



MERCURY SECURITIES SDN. BHD.

# Evolution of Wealth: Ecosystem Players

---

MIDSTREAM COMPANIES

## Foreword

The electrification of the automotive industry is propelling the world into a new era of transportation. The global shift towards electric vehicles (EVs) has gained momentum as we strive for environmental sustainability and reduced emissions.

This report series aims to illuminate the multifaceted benefits and evolving landscape of the electric vehicle industry. We will delve into the drivers behind the surge in EV adoption and uncover the promising investment opportunities that this burgeoning sector presents to investors.

*Ecosystem Players* is the third in a series of reports assessing the EV market outlook in Malaysia. This report is divided into two sections, offering insights into Malaysia's EV value chain, and detailing the roles and impacts of local companies within each segment.

The second part of this report will be released next week and will delve into the downstream segment of the value chain, providing further in-depth analysis of local industry players. The complete list of reports is as follows:

Title	Content
Investment Opportunities in Electric Mobility	This report delves into the evolving business prospects in the electric mobility sector, specifically exploring the impact of emerging low carbon regulations on Malaysia's trade environment. It also discusses the increasing market interest in EVs and navigates the entire value chain.
Policies Powering the Shift	This report discusses the environmental advantages of EVs and emphasises the role of government policies and incentives in stimulating the transition to electric vehicle adoption.
Ecosystem Players	This report outlines the initiatives, services, and products introduced by industry players which are expected to drive growth and advancement in Malaysia's EV sector.

*Mercury Securities Research Team*  
*February 2024*

## **Table of contents**

<b>Foreword</b> .....	<b>0</b>
<b>Table of contents</b> .....	<b>1</b>
<b>Malaysia's EV midstream mastery</b> .....	<b>1</b>
<b>Battery packs</b> .....	<b>1</b>
Greatech.....	1
Genetec.....	2
<b>Other components</b> .....	<b>4</b>
MPI .....	4
Pentamaster .....	5
D&O Green Technology .....	6
<b>Disclaimer &amp; Disclosure of Conflict of Interest</b> .....	<b>8</b>

## Malaysia's EV midstream mastery

As highlighted in our previous report, the upstream segment of the EV value chain involves the extraction of essential raw minerals such as lithium, nickel, graphite, cobalt, and manganese. These minerals constitute the crucial components for manufacturing lithium-ion batteries that power EVs. However, Malaysia is not actively engaged in the extraction of these critical minerals, prompting our focus on highlighting the efforts and contributions of local companies operating in the midstream and downstream segments of the EV value chain.

In the midstream segment of EV manufacturing, key components necessary for powering these vehicles are assembled. This manufacturing stage can be delineated into the creation of battery packs and other integral components.

## Battery packs

### Greatech

Based in Penang, Greatech Technology Berhad is a leading provider of factory automation solutions. The company has made significant strides in the EV sector, particularly in the manufacturing of EV battery packs.

With more than two decades of experience, Greatech specialises in customising equipment and systems for clients in various sectors. Greatech's clientele primarily comprises of global multinational corporations engaged in the manufacturing of solar panels, EVs, medical devices, smart devices, as well as computers and peripherals.

### *Greatech reported strong financial performance in the EV segment (2020-2022)*

Greatech demonstrated robust financial performance in the EV segment from 2020 to 2022.

In 2020, the company secured a substantial order for a Production Line System (PLS) related to an EV battery assembly system, resulting in a revenue increase of RM261.13 million. The company's profit for the financial year saw a significant growth of 68.0%, reaching RM87.85 million, driven by the expansion in the solar and EV energy storage sectors.

In 2021, Greatech's impressive organic growth continued, with its PLS and Single Automated Equipment (SAE) businesses achieving full-year increase of 48.4% and 465.6%, respectively.

This translated to an impressive revenue increase of RM239.32 million in the North America region, driven by strong demand from EV customers. The company continued to secure new orders, particularly in the EV sector, and expanded its presence in Michigan, USA, focusing on EV and energy storage, which further contributed to its financial success.

In 2022, Greatech sustained its growth trajectory, securing new orders from other American EV manufacturers for the design, construction, and installation of battery assembly systems. The company achieved a remarkable revenue growth of 35.8%, with an increase in order intake by 39.0% to RM760 million compared to the previous year.

Greatech's strong financial performance reflected the company's strategic focus on diversifying its revenue base among various industries, but with a heavy emphasis on the e-mobility sector.

## ***Business expansion and strategic partnerships in the EV sector***

Greatech's journey into the EV segment began in August 2020, when Greatech secured its first order for a PLS for a battery assembly system from a new EV manufacturing customer.

The total contracts secured from this customer during the year were notably substantial, exceeding RM200 million.

