Allenby CAPITAL

Company Note

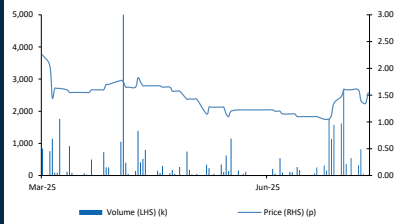
Initiation

4 August 2025

Corporate

Current price	**1.55p**
Sector	**Mining**
Code	**HREE.L**
Listing	**Main Market**

Share Performance



% Change	1m	3m	12m
HREE.L	+34.8	-7.5	NA

Source: Refinitiv, Allenby Capital

Share Data (pro forma)		
Market Cap (£m)		**7.7**
Shares in issue (m)		**495.88**
52 weeks (p)	High	Low
	2.44	**0.935**
Financial year end		**June 30**

Source: Company Data, Allenby Capital

Key Shareholders	
Jurd (Sebastain)	9.88%
Mulligan (Allan)	8.78%
RAB Capital	5.53%
Lynn (Stephen Francis)	4.52%
Nealon (Edward)	3.44%

Source: Refinitv (July 2025)

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Harena Resources Plc (HREE.L)

An undiscovered IAC rare earths play

Harena Resources is a junior rare earth play based on its Ampasindava project in northwestern Madagascar. The project centres around an IAC (ionic absorption clay) deposit. Historically, such deposits have only been mined in southern China and Myanmar but of late have attracted growing interest elsewhere, notably northeastern Brazil. Geological conditions are analogous in northwestern Madagascar. IAC projects offer low capital, mining and processing costs compared with their hard rock peers and contain ore rich in the key magnet elements. Significantly, rare earth IAC mineralisation occurs close to the surface and requires no drilling and blasting before excavation. The elements can be relatively easily heap leached using a benign ammonium sulphate solution to form a mixed rare earth carbonate. The Ampasindava project is in the final stages of a pre-feasibility study and has a sizeable JORC defined resource base. With a market capitalisation of a mere £5.6m (pre-placing), Harena is undiscovered and sells at substantial discounts to ASX and TSX-listed Brazilian focused IAC rare earth peers.

- **Location and geology:** The Ampasindava project is situated about 500km northwest of the Madagascar capital Antananarivo and 250km south of the deepwater port of Antsiranana. Geologically the project is underlain by alkaline igneous bedrock associated with Tertiary magmatic intrusion activity. The bedrock is overlain by a thick weathered zone or regolith which hosts the rare earth IAC mineralisation on the surface of clay minerals. The mineralisation stems mainly from weathering of the rare earth containing bedrock. The tropical climate has been conducive to the process.

- **Exploration and resources:** Ampasindava has been subject to considerable exploration and development activity by several operators since 2008. Previous operators have drilled >20,000m into the bedrock and have dug 4,470 pits in the regolith. The regolith was judged most prospective for rare earths given the much higher concentration of the elements. A 2023 JORC resource estimate revealed 698.5m tonnes of ore @ 868ppm TREO (total rare earth oxide) for 606,000 tonnes of contained TREO. Significantly, high-grade mineable zones with >1,000 ppm have been identified. The high confidence categories measured and indicated accounted for 32% of the total contained resource.

- **Processing:** Compared with their hard rock peers, IAC rare earth projects utilise simpler mining and processing technology. This translates into lower CAPEX and OPEX. Brazilian IAC projects point to the potential for first quartile positioning on the rare earths cost curve. The key positives for IAC projects are shallow mining depths, free-dig excavation and processing based on heap leaching, rather than mechanical separation, SAG/ball mill beneficiation and flotation. IAC projects also eliminate the need for tailings facilities.

- **The road ahead:** The Ampasindava pre-feasibility study is expected to be completed by end Q3 2025. Subsequently a definitive feasibility (DFS) is scheduled for completion by Q1 2026. A pilot plant should follow to confirm feasibility. The start-up of a 5,000 tpy commercial plant is technically possible during H2 2028. Management estimates an upfront capital cost of c. US$143m and we would expect this to be project financed.

Year End: 30 June				
(£'000)	2024*	2025E	2026E	2027E
Net cash flow	(121)	(583)	(1,152)	(3,938)
Net cash/(debt)	34	(549)	(1,701)	(5,639)

Source: Company; Allenby Capital. Allenby Capital acts as financial adviser and broker to Harena Resources Plc (HREE.L).
* April year end and data for FY24 relates to Citius.

Contents

Investment thesis

Play on rare earths one of the most dynamic industrial commodity sector: Harena Resources is an interesting new play on rare earths, a commodity grouping which has among the most dynamic growth characteristics in the industrial field. We see growth being driven in part by exposure to high technology applications, particularly in magnetics and in part the substitution of mechanical by electronic control systems across a wide range of mature technology industrial and consumer durable products. Rapid demand growth and lagging supply raises the prospect of a tightening supply-demand balance over the balance of the decade and in all probability beyond. This we believe is likely to set the scene for a firming price trend particularly for the five main magnet facing rare earths: praseodymium, neodymium, terbium, dysprosium and samarium.

Advanced Ampasindava project: Harena has entered the world of rare earths through its advanced Ampasindava project in northwestern Madagascar. Significantly, this is based on an IAC deposit which has critical mass and offers the potential for low capital and operating cost. The key positives are near surface mineralisation, deposition of weathered rare earth elements on the surface of clays rather than in hard rock minerals and the application of simple heap leaching to produce a mixed rare earth carbonate product. The evidence from a series of IAC rare earth projects in northeastern Brazil is pointing to the potential for operating costs in the first quartile of the international rare earths cost curve.

Considerable discounts to its ASX and TSX IAC peers: The Ampasindava project is at an advanced development stage with a pre-feasibility study pending in late Q3 2025. The commissioning of a commercial plant is technically plausible by late 2028. With a market capitalisation of a mere £4.5m, Harena stands at considerable discounts to its ASX and TSX -listed peers with IAC rare earth projects in Brazil, an emerging rare earths powerhouse. Positive news flow surrounding firstly the PFS and then the DFS could, we believe, lift the valuation from around US$13/tonne currently to perhaps $30/tonne. The latter would imply a market capitalisation of US$14m and US$18m on a 75% ownership and 100% ownership basis respectively. For perspective, the ASX and TSX listed Brazilian plays are selling on valuations ranging between US$35 and US$1,694/tonne in the case of Brazilian Rare Earths (BRE: ASX).

Corporate profile and background

Genesis of the company

Pure rare earths play:

REE IAC project in NW Madagascar: Harena Resources plc (HREE.L) is a pure rare earths play based on the advanced stage and large scale 75% owned Ampasindava development project in northwest Madagascar. The project is based on an ionic adsorption clay (IAC) deposit which historically have only been developed in southern China and Myanmar. Recently, interest in IAC development has grown rapidly with Brazil very much at the forefront in this regard. Significantly, IAC projects are rich in the four key magnet related rare earth elements.

Harena Resources listed following an RTO in March 2025: Harena Resources plc has its origins in two companies. These are the privately held and Perth-based Australian company Harena Resources Pty Ltd and the previously London Stock Exchange listed Citius Resources Plc (CRES.L). The former held the 75% interest in the Ampasindava project while the latter was established as a Special Purpose Acquisition Vehicle seeking resource sector projects. Citius Resources completed the acquisition of Harena Resources Pty Ltd on March 20, 2025, in a reverse takeover (RTO). The new entity was listed on the Main Market of the London Stock Exchange (LSE) on March 21, 2025. Subsequently, the name was changed to Harena Resources plc.

The deal:

£10m consideration for Harena Resources Pty Ltd: The consideration for Harena was £10.0m based on 333.33m Citius shares at 3.0p/share. In addition, there are potentially a further 133.3m which have been referred to as performance shares. This element of the deal would be triggered in the event of the equity interest in Ampasindava being increased to more than 90% and completing the conversion of the licence to permit extraction. These two factors would increase the shares in issue by 66.6m and 66.7m respectively.

£1.38m raised in equity and debt raised at the time of the float: At the time of the admission to the LSE Harena raised £1.38m comprising £0.6m in equity and A$1.5m (£0.80m) in loan notes. The raise was required to fund a pre-feasibility and environmental impact and social assessment studies and for general working capital purposes. The loan notes are unsecured, have a term of 2 years and carry a coupon of 18% pa payable in arrears. Following the RTO there were 413.88m shares in issue of which the Harena acquisition accounted for 81%. Additionally, there are 124.5m warrants and options.

Exhibit 1: Harena plc capital structure

	Ordinary shares in issue	
	m	%
Citius shares originally in issue	43.25	10
Harena consideration	333.33	81
Placing	20.73	5
Fee shares	16.57	4
Enlarged share capital	413.88	100
Harena performance shares	133.3	
Warrants and options	124.5	

Source: Company; Allenby Capital

Harena Resources Pty Ltd involvement

Harena Resources Pty Ltd incorporated in April 2022 in Perth--- Harena Resources Pty Ltd was incorporated in April 2022 in Perth WA. One of the founders was Allan Mulligan who is now an Executive Director of Harena Resources plc. He is a seasoned mining engineer who has had considerable experience of mine development and operations in Australia and Africa. His experience includes some limited design and development work on the

Makuutu ionic clay rare earths project in Uganda and the Walkabout Lindi Jumbo graphite mine in Tanzania.

