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Initiating Coverage
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AGP Energy Group

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(NASDAQ: VVPR)

Price	$1.98
52 Week Range	($1.58 - $11.36)
Price Target	**$5.00**
Market Cap (mil)	$40.10
Shares out (mil)	18.51
3-Mo Avg Vol	141,540
Cash per share	$0.14
Total Debt (mil)	$25.20
Debt/Equity	75.0%

EBITDA (thousands)

Yr Jun	2022E	2023E	2024E
	Actual	Curr	Curr
Sep	(2,264)A	(1,807)E	1,550E
Dec	(2,590)A	(1,963)E	1,899E
Mar	(2,788)E	(446)E	6,289E
Jun	(2,057)E	2,372E	5,579E
YEAR	(9,699)E	(1,845)E	15,316E

Revenues (thousands) $

Yr Jun	2022E	2023E	2024E
	Actual	Curr	Curr
Sep	9,422A	17,630E	41,419E
Dec	9,524A	16,574E	39,506E
Mar	8,472E	21,795E	56,338E
Jun	16,247E	31,072E	61,185E
YEAR	43,665E	87,071E	198,448E

EPS $

Yr Jun	2022E	2023E	2024E
	Actual	Curr	Curr
Sep	(0.24)A	(0.16)E	(0.03)E
Dec	(0.30)A	(0.16)E	(0.02)E
Mar	(0.22)E	(0.11)E	0.22E
Jun	(0.19)E	0.01E	0.17E
YEAR	(0.89)E	(0.41)E	0.35E
P/E	NM	NM	5.7x

VivoPower International Plc — Buy

A Unique Approach to Off-Road Vehicle Electrification and Energy Sustainability

We initiate coverage of **VivoPower (VVPR)** with a Buy rating and $5.00/shr valuation based on 7.0x our 2024 EBITDA estimate of $15.3MM. We see significant increases in revenues, EBITDA, and earnings over our forecast period as detailed in our analysis.

The structural growth catalysts for VVPR during our forecast period are *the attractive economics of PV solar renewable energy generation (REG) vs fossil-fuel Australian power generation and increasing REG uptake in the mining industry.*

- In most of the developed world PV solar REG is the cheapest form of power. Australian electricity prices have declined in recent years due to the growth of on-grid REG. Off-grid mines are seeking to benefit their operations by installing solar REG vs power generation from fossil fuels. VVPR's trucks are low-hanging fruit for capturing REG cost efficiencies.
- VVPR's sales of ruggedized electrified pick-up trucks to the Aussie mines are something like a Trojan Horse in their potential to generate additional sales of supporting hardware, software, and solar generation design and installation.
- The global nature of mining REG uptake is illustrated by VVPR's vehicle distribution deals, which aside from Australia include Africa, Asia, EU, NAM, and SAM. Beyond favorable economics, there are ESG and miner health and safety benefits as well.

The VVPR REG-centered offering comprises three primary divisions:

Tembo (TB). VVPR subsidiary Tembo e-LV is a specialist designer and assembler of kits used to convert **Toyota (TM)** Land Cruiser and Hilux internal combustion engine (ICE) trucks, the mining sector's favorite light-duty vehicles, into ruggedized Light Electric Vehicles (LEVs) suitable for off-road applications. TB's latest conversion kit has more pulling power and hill climbing capability than its diesel equivalent. Tembo has an exclusive conversion partnership with TM announced 6/21.

Critical Power Services (CPS). CPS provides >750 active governmental, commercial, and industrial customers with site-specific REG, electrical, and power generation infrastructure in some of Australia's largest and fastest-growing industries. Power control systems, uninterruptable power generation for data and health care centers, large-scale PV solar EPC, and battery storage systems are some important core competencies.

Sustainable Energy Solutions (SES). In Australia, SES is a turnkey facilitator and integrator of offerings in support of TB sales. Utilizing CPS hardware capabilities this can include on-site REG microgrids, EV charging stations, batteries, and emergency backup power as well as all required system software.

TB business is a mix of conversion kits and finished vehicles. VVPR will acquire desired Toyota vehicles and convert them to TB LEVs for sales within Australia. Agreements outside Australia will represent the sale of conversion kits to 3rd-parties that will procure and convert Toyota vehicles and provide TB LEV maintenance services.

The recent acquisition of GB Auto provides VVPR with a legacy revenue stream plus full control of Tembo roll-out in Australia. Prior to becoming a VVPR subsidiary, GB Auto, Australia's exclusive TB distributor, had committed to purchase at least 2K Tembo conversion kits through 2026 at an estimated revenue value of $250MM. It will also provide maintenance of both LEVs and associated SES products.

Tembo growth is international. Along with GB Auto, VVPR has announced distribution agreements to sell 7,825 TB LEV conversion kits through 2026 for a total estimated revenue value of $704.4MM USD. Purchasers include Acces in Canada; Arctic Trucks for sales in Nordic markets; Bodiz International, Mongolia's first Toyota dealership; and GHH Group, a German mining and tunneling equipment specialist with sales in >50 countries on four continents.

In Australia, SES growth will track Tembo vehicle sales. Current VVPR modeling assumes that delivery of 50 TB LEVs is required to create demand for SES support infrastructure, which we view as a conservative estimate. We also think it reasonable

to assume that as customers prove satisfied with initial Tembo adoption they will move to more comprehensive turnkey packages with future installations.

Deal with Tottenham Hotspur Football Club augers SES potential outside of Australia. In a partnership announced 2/21, VVPR will provide a full turnkey solution to decarbonize the THFC stadium and club training facilities. Potential products include rooftop solar panels, battery storage, custom microgrid controls, and LEV charging infrastructure. VVPR will design all systems while working with UK 3rd-parties to provide components and installation.

Australian Covid-related border restrictions have been relaxed. This is specifically important for importing needed CPS components, as well as TM vehicles and TB conversion kits. Opening up the country should aid an increase in overall economic activity, which will benefit all aspects of the VVPR portfolio.

Table of Contents

P.4 begins with an examination of the VVPR portfolio and TB as the unique glue that holds the group together.

From p.5 we view the mining emissions and decarbonization landscape and mining benefits from electrification.

On p.6, we take a quick look at the Australian grid and REG Corporate Power Purchase Agreements (PPA). This is followed by off-grid solar REG and mining. Here we examine the economic basis for choosing REG over further investment in fossil-fuel power generation and include some current Australian projects. This portion ends with a look at one innovative solution for installing PV solar than can easily be transported to other locations when a mined resource is exhausted.

From p. 9, we look specifically at TB: where its distribution deals are located and who they are with, what its LEV conversion provides and that it has been fully vetted for quality and safety by TM. We then look at TM and its impending entry into the BEV marketplace with its first “bZ” series vehicle, which highlights TM battery technology that purports to be far more durable than batteries in current usage. Juxtaposing these two logically begs the question “Why doesn’t TM make ruggedized LEVs itself instead of handing the business off to TB?”

On p. 12, we survey VVPR’s legacy businesses to understand their key merits as well as how they may support business emanating from TB LEV sales.

On pp.13, the prior analysis of TB and legacy businesses comes together with turnkey project facilitator SES. This is followed by a brief look at the emerging Caret U.S. solar Power-to-x business in the U.S.

On p.15 we describe VVPR’s corporate model, with which it provides its own business forecasts, with a particular focus on the logic and mechanics of the SES business.

On 16, we summarize our modeling of the company and illustrate the difference between VVPR forecasts for revenues, gross profit, gross margin, and EBITDA and our own over our forecast period. The report concludes with illustrations from our VVPR financial model.