From this point, the company has consistently procured additional contracts from various American EV manufacturers, providing the design, construction, and installation of battery assembly systems. Greatech continues to see sustained interest and a gradual increase in demand for automation, driven by the electrification of energy and transport networks.

In October 2020, Greatech incorporated a new wholly-owned foreign subsidiary, Greatech Integration (USA) Inc. in Delaware, USA. The subsidiary focuses on the e-mobility sector, strengthening Greatech's market presence and customer awareness within the region.

Furthermore, in response to the North American automotive industry's shift to electrification, the subsidiary has leased a 16,000-square-foot building in Michigan to exploit growth opportunities and serve the North American region better, with operations commencing in February 2021. The company's presence in Michigan also focuses on the EV and energy storage sector, providing battery assembly and handling systems for lithium-ion battery cells, modules, and packs.

In February 2021, the subsidiary also forged a collaboration with Atlis Motor Vehicles, Inc. and leveraged this partnership to initiate discussions with multiple entities regarding the production of PLS or equipment for EV energy storage.

Despite challenges posed by the COVID-19 pandemic, the subsidiary also successfully secured its first purchase order for equipment to produce lithium-ion battery cells from a new EV customer in April 2021.

As of 2022, North America is Greatech's largest market, but the company is considering extending its brand presence to potentially encompass countries like Germany, Ireland, and India in the coming years.

Notably, a Memorandum of Understanding (MOU) was executed in August 2022 for the acquisition of 60% equity interest in Kaon Automation Limited, an Irish company specialising the provision of automation solutions for leading manufacturing companies globally in the medical device, automotive, electronics and consumer goods sectors.

## ***Greatech received pioneer status tax incentive***

Finally, Greatech received preliminary approval from the Malaysian Investment Development Authority (MIDA) on June 27, 2022, under the Income Tax Act of 1967 for its pioneer status incentive application related to the development of robotic and factory automation systems, along with associated modules and components for the electric vehicle and energy storage industries. This approval entails a ten-year tax exemption on the statutory income generated from this endeavor, starting from the manufacturing date.

## **Genetec**

Genetec Technology Berhad is a global provider of cutting-edge manufacturing technologies with a focus on becoming a

world leader in industrial automation. Serving various industries such as e-mobility, energy storage, automotive, hard disk drives (HDD), consumer electronics, and pharmaceuticals, the company specialises in offering innovative process solutions that align with Industry 4.0 principles, thus enhancing manufacturing processes across different sectors.

In the context of the EV sector, Genetec has positioned itself as a key player in the technological advancement of EV components and green energy storage. By contributing to the development of intelligent systems such as the Intelligent Radar System, Camera System, Regenerative Braking System, Electronic Control Units, and Full Self Driving System, Genetec plays a pivotal role in transforming the driving experience and promoting green technology.

The company emphasises the crucial link between electric vehicle motors and sustainable energy storage, aligning with the broader goal of reducing greenhouse gas emissions.

Through its integrated applications, Genetec contributes to the advancement of the EV value chain, supporting the growth of green and sustainable technologies in the automotive industry.

### ***Genetec's surging growth and strategic investments in the EV sector***

In 2021, Genetec experienced a remarkable surge in EV sector, with revenue increasing by an impressive 3,033.3% to RM28.2 million, constituting 29.0% of the Group's total revenue.

This surge was accompanied by a historical high new order book totaling RM204.6 million, showcasing Genetec's pivotal role in the burgeoning EV market. The company strategically increased its workforce and production capacity to meet

escalating demand, demonstrating its commitment to staying ahead in the EV sector.

This momentum continued into 2022, where the revenue from key EV and energy storage segments skyrocketed by 481.2% to RM163.9 million, representing 73.3% of the Genetec's total revenue. The company's prudent strategy of expanding production capacity, as evidenced by a conditional sale and purchase agreement for land acquisition in May 2022, further solidified its position in the EV market.

### ***Genetec's tactical move into energy storage solutions***

In 2023, the Group delivered exceptional results, experiencing record-breaking revenue and profit, largely propelled by robust orders in the e-mobility and energy storage sectors, particularly from key customers in the USA and Europe. The total revenue for the year reached RM294.6 million, a significant increase of 31.8% from the previous year. Notably, the e-mobility and energy storage sectors were the key contributors, representing RM255.5 million or 86.7% of the total revenue, showcasing a substantial growth of 33.9% from the figures reported in 2022.

The Group foresees significant growth potential in the e-mobility and energy storage segments in the coming years, expecting them to remain key drivers for revenue growth. Genetec aims to deepen its strategic collaboration with existing key customers in these segments to capitalise on global and local opportunities arising from the renewable energy transition.

