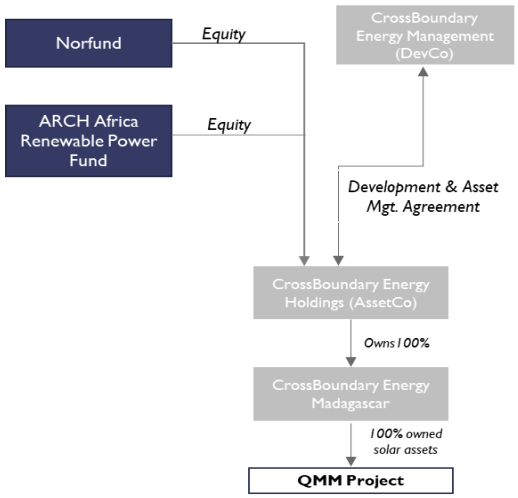
MITIGATION
NON-BLENDED

Project Name	**Rio Tinto QMM Renewable Energy Project**[1]
Country/Region	Madagascar
Sector	Energy
Project/Investment Amount	Not disclosed
Development Partner(s)/Stakeholders	The QIT Madagascar Minerals (QMM) Mine in south-eastern Madagascar is a joint venture between Rio Tinto (80%) and the government of Madagascar (20%)
Beneficiary Ministry/ Institution	N/A
Investor(s) and Funders	CrossBoundary Energy
GUIDEBOOK TAXONOMY FINANCIAL SYSTEM ACTOR	Corporate Expenditure Private Equity
Project Overall Goal	The renewable energy project will be able to meet up to 60 percent of the mine's annual electricity demand, and will be able to fully power the mine during periods of peak renewable energy generation
Project Outcomes	Construction of the renewable energy plant commenced in 2021. Rio Tinto's operations in Madagascar are committed to carbon-neutrality by 2023
Alignment with Country Identified Climate Strategies, NDCs, etc. (if applicable)	Madagascar's Intended Nationally Determined Contribution under the Paris Agreement includes a commitment to reduce national emissions by 14% against Business As Usual by 2030, relying on increasing the share of renewable energy in the generation mix from 35% to 79%. CBE's renewable energy project also aligns with the national development strategy, 'Plan Emergence Sud', which prioritizes providing energy access to communities of the Anosy region. This landmark commercial-scale solar, battery, and wind project in Madagascar additionally positions the country as a destination for technological innovation in the field of renewable energy and will serve to attract future expertise and investment.
Contribution of the Project to the UN SDGs	SDG 7 (affordable and clean energy) SDG 13 (climate action)
Socioeconomic Impact	QMM will be providing predominantly clean, renewable energy to the town of Fort Dauphin (a community of around 80,000 people), significantly reducing the existing fossil-fuel-based energy supply
Environmental Impact (on climate mitigation and/or adaptation)	Through close collaboration between QMM, CBE, the local institutions, and the neighboring communities, careful consideration of the design, layout, configuration, and location of the solar and wind installations has been taken. In addition, two social and environmental impact studies have been conducted, on the wind and solar components respectively, which confirm that to date there has been no impact of this project on the communities, fauna and flora. Once completed, the hybridized solar, wind, and battery storage project will reduce the mine's annual carbon dioxide emissions by about 26,000 tonnes. In addition, the renewable power supply will reduce QMM's heavy fuel oil purchases by up to 8,500 tonnes per year.

[1] This case was provided by CrossBoundary as a contribution to the Sharm El-Sheikh Guidebook for Just Financing

	With this plant, QMM will also replace the majority of the electricity it currently supplies to the town of Fort Dauphin and its 80,000 residents with renewable energy
Enabling Environment (Supporting Policies)	• In undertaking this project, there has been formal, productive engagement with Malagasy institutions and regulatory bodies, including the National Environment Office, the Maritime and River Port Authority, and the Civil Aviation of Madagascar. All requirements have been met to ensure that the project avoids or mitigates any social and environmental impacts. A clear roadmap for construction has also been developed, according to the planned schedule
Technical Assistance (If Provided)	N/A
Financing model/approach (ex: Blended finance)	The QMM project is all-equity funded on a commercial basis by CrossBoundary Energy at the project level, with senior debt to be added at the parent company level, with senior debt to be added at the parent company level
Rationale for financing model/approach	The client has the willingness and ability to receive funding on a purely commercial basis. CBE develops and delivers its projects on an all-equity basis and plans to subsequently introduce debt at the parent company level. This allows for flexible and efficient development and delivery, in line with customer expectations
Financial instrument(s) (loans (commercial/ concessional), equity, guarantee)	Equity Corporate offtake agreements (20-year contracts) signed between QMM and CrossBoundary Energy (CBE), which will build, own and operate a hybrid plant (8 MW solar park and 12 MW wind farm)
Diagram of the financing structure	