Investment Summary:

Investment Thesis: VVPR subsidiary Tembo has established itself as the leader of electrified light equipment vehicles in the mining industry. As climate change-related investments and regulations increase, the mining industry is focused on decarbonization wherever possible with electrification of equipment using renewable energy a particular focus. Other VVPR subsidiaries CPS and SES provide the means to fully support large fleets of Tembo LEVs while lowering the overall carbon footprint of mining enterprises in the field.

Valuation:

We initiate coverage of **VivoPower (VVPR)** with a Buy rating and $5.00/shr valuation based on 7.0x our 2024 EBITDA estimate of $15.3MM.

Risks to achievement of target price:

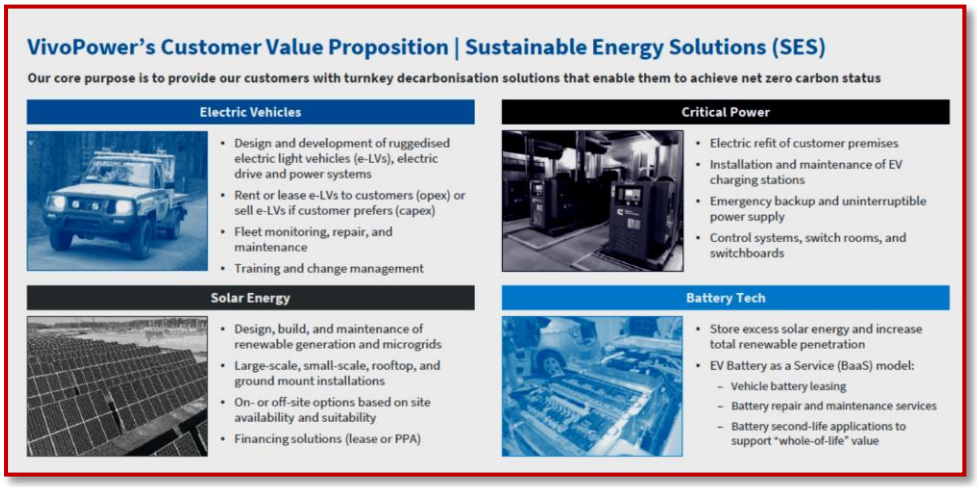
Risks: The primary risks to our VVPR forecast are

1. Inflation in battery costs that prove difficult to pass on to customers;
2. Unexpected component shortages due to the ongoing logistical strictures;
3. Economic downturn that pressures commodity prices and slows mining electrification investment.

Company description:

VivoPower comprises a group of standalone businesses in power solutions, light internal combustion vehicle electric conversion kits, and heavy vehicles for mining and construction that collectively contribute to the use of PV solar renewable energy generation in the mining industry.

VivoPower



Source: VVPR Company Presentation

A mixed bag. At first glance VVPR looks like a group of companies whose overall raison d'être is not obvious. Its Australian businesses include power solutions providers J.A. Martin and Kenshaw. While they have some overlap Martin has a growing presence in PV solar EPC and power control systems while Kenshaw is an uninterruptible power specialist. GB Auto is a heavy equipment dealership. Netherlands-based builds kits that convert ICE TM pick-up trucks into ruggedized electric vehicles. Caret is developing emissions-free crypto mining in Texas. What pulls this group together?

Mining decarbonization. As we detail below, miners are feeling the ESG heat for their fossil-fuel emissions. Fortunately, REG provides them with a more economical, cleaner, and safer choice than fossil fuels for running their mines. Within that context, TM's trucks are a ubiquitous part of mining operations ready to go electric with TB conversions. GB Auto will be the conduit for LEV sales and service in the Australian market.

Building upon Tembo. If selling TB LEVs to Aussie miners was all there was VVPR would still be an attractive business. However, management has cleverly stationed design teams within its SES division to leverage the capabilities of its two electrical subsidiaries to provide all the supporting infrastructure required to use the TB trucks to best effect. SES will also assemble software to manage all electrical hardware functions at the mine.

Beyond Tembo. Implementation of PV solar generation into mining operations is not a skill solely possessed by VVPR. However, TB electrification of TM trucks is unique to the company, and we believe it will prove to be an effective springboard for SES wins over time. Turnkey design and installation of fixed solar power generation, mobile solar generation, li-ion battery storage, supplying software that can manage workflows, monitor equipment for availability and operating efficiency, predict problems before they become acute, and provide data and analysis of energy consumption and emissions throughout the mine are some prominent examples.

Further SES. Particularly because of the wide customer net of its legacy businesses, we also believe that VVPR can become a sustainability partner to Australian industries outside of mining. GB Auto has relationships in the construction industry, itself an area that is beginning to feel the ESG push from investors. The Martin and Kenshaw businesses have significant exposure to government projects, healthcare, agriculture, and data rooms.

SES design credibility outside mining is also being demonstrated by VVPR's sustainability partnership with the Tottenham Hotspur Football Club in London, where implementation of VVPR designs will be handled by local contractors.

The base businesses will contribute as well. We also expect positive growth from the two electric businesses and GB Auto's non-TB sales and service as Australia opens up after 2 years of Covid restrictions.

Mining Emissions and Decarbonization

The recent UN climate change conference (COP26) confirmed that mining companies should treat decarbonization as a serious strategic risk to their businesses.

Investors increasingly realize that end use decarbonization cannot be disengaged from feedstock. For example, while a battery electric vehicle (BEV) creates much lower emissions than an ICE vehicle, battery materials derived from highly polluting mines dilutes their positive impacts on climate change.

To date, mining decarbonization has primarily surrounded divestment in coal production. However, regulators and investors are increasingly cognizant that all manner of mining creates significant pollution, currently estimated at 2-3% of global CO2 emissions.

- In its June 2021 report, "Creating the Zero-Carbon Mine", McKinsey's analysis of an Australian iron ore open pit mine's CO2 emissions revealed that 4% came from drilling, 5% from equipment such as light vehicles (LEVs), 14% from loading haulage trucks, and 31% from operating the haulage trucks, 54% in total.

All of the equipment responsible for the majority of CO2 emissions are operated using diesel fuel or natural gas.

Lower carbon drop-in solutions such as renewable diesel or synfuel can be short-term fixes, but their feedstock is limited and on-road transportation modalities compete for these fuels. Plus, in the absence of government incentives it is significantly more expensive than fossil diesel.

Green hydrogen or green ammonia have future potential, but they will either need to be derived from renewable electricity such as solar and wind, or if derived from fossils, connected to dedicated carbon capture and sequestration to be zero emitting.

Electrification Benefits in Mining Go Beyond Climate Change Emissions

Diesel particulate matter exposes the underground miners to serious potential health hazards. Based on mining leadership commentary, we expect elimination of diesel pollution in downhole mines to become an increasing priority over the course of this decade.

- ICE's have ~40% energy efficiency and generate significant waste heat as the result. Electric motors have energy efficiency of >90% and minimal waste heat.

The traditional mining environment has a large ambient "noise pollution" component from diesel-powered equipment and a resulting air ventilation requirement. Lower ventilation requirements due to equipment electrification can significantly reduce ambient noise in the mine and also reduce ventilation operating expense.

Electrical conversion of downhole equipment contributes OPEX savings. The higher reliability of the electrical components means less downtime and lower maintenance requirements.

Creating a cleaner, safer, and less noisy working environment makes the mining industry more appealing for potential new employees.

Regulatory bodies are starting to favor mines that commit to an all-electric underground environment, resulting in a faster permitting process, and even approvals that would otherwise be denied.

- For its part, **BHP (BHP)** has noted that "Reducing our reliance on diesel at our operations will help achieve our medium-term target of reducing operational emissions 30% by 2030".
- Canada's **Teck Resources (TECK)** aims to reduce its carbon intensity from operations 33% by 2030 and to reach carbon neutrality by 2050. Altering operations to run on renewable electricity is a major part of TECK's strategy.
- Some greenfield mines have already taken the opportunity to incorporate more sustainable technology up front. **Kirkland Lake Gold's (NGSA.BE)** Macassa mine and **Newmont's (NEM)** Borden mine in Canada both implemented electric vehicles from inception of operations in 2016.