Genetec also emphasises the lucrative growth and momentum in the Battery Energy Storage System (BESS) market, aligning with the worldwide shift toward achieving net-zero carbon emissions by

2050. The development of BESS addresses challenges in power distribution, storage, scalability, and portability, providing cost-effective solutions for integrating renewable energy into businesses.

To demonstrate this, Genetec entered into a joint venture with Citaglobal Berhad to establish a broad-based collaboration arrangement for the development of BESS projects. This collaboration led to the formation of "Citaglobal Genetec BESS Sdn Bhd" on January 19, 2023, with both parties holding an equal share (50%) in the joint venture.

On 11 April 2023, the joint venture launched Malaysia's first locally developed and produced BESS. Currently, the prototype is actively employed to meet the energy requirements of the newly operational Genetec EPIC plant located adjacent to the main factory in Bandar Baru Bangi, showcasing its operational capabilities.

Additionally, the acquisition of a new piece of land in Bandar Baru Bangi, Selangor, in May 2022, further supports the Genetec's expansion of manufacturing facilities to meet the increasing demand from key customers, especially in the EV and energy storage segments. The completion of the sale and purchase agreement occurred on March 23, 2023.

### ***Tax incentives for smart factory automation***

Similar to Greatech, Genetec also secured a significant milestone by obtaining pioneer status tax incentives from the MIDA. The incentives, granted for the company's "Smart Factory Automation System and Related Modules for Autonomous and Electric Vehicle" activities, provided a 70% tax exemption on statutory income for five years,

spanning from December 2019 to December 2024.

This incentive further bolstered Genetec's financial position and supported its continued growth in the EV sector.

## **Other components**

### **MPI**

With three key operating subsidiaries and four manufacturing operations, Malaysian Pacific Industries Bhd's (MPI) presence spans across Malaysia and China.

Carsem (M) Sdn Bhd operates in Ipoh, Perak, offering comprehensive turnkey solutions for both leaded and leadless semiconductor packaging and testing services.

Carsem Semiconductor (Suzhou) Co., Ltd, located in Suzhou Industrial Park, Jiangsu province, China, specialises in outsourced semiconductor packaging and testing, focusing on leadless semiconductor, flip chip, and ball grid array technology.

Lastly, Dynacraft Industries Sdn Bhd, situated in Bayan Lepas Free Industrial Zone, Penang, Malaysia, is engaged in the manufacturing and sale of leadframes, catering to industrial, automotive, and telecommunications markets.

### ***MPI's pioneering move into the wide bandgap semiconductor space***

MPI is strategically positioning itself in the dynamic EV market by capitalising on emerging applications related to autonomous driving, micro-electromechanical systems (MEMS) for safety & security, and smart vehicles encompassing both electric and hybrid electric vehicles (EV/HEV).

With acquired design and technology for power management products, the company is venturing into automotive EV segment, particularly adopting silicon carbide (SiC) and gallium nitride (GaN) wafer technology.

SiC and GaN materials are considered wide bandgap semiconductors and are known for their advantages in EV power electronics applications. This is because they can operate at higher temperatures, handle higher voltages, and offer better efficiency compared to traditional silicon semiconductors.

### ***MPI's automotive power electronic solutions***

MPI's technological offerings in the automotive power electronics domain include the innovative Automotive Power Inverter – TPAK.

This module, designed for energy conversion from high voltage batteries to multiphase AC current to drive traction motors in full EV or hybrid vehicles, utilises SiC die, which enables the creation of smaller-sized components compared to the conventional Insulated Gate Bipolar Transistor (IGBT) technology, and is crucial for EV application.

Additionally, MPI is also engaged in the development of automotive power converter/inverter, which utilises the GaN technology. This solution enhances thermal management in EV charging stations, contributing to increased product efficiency by reducing losses at higher operating temperatures.

MPI's S-Site is actively conducting reliability assessments, anticipating the commencement of production in FY25. These technological advancements underscore MPI's commitment to staying at the forefront of innovation in the EV and power electronics sectors.

In conclusion, MPI's strategic focus on the EV market, combined with its technological offerings and production site capabilities, positions the company to play a significant role in the evolving landscape of electric vehicles and power management systems.

### **Pentamaster**

Pentamaster Corp Bhd (Pentamaster), an innovative automation manufacturing and technology solutions provider established in 1991, is headquartered in Penang, Malaysia. Boasting over three decades of expertise, the company specialises in delivering integrated and tailored solutions across a diverse array of industries worldwide.

The company, through its subsidiaries, offers a comprehensive suite of innovative services in the manufacturing of automated and semi-automated machinery and equipment.

### ***Pentamaster's steady growth in the EV segment***

Pentamaster has strategically expanded its presence in the EV segment in recent years, aligning with the growing demand in the automotive industry.