-------and acquired the project following an earlier bankruptcy: Harena Resources Pty Ltd involvement with the Ampasindava project followed the bankruptcy in 2022 of the then 75% owner, Reenova Global Pte Ltd, a Singapore-based privately held company. Reenova was acquired from the secured creditor through a Singapore court and judicial and administration process in 2023. The consideration was modest at around A$4m including a negotiated settlement with the creditors. It should be noted that prior to Reenova's involvement the Ampasindava project had been operated by several juniors since the first exploration licence was granted in 2003. As is often the case with juniors they all struggled with financing. In the early part of the current decade covid constituted a particular problem.

Madagascar legal entity owns 100% of the Ampasindava project: The acquisition of Reenova Global Pte Ltd gave Harena Resources Ltd a 75% share in a Mauritius holding company Reenova Holding (Mauritius) Ltd. This in turn owned 100% of the Madagascar legal entity Reenova Rare Earth (Malagasy) SARLU which held the Ampasindava project on Permit 6698 in northwestern Madagascar. The 25% minority interest in Ampasindava is owned by a former operator of the project, Tantalus Rare Earths AG. Harena Resources plc intends acquiring the minority in due course.

Why is the Ampasindava project interesting?

We see the Ampasindava project as highly interesting in the context of rare earth projects reflecting the following:

- Ampasindava is at an advanced development stage and is now approaching pre-feasibility study status. Previous owners have undertaken >20,000m of drilling with 277 holes and have dug 4,470 test pits. Extensive high quality development work provides a favourable basis for mine design.
- A sizeable JORC defined resource has been established including in the high confidence indicated and measured categories. Overall TREO contained resources stand at 606,000 tonnes of which 32% are in the high confidence indicated and measured categories.
- The resource is based on a near-surface ionic absorption clay (IAC) deposit which lends itself to simple two-stage heap leaching without toxic chemicals. A major differentiator compared with hard rock rare earth deposits is that the processing route envisaged does not require complex high-cost infrastructure and tailings facilities as would be the case with a hard rock operation.
- Development work has revealed high-grade ore zones by ionic clay standards. which can be mined in the early years of operation.
- A prospective mine is planned about 15 km north of the main Madagascar north-south N6 highway.
- The nature of the deposit and simple leach processing point to the potential for a competitive position on the rare earths international cost curve.

Exhibit 2: Madagascar highway map

Source: vidiani.com

Shareholders and management

Executive Technical Director Allan Mulligan: Harena operates with a lean management structure. The key operational member of the team is the Executive Technical Director, Allan Mulligan. He is directing Ampasindava project development including the pre-feasibility study and operates from Mauritius. According to Refinitiv data, Allan Mulligan owns 8.78% of Harena plc and is the second largest shareholder.

Allan has a South African background and is a seasoned mining engineer with over 35 years' experience in the field. He has extensive experience in mine development and operations particularly in South Africa. His specialty has been underground gold and platinum mining. Allan has held technical and managerial positions with Gold Fields of South Africa and Lonmin, formerly one of the world's top three platinum producers. At Lonmin plc he spent 14 years in technical and managerial roles.

In the junior sector Allan was a founder and Managing Director of the ASX listed Walkabout Resources and directed the development of the Lindi Jumbo graphite mine in Tanzania. He has also been involved in the development of Ionic Rare Earth's (IXR:ASX) Makuutu ionic absorption clay project in Uganda. Allan has been involved with the Ampasindava project since 2022 when it was acquired by Harena Resources Pty Ltd.

Non-Executive Chairman Ivan Murphy: Ivan Murphy is the Harena Resources Plc Executive Chairman elect and is a Corporate Finance Director at Capital Plus Partners Ltd, a London-based and FCA regulated corporate broking and advisory firm. He will commence his new role following the completion of the Harena equity placing announced on July 22. Ivan has previously been the Executive Chairman of Tantalus Rare Earths AG, a previous owner of the Ampasindava project. He has over 25 years' corporate finance experience and is well acquainted with raising equity from private and public market sources for natural resource juniors. Among his achievements was a US$20m private equity fund raise for Aladdin Middle East, a Turkish E&P company. Ivan also has an entrepreneurial background. Companies that he has been involved with as a founder include Cove Energy Plc, Murphy Richards LLC and Fairfax I.S. Ltd. Ivan has a BA in Economics and Sociology from University College, Cork. He is fluent in French.

Non-Executive Director Paul Richards: Paul Richards is a qualified solicitor and an experienced investment banker. He has spent over 35 years in the latter field and has worked on numerous IPOs and fund raisings across various sectors, including natural resources. His earlier work experience has included stints in senior positions with UK brokers and corporate finance houses Hoare Govett, Collins Stewart and Fairfax I.S. Paul has previously been an Executive Director of Tantalus Rare Earths AG and has a detailed knowledge of the Ampasindava project. He is a partner in the boutique advisory firm Jesty Capital LLP and is the Chairman of Cleantech Building Materials Plc.

Non-Executive Director Timothy Morrison: Timothy Morrison was the former Chairman of Harena Resources Plc. He is a capital markets specialist having over 20 years in the field in both private equity fund management and the public markets. His area of specialty has been the Australian Stock Exchange where he has floated several businesses.

Non-Executive Director Stephen Weir: Stephen Weir was appointed as a Non-Executive Director in June 2025. This was in accordance with the rights of the trustee under the Company's A$1.5m loan note facility created in conjunction with the Harena Resources listing in March 2025. The facility was arranged by Sydney-based GBA Capital Pty Ltd. The Principal of GBA Capital, Sebastian Jurd is the largest shareholder in Harena Resources plc and owns 9.88% of the stock. Stephen Weir owns a further 1.07%.

Stephen Weir holds a Bachelor of Engineering (Hons, Mechanical) and has over 25 years' experience in equity capital markets and corporate advisory roles. He has previously

served as the Managing Director of RFC Ambrian, a London and Sydney-based corporate advisory group. Stephen has extensive experience in mining and corporate finance. A recent role was as CEO of Magnetite Mines Ltd (MGT:ASX).

In addition to the above, Harena Resources also has a Madagascar Country Manager and a CFO. Currently Harena is without a CEO but the company has indicated that one is likely to be appointed in due course. Allan Mulligan is the de-facto CEO.

Madagascar political and economic profile

Government and politics

Constitutional and political backdrop

Semi- presidential republic: Madagascar is a semi-presidential republic established under a 2010 constitution that was supported in a referendum with 74% of the vote but on a relatively low turnout of 53%. The 2010 constitution established the Fourth Republic and followed a military coup d'etat in 2009. Under the constitution the President combines both executive and head of state functions and is elected by universal suffrage. Each term is five years with a maximum of two.

Under the 2010 constitution, there is a bicameral legislature with the lower house also elected by universal suffrage every five years. The upper house is a consultative chamber on social and economic matters that is partially selected by an electoral college and partially appointed by the President. The lower house nominates a candidate for Prime Minister which must subsequently be approved by the President.

Independent judiciary: The 2010 Madagascar constitution provides for a judiciary independent of the executive. The legal system in the country is based on the French Civil Code reflecting the country's colonial heritage. The national language of Madagascar is Malagasy but French is also widely spoken

President in power since 2019: The current Madagascan President is Andry Rajoelina. His party also has a majority in the National Assembly. At 51 he is relatively young and has a background in business, primarily in the media field. Andry Rajoelina first came to prominence nationally at the time of the 2009 coup. With the support of the military, he unilaterally formed a government and remained in power until the late 2013 election which he did not contest. Andry Rajoelina won both the late 2019 and 2023 Presidential elections comfortably but on low turnouts. The elections were characterised by acrimony. The next Presidential and legislative elections are scheduled for late 2028 and 2025 respectively.

Fraught political backdrop: Since the 2010 constitution the Madagascan political backdrop has been less contentious and prone to violence than in the 50 years following independence in 1960. Nevertheless, the situation remains fraught. Arguably the underlying issues, however, appear to relate less to ideology and more to personal rivalries and allegations of corruption. Exacerbating the situation is the issue of extreme poverty in some parts of the country.

Economic backdrop

Commodity driven low-income economy: Based on World Bank definitions, Madagascar ranks as a low-income country with GDP in 2024 of around US$17.4bn and GDP/capita of US$545. Significantly, the country is among the world's poorest with a poverty rate of a very high 75%. For perspective South Africa's GDP/capita in 2024 was US$5,709.

Madagascar is very much a commodity driven economy. The key sectors are agriculture and mining. Agriculture and fishing account for about 25% of the economy but employ roughly 70% of the workforce. Rice and sugar cane are the key agricultural commodities by volume but specialised cash crops such as coffee, cloves and vanilla (world's leading producer) and timber are important in terms of exports.

Significant mining sector with Rio Tinto a major operator: Mining accounts for about 12% of Madagascar GDP and over 30% of exports. The principal commodities are ilmenite, chromite, rutile, zircon, graphite, gold, marble, limestone and gemstones. The largest operators are Rio Tinto (RIO.L), Sumitomo and Kraoma SA. Rio Tinto has operated the 80% owned QMM (QIT Madagascar Minerals) ilmenite mine in the southeast of the country for

about 25 years. Sumitomo operates the Ambatovy nickel-cobalt mine and mill in eastern Madagascar. To date it is Madagascar's largest capital investment project and is the leading exporter. Kraoma SA is a state-owned chromite mining operation with a mine north of Antananarivo that is now close to being depleted. Excluding the three main operators, much of the mining in Madagascar is undertaken by artisanal miners.