The Australian On-Grid Solar Power Market

Australian electricity prices, while still expensive compared to most of the U.S., have gotten cheaper in the last several years due to the growth of REG. This reduction in retail and wholesale electricity prices has been the major economic proof-of-concept for solar REG in the country.

While utility-scale U.S. solar projects have traditionally been underpinned by 25-30 year power purchase agreements (PPAs), Australian REG PPAs are typically much shorter.

This is illustrated by the growth of the corporate off-site REG PPA market that has contracted for >4 GW of REG generation since 2017. Greater numbers of small and mid-sized buyers have shown a preference for contracts not exceeding 3 years duration.

Corporate REG PPAs are fundamentally synthetic Contracts for Difference that require REG connection to the grid in order to arbitrage retail electricity pricing.

Finally, regardless of PPA structure, large grid-connected solar farms can require 3-5 years to develop, permit and construct.

Australian Solar and Mining

- According to the Australian Renewable Energy Agency (ARENA) there are >400 mines operating in Australia. ~65% of these use grid power from the National Electricity Market (majority of Eastern States; ~50% of South Australia) and South West Interconnected System (~30% of Western Australia). These can participate in corporate PPAs.

  Most of the operating off-grid mines usually generate power solely for their own consumption. These mines derive the majority of their power from reciprocating engine technology using either diesel or natural gas as feedstock. Some generators can use either fuel.

  The analysis of CAPEX and OPEX below was prepared by Aurecon, an international design, engineering, and advisory company headquartered in Melbourne, Australia. The illustrations were taken from "2020 Costs and Technical Parameter Review" prepared for the Australian Energy Market Operator (AEMO), published 12/10/20.

  While all mine generation projects are inherently bespoke, and comparable 2022 figures may vary, we believe the illustrations provide an accurate relative sense of the CAPEX and OPEX costs of PV solar vs reciprocating engines.

  In our opinion, the Aurecon analysis supports the thesis that mines will prefer to add PV solar vs combustion generation in the future wherever possible. This appears to be the case in current Australian mining industry behavior as well.

Cost Analysis of Prototypical PV Solar Generation Installation

Item	Unit	Value	Comment
CAPEX – EPC cost			
Relative cost	$ / W (DC)	1.075	
Total EPC cost	$	258,000,000	
▪ Equipment cost	$	180,600,000	60% of EPC cost – typical.
▪ Installation cost	$	77,400,000	40% of EPC cost – typical.
Other costs			
Cost of land and development	$	15,480,000	Assuming 6% of CAPEX.
Fuel connection costs	$	N/A	
OPEX – Annual			
Fixed O&M Cost	$ / MW (Net)	16,990	
Variable O&M Cost	$ / MWh (Net)	-	Included in the fixed component.
Total annual O&M Cost	$	3,398,000	Annual average cost over the design life

Cost Analysis of Prototypical Reciprocating Engine Generation Installation

Item	Unit	Value	Comment
CAPEX – EPC cost			
Relative cost	$ / kW	1,350	Net basis
Total EPC cost	$	282,285,000	
▪ Equipment cost	$	169,371,000	60% of EPC cost – typical.
▪ Installation cost	$	112,914,000	40% of EPC cost – typical.
Other costs			
Cost of land and development	$	25,400,000	Assuming 9% of CAPEX.
Fuel connection costs	$M	$20M +$1.5M/km	
OPEX – Annual			
Fixed O&M Cost	$ / MW (Net)	24,100	Based on Aurecon internal database.
Variable O&M Cost	$ / MWh (Net)	7.6	Based on Aurecon internal database.
Total annual O&M Cost	$	8,520,000	Annual average cost over the design life

Source: Aurecon

Most mining-specific REG projects are associated with mining sites that are off-grid and supply their output directly to the mine in question. These off-grid projects are significantly faster to design, permit, and deploy than those intended for a multitude of consumers through connection to the power grid.

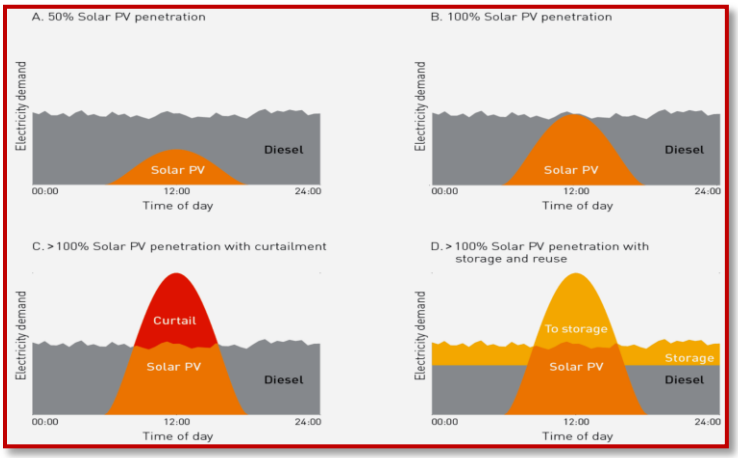
Legacy consumption of mine electricity is largely associated with comminution of metallic minerals with copper and gold mines being large power consumers in Australia.

Other areas of high electrical consumption include underground mine ventilation, crushing, milling, electrowinning, electrolysis, tailings conveyance, rail, and port facilities, if utilized.

Because existing mines already contain significant power generation capacity, their brownfield REG projects are typically smaller-scale. This REG/fossil fuel approach in Australia is called hybrid power generation (HPG). The first such facility went online in 2016; others continue to be developed.

Power Penetration (PP) is defined as the maximum instantaneous REG output contribution. The commercially optimal PP is primarily a function of fuel cost, technology cost, load characteristics, and site resources.

Grid stabilization technologies can allow REG PP to reach or exceed 100% of electrical demand. Load shifting, where the mine's greatest electricity consumers are coordinated with PP, enhances PV solar OPEX reduction through fossil fuel displacement. Any excess REG is either curtailed or directed to bulk energy storage, if available.



Source: ARENA

There are a variety of commercial agreements surrounding HPG installation and operation. Generally these will hinge on expected Life of Mine (LoM), desired ratios of CAPEX and OPEX, type of assets employed (e.g., fixed vs redeployable PV solar), and operations and maintenance responsibilities.

Generally, off-site PPAs suggest no owner CAPEX and only OPEX exposure. Unit electrical costs based on life of power station rather than LoM can potentially represent a unique PPA benefit vs other commercial arrangements and even impact the extent of the recoverable ore reserves.

While we do not consider incentives to be primary drivers of HPG systems installation at mines, every bit helps. Programs for which new HPG projects may be eligible include the Emissions Control Fund (ERF), which generates tradeable Australian Carbon Credit Units, and Renewable Energy Certificates (RECs).

- The Gruyere mine site in Western Australia (WA) is supporting construction of an off-grid 13MW solar PV farm to be integrated into an existing 49MW gas-fired power station. The system will also feature a 4.4 MW/4.4 MWh battery energy storage system. The HPG facility is expected to reduce carbon emissions ~16K TPA.
- Iluka's Jacinth-Ambrosia mine in South Australia has installed a 3.5 MW solar farm that is integrated with 10MW of diesel-powered generation. The fossil generation employs electric turbo technology for greater fuel efficiency. The revised off-grid system is under a 7-year PPA. The system is expected to reduce carbon emissions ~5.5K TPA.
- Late 2021, Australia's largest off-grid HPG system—4MW solar, 18MW wind, 13MW/4MWh battery storage, and 21MW gas/diesel generation--was completed at the Agnew gold mine in WA. Supplying up to 85% of the mine's power needs, the microgrid is operated under a 10-year agreement.