Executive Summary

QIT Madagascar Minerals (QMM) is a joint venture between Rio Tinto (80%) and the government of Madagascar (20%). It is located near Fort Dauphin in the Anosy region of south-eastern Madagascar. The mine primarily produces ilmenite, which is a major source of titanium dioxide, predominantly used as a white pigment in products such as paints and paper. QMM also produces zirsill used in the manufacture of ceramic tiles and certain types of electronic displays and monazite, a rare earth element, used in renewable energy technologies like high-powered permanent magnets used in wind turbines and electric vehicles.

In 2021, Rio Tinto QMM and CrossBoundary Energy signed a 20-year power purchase agreement for a renewable energy plant comprising an 8 MW solar facility and a 12 MW wind energy facility for QMM's mining and processing operations on a build-own-operate basis. The renewable energy project plays a key role in implementing QMM's 'sustainable mine' concept and enabling Rio Tinto's operations in Madagascar to reach carbon neutrality by 2023.

The first unit, an 8 MW solar energy facility, will be operational in 2022. The 12 MW wind power facility will be completed in 2023. The project also includes an 8.25 MW lithium-ion battery energy storage system. Around 18,000 solar panels and 19 wind turbines will enable QMM to meet all its electricity needs during peak renewable energy production periods and up to 60% of its annual electricity consumption. In addition to reducing emissions at the mine, the plant will also provide power to a nearby town of 80,000 people.

Analysis

What made this project successful?	Technical: One of the most difficult tasks from a technology and engineering viewpoint was the integration of 2 different variable renewable energy sources (solar and wind) into the existing mini-grid, in order to offset the existing heavy fuel oil generation plant. CBE's technical specialists have worked with QMM to optimise an industry-leading renewable energy solution while ensuring a stable grid operation. Commercial: It has also been challenging delivering this remote and pioneering project through the Covid-19 pandemic and its associated impacts on global manufacturing and logistics. CBE has taken an active and leading role in project coordination and delivery in order to address those challenges, as distinct from the more typical "wrapped" contracting approach with a lead contractor.
To what extent is this model scalable?	Commercial: The provision of financed, onsite renewable energy solutions to the commercial and industrial energy users is completely scalable and replicable and is viewed by CBE as being one of the most direct and immediate ways to reduce emissions by commercial power consumers today, whilst simultaneously providing for a cheaper and cleaner means of powering future economic growth across Africa.
What are the necessary conditions to make it replicable in other countries/regions?	Technical The island conditions at the southern tip of Madagascar are ideal for renewable energy generation, allowing for solar generation during the day and a strong wind resource during the evenings. These conditions support a high RE contribution and offset of thermal generation. Countries/regions with access to both wind and solar resources would be able to apply similar models. Commercial: CBE's business model is almost fully transferable between countries and regions, save for specific markets where the generation and sale of power, and leasing of associated equipment, is carefully centralized and limited. CBE is already active in 14 countries across Africa, delivering projects for over 30 customers.
Constraints/Drawbacks of Financing Model	The general constraints of funding renewable energy infrastructure projects remain i) tenor of contractual commitment (and associated protections), ii) allocation of currency risk between the parties to the contract, and iii) clarity and consistency of regulatory and tax frameworks within emerging markets.
Lessons Learnt	The cost competitiveness of renewable energy solutions can now offer very high (60%+) clean energy contributions to total energy consumption, whilst still realising substantial savings. Manufacturing and logistics challenges can be mitigated by creative contractual solutions and open and early communication between project stakeholders.

SOURCES:

- CrossBoundary Energy
- Text directly from: https://www.riotinto.com/news/releases/2021/Rio-Tinto-QMM-Launches-the-Construction-of-Its-Renewable-Energy-Project
- https://energyandmines.com/2021/07/rio-tinto-signs-renewable-energy-ppa-for-madagascar-mine-and-community/