	-8.5	-10.9	5.8
CAPEX	-0.3	-1.7	-5.1	-21.4	-62.0	-96.0	-404.0
Free cash-flow	**3.6**	**-1.9**	**-6.2**	**-36.7**	**-70.5**	**-106.9**	**-398.2**
Acquisitions / disposals	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dividends	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net capital increase	0.3	3.2	4.4	114.6	0.0	0.0	0.0
Others	2.1	-0.6	-0.9	53.5	0.0	0.0	0.0
Change in net cash	7.0	0.7	-1.8	133.3	-70.5	-106.9	-398.2
GROWTH MARGINS PRODUCTIVITY	**12/20**	**12/21**	**12/22**	**12/23**	**12/24e**	**12/25e**	**12/26e**
Sales growth	-	ns	-15.0%	-5.8%	58.5%	ns	86.4%
Lfl sales growth	**-**	**ns**	**-15.0%**	**-5.8%**	**58.5%**	**ns**	**86.4%**
Current EBIT growth	-	ns	ns	ns	ns	ns	ns
Growth in adjusted EPS	-	ns	ns	ns	ns	ns	ns
Net margin	94.9%	-18.9%	-15.4%	ns	ns	-67.4%	-75.3%
EBITDA margin	**-43.4%**	**-17.3%**	**-14.4%**	**ns**	**-49.1%**	**-15.2%**	**10.9%**
Current EBIT margin	**-76.1%**	**-30.2%**	**-32.8%**	**ns**	**ns**	**-71.3%**	**-80.6%**
CAPEX / Sales	-7.7%	-13.3%	-48.0%	ns	ns	ns	ns
WCR / Sales	40.5%	-12.3%	ns	-45.4%	-24.6%	4.6%	4.6%
Tax Rate	0.4%	-1.6%	-1.0%	1.8%	0.0%	0.0%	0.0%
Normative tax rate	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
Asset Turnover	-	1.4	-27.6	0.4	0.2	0.2	0.2
ROCE post-tax (normative tax rate)	**-**	**-32.7%**	**ns**	**-54.2%**	**-16.9%**	**-12.8%**	**-11.0%**
ROCE post-tax hors GW (normative tax rate)	-	-32.7%	ns	-54.2%	-16.9%	-12.8%	-11.0%
ROE	-	-62.1%	ns	-65.7%	-10.7%	-17.5%	-50.0%
DEBT RATIOS	**12/20**	**12/21**	**12/22**	**12/23**	**12/24e**	**12/25e**	**12/26e**
Gearing	132%	150%	ns	-74%	-38%	34%	540%
Net Debt / Market Cap		21.13	0.01	-0.31	-0.23	0.17	1.64
Net debt / EBITDA	**-3.06**	**-2.25**	**-1.30**	**8.93**	**7.75**	**-8.58**	**61.71**
EBITDA / net financial charges	-325.2	362.7	1.9	2.2	ns	ns	ns

Sources: ODDO BHF Securities, SIX

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Valuation method

- Our target prices are established on a 12-month timeframe and we use three valuation methods to determine them. First, the discounting of available cash flows using the discounting parameters set by the Group and indicated on ODDO BHF' website. Second, the sum-of-the-parts method based on the most pertinent financial aggregate depending on the sector of activity. Third, we also use the peer comparison method which facilitates an evaluation of the company relative to similar businesses, either because they operate in identical sectors (and are therefore in competition with one another) or because they benefit from comparable financial dynamics. A mixture of these valuation methods may be used in specific instances to more accurately reflect the specific characteristics of each company covered, thereby fine-tuning its evaluation.

- **Sensitivity of the result of the analysis/ risk classification:**
The opinions expressed in the financial analysis are opinions as per a particular date, i.e. the date indicated in the financial analysis. The recommendation (cf. explanation of the recommendation systematic) can change owing to unforeseeable events which may, for instance, have repercussions on both the company and on the whole industry.

- **Our stock market recommendations**
Our stock market recommendations reflect the RELATIVE performance expected for each stock on a 12-month timeframe.
Outperform: performance expected to exceed that of the benchmark index, sectoral (large caps) or other (small and mid caps).
Neutral: performance expected to be comparable to that of the benchmark index, sectoral (large caps) or other (small and mid caps).
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Recommendation and target price changes history over the last 12 months for the company analysed in this report

Date	Reco	Price Target (EUR)	Price (EUR)	Analyst

In accordance with Article 20 of European Regulation No. 596/2014 (Market Abuse Regulation), a list of all recommendations on any financial instrument or issuer that have been disseminated over the past twelve months is available by clicking on the following link www.securities.oddo-bhf.com/#disclaimer.

Recommendation split

		Outperform	Neutral	Underperform
Our whole coverage	(697)	51%	39%	10%
Liquidity providers coverage	(78)	45%	46%	9%
Research service coverage	(54)	63%	24%	13%
Investment banking services	(37)	49%	49%	3%

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