While less numerous than off-grid solutions, we also assume there will be additional REG mining power systems that will be grid-connected and serve both mines and communities. These systems should be able to participate in the corporate PPA market, which is, in effect, a perpetual and growing market.

- ARENA notes that HPG has unattractive economics for a LoM of <3 years. For mines with LOM moderately greater than that stricture, Australian solar provider 5B provides an innovative solution: the pre-assembled and pre-wired Maverick system.

Source: 5B Company Presentation

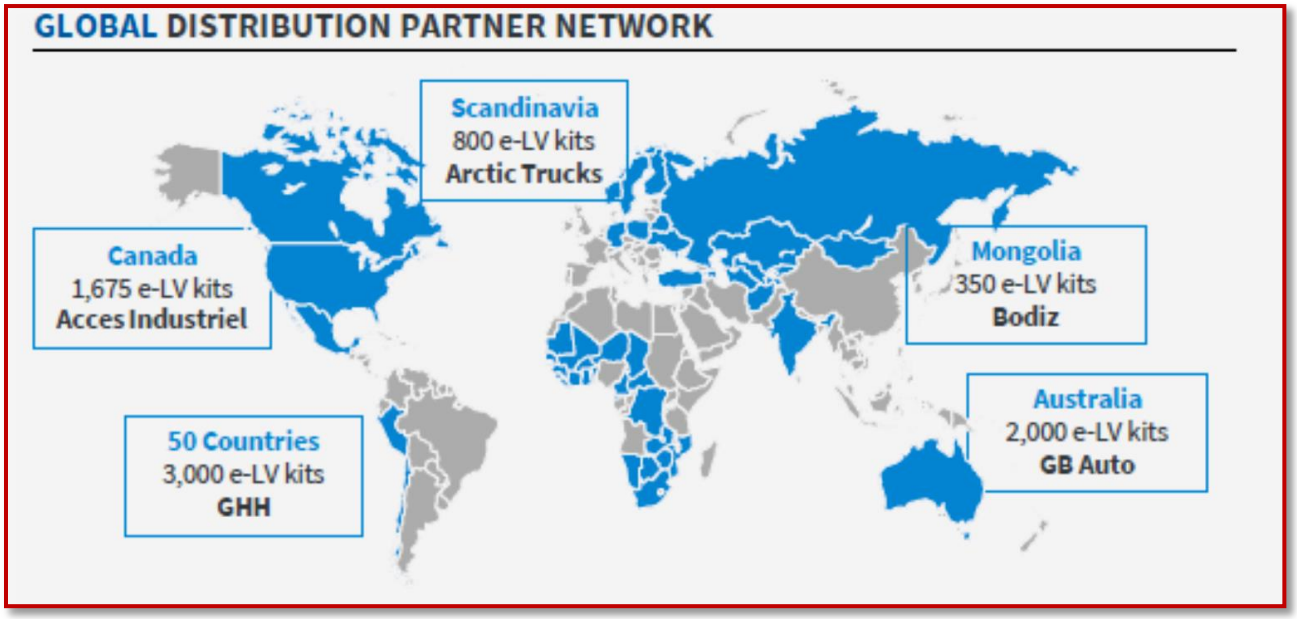
5B Maverick is a fully prefabricated, plug & play solar farm in a box.

- Blocks of up to 90 540-550W solar panels are mounted on specially designed racks. 4 blocks can fit in a 40-ft shipping container at under 6 tons payload. Once unloaded and expanded there is no need for cable trenching or significant ground work.

Efficiencies in assembly, deployment, and logistics can lower the cost of MWh energy compared with traditional solar trackers and racking solutions. No corridors, no moving parts and minimal gaps between structures generates energy output commensurate with fixed-mount trackers on significantly less land.

- 5B has installed small projects such 98 kWp requiring 5 Maverick blocks in one morning with a team of two up to 12.8 MWp requiring 375 Mavericks in 12 weeks with two teams of three. In addition to installations throughout Australia, 5B has also installed a 1.9MWp project in Panama.
- 5B's recent Ecosystem Framework Agreement-Deployment with Zenith Energy highlighted Maverick's utility at mines of shorter LoM. The systems can be packed up and redeployed elsewhere, substantially reducing the risk of stranded assets in mining, agricultural and industrial operations.

Tembo LEV Conversion Kits



Source: VVPR Presentation

TB is a LEV specialist designing and assembling conversion kits used to fully electrify former ICE vehicles. The company is focused on mining and the sector's focus most enduringly popular vehicles – the Toyota LC and Toyota HLX.

- TB's latest conversion kit designed for the LC has 72kWh battery capacity/200km range with a capability to deliver 220Nm of torque and 110kW of power, resulting in more pulling power and hill climbing capabilities than the diesel equivalent predecessor.
- TB vehicle electrification includes a modern touch screen display; improved thermal management over a wider temperature range; regenerative braking to recuperate energy; convenient 1 pedal driving; and an onboard charger that supports AC outlet charging from 20-80% charge in just 2 hours.

  The TB LEV kit has been designed for overground and underground mining environments. This includes resistance to corrosion due to high salt exposure; ability to endure very rough terrain driving for extensive periods; and an emphasis on battery safety for fire prevention as well as fire suppression systems.

  TB LEVs have been fully validated by the very strict technical and safety requirements of TM and is the only 3rd-party EV converter with a LOI for collaboration between TB (as part of VVPR) and Toyota Australia for LC electrification globally. This is expected to result in a 5-year MSA with a 2-year option.
- As illustrated above, through 2026 VVPR has signed sales agreements for 7,825 TB LEVs kits for distribution to 6 continents with a current value of $704.0MM USD.

Toyota's Entry Into the BEV Marketplace

TM's "bZ4X," a BEV crossover somewhat reminiscent of its popular Rav-4, is planned for release in NAM, Japan, China and EU in mid-2022. It is the first of seven "bZ" series EV models the automaker plans to introduce globally by 2025.

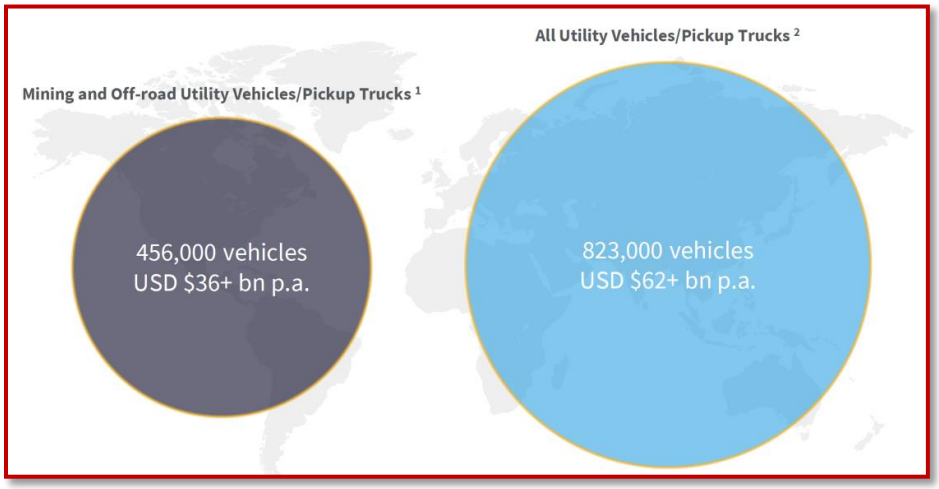
- According to Bloomberg, TM said the bZ4X will offer ~250 mi of range per charge, vs the ~318 mi claimed for **Tesla's (TSLA)** Model Y crossover. However the bZ4X is expected to sell at a much lower price point.
- TM battery technology will provide 90% charging capacity retention after 10 years of use due to proprietary thermal management. Current EV batteries retain ~70% capacity over the same time period. This is a meaningful issue relative to range anxiety and the eventual resale value of used EVs.
- The bZ4X will come with optional rooftop solar panels to provide electric charge when the vehicle is outdoors. TM estimates they are capable of supporting an extra 1,200 mi of driving per year.