On the development front, Denver Colorado-based Energy Fuels Inc (EFR:TSX, UUUU: NASDAQ) has the large scale Toliara mineral sands project 45 km north of the port city of the same name on the southwest coast of Madagascar. Significantly, the project is scheduled to produce monazite sands rich in rare earth elements as a by-product of rutile, ilmenite and zircon mineral production. According to the Energy Fuels website, Toliara mine start-up is planned for mid-2028. The intention is to ship monazite concentrate to Energy Fuels, White Mesa mill in Utah.

In addition to agriculture and mining, Madagascar also has a significant industrial sector. This accounts for around 10% of GDP and is mainly centred on textiles and the process industries such as cement, food and beverage processing and paper. Industrial development in Madagascar has been constrained by logistical infrastructural deficiencies particularly in terms of highways and an unreliable and relatively expensive power. The tertiary service sector and construction account for just over 50% of GDP in Madagascar. A key dynamic element in the service sector is tourism reflecting Madagascar's unique, fauna (lemurs) and flora (baobad trees and orchids), spectacular landscape, vibrant culture and tropical beaches. The island of Nosy Be is probably the largest single tourist destination in terms of dollar contribution.

Buoyant economic growth partly offset by growing population

Madagascar's economic growth has tended to accelerate over the past ten years abstracting from the covid year of 2020. In 2024 real GDP grew by 4.2%, according to World Bank data. Growth was similar to the previous year and was buoyed by strong performances by mining, tourism and public investment. Based on World Bank forecasts growth could be modestly higher in 2025. In per capita terms growth is very much slower reflecting the underlying gain population of around 2.4% pa. Inflation also continued to run at a rapid pace of around 8% pa while the balance of trade remained in sizeable deficit.

The rating agency S&P Global is looking for real GDP growth to average 4.8% during 2025-2028. Most major sectors are expected to contribute to the strong showing. As always, a key risk in Madagascar is severe weather. This is typically associated with cyclone activity in the first and possibly second calendar quarters and droughts especially in the south of the country. Commodity price weakness has also adversely impacted economic performance on occasion.

Through its PEM (Plan Emergence Madagascar) programme the Madagascan government is aiming to boost economic growth long term. This involves implementing structural economic reforms and undertaking large scale infrastructural investment across a broad swathe of the economy. The ultimate objective is to transition the economy from low-income to emerging market status by 2038. The cost of the plan is expected by the government to be US$37bn by 2028. The bulk of the funding is expected to come from the private sector and international donors.

Fiscal position and credit rating

Madagascar's debt: GDP ratio is relatively low in the range 41-45% but the country's developing status needs to be remembered in this context. Indebtedness has been kept under control by debt forgiveness, donor contributions and concessionary financing. Significantly, the budget deficit, which is running at 6-6.5% of GDP, is partially financed by grants. The fiscal position could improve if GDP growth can be stimulated. However, inflation particularly in terms of wages is running at a high rate and there is always the risk of natural disasters in Madagascar. S&P reiterated its B-credit rating with a stable outlook

in April 2025. Needless to say, this is firmly in the non-investment grade sector and is typical for Sub-Saharan Africa.

Madagascar currency

Madagascar's currency is the Malagasy ariary. This is subject to a central bank managed float centred around the control of foreign currency inflows and outflows. Since the beginning of 2020, the ariary has depreciated against the US dollar by about 15% to MGA 4,447.

Rare earths review

What are rare earths:

15 metallic elements plus two others with similar characteristics: Rare earths comprise 15 metallic elements, known as lanthanides, with similar chemical and physical characteristics and atomic numbers between 57 and 71. Two further elements, scandium and yttrium with atomic numbers of 21 and 39 respectively, are often classified as rare earths and are present in the same ore bodies as the lanthanides. Rare earths are classified as light and heavy with the former having atomic numbers between 57 and 62. The balance are defined as heavy. The two key magnet elements, neodymium and praseodymium, are the largest revenue contributors, accounting for c.90% of the total.

Exhibit 3: Rare earth elements

					Lanthanides					
Element	**Lanthanum**	**Cerium**	**Praseodymium**	**Neodymium**	**Promethium**	**Samarium**	**Europium**	**Gadolinium**	**Terbium**	**Dysprosium**
Symbol	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy
Atomic no	57	58	59	60	61	62	63	64	65	66
Category	Light	Light	Light	Light	Light	Light	Heavy	Heavy	Heavy	Heavy
Magnet REE			X	X	X	X	X	X	X	X

			Lanthanides					
Element	**Holmium**	**Erbium**	**Thulium**	**Ytterbium**	**Lutetium**	**Element**	**Scandium**	**Yttrium**
Symbol	Ho	Er	Tm	Yb	Lu	**Symbol**	Sc	Y
Atomic no	67	68	69	70	71	**Atomic no**	21	39
Category	Heavy	Heavy	Heavy	Heavy	Heavy	**Category**	Heavy	Heavy
Magnet REE	X	X	X					

Source: Allenby Capital

Note: The principal commercial magnet REEs are praseodymium and neodymium.

Processing:

Ore mineralisation complexity makes extraction difficult: Rare earth elements are mined and initially processed together. Processing rare earths minerals into metallic elements from a hard rock source involves a lengthy, complex and expensive process reflecting ore mineralisation complexity. Upstream processing starts with conventional mechanical beneficiation and flotation to produce a TREO concentrate with a grade of about 60%. This is then subject to a multi-stage hydrometallurgical element separation and refining process involving roasting, acid leaching, solvent extraction and ion-exchange. Overall, the downstream process is energy, water and chemicals intensive.

Geology:

Concentrations of elements suitable for mechanised extraction are indeed rare: Rare earth elements (REE) are not unusual in the earth's crust but concentrations suitable for mechanised mining are indeed scarce. Economic concentrations of rare earth elements mainly derive from tectonic and volcanic activity resulting in igneous intrusions into sedimentary formations. The source of the REEs is generally carbonatite and pegmatite igneous rock. When weathered and oxidised, the carbonatite material releases insoluble REEs in small quantities. The elements are hosted in carbonate and phosphate minerals with the most common being bastnasite and monazite.

Economic concentrations of REE minerals typically occur either in carbonatite and pegmatite hard rock settings or in monazite sand and laterite ion-absorption clay zones. The latter occur in tropical regions where prolonged weathering of the underlying igneous rock in a high temperature and wet environment potentially results in a REE deposit. Typically, hard rock deposits host LREE deposits while the laterite clays are more orientated to the HREEs. Historically, commercial laterite REE production has been concentrated in China and Myanmar. In recent years, however, several laterite IAC development projects, such as Meteoric Resources (MEI: ASX) Caldeira have commenced in northeastern Brazil. In the Brazilian state of Goiás, Serra Verde's Pela Ema mine based

on an ionic-absorption clay deposit came on-stream commercially in 2024. Elsewhere, Ionic Rare Earths (IXR:ASX) has its Makuutu project underway in Uganda. Harena's Ampasindava project in Madagascar ranks as a major ionic-clay rare earths development.

Typically, ionic-absorption clay projects have lower grades than those based on hard rock deposits. Grades are <0.35% TREO against >1%. The two western world hard rock mines, Mountain Pass (MP Materials, MP: NYSE) California and Mt Weld (Lynas Rare Earths LYC:ASX), in fact, have TREO grades of 5-6%. The Clay deposits, however, are simpler to mine reflecting near-surface deposits, an absence of drilling and blasting and free-dig extraction. The processing route is also less complex and potentially less costly than with a conventional mill infrastructure requiring a crusher, mechanical separation, a SAG/ball mill and flotation plant to produce a mixed rare earth concentrate. Additionally, there is no need for a tailings facility to handle waste material. By comparison, processing ionic-clay is based on heap leaching followed by precipitation to produce a mixed rare earth carbonate. Waste material is backfilled into the mine with a short lag.

Downstream processing

Ore mineralisation complexity makes extraction difficult: Rare earth elements are mined and initially processed together. Downstream processing of concentrate into metallic elements involves a lengthy, complex and expensive process reflecting ore mineralisation complexity. Starting with a mixed 60% MTREO concentrate, downstream processing follows a multi-stage hydrometallurgical element separation and refining process. Leaching and solvent extraction are used to achieve element purities of 95%-99.9%. For high-performance applications in electronics, magnetics, phosphors and optics purity is boosted to >99.99% using ion-exchange technology. The downstream process is energy, water and chemicals intensive.

Production and sourcing:

REO production in 2024 of which China produced 69%: Based on US Geological Survey (USGS) data, world REO production in 2024 was 390,000 tonnes, up 5.9% on a year earlier and a clear record. Since 2010, production has increased at 8% pa with the trend having been boosted in the mid-2010s by the restart of operations at MP Materials Mountain Pass. Rare earths are very much a China-based industry upstream and particularly downstream. Based on USGS data, China's mined output in 2024 was 270,000 tonnes, representing 69% of the world total. The Bayan Obo mine in Inner Mongolia is the world's largest rare-earth source, accounting for about 80% of China's output. Rated number two in rare earths mine output is the US via the Mountain Pass mine. Production here in 2024 was 45,000 tonnes for a 12% global share. Myanmar is number three in world rare earths output with a share of 8%. The balance of the mix is largely represented by Australia, Nigeria and Thailand.

