Tivan Seabed Mining

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Rare earth metal demand is growing, and we plan to revolutionize how this mining takes place.



80% of the worlds cobalt lies in the ocean

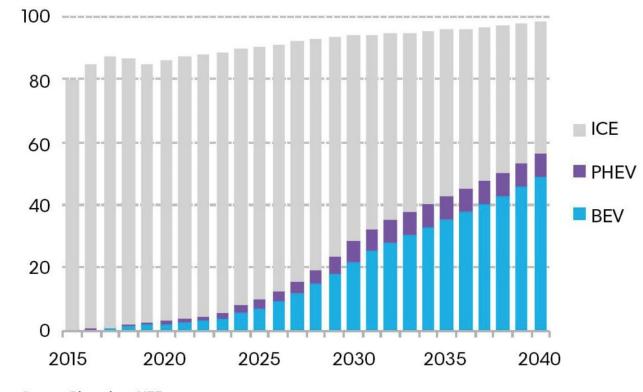
Seabed mining is an untapped market that will be a major part of the mining industry in the future

Problem to Solve

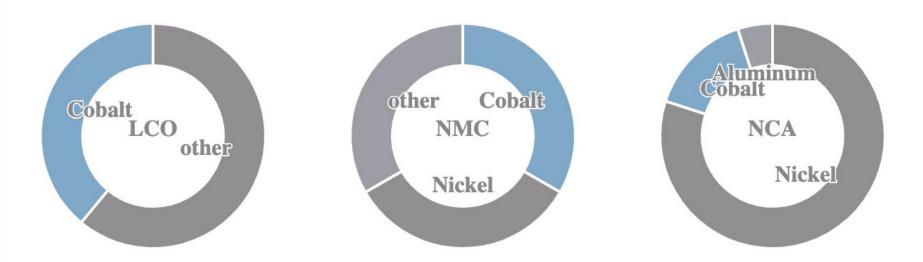
Electric Vehicle market is expanding due to governmental pressure and improving technology

BloombergNEF suggests by the mid 2020's the EV market could be 3x the size of what it is now Global long-term passenger vehicle sales by drivetrain





Source: BloombergNEF



Electric car batteries all use at least some of the metals mined from the seabed, including nickel, cobalt, manganese, and copper. Most common among EV's are NCA and NCM

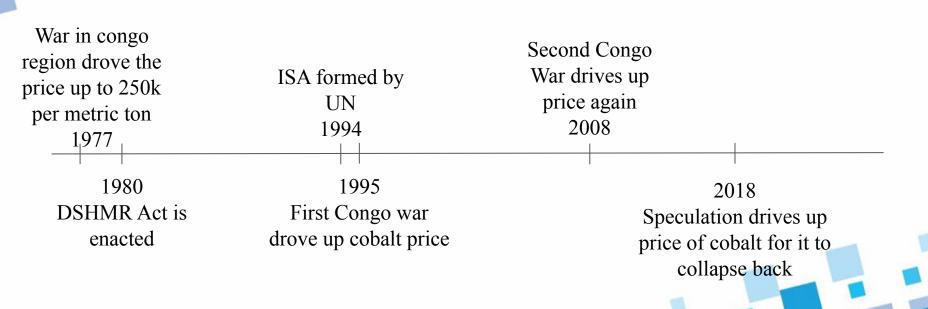
What we're doing

We're building an autonomous system to mine polymetallic nodules from the seabed floor in a cost-effective manner

The rapid improvement of reliable satellite internet is making remote autonomous systems feasible

The absence of multi-kilometer pumps and crushing equipment on our system greatly reduces costs to operate and mine

History of Seabed Mining and Demand



Market and Consumers

The USGS says the raw nickel, copper, manganese, and cobalt markets in 2018 were worth 13.24 billion dollars in the US.

29 companies currently have plots reserved on the seabed, have demonstrated they have the financial means to carry out a full mining operation, but have no plans for excavation because the equipment isn't feasible.



Competition

Nautilus Minerals

First and only company to have applied for an excavation permit from the ISA.

Mining for gold off the shores of Papua New Guinea, but due to high complexity costs and staff the company's future is uncertain.