TM has been slower to introduce BEVs compared with major rivals such as **Volkswagen AG (VOW.DE)**, which began shipping the ID.3 EV in 2020. Nevertheless, TM asserts the bZ4X represents 25 years of experience with battery-powered cars, beginning with the hybrid Prius in 1997.

The bZ4X's electric-Toyota New Global Platform (e-TNGA) can support a broad range of vehicle sizes reducing development time and allowing different models to be designed in parallel. While the battery and electric motor will remain consistent, car type and trim can be adjusted to support different models.

TM sees hybrid, fuel-cell and traditional gasoline-powered cars playing a role in its fleet over the current decade. By 2030, Toyota plans to sell around 8MM electrified vehicles, of which 2MM will be BEVs and fuel-cell cars with the remaining vehicles hybrids and Plug-in Hybrid Electric Vehicles (PHEVs).

Why Doesn't Toyota Produce Its Own LEVs?



Source: VVPR Company Presentation

In the illustration above, the left bubble is VVPR's estimated sales of LC and HLX vehicles specifically adapted for mining/off-road uses globally based on 2018 data from Marklines.com and TM:

- Marklines noted that 118,913 LC 70 and 90,932 LC Prado units--totaling 209,845 vehicles specifically designed for offroad/heavy industrial use--were sold in 2018.

- TM reported 379,000 total LC vehicles sold in 2018. Together this suggests that 55.4% of LC vehicles sold globally are offroad/mining capable (209,845/379,000).
- In addition, Marklines reported 444,204 total Hilux vehicles sold. Applying the same 55.4% of sales to the offroad/mining niche suggests another 245,947 vehicles sold for that purpose.
- Summing 209,845 of LCs and 245,947 Hilux's designed for mining/offroad capability totals 455,792 vehicles.

- The larger bubble on the right illustrates all comparable TM LCs and Hilux vehicles sold in 2018, reinforcing that 55% of those went to off-road applications.

  The VVPR data analysis seems to suggest that the mining/off-road vehicle niche is historically a good piece of business for TM. That said, it does not appear that offering LEVs in this space is a task that the company wants to undertake at the present time.

- TM's impending introduction of the bZ4X illustrates that the company's current BEV focus is on the vastly larger consumer passenger market. For example, global sales of Corollas and RAV-4s alone were 2,105,780 units in 2020 (Source: Statista).

- Tangentially, TM appears satisfied to let TB establish the relevance of electrified LCs and Hiluxes. Through 2026 VVPR has signed sales agreements for 7,825 TB LEVs kits with a current value of $704.0MM USD. While very important to VVPR, it pales compared to TM presence in passenger cars, trucks, and material handling equipment.

  TB/TM's 5-year LOI with options to 7 years may indicate TM management's belief that mine electrification will still be a fairly small transition in absolute terms, even in 2028-29.

  TM may also wish to gauge potential competition from truck OEMs that are further along on the LEV path (e.g., the **Ford (F)** F-150 and Chevrolet Silverado BEVs) and how well they compete with TB LEVs.

  It is also worth observing that TM's specific ascendency in the mining market appears to have been led in part by current TB regional sales and distribution partners that are themselves close to the mining industry.

- **Accès Toyota.** Beginning in 1996, mining customers ordered Toyota parts unsuitable for passenger cars through Accès. Following meetings to understand their needs, Accès supplied those parts and the LC itself. Over time Accès' forged a strong reputation with mining customers all across Canada.

- **Bodiz International** began operations in 1997 as Mongolia's first official Toyota dealer. The business includes automotive and spare parts sales, unit repairs, body repairs, off-road equipment, and Tembo 4x4 electric vehicle sales, which Bodiz became the official distributor for in 2019. Mining is 30% of all Mongolian industry.

- **GHH** roots trace from Ruhr valley iron manufacturing beginning in 1782. Ore and coal mining was added during the 19th century. GHH has over 50 years of experience in the production of robust and safe vehicles for mining and tunnelling in hard and soft rock.

  Efforts to electrify mining equipment are still a fairly new phenomenon in line with growing decarbonization efforts throughout all manner of industries.

- Kaunis Iron has recently teamed up with Swedish power company Vattenfall, Volvo Trucks, ABB and Wist Last & Bus in a pilot project aimed to prove that battery-power is well suited for long-distance transport of ore, even in extreme cold.

- Sandvik Mining and Rock Solutions, part of **Sandvik AB (SAND.ST)**, is developing new equipment that is powered by electricity. The technology offers a cleaner, cooler, and more efficient alternative to diesel-powered mining.

  In the meantime, TB is *actually helping TM maintain its presence in the mining industry and not taking anything away from it as the result.* TM currently ships finished LCs to TB distributors at its usual prices and margins. Addition costs for LEV conversion are borne by mining customers.

If it emerges that we are underestimating the pace of LEV transition, we think it makes more sense that TM would buy TB outright than reinvent it in-house. The TB solution has been in the market for several years and is growing. TB LEVs already meet all of TMs strict performance and safety standards.

VVPR Legacy Businesses

The primary VVPR growth engine through at least 2026 is targeted to be TB LEV conversions as described above.

However, VVPR possesses 3 corporate entities with historical businesses apart from TB that we expect to recover to pre-Covid revenue levels and grow a further ~20% through 2024. Collectively, these businesses represent 42% of our 2024 revenue estimates.

Critical Power Services

Source: VVPR Company Illustration

JA Martin Electrical is a leading provider of electrical services to all areas of Australia and has been in operation for over 50 years. ISO9001 (Quality Management) and ISO45001 (WHS Management) certified, core competencies include electrical engineering, switchboard manufacture, CCTV, data cabling, service and maintenance and electrical project management to the industrial sector in Australia. JA Martin performs all solar electrical work from design and field installation to the inverter.

- As a solar EPC, J.A. Martin has completed over 150MW of solar projects in just three years since commencing solar operations, with another 300MW+ in the pipeline. It also has mobile solar power and storage solutions that have utility in remote locations such as agriculture, construction and satellite mining operations.
- Control systems that include power management and load control will be among the greatest custom design requirements in the majority of hybrid mine power projects that we analyze below. This should touch on Martin core competencies.

Source: VVPR Company Illustration

Kenshaw specializes in the design, manufacture, installation, commissioning, repair, testing and servicing of business-critical power generation and electric motor products. Kenshaw is ISO9001 (Quality Management) and

ISO45001 (WHS Management) certified and recently moved into a new 108K-sq ft facility to accommodate more and larger critical power services projects for its growing client base.

- Uninterruptable power supply is a focus for customers within data center, mining and resources, health care, infrastructure, manufacturing, and utility sectors across Australia's eastern seaboard.