China accounts for 90% of refined rare earth output: Industry estimates suggest that in recent years China has accounted for c. 90% of world REE downstream output. This not only reflects the availability of feedstock from domestic mines but also stems from Chinese refiners processing concentrate produced by MP Materials and Myanmar. In the former case, processing has been undertaken by Shenghe Resources. Until the July 10, 2025, announcement that the US Department of Defence was taking a 15% stake in MP Shenghe was the second largest shareholder in the company. Following the commissioning in 2023 of a separation plant and refinery at Mountain Pass, concentrate shipments to Shenghe were approximately halved by end Q1 2025. MP's shipments of concentrate to Shenghe ceased in early April 2025 in response to China imposing swingeing tariffs. We would, however, expect a resumption following a US-China trade agreement.

Only two western world integrated REE producers:

MP Materials and Lynas only major integrated producers outside China: Currently, there are only two major integrated producers of REEs outside China. These are MP Materials

and Lynas Rare Earths. Downstream, MP commenced operations in late 2024 at its inaugural metal refinery and permanent magnet facility at Fort Worth, Texas. General Motors is a foundation customer and has provided financial support.

Sera Verde in Brazil commenced operations in early 2024: Interestingly, the PE backed Serra Verde Group commenced operations at its Pela Ema mine/mill at Minacú in the Brazilian state of Goiás in 2024. Mining operations are based on an ionic clay deposit rich in elements suitable for magnet operations. Capacity is currently 5,000 tpy MREO but management is planning to double this by end decade. Significantly, Serra claims that Pela Ema is presently the only mill outside Asia capable of separating all four major magnet rare earths, neodymium (Nd), praseodymium (Pr), dysprosium (Dy) and terbium (Tb).

Lynas increasing capacity and exposure to heavy rare earths: Lynas Rare Earth's upstream operations are based on the high-grade, long life Mt Weld mine in Western Australia and the Mixed Rare Earth Carbonate processing facility located near Kalgoorlie. Mt Weld has undergone considerable mine development of late, expanding ore reserves by 63%. This includes significantly increased exposure to heavy rare earth mineralisation. Downstream operations centre around the Kuantan separation plant and refinery in Malayasia. An REE refinery is under development in Texas. Supported by the US Department of Defence, a heavy rare earths circuit is under construction at Kuantan that will be the only western world facility capable of processing heavy rare earths.

China's downstream share likely to decline near-term following investment at MP and Lynas: Downstream investment at MP and Lynas implies declining dependence on China for refined REE product near-term. The EU has expressed an interest in establishing REE refining capacity in Europe. Probably the most advanced project is the pilot plant of Swedish iron-ore miner, LKAB, at Luleå in northern Sweden. This will use feedstock from the nearby Kiruna iron-ore mine which is believed to host the largest rare-earth resource base in Europe. We doubt that a commercial processing facility could be established at Luleå before 2030.

Given the lead times involved in installing refining capacity, China will continue to dominate the supply of refined REEs and permanent magnets for the balance of the decade, albeit with a declining share from current elevated levels.

Longer term China's share also likely to decline particularly due to development in Brazil: Longer term, project development elsewhere will probably reduce China's share of separation and downstream processing capacity significantly. Arguably, Brazil is in the best position to gain share in rare earths medium term. This reflects a combination of factors. These include large scale easily accessible resources, domestic engineering and mining expertise, short lead time permitting for industrial projects, public sector support, internationally competitive labour rates, excellent infrastructure and a host of ambitious new operators entering the field of rare earths. In terms of the last mentioned, Brazilian Rare Earths (BRE:ASX), Meteoric Resources (MEI:ASX) and indeed Serra Verde are good examples.

Properties and applications

Excellent range of properties unique to each element: Each rare earth element has unique properties. Key properties relate to magnetic strength, excellent luminescence, catalytic capability, good electrical conductivity, high energy density and metallurgical alloying capability. Applications can be divided into mature industrial and high technology. The former centre around petroleum refining and auto catalysts (cerium), abrasives (cerium), glass making (ytterbium and neodymium), PVC manufacture (lanthanum) and nickel-metal hydride batteries (lanthanum). We believe mature market applications account for >50% of rare earth demand by volume.

High-tech elements account for c. 90% of rare earth revenue: High tech applications largely relate to the elements, neodymium, praseodymium, dysprosium, terbium and samarium. Neodymium is by far the most important in terms of volume. Although accounting for less than 50% of the mix by volume, the contribution of the high-tech elements by value is far greater and possibly nearer 90%. This reflects substantially higher prices than for those orientated to mature industrial markets. Neodymium, for example, sells for 18x cerium.

Exhibit 4: Rare earth element prices

Metal	US$/kg FOB China
Lanthanum	2.64
Cerium	3.72
Yttrium	28.88
Neodymium	72.82
Praseodymium	72.51
Dysprosium	256.87
Terbium	1,096.90
Scandium	3,257.90

Source: Shanghai Metals Markets (SMM)

Prices are at July 19, 2025, status

Permanent neodymium magnets

Neodymium permanent magnets are the most powerful available: By far the most important rare earth high technology application is permanent magnets. Around 80% of these are produced using a sintered neodymium-iron-boron alloy (NdFeB). Sometimes they may also contain dysprosium and praseodymium to enhance various properties of which demagnetisation at high temperatures is probably the most important. Samarium cobalt magnets provide an alternative to neodymium where operating temperatures are particularly high.

Significantly, neodymium magnets are the most powerful available. They have about 18x the magnetic energy of an iron magnet of the same volume. NdFeB magnets are commonly used in electric motors but can also be used for generators. The powerful magnetic field of NdFeB magnets enable electric motors to be more compact and lightweight compared with alternative induction motors.

Widely used in auto applications: NdFeB permanent magnet electric motors and alternators are used extensively in automotive applications. It should be noted that typical conventional light vehicles contain 30 to 50 or more electric motors to control a variety of auxiliary functions. In these applications, NdFeB electric motors offer major advantages in terms of weight and space vis-à-vis traditional mechanical control systems, such as hydraulics.

EV traction motors have boosted demand: The advent of electric and ICE (internal combustion engine)/hybrid powered vehicles has provided a major boost to neodymium usage by increasing the demand for NdFeB permanent electric motors. Typically, EVs use one electric drive motor but some have two or more for extra performance and 4wd capability. A further innovation is the extended range EV which requires a generator connected to an ICE to produce electricity. According to industry sources, automotive traction motors contain around 3 kg of which neodymium accounts for 1 kg. Including auxiliary control functions, total neodymium usage per EV might be 3-4 kg.

Industrial consumer electronics and defence applications: Other major markets for rare earth permanent magnets are wind turbine generators and electric motors for various types of machinery including robotics, consumer electronics and HVAC (heating, ventilation and air conditioning). Neodymium based permanent magnet electric motors also have broad application in defence equipment and aerospace. Based on industry sources Lockheed F35 jet uses 427 kg of REEs while a Virginia-class submarine uses no less

than 4,000 kg. Humanoid robotics will probably be a rapidly growing application for neodymium permanent magnets in the coming years reflecting in part positive automation trends and in part the large number of electric motors required to control humanoid functions.

Exhibit 5: Main markets by rare earth element

Use	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Y
Polishing Agent		V													
Glass making	V		v	v			v							v	v
Catalysts	V	V	v	v											
Ceramics	v	v	v	v											V
Pigments		v	v								v				
Metallurgy	V	V	v	V											
Specialty Alloys		V							V	V					
Battery Alloys	V	V	v	v	v										
Permanent Magnets			V	V	V			v	v						
Phosphors	v	v				v	v	v							V
Others	V	V	v	V	v		v			v	v	v	v	v	V

Source: Adamas Intelligence

NdFeB electric motors unlikely to be substituted medium-term but research is underway with this in mind: Such are the performance advantages, broadly defined, of NdFeB electric motors, we think it very unlikely that they can be replaced medium-term. However, given the potential for sizeable design cost savings there is a clear incentive to look for alternatives and if possible, technically, thrift in the use of neodymium. Interestingly, the German Tier1 auto component producer, Mahle GmbH, announced two years' ago that it had developed the 'perfect motor'. This can operate at high efficiency over extended periods without degradation. Furthermore, the perfect motor operates without neodymium permanent magnets thanks to an innovative cooling system and power transmission system. As far as we are aware, the 'perfect motor' has yet to be developed sufficiently for mass production.

Exhibit 6: Neodymium price trend

Source: tradingeconomics.com; Allenby Capital

Note: Prices are monthly averages fob China. Exchange rate: US$1=CYN7.28

Neodymium supply-demand balance and prices

Supply-demand balance swinging from surplus towards equilibrium: Reflecting variations in demand dynamics, REE supply/demand balances need to be assessed on an individual element basis. Given the all-pervasive influence of China in downstream processing, supply can from time to time be heavily influenced by political decisions relating to production quotas and export restrictions. Looking at neodymium, arguably most influential REE, the market according to the Toronto consultancy Adamas Intelligence was in supply surplus between early 2023 and late 2024. This reflected an inventory build related to over-estimated demand by Chinese refiners. Rising feedstock availability from the US and Myanmar may have contributed to the over exuberance.

Neodymium ex-China has firmed from the July 2024 low: Based on Trading Economics data Neodymium prices ex China bottomed at around US$64/kg in July 2024. Subsequently, the trend has firmed as the market has moved back towards approximate balance driven in part by Chinese export restrictions. In mid-July 2025 neodymium was trading at around US$81/kg ex-China. Based on Adamas's base case scenario the neodymium market is scheduled to tighten post 2025 driven by strong permanent magnet demand growth and lagging downstream processing capacity expansion. Lynas Rare Earths is looking for neodymium demand globally to increase by about 7% p.a. between 2024 and 2030.