DeepGreen Metals

DeepGreen tried to use a method similar to Nautilus where they would crush the nodules and pump them back up, but their system can only be profitable if the price of cobalt remains exceptionally high

16-22 months

Until our system will pay for the platform and drone costs, bringing in 350k to 500k per month at current metal prices

Financials

We're able to achieve this level of returns because not keeping staff on-board is able to significantly reduce costs, as well as using a simpler recovery system reduces overall costs of construction.

	A	В	C	D	Е	F	G	Н	1	J	K	L
1	Nodule Extraction			Shipping Nodules		Refining Nodules	- use below refining costs		Cost Structure			
2	Mas per area	9.7	kg/m2	Transport Ship	3500000	usd	Cost to build	100000000	usd	Revenue (1 drone)	29.5919909	M usd/yr
3	Escavation speed	720	m/hr	Payment length	10	yrs	Lease length	10	yrs	Costs	146.7383807	M usd/yr
4	Max Load	8000	kg	Ship cost 10 ye	350000	usd/yr	Cost of 10 yr lease	10000000	usd/yr	Dry ore for 4 drones	135696.2614	tonne/yr
5	Width of Collector	2.5	m	Wages	210000	usd/yr	Maintanence	750000	usd/yr	Revenue of 4 drones	118.3679636	M usd/yr
6	Collection Time	0.4581901489	hr	Ship Mainetance	262500	usd/yr				Max Revenue	152.1046113	M usd/yr
7	Time up	1.025	hr	Shipping cost	822500	usd/yr	Cost per year	10750000	usd/yr			
8	Time Down	0.4166	hr	Number of truck	0					Max profit 4 drones	5.366230566	M usd/yr
9	Unload Time	0.166	hr	Truck shipping across US/China		Refining Nodules %			Mine profit all revenue	3.53	%	
10	Total time per load	2.065790149	hr	Move to Truck	0	usd/yr	Cost per tonne	872.300846	usd/tonne	Profit on mining divisi	70.6	%
11	Total time minus colle	1.6076	hr	Truck shipping	0	usd/yr	Percent to refining	0.95	%	Monthly profit	0.4471858805	M usd/yr
12	R&D	3490000	usd	Unload truck	0	usd/yr	Cost to refine tonr	828.6858037	usd/tonne	Time till ROI	17	months
13	Platform cost	3500000	usd	Total shipping	822500	usd/yr	Cost per year	144499380.7	usd			
14	Platform Maintenance	612500	usd/yr	Total shipping	0.8225	M usd/yr	Cost per year	144.4993807	M usd/tonne	Min required capital	15.19	M usd
15	Lifts on platform	2		Rail and/or Port		Portion for mining	43.6150423	usd/tonne	Time till profit	2	yrs	
16	Drone cost	150000	usd	Rail distance 20 mi		(Nickel ore costs between 60 and 100usd/tonne)		Capital requirement	17.3825	M usd		
17	Drone Maintenance	11250	usd/yr	Price per mile	1200000	usd						
18	Drones per lift	2		Transport over	2400000 usd/yr 420000 usd/yr			Key				
19	Number of drones	4		Wages					Value doesn'	esn't affect profitability/ROI significantly		
20	Total Hardware costs	4100000	usd	Port unloading	130000 usd/yr				Has a more meaningful effect on profitability/ROI			
21	Extraction mech costs	1416500	usd/yr	Total transport	3772500 usd/yr				Has a potentially concerning effect on profitability/ROI			ty/ROI tha
22	Num of trips per drone	4240.508168		Total transport	3.7725 M usd/yr							
23	Ore per drone	33924065.34	kg/yr									
24	Num trips max all drom	21796.46678										
25	Ore per year max drong	174371734.3	kg									
26	Bi-weekly ore	6706.605164	tonne									

Use of Funds

Looking for 450k to continue seabed exploration, apply for license through the NOAA, and complete the environmental report

1,108k will be able to hire a team of 4 for 18 months to complete plans on retrofitting a barge for metal extraction and test deep water drones

100k to apply for an excavation license

Here we could raise further funds for construction of the platform, or we have the option of an IPO (since mining operations exist under separate rules)

Team

Thomas Hansen, CEO - Electrical engineer and computer science major

Michael Zhou, CFO - Economics and math major, has family and personal connections to the mining industry in China where 85 to 90% of all rare earth metals refining takes place

Contacts

Thomas Hansen -----

Michael Zhou -----