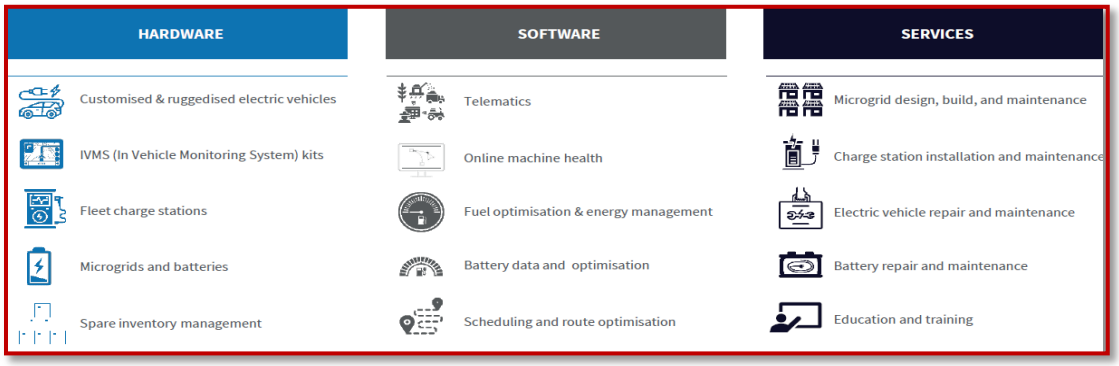
GB Auto

Source: VVPR Company Illustration

Over >35 years **GB Auto (GBA)** has established itself as a leading product and service provider to Australian fleet, heavy vehicle, and mobile equipment operators with the mining and construction sectors as core relationships. Capabilities include vehicle electrical and air-conditioning servicing, light and heavy mechanical and fitter services, skilled operating personnel, comprehensive parts inventory, machine assembly, fleet management, vehicle tracking, and specific mining and construction applications.

- GBA is VVPR's exclusive converter and distributor of finished TB e-LV Electric Cruiser and Electric HLX in Australia. We expect GB Auto's revenues to grow ~10% over our forecast period. This estimate includes only anticipated service revenues for TB electric vehicles. It does not include sales of converted electric vehicles within Australia.

Sustainable Energy Solutions (SES): Augmenting the Value of Tembo Vehicle Sales in Australia



Source: Company Presentation

Our Australian solar development research reinforces the viability of bringing REG to the mines. It will promote positive health benefits for miners while providing tangible cost savings and far more ESG credibility, increasingly important to both investors and regulators. Within a long-term increasing REG mine electrification goal, LEVs can the seen as low-hanging fruit and a Trojan Horse.

- VVPR mining customers have made it clear that they want to focus on mining and prefer a "one-stop shop" turnkey solution vs dealing with multiple vendors. Aside from the other verities of REG, simplicity of planning and high-quality execution will be SES's calling card.
- Current SES guidance primarily surrounds charging and battery installations, infrastructure upgrades, software, and services. It forecasts solar generation construction only in the instances of large TB LEV fleet installations.

Source: VVPR Company Presentation

- VVPR has ambitions beyond Australia for SES over time. Through its deal with Tottenham Hotspur Football Club (THFC), an iconic English professional team based in Tottenham, London, VVPR hopes to build brand awareness as it enters the sports infrastructure industry.
- Feasibility studies to decarbonize THFC's 62.9K seat stadium in north London, and its state-of-the-art training center nearby were completed in June 2021 VVPR's first SES project as part of the technology partnership that is expected to be completed in 2022.
- Decarbonization solutions will draw from a menu of products including rooftop solar panels, battery storage, custom microgrid controls, and EV charging infrastructure at THFC's training grounds. Reduction of operating costs increasing sustainability are the twin SES goals for the project. Hardware will be executed by UK 3rd-parties.

Caret

- Caret LLC is a wholly owned subsidiary of VVPR in charge of its US solar assets and currently owns 12 projects in Texas and New Mexico. The total generation capacity of these projects is ~682MWdc.
- In August 2021, VVPR rebranded this business unit to Caret Solar with a focus on monetizing value from Power-to-X applications potentially including crypto-mining, AI computing, and green hydrogen production.
- In December 2021, VVPR signed an LOI with an experienced NYC-based crypto mining team to launch a joint venture, Caret Decimal, a renewable powered digital asset mining business.
- Caret will contribute an initial 206MWdc of its shovel-ready solar sites in Cottle and Hardeman Co.'s, TX. Valued at US$20MM, the sites will be built and commissioned for 100% renewable powered digital asset mining in exchange for equity in Caret Decimal.
- VVPR intends for Caret Decimal to raise capital to fund the build out of the mining sites, which will then be commissioned on a staged basis over a 24-month period.

VVPR Corporate Model

VVPR provides a very thorough corporate forecast through 2026. The model contains detailed information that flows into low, base, and high case scenarios within the framework.

In essence there are three legacy business lines--Martin, Kenshaw, and GB Auto--that model a recovery from ~2 years of very strict Australian border restrictions from the inception of the CV-19 pandemic until 3/3/22. Beyond that recovery these businesses are exposed to markets that should experience growth in a more normal economy.

TB LEV sales are the largest source of projected new revenue growth and in our opinion the least risky. The announced distributors that have reserved future LEV units are close to the mining industry. As we have detailed in this report, we believe demand for TB LEVs--based upon favorable PV solar economics and the mining industry's growing acknowledgement that its decarbonization efforts must increase--are real. It would not be surprising for VVPR to announce additional distribution orders over our forecast period.

The largest VVPR model percentage revenue growth from FY23 through FY24 is in SES. VVPR is predicating this increase based on a) expected follow-on sales of supporting hardware and software in relation to the number of TB LEVs a customer buys; b) PV solar microgrid design and installation, which will include power control equipment and other potential hardware and software as a given mine's HPG facility is expanded with REG. VVPR sees these trends increasing SES sales from $3.77MM in 2023 to $115.2MM in 2026 when SES becomes the company's second largest line item.

With a), the company is assuming a client must buy at least 50 TB LEVs before support sales of any kind will accrue to SES. This strikes us as conservative. We doubt mines will be satisfied with trucks plugged into wall sockets. Rather, these trucks are "use until they drop" with typical 3-5 year lives. Remembering that many mines are 24/7 operations, they will want their LEVs to charge quickly and conveniently to get back to work.

With b), the model has combined a variety of LEV, solar generation, battery, and time data into a unitized total system cost that can be correlated to the number of vehicles in a fleet. Modeled SES sales will correspond to 50% of the actual number of LEVs in a mine fleet at a point in time. Overall, the SES model is clever in execution and is attached to the number of TB LEVs sold in a financially logical way.

In our opinion, the overriding assumption is that having once bought enough TB LEVs, a mine is not going to charge them with fossil fuel-powered generation if rational economics are in play. Assuming that mines will choose solar power for charging the LEVs will drive related hardware/software construction.

We think the 50 vehicle threshold to even entertain SES sales and the further 50% discount between a given LEV fleet and SES "per unit" revenue values contains more than enough conservatism to account for those instances in which a customer buys TB LEVs but does not choose VVPR as its infrastructure contractor.

Regarding the THFC, we regard this an opportunity to expand VVPR's sustainability enablement brand outside of both mining and Australia. The project itself is not monetarily important to VVPR but is not losing money. It will be interesting to see if the relationship shows follow-on growth with THFC or others in the sports world but it is not an important input in our current forecast.

With Caret we take a wait and see attitude. Our understanding is that its development is not costing VVPR much more than contributing TX solar development locations that have been sitting idle. That management wants to eventually spin Caret off as an IPO suggests it is not viewed as a core asset long term.

Our Modeling Approach

Since VVPR is the very unusual example of a company that has provided its own comprehensive integrated model for forecasting, our first task has been to test the beliefs and expectations that underlie that model. Our VVPR report represents the result of that labor.

Global distributors have announced future orders of TB LEVs. The technical assumptions referenced broadly in the SES discussion above appear sound.

We have provided illustrations from an engineering study comparing the relative merits of PV solar and fossil fuel reciprocal generation commissioned by the Australian government presumably meant to support industry decision-making more than investor confidence. It should nevertheless be helpful to the latter.

The legacy Martin, Kenshaw, and GB Auto businesses enjoyed impressive revenue growth prior to the CV-19 pandemic. The VVPR model does not assume revenues beyond full recovery of the pre-pandemic period until the end of FY23. In short, we believe the corporate model is based on sound and defensible assumptions.

That said, we have some caveats:

Despite improvement in the frequency and severity of Covid infections we still have global flareups, a slow labor recovery, global scarcity of industrial components, and logistic bottlenecks. There is an imbalance in supply and demand that is apparent in inflationary pressures in a host of goods and services currently.