Ampasindava project

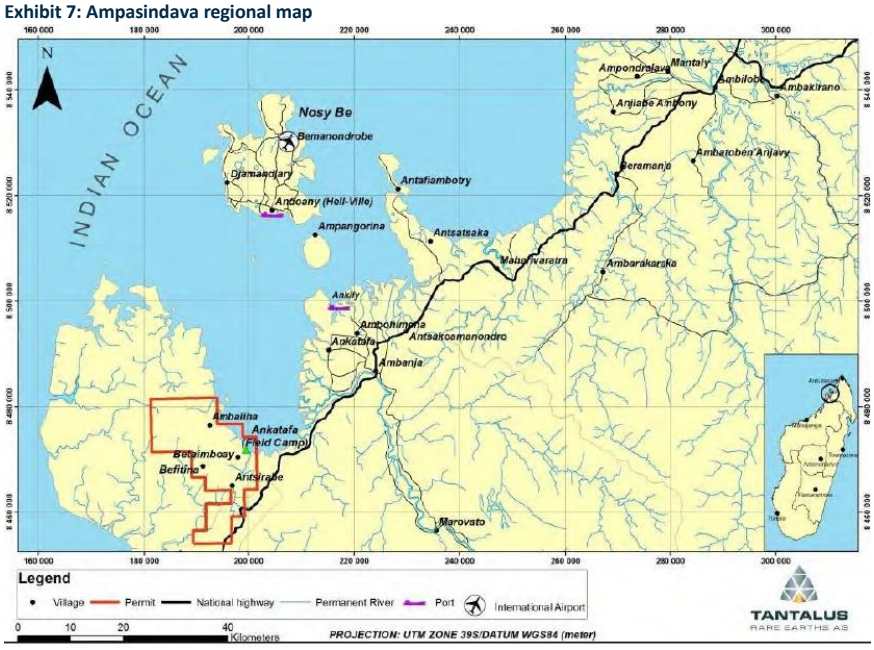
Location

500 km north of the Madagascan capital Antananarivo: The Ampasindava project is located in northwest Madagascar on the eastern side of the Ampasindava Peninsula. The project area lies in a remote region about 500 km north of the Madagascar capital, Antananarivo and 250 km south of the largest north Madagascan city and deepwater port of Antsiranana. The nearest town to the project is Ambanja which is about 40km to the northeast and is the commercial hub for the region. Significantly, the southern margin of the Ampasindava project area lies about 10 km from the main N6 south-north highway running from Antananarivo to Antsiranana. We believe the N6 is paved but is only two-lane.

Ampasindava can be accessed from Antananarivo via N6 highway or from Nosy Be island: Access to the project site, perhaps not surprisingly, is not particularly easy. From an international perspective access could be by road on the N6 from the international airport at Antananarivo. The last 10-15 km would be along a dirt track. Antananarivo is the only Madagascan airport with regular long-haul flights from Europe. The alternative route from Europe to the site would be via the Fascene airport on the island of Nosy Be, about 40 km north of the mainland and Madagascar's main tourist destination. A boat can then be taken from the south side of the island at Hell-Ville to Ankify on the mainland. The time from Fascene to the project site would be about two hours. Fascene is connected to both Johannesburg, South Africa and Mauritius.

The project area has no power and telecommunications infrastructure. Most movement on the project area must be undertaken on foot currently. The area is sparsely populated with some small communities dependent on subsistence agriculture.

Exhibit 7: Ampasindava regional map



Source: Tantalus Rare Earths AG

Port logistics

Two major container ports on west side of Madagascar: There are five ports of potential relevance for the Ampasindava project. The largest Madagascan port is Toamasina. This accounts for 75% of freight imported into the country but is located on the east coast,

>700 km from Ampasindava and would take over 24 hours to access by truck. Toamasina may have to be used for the importation of major items of capital equipment. As far as containerised shipments of MRE carbonate from Ampasindava are concerned, the closest container port is Antisarana. An alternative container port on the west coast is Mahajanga. This can be accessed via the N6 but is more than twice the distance of Antisarana and would take about 15 hours by truck from a prospective mine site. For light freight and passenger traffic the Hell-Ville to Ankify route can be used. The former can handle freight with mobile cranes but the latter is without heavy lift capability.

Climate

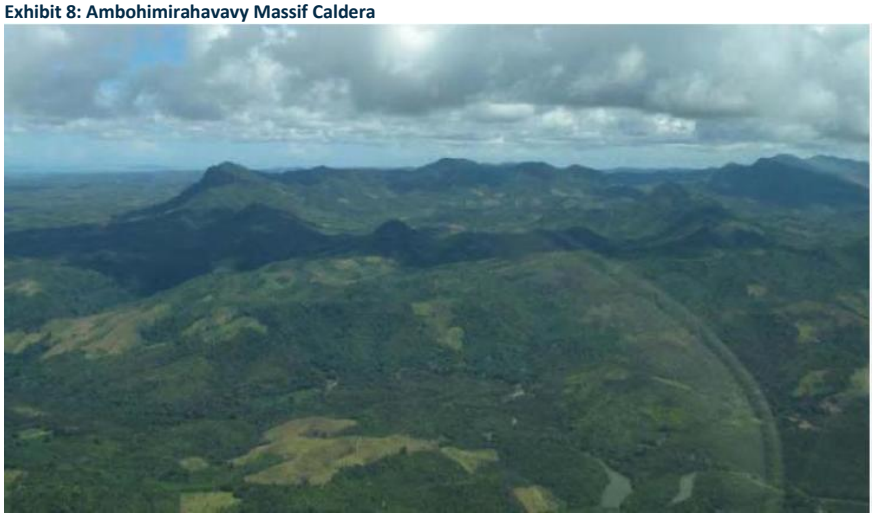
Tropical climate with marked dry and wet seasons, intense cyclones: Northern Madagascar has a tropical climate with pronounced dry and wet seasons. The former runs from April to October while the latter extends from roughly November to March. Rainfall in the project area averages about 2,000mm/ year (80 inches) with the bulk falling in the wet season. Typically, northern Madagascar experiences several intense cyclones during the wet season driven by easterly trade winds. Cyclonic activity can make road logistics and construction activity hazardous.

Bearing in mind northern Madagascar's location just north of the Tropic of Capricorn temperatures are elevated practically year- round. For the project area temperatures average about 25 °C but in the summer months of December to March may exceed 30 °C. Temperatures only slip modestly during the winter months. Note, the high temperature wet climatic environment is conducive to the formation of laterite deposits.

Physiography

Rugged terrain: The Ampasindava project area is characterised by rugged terrain with altitude ranging from sea level to 713m in the northwest. The key physiographical feature of the licence is a six km wide caldera. It should be noted that the mine and processing plant prospectively will have a small footprint on the licence close to the shoreline. The licence area is mainly covered in secondary vegetation such as bamboo. Primary forest is largely confined to a small 20km² area to in the northwest of the licence area. Harena has no intention of encroaching on pristine forest.

Exhibit 8: Ambohimirahavavy Massif Caldera

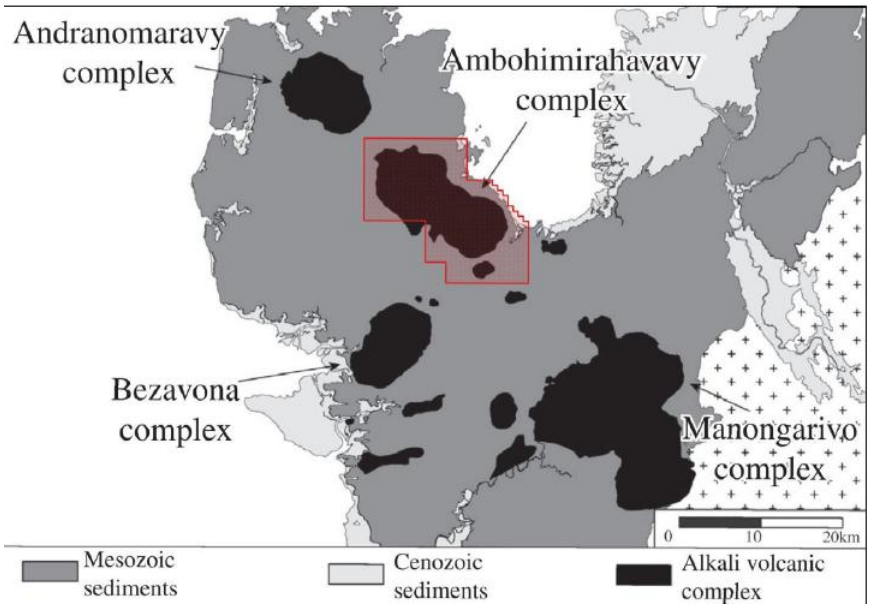


Source: Ampasindava Technical Report

Geology and mineralisation

REE mineralisation occurs in both the basement rock and the weathered regolith: Geologically northern Madagascar is defined by Mesozoic (252-66Ma) marine based sedimentary formations subject to igneous intrusions. These resulted from the release of hydrothermal fluids following rifting and volcanism associated with the separation of Madagascar from the India and Seychelles Plates starting approximately 90 Ma. The project area contains the large Ampasindava Igneous Complex. This covers most of the peninsula of the same name. The Complex includes several intrusions, one of which is the Ambohimirahavavy Massif which broadly covers the Ampasindava project area. It is about 20 km in length, up to 8 km in width and has an area of approximately 150 km². REE mineralisation occurs in both the igneous bedrock and the overlying regolith, a zone of weathered igneous basement rock. In the case of the former the key source rocks are alkaline and peralkaline granite hosted in dyke and sill intrusions.

Exhibit 9: Ampasindava peninsula geological setting

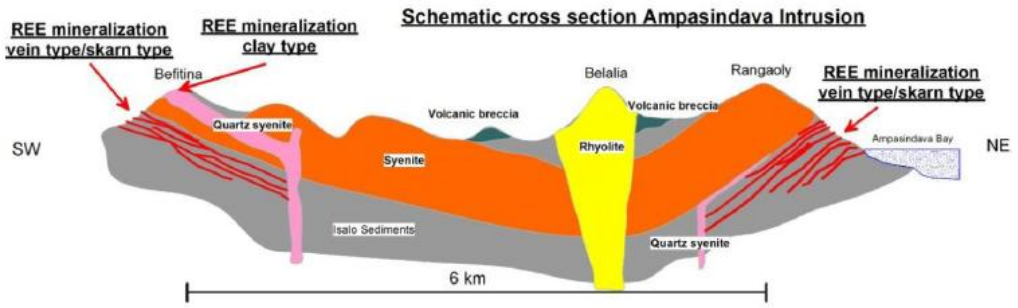


Source: Ampasindava Technical Report

REE geology and mineralisation is analogous to southern China: REE geology and mineralisation at Ampasindava appears to be analogous to deposits in southern China. Climatic conditions characterised by heat and high rainfall have been conducive to weathering of the undying bedrock and the dispersal of the rare earth minerals in the regolith. According to the technical report prepared by the consultants SGS Canada, the regolith thickness overlying the Ampasindava Complex averages 13.5m but in places exceeds 40m. Not surprisingly perhaps, the REE mineralisation is not uniform but increases at depth as does the concentration of heavy rare earths. Importantly, the REEs are ionically absorbed onto the surfaces clay minerals as in the case of China. Metallurgical testing has confirmed that the REEs can be recovered by heap leaching using non-toxic sodium chloride and ammonium sulphate.

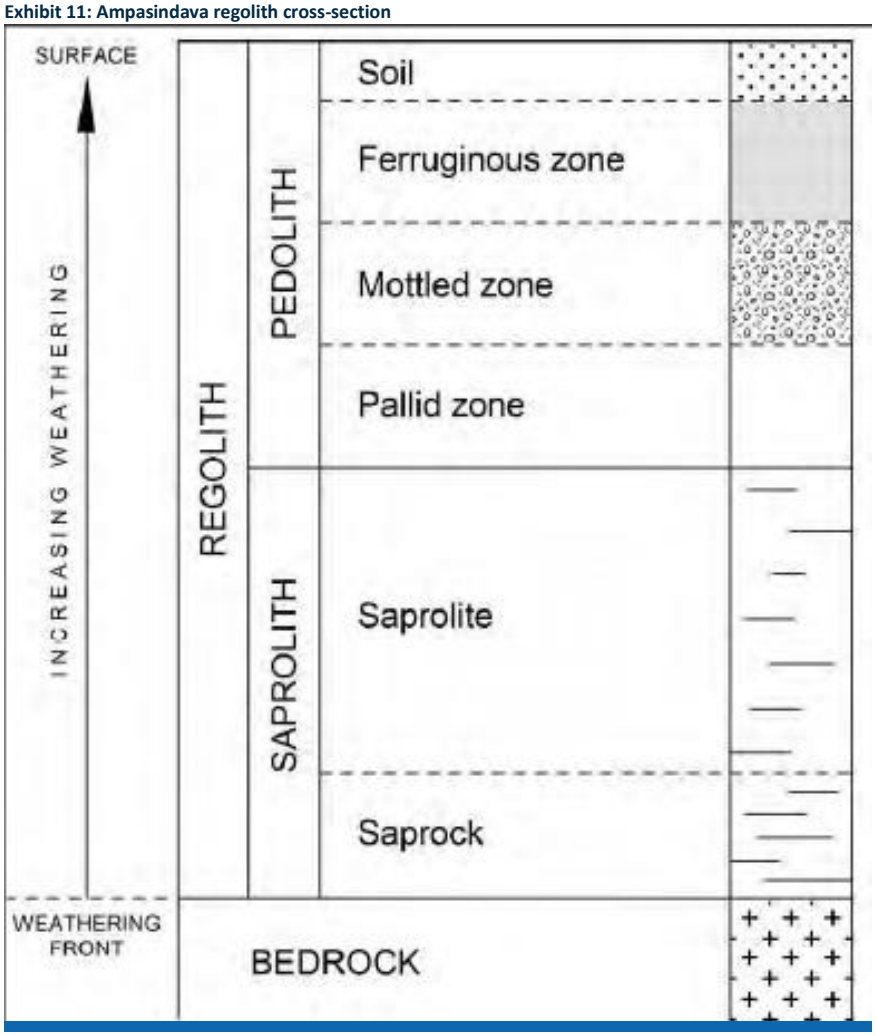
Grades are similar to China: REE mineralisation in the Ampasindava regolith is low-grade compared with hard rock sources but is apparently similar to the ion-absorption clay mines in southern China. According to the SGS technical report, TREO grades in China are typically in the range 0.05% to 0.35%. Grades at the low end of the range are thought by SGS to be economic subject to adequate critical mass in terms of deposit size. Interestingly, SGS has referred to the Chinese deposits being relatively small.

Exhibit 10: Ampasindava intrusion cross section



Source: Ampasindava Technical Report

Exhibit 11: Ampasindava regolith cross-section



Source: Ampasindava Technical Report

Exploration activity

Comprehensive exploration programme since 2008: The Ampasindava project has been subject to a comprehensive exploration and appraisal programme by several operators since 2008. The work programme has included outcrop sampling, soil sampling, trenching, pitting and window sampling (a cost-effective method for drilling shallow bore holes) and diamond drilling.

The diamond drilling programme was undertaken in 2010/11 to test the prospectivity of the igneous bedrock. Drilling was undertaken mainly on Ampasibitika prospect to the south of the Complex. In total 277 holes were drilled covering >20,000m. Evidence of REEs was confirmed with grades up to 2.39% TREO. However, the continuity, predictability and grades of the intrusions were insufficient for a commercial REE resource. Subsequently, a decision was made to focus development on the regolith-hosted mineralisation.

JORC resources

JORC defined resources of 606,000 tonnes TREO: Harena reported a JORC resource statement using the 2012 code for its Ampasindava IAC project in 2023. This was an updated version of an earlier NI43-101 statement released in 2014. The latest statement revealed a resource across all classification categories of 698.5m tonnes of ore at a TREO grade of 868 ppm for contained TREO of 606,000 tonnes. The cut-off was 500 ppm. Significantly, 32% of this was assigned to the high confidence measured and indicated categories. Looking at another key metric, the ratio of magnet orientated elements (MREO) to total rare earth oxides (TREO), this came in at 21.6% overall and 21.5% for the measured and indicated categorisation.

Our key conclusions concerning the Ampasindava resource base are as follows:

- The contained TREO tonnage is highly meaningful, although somewhat less than for some of the Brazilian projects such as Meteoric Resources Caldeira, tonnages of well over 1m tonnes have been reported. Ampasindava, however, probably has sufficient critical mass to initiate development. Harena's preliminary development plan is also based on mining high-grade ore zones, with>1,000 ppm, simultaneously.
- The TREO grade appears comfortably in the range necessary for an economic IAC project. This conclusion is supported by the existence of high-grade zones.
- The measured and indicated MREO/TREO ratio at 22% is similar to the Brazilian projects.

Exhibit 12: Ampasindava resource statement

CLASSIFICATION	TONNAGE (mt)	THICKNESS (m)	MREO (ppm)	CONTAINED MREO (t)	TREO (ppm)	MREO/ TREO%	CONTAINED TREO (t)
MEASURED	42.5	5.5	221	9,400	958	23	40,700
INDICATED	184.0	6.7	178	32,700	842	21	154,800
MEASURED + INDICATED	**226.5**	**6.4**	**186**	**42,100**	**863**	**22**	**195,500**
INFERRED	472.0	5.4	189	89,000	870	22	410,500
TOTAL	**698.5**	**5.7**	**188**	**131,100**	**868**	**22**	**606,000**

Source: Harena Resources presentation

Exhibit 13: How the REE IAC projects compare

							Contained TREO-MREO		
				Ore	TREO	MREO	TREO	MREO	MREO/TREO
Company	Symbol	Project	Classification	t (m)	ppm	ppm	t (000)	t (000)	ratio
Harena Resources	HREE.L	Ampasindava	M+I	226.5	863	186	195.5	42.1	0.22
		Madagascar	**Total**	**698.5**	**868**	**188**	**606.0**	**131.3**	**0.22**
Meteoric Resources	MEI: ASX	Caldeira	M+I	666	2685	605	1788.2	402.9	0.23
		Minas Gerais	**Total**	**1497**	**2359**	**526**	**3531**	**787.4**	**0.22**
		Brazil							
Brazilian Critical Minerals	BCM: ASX	Ema	M+I	248	759	192	188.2	47.6	0.25
		Amazonas	Total	341	746	190	254.4	64.8	0.25
		Brazil							
Viridis Mining and Minerals	VMM: ASX	Colossus	M+I	330	2680	659	884.4	217.5	0.25
		Minas Gerais	**Total**	**493**	**2508**	**601**	**1236.4**	**296.3**	**0.24**
		Brazil							
Aclara Resources	ARA: TSX	Carina	M+I						
		Goiás	**Total**	**297.6**	**1452**	**329**	**432.0**	**98.0**	**0.23**
		Brazil							
Ionic Rare Earths	IXR: ASX	Makuutu	M+I	517	650	440	336.1		
		Uganda	**Total**	**617**	**630**	**430**	**388.7**		

Source: Company reports, Allenby Capital

Notes: M+I is measured plus indicated. Total is measured plus indicated plus inferred.