Russia's war with Ukraine is exacerbating these issues while creating geopolitical and economic instability. While Australia is far from that conflict, Tembo is based in the Netherlands, Russia is tied to battery metals, and Ukraine is a major supplier of neon, a necessary element in the production of EV wiring components. Battery inflation is said to be soaring and it is doubtful the conflict is helping the situation.

If the fairly quick inflation recovery predicted by some does not materialize, it will likely correct by blunting demand. This could pressure commodity prices and delay or reduce mining investment into decarbonization.

These and other challenges should sort themselves out over time; however, the time required could mean the TB LEV ramp up and its follow-on SES sales will be slower than the VVPR model's base or upside cases. The same could be true for the three legacy businesses. Until these meaningful external headwinds sort themselves out we prefer to err toward conservatism.

Happily, our assumptions still suggest that VVPR should see demonstrative growth during our forecast period. With strong products, a solid balance sheet, and clear exposure to long-tail climate change and sustainability trends, we believe VVPR is both a pathfinding and worthwhile investment.

		VVPR Model					AGP Model		
($-USD)		FY21/22	FY22/23	FY23/24	($-USD)		FY21/22	FY22/23	FY23/24
Revenue	Critical Power Services	36.65	53.15	57.14	Revenue	Critical Power Services	33.41	43.77	49.61
	Electric Vehicles	1.63	18.46	108.07		Electric Vehicles	1.12	13.85	98.99
	Sustainable Energy Solutions	2.55	3.77	24.63		Sustainable Energy Solut	2.55	3.77	21.01
	Auto Services	6.44	26.68	29.15		Auto Services	5.80	24.49	27.63
	Corporate/Others	1.67	1.20	1.20		Corporate/Others	0.79	1.20	1.20
	Totals	**48.93**	**103.27**	**220.18**		**Totals**	**43.66**	**87.07**	**198.45**
		VVPR Model					**AGP Model**		
		FY21/22	**FY22/23**	**FY23/24**			**FY21/22**	**FY22/23**	**FY23/24**
Gross Profit	Critical Power Services	5.31	9.57	10.29	Gross Profit	Critical Power Services	2.68	7.88	8.93
	Electric Vehicles	0.33	5.37	34.29		Electric Vehicles	0.21	4.03	31.35
	Sustainable Energy Solutions	0.00	0.66	6.01		Sustainable Energy Solut	0.14	0.66	5.12
	Auto Services	1.29	5.34	5.83		Auto Services	1.16	4.90	5.53
	Corporate/Others	0.33	0.24	0.24		Corporate/Others	0.16	0.24	0.24
	Totals	**7.25**	**21.18**	**56.65**		**Totals**	**4.34**	**17.71**	**51.17**
	Gross Margin	**14.82%**	**20.51%**	**25.73%**		**Gross Margin**	**9.00%**	**19.90%**	**25.70%**
	EBITDA	**(10.65)**	**1.03**	**23.82**		**EBITDA**	**(9.70)**	**(1.85)**	**15.32**

Source: Company presentations, SEC filings, Alliance Global Partners

Regarding the balance sheet, management has indicated minimal concern about debt or liquidity. Arowana (AWN), a global B corporation investment firm founded in Australia in 2007 with offices in London, Tel Aviv, Singapore, Manila, Brisbane, and Sydney, is VVPR's only lender at this time. AWN continues to provide credit to AWN when required. It is also VVPR's largest shareholder. AWN's founder and CEO is VVPR CEO Kevin Chin. Conceptually, we view AWN as a private investment firm with a strong commitment to VVPR's mission and future success. This, combined with VVPR's significant and publicly disclosed backlog with mining-attuned distributors, along with base businesses with direct exposure to growing power procurement needs in a host of growing Australian business sectors, persuades us that liquidity is not significant risk to VVPR at this time.

Management advises that as TB sales begin ramping significantly during 2023-24, VVPR will shift to a working capital facility that is closely aligned with operating capital needs. This is visible on the forecasted balance sheet as long-term borrowing diminishes while current borrowing increases during that period.

Coincident with this balance sheet shift, we also expect VVPR to become cash flow positive in 2024 based on our current forecast.

Financial Models

VivoPower																	
VVPR																	
All data ($-USD MM)																	
INCOME STATEMENT (Fiscal Year)	2020A	2021A	1Q22A	2Q22A	3Q22E	4Q22E	2022E	1Q23E	2Q23E	3Q23E	4Q23E	2023E	1Q24E	2Q24E	3Q24E	4Q24E	2024E
INCOME STATEMENT (Calendar Year)	3Q19-2Q20	3Q20-2Q21	3Q21	4Q21	1Q22	2Q22		3Q22	4Q22	1Q23	2Q23		3Q23	4Q23	1Q24	2Q24	
Gross Revenue and Costs																	
Revenues	48.71	40.41	9.42	9.52	8.47	16.25	43.66	17.63	16.57	21.79	31.07	87.07	41.42	39.51	56.34	61.18	198.45
Cost of Goods Sold	40.89	34.08	9.11	9.33	7.35	13.66	39.32	14.50	13.43	17.49	23.93	69.36	31.09	29.31	41.65	45.23	147.28
Gross Profit	**7.83**	**6.33**	**0.31**	**0.19**	**1.12**	**2.59**	**4.34**	**3.13**	**3.14**	**4.30**	**7.14**	**17.71**	**10.33**	**10.19**	**14.69**	**15.95**	**51.17**
Operating Expenses																	
General and Administrative	5.48	11.13	3.72	4.21	4.56	5.39	17.87	5.44	6.46	4.99	5.01	21.91	8.96	8.98	9.00	9.02	35.96
Depreciation & Amortization	1.77	2.26	0.54	0.63	0.77	0.91	2.86	0.92	0.99	1.09	1.23	4.22	1.34	1.43	1.71	1.84	6.32
Operating Profit (Loss)	**0.58**	**(7.06)**	**(3.95)**	**(4.65)**	**(4.21)**	**(3.71)**	**(16.39)**	**(3.23)**	**(4.31)**	**(1.78)**	**0.90**	**(8.42)**	**0.04**	**(0.22)**	**3.99**	**5.09**	**8.89**
Gain (loss) on Asset Sales	1.59	0.77	0.00	0.09	0.00	0.00	0.09	0.26	1.12	0.00	0.00	1.38	0.00	0.53	2.23	0.00	2.76
Other Income	0.00	1.51	0.50	0.69	0.00	0.09	1.28	0.09	0.09	0.09	0.09	0.37	0.09	0.09	0.09	0.09	0.37
Other Income	**2.17**	**(4.78)**	**(3.45)**	**(3.86)**	**(4.21)**	**(3.62)**	**(15.01)**	**(2.88)**	**(3.10)**	**(1.68)**	**0.99**	**(6.67)**	**0.13**	**0.40**	**6.31**	**5.18**	**12.03**
Non-recurring (Expense)/Gain	(3.41)	(2.88)	(0.23)	(0.28)	0.00	0.17	(0.35)	0.00	0.34	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00
Finance Expense	(3.15)	(0.41)	(0.55)	(2.47)	(0.54)	(0.56)	(4.13)	(0.57)	(0.57)	(0.66)	(0.76)	(2.57)	(0.78)	(0.76)	(0.77)	(0.80)	(3.10)
Income (Loss) Before Income Taxes	**(4.39)**	**(8.07)**	**(4.23)**	**(6.62)**	**(4.75)**	**(4.01)**	**(19.49)**	**(3.45)**	**(3.34)**	**(2.35)**	**0.23**	**(8.90)**	**(0.65)**	**(0.36)**	**5.55**	**4.39**	**8.93**
Income Tax Benefit (Expense)	(0.71)	0.12	0.30	0.52	0.14	0.12	1.08	0.10	0.10	0.14	(0.01)	0.33	0.02	0.01	(0.89)	(0.75)	(1.60)
Net Income (Loss)	**(5.10)**	**(7.96)**	(3.93)	(6.11)	(4.61)	(3.89)	**(18.41)**	(3.34)	(3.24)	(2.21)	0.22	**(8.57)**	(0.63)	(0.35)	4.66	3.64	**7.33**
EPS--Basic	**(0.38)**	**(0.59)**	**(0.24)**	**(0.30)**	**(0.22)**	**(0.19)**	**(0.89)**	**(0.16)**	**(0.16)**	**(0.11)**	**0.01**	**(0.42)**	**(0.03)**	**(0.02)**	**0.23**	**0.18**	**0.35**
EPS--Diluted	**(0.38)**	**(0.59)**	**(0.24)**	**(0.30)**	**(0.22)**	**(0.19)**	**(0.89)**	**(0.16)**	**(0.16)**	**(0.11)**	**0.01**	**(0.41)**	**(0.03)**	**(0.02)**	**0.22**	**0.17**	**0.35**
Weighted common outstanding-Basic (MM)	13.56	13.56	16.31	20.64	20.64	20.64	20.64	20.64	20.64	20.64	20.64	20.64	20.64	20.64	20.64	20.64	20.64
Weighted common outstanding-Diluted (MM)	13.56	13.56	16.31	20.64	20.64	20.64	20.64	20.64	20.64	20.64	21.10	21.10	21.10	21.10	21.10	21.10	21.10
EBITDA			(2.264)	(2.590)	(2.79)	(2.06)	**(9.70)**	(1.81)	(1.96)	(0.45)	2.37	**(1.85)**	1.55	1.90	6.29	5.58	**15.32**