All resource data are shown on a 100% ownership basis

TREO is total rare earth oxide. MREO is magnet rare earth oxide. PPM is parts per million

Mining and REE IAC processing

REE IAC projects have low CAPEX and OPEX compared with hard rock counterparts: REE IAC projects are characterised by low CAPEX and OPEX compared with their hard rock counterparts. This reflects near surface mineralisation and rare earth elements that have already been released from host minerals by weathering. A prospective Ampasindava mine will be shallow and require no drilling and blasting. The stripping ratio will probably be very low at perhaps 0.20-0.25: 1.00. Ore will be extracted using free digging with a hydraulic excavator followed by trucking a few kilometres to the processing plant.

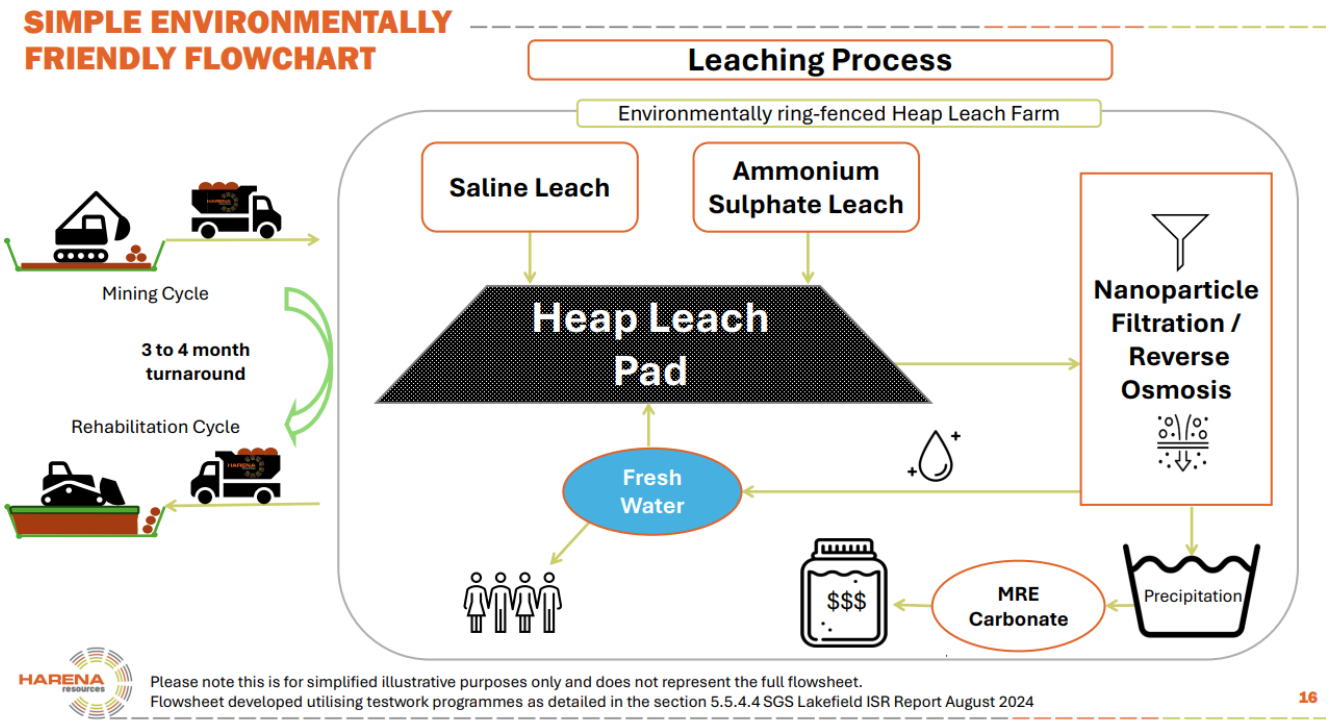
Simple processing route using heap leaching to produce a mixed carbonate: The Ampasindava processing plant will apply much simpler technology than one using hard rock feedstock. Rather than multi-stage hard rock processing from mechanical separation through the SAG (semi autogenous grinding)/ball mill and the flotation plant, the use of IAC feedstock will enable a simple heap leaching process to be applied. The leaching agents will be benign in form of saline and ammonium sulphate. The leach slurry will be filtered by reverse osmosis and precipitated to produce a mixed rare earth (MRE) carbonate with an approximate 60% REE grade. This would then be shipped to refiners. The carbonate currently sells for about US$53,000/tonne. The cycle time between mining and carbonate production is likely to be 28-40 days.

Confirmation of extraction process: Importantly, the metallurgical testing consultancy, SGS Lakeland, has confirmed that rare earth elements can be extracted from the Ampasindava ore by ion desorption using ammonium sulphate or sodium chloride solution as the eluant. High recoveries were announced for the key battery elements Nd and Dy of

88% and 73% respectively. It was also confirmed that most of the gangue material do not follow the REE into solution. Leaching agents will possibly be sourced locally for the prospective Ampasindava plant. The saline leach should be readily available given Ampasindava's location close to the coastline. Ammonium sulphate might be available from the Ambatovy nickel mine where it is produced as a by-product.

A key advantage of the heap leaching approach is that waste material is dry and non-toxic. This obviates the need for a tailing's facility. The intention is that the waste would be shipped back to the pit for back filling.

Exhibit 14: Simplified IAC heap leaching flow sheet



Source: Company

Non-binding offtake agreement

Harena has announced a non-binding offtake agreement with the US privately held company United Rare Earths Inc for refining Ampasindava's MRE carbonate output. United Rare Earths is in the throes of developing a rare earth refining and magnets recycling centre in Campbell County, Tennessee.

The road ahead

PFS expected to be completed by end Q3 2025: Harena is currently undertaking the PFS for its Ampasindava project. This is a pre-requisite for converting the current exploration to a mining licence in addition to enhancing the knowledge base on project economics. The Madagascar regulatory body involved in reviewing Harena's case is the Bureau of Cadastre for Mining and Minerals (BCMM). Submission of the PFS to the BCMM is scheduled for late Q3 2025.

DFS will follow with a scheduled completion date of Q1 2026: The second stage of the project feasibility study is expected by Harena to commence shortly and to be completed by Q1 2026. This will focus on the following:

- Establishing a mining reserve, investigating the potential for high-grading and identifying the first mining pit locations.
- Finalising the Demo plant flow sheet so design work can proceed.
- Investigate improved logistical solutions for cost assessment and project planning purposes.
- Refining capital and operating cost estimates to de-risk project modelling and planning.

The feasibility study stage will include environmental and social impact planning along with fiscal negotiations with the Madagascar government. Completion of the second feasibility study stage will take the project to definitive status. Following completion of the definitive feasibility study (DFS), design work can commence on the Demo plant. Once in operation possibly in 2027 this will act as a pilot facility to confirm viability. Long term the Demo plant will evolve as a mine test and research facility.

Upfront capital cost US$143m: We believe the cost of the Ampasindava project through to the start of pilot production could be about US$4.8m. A fully commercialised operation based on a plant with capacity for 5m tpy according to Harena cost about US$143m, including feasibility study work. During the 15years life of the plant a further £23m of sustaining capital expenditure will be required based on company estimates. The longest lead time and highest cost item of equipment pUS$20m. Initially two such plants will be required with a third following. The lead time is nine months. It should be noted that the cost estimates made by Harena are modest for a significant mine project

Commercial start-up possible H2 2028: Commissioning of a commercial processing plant, we believe, is technically possible in the second half of 2028 with first shipments in Q4 2028. Nameplate capacity could be reached by 2030. It should be noted that all costs and start-up dates are tentative at this stage. Harena believes that the key constraint on achieving the target commissioning date will be securing funding in a timely fashion. An early start on civil engineering work will be particularly important in this context.

Financials

Harena Resources will be reporting on a June year end rather than an April basis as for Citius. The company is exploration focused so will not be revenue generating near to medium-term. For the 14-month period to June 2025 we look for a net cash outflow of £0.58m which would imply a net debt position of £0.55m bearing in mind the carryover cash position of Citius in the previous year. We have assumed that the rate of expenditure has gathered momentum in recent months on the Ampasindava project related to the PFS. As noted earlier, expenditure underpinned partly by the equity injection of £0.6m and the sale of £0.8m of loan notes in late March.

Cash needs will probably increase noticeably in 2026/27 as work gathers pace on the Ampsindava project. Particularly significant in the former year will be the Demo plant which should then be followed by design and construction work for the commercial plant. In the light of near-term cash needs Harena Resources Plc announced on July 29 a £1.20m gross (£1.05m net) equity placing at an issue price of 1.5p/share. Harena has indicated that the key uses of funds will be as follows:

- The feasibility work mentioned earlier.
- Environmental studies.
- Conversion of the exploration to a mining licence.
- Early site civil engineering work.
- Construction of an on-site laboratory.

Including the late July 2025 raise, we look for a net cash outflow of £1.15m in the financial year to June 2026 which would imply net debt at year end of £1.70m. The outflow reflects an operational outflow of £0.86m and capital expenditure on intangibles of £1.34m. For the year to June 2027, we forecast a cash outflow of £3.94m based on operational outlays of £1.09m and capital spending of £2.85m. The years 2028 and 2029 will probably correspond to the peak years for capital spending with outlays comfortably over £100m reflecting mine development and plant construction. We would expect the bulk of the financing for the commercial plant to be project financed using a large element of debt secured by future revenues.

Exhibit 15: Summary financials				
Income statement £(000)				
Year-end*	**2024**	**2025e**	**2026e**	**2027e**
Loan written off	-249.3	0	0	0
Administrative fees and other	-142.7	-367	-555	-583
EBIT	-392.0	-367	-555	-583
Finance costs	0	0	-306	-862
Loss before costs	-392.0	-367	-861	-1445
Tax	0	0	0	0
Comprehensive loss	-392.0	-367	-861	-1445
Balance sheet	**2024**	**2025e**	**2026e**	**2027e**
Non current assets				
Intangibles	0	10000	11341	14191
Other	0	0	0	0
Total	**0**	**10000**	**11341**	**14191**
Current assets				
Receivables	8.5	8.5	8.5	10.0
Cash	34.0	251.0	200	200
Total	**42.5**	**259.5**	**208.5**	**210.0**
Total assets	**42.5**	**10259.5**	**11549.5**	**14401.0**
Current liabilities				
Trade and other liabilities	141.6	141.6	141.6	500.0
Debt	0	800.0	1900.9	5839.0
Total current liabilities	**141.6**	**941.6**	**2042.5**	**6339.0**
Net (liabilities)/assets	**-99.1**	**9317.9**	**9507.0**	**8062.0**
Net cash/(debt)	**34.0**	**-549.0**	**-1700.9**	**-5639.0**
Shareholders' equity				
Share capital	216.3	2069.4	2469.4	2469.4
Reserves	-315.4	7248.6	7037.6	5592.6
Total equity	-99.1	9318	9507.0	8062.0
Shareholders' equity and liabilities	42.5	10259.6	11549.5	14401.0
Shares outstanding m	43.3	413.9	495.9	495.9
Cash flow	**2024**	**2025e**	**2026e**	**2027e**
Profit after tax	-392.0	-367	-861	-1445
Bad debt written off	249.3	0	0	0
Receivables (inc)/dec	-0.5	0	0	-1.5
Payables inc/(dec)	22.4	0	0	358.4
Operating cash flow inc/(dec)	**-120.8**	**-367**	**-861**	**-1088.1**
Share issues	0	10000	1050	0
Capital expenditure	0	-10000	-1341	-2850
Other	0	-216	0	0
Net cash flow	**-121**	**-583**	**-1152**	**-3938**
Net cash/(debt)	**34**	**-549**	**-1701**	**-5639**

Source: Company; Allenby Capital. * Year end 2024 April, 2025/26/27 June

Risks and challenges

Ampasindava has to a considerable been de-risked geologically: We think that the Ampasindava project has to a significant extent been de-risked from a geological perspective, given that a resource base with significant critical mass has been established in the high confidence indicated and measured categories. We also note that the clays show evidence of being ionic and amenable to desorption technology using simple heap leaching and non-toxic solvents. REE IAC leaching technology has not been widely applied outside China but as noted, several IAC projects are now underway in Brazil and show very promising results in terms of scale, grade and leaching capability. Harena has to undertake more metallurgical test work before reaching FID (final investment decision) but there is nothing to suggest that this will not be successful.

Financing is the key issue: The key risk, as alluded to previously, is obtaining financing for project development. Junior miners across a range of commodities have found obtaining financing for mine development projects decidedly challenging for many years. The key concerns surround, capital intensity, dilution with long lead time projects, elevated coupons on debt and technical challenges. Obtaining project finance usually is a long-drawn-out process which can significantly delay development.

Political developments pose a risk but we are not aware of any particular issues: Another risk that can adversely impact resource projects are political developments that arbitrarily change the legal framework surrounding the industry. While we are not aware of a particular issue in Madagascar currently, it is a possibility. Resource nationalism is the Achilles heel of resource projects.

Share price performance and valuation

Weak share price performance since the March RTO has left the valuation languishing: Since the Harena Resources RTO in March 2025, the trend in the stock has been disappointingly weak. As of July 16, Harena was trading at 1.10p share down about 52% post RTO. At this level the stock was valued at a marginal £4.4m (US$5.9), one of the lowest valuations for a rare earth play with a significant resource base, particularly in the high confidence measured and indicated categories.

Sharp contrast with the ASX and TSX Brazilian IAC plays: The declining trend in Harena contrasts with the strong performance of several medium-sized REE IAC junior exploration plays. For example, ASX-listed Brazilian Rare Earths and Meteoric Resources and TSX-listed Aclara Resources have more than doubled since late March. We believe the Brazil-focused IAC plays have benefited in recent months from the growing concern in political and industrial circles surrounding the need to diversify the sources of rare earths. The apparently large and easily accessible resource base in northeastern Brazil is seen as providing the basis of a new rare earth hub both upstream and downstream. In addition, there have been two further positive developments for rare earth stocks of late as follows:

- The trend in the price of the rare-earth benchmark, neodymium, has been strengthening.
- The announcement on July 10 by the US Department of Defence (DoD) that it was taking a 15% stake in the rare earths major MP Materials. The DoD further announced that it was supporting the company by guaranteeing on an offtake agreement NdPr price realisations at US$110/kg, a sizeable premium of 36% to current spot prices.

The DoD's decision to invest in MP reflects the importance of rare earths to a high technology economy with the world's leading military.

Valuation/tonne

Brazilian plays sell on US$35-US$1,694/tonne TREO-----: The key valuation metric for advanced rare earths exploration plays is market capitalisation/tonne of REO remembering that this includes a medley of elements. A refinement in the process is to also look at the MREO/TREO ratio which shows the proportion of high value magnet elements in the mix. Looking at the principal Brazilian IAC plays we note that valuations range from US$35/tonne in the case of Viridis Mining and Minerals to US$1,694/tonne for Brazilian Rare Earths. Meteoric Resources, which has the largest resource base, and is probably the most developed IAC play stands on US$69/tonne.

-------while Harena sells on US$13/tonne TREO: Harena sells on US$13/tonne, well below the valuations for the Brazilian plays. The valuation premium for Brazilian Rare Earths reflects several factors including a very large acreage, multiple discoveries with ultra- high grades and some high- profile Australian shareholders notably Whitehaven Coal (Australia's largest coal miner) and Hancock Prospecting Pty Ltd (Pilbara iron-ore pioneer).

Successful development activity could narrow the valuation gap: By comparison with the Australian Brazilian IAC plays, Harena is still unknown. Assuming that news flow points to progress on the development front, we believe that Harena's valuation could strengthen noticeably in the coming months. Successful outcomes to the upcoming PFS and then the DFS could lift the valuation to US$30/tonne in our view. This would imply a market capitalisation of around US$14m and US$18m assuming 75% and 100% ownership respectively and a 606,000-tonne resource base. The implied per share valuations are 2.1p (75%) and 2.7p (100%) based on the post raise shares outstanding of 495.88m and £1=US$1.326.

Exhibit 16: REE IAC valuation comparisons

Stock	Project	Interest	Status	Symbol	Share price	Market capitalisation Local currency	Market capitalisation US$	TREO	TREO 100%	TREO net	MREO/ TREO ratio	TREO net/
		%				(m)	(m)	ppm	t (000)	t (000)		US$/t
Harena Resources	Ampasindava	75	M+I JORC resource	HREE.L	1.05p	4.36	5.86	868	606	455	0.22	12.90
	Madagascar		PFS underway									
Aclara Resources	Carina	100	CIM inferred resource	ARA:TSX	C$1.12	242	176.64	1452	432	432	0.23	408.89
	Goiás		pilot production									
	Brazil											
Brazilian Rare Earths	Rocha da Rocha	100	JORC inferred resource	BRE:ASX	A$2.61	648	423.53	10000	250	250		1694.12
	Bahia		Monte Alto project									
	Brazil		feasibility studies									
Brazilian Critical	Ema	100	Bankable feasibility study	BCM: ASX	A$0.015	19.66	12.85	746	254	254	0.25	50.59
Minerals	Amazonas											
	Brazil											
Ionic Rare Earths	Makuutu	60		IXR: ASX	A$0.018	97	63.40	630	389	233.4		271.63
	Uganda											
Meteoric Resources	Caldeira	100	PFS	MEI: ASX	A$0.16	374	244.44	2359	3531	3531	0.22	69.23
	Minas Gerais											
	Brazil											
Viridis Mining and Minerals	Colossus	100	PFS	VMM: ASX	A$0.775	67	43.79	2508	1236	1236	0.24	35.43
	Minas Gerais											
	Brazil											

Source: Allenby Capital.

Notes: TREO total rare earth oxide. MREO magnet rare earth oxide. PPM parts per million. Exchange rates: £1=US$1.345, US$1=A$1.53, US$1=C$1.37

Valuations are at July 19,2025 status

Share price catalysts

Near to medium term we see the following developments on the Amp as being potentially influential for Harena:

- Completion of the pre-feasibility study probably in late Q3 2025
- Completion of the definitive feasibility study probably in QI 2026
- Commencement of work on the Demo plant possibly in Q2 2026 with start-up following in late 2026.

- FID (final investment decision) for Ampasindava commercial development in Q1 2027.

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