Source: Company presentations, SEC filings, Alliance Global Partners

All data ($-USD MM)					
Balance Sheet (Fiscal Year)	2020A	2021A	2022E	2023E	2024E
Balance Sheet (Calendar Year)	Q19-2Q20	Q20-2Q21	2Q22	2Q23	2Q24
Assets					
Cash & Equivalents	2.82	8.60	7.43	4.42	6.17
Restricted Cash	1.01	1.14	1.14	1.14	1.14
Receivables	12.56	12.71	11.09	19.45	29.36
Inventory	0.00	1.54	4.44	6.35	9.37
Total Current Assets	**16.39**	**23.99**	**24.10**	**31.36**	**46.04**
Property & Equipment	2.49	2.58	5.24	7.80	8.34
Intangible Assets	29.85	47.14	48.40	54.32	55.59
Deferred Tax Assets	14.17	2.50	4.20	3.87	2.24
Total Assets	**62.90**	**76.20**	**81.94**	**97.35**	**112.21**
Liabilities					
Payables	15.40	8.92	9.83	19.43	23.59
Provisions	2.90	2.90	2.80	3.01	3.01
Loans and Borrowings	1.31	1.00	2.79	20.47	30.89
Total Current Liabilities	**19.60**	**12.82**	**15.42**	**42.91**	**57.50**
Loans and Borrowings	24.64	22.09	21.72	14.81	7.75
Provisions	0.17	0.17	0.16	0.75	0.75
Other Liabilities	0.78	0.71	0.71	0.71	0.71
Total Liabilities	**45.19**	**35.78**	**38.01**	**59.18**	**66.70**
Total Equity	**17.71**	**40.41**	**43.93**	**38.17**	**45.50**
Total Liability & Equity	**62.90**	**76.20**	**81.94**	**97.35**	**112.21**

Source: Company presentations, SEC filings, Alliance Global Partners

All data ($-USD MM)					
Cash Flow Statement (Fiscal Year)	2020A	2021A	2022E	2023E	2024E
Cash Flow Statement (Calendar Year)	3Q19-2Q20	3Q20-2Q21	2Q22	2Q23	2Q24
Cash Flow from Operations					
Net Income (Loss)	(5.10)	(7.96)	(18.41)	(8.57)	7.33
Reconsiliations before Working Capital	3.68	2.94	1.30	0.87	0.63
Changes in Working Capital	(3.15)	(10.36)	(0.37)	(0.67)	(8.77)
Cash Flow from Operations	**(4.57)**	**(15.38)**	**(17.48)**	**(8.36)**	**(0.81)**
Cash Flow from Investing					
Investments	(1.16)	(8.03)	(3.40)	(12.32)	(19.06)
Asset Sales	1.46	5.34	(2.81)	0.00	11.21
Cash Flow from Investing	**0.29**	**(2.68)**	**(6.21)**	**(12.32)**	**(7.85)**
Cash Flow from Financing					
Equity sales (repurchase)	0	34.87	21.99	0.00	0.00
Borrowing	0.92	0.01	1.42	17.67	10.42
Costs and Repayments	(0.90)	(11.38)	(0.90)	(6.91)	(7.06)
Cash Flow from Financing	**0.022**	**23.50**	**22.51**	**17.67**	**10.42**
Beginning period cash & equivalents	7.13	2.82	8.60	7.43	4.42
Net increase / (decrease) in cash & equivalents	(4.26)	5.48	(1.18)	(3.01)	1.75
End period cash & cash equivalents	**2.82**	**8.60**	**7.43**	**4.42**	**6.17**

Source: Company presentations, SEC filings, Alliance Global Partners

Important Research Disclosures

Distribution of Ratings/IB Services

			IB Serv./Past 12 Mos.	
Rating	**Count**	**Percent**	**Count**	**Percent**
BUY [BUY]	**110**	**83.33**	**18**	**16.36**
HOLD [NEUTRAL]	**15**	**11.36**	**0**	**0**
SELL [SELL]	**0**	**0.00**	**0**	**0**
NOT RATED [NR]	**7**	**5.30**	**1**	**14.29**
UNDER REVIEW [UR]	**0**	**0.00**	**0**	**0**

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Sources referenced in this report: The information and statistics in this report have been obtained from sources we believe are reliable but we do not warrant their accurance or completeness.

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Regulation Analyst Certification ("Reg AC") — Jeffrey Campbell,

The views expressed in this report (which include the actual rating assigned to the company as well as the analytical substance and tone of the report) accurately reflect the personal views of the analyst(s) covering the subject securities. An analyst's sector is the universe of companies for which the analyst provides research coverage. Accordingly, the rating assigned to a particular stock represents solely the analyst's view of how that stock will perform over the next 12 months relative to the analyst's sector average.

Furthermore, in accordance with FINRA Rules 2711, 2241, and their amendments related to disclosure of conflicts of interest, the analyst preparing this report certifies:

- The analyst or member of the analyst's household does not have a financial interest in the company that is the subject of this report, including a position in the debt or equity of the company, without limitation, whether it consists of any option, right, warrant, future, long or short position.

- The analyst or member of the analyst's household does not serve as officer, director or advisory board member of the company that is the subject of this report.
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Ratings

Buy: Expected to materially outperform sector average over 12 months and indicates total return of at least 10% over the next 12 months.

Neutral: Returns expected to be in line with sector average over 12 months and indicates total return between negative 10% and 10% over the next 12 months.

Sell: Returns expected to be materially below sector average over 12 months and indicates total price decline of at least 10% over the next 12 months.

Not Rated: We have not established a rating on the stock.

Under Review: The rating will be updated soon pending information disclosed from a near-term news event.

Volatility Index

1 (Low): Little to no sharp movement in stock price in a 12 month period

2 (Low to medium): Modest changes in stock price in a 12 month period

3 (Medium): Average fluctuation in stock price in a 12 month period

4 (Medium to High): Higher than average changes in stock price in a 12 month period

5 (High): Extremely sharp movements in stock price in a 12 month period

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