In 2020, the Automated Test Equipment (ATE) business segment contributed approximately 67.9% to the company's revenue, with the regional expansion plan gaining prominence. Meanwhile, Pentamaster's exposure to the automotive segment represented 20.1% of total revenue, marking a commendable 19.5% growth from 2019.

This growth was attributed to the Group's technological capabilities covering silicon carbide (SiC) and gallium nitride (GaN) in



compound power modules. The development of end-to-end solutions, covering front-end testers for new compound substrates and back-end solutions for integrated power management circuits, positioned Pentamaster as a key player in the automotive sector.

In 2021, the automotive segment's revenue further increased to 20.5% of total revenue, reflecting a 24.0% growth from 2020. The Group's timely penetration into the automotive segment, coupled with global structural shifts towards decarbonisation and environmental sustainability, contributed to steady revenue growth.

Finally, in 2022, the Group's exposure in the automotive segment expanded significantly, constituting 42.4% of total revenue, becoming the largest share of the wallet. The robust demand for automotive test solutions, particularly for SiC-based wafer level burn-in testers, reflected the opportunity presented by the global shift towards sustainable e-mobility with more stringent decarbonisation targets.

### ***ATE segment growth fueled by automotive industry penetration***

The ATE segment emerged as Pentamaster's main revenue source, contributing significantly to the Group's overall revenue and profit. After marking a turnaround with double-digit growth of 25.9% in 2021, the ATE segment continued its growth trajectory in 2022, achieving an 18.1% increase in total revenue to RM420.7 million.

This growth was fueled by the electrification trend in the automobile industry and the proliferation of the EV ecosystem. The automotive industry became the leading segment within the

ATE business unit, contributing approximately 58.4% in 2022, a substantial increase from 27.6% in the previous year.

The remarkable growth of the automotive segment within the ATE business unit, at an impressive rate of 150.1%, reflected Pentamaster's milestone in penetrating the automotive industry.

The Group's broad array of automotive test solutions, especially the front-end tester for SiC and back-end solutions for power devices, made a meaningful breakthrough in the addressable market. While the semiconductor industry is inherently cyclical, the ATE segment also benefited from the overall growth in the semiconductor industry, with a revenue contribution rate of 19.9%, representing a 17.6% growth compared to 2021.

Pentamaster's diverse product offerings in test handling equipment found applications in various industries, from computer and telecommunication to healthcare and general industrial applications, demonstrating the continued opportunities and demand for the Group's ATE solutions. The ATE segment's strong performance underlines Pentamaster's adaptability and agility in catering to evolving industry demands.

### **D&O Green Technology**

D&O Green Technologies Bhd (D&O), through its principal operating subsidiary Dominant Opto Technologies Sdn Bhd, has earned global recognition as a leading automotive LED manufacturer since its establishment in 2000.

With cutting-edge innovation, advanced manufacturing facilities, and extensive experience in Surface Mount Technology (SMT) Light Emitting Diodes (LED), D&O boasts a significant presence in major

automotive markets worldwide, including China, Europe, the USA, Japan, Republic of Korea, and India.

### ***D&O's illuminating contribution: LED technology's vital role in the EV revolution***

D&O has strategically positioned itself to leverage the increasing demand for EVs, aligning with the global shift towards lower carbon emissions. Recognising that EVs represent the future of the automotive industry, the company has responded by focusing on the development and production of energy-efficient LED lighting technology specifically designed for EVs.

The management emphasised that the density of LED applications in electric vehicles is higher compared to combustion engine vehicles, driven by styling trends and personalisation requirements.

LED lighting is also crucial for EVs to conserve maximum electrical energy for the vehicle's operation, and D&O's flagship product, seddLED, plays a pivotal role in addressing this need.

In 2022, the EV market share reached almost 13% of total vehicle sales, signifying a 52% increase from 2021 levels. This trend has positively impacted D&O as LEDs continue to be widely adopted in EVs due to their versatility and low-energy consumption characteristics. LED lighting achieved a 90% penetration rate in the new energy vehicle market in 2021, further emphasising its importance in the EV industry.

### ***D&O's vision: Automotive innovation through smart LED solutions***

D&O's commitment to becoming a world-leading player in the global automotive LED industry is evident through its strategic initiatives. The company established two complementary business units, one focusing on the design and manufacturing of LED modules and the other on the design and development of Integrated Circuits (IC).

This move aimed to provide value-added services to existing and future automotive customers, solidifying D&O's position as a one-stop smart-solution LED supply chain platform for the automotive sector.

Dominant Opto Technologies Sdn Bhd, a subsidiary, stands out as one of the few worldwide automotive LED manufacturers offering a full range of color spectrum and brightness intensity.

The seddLED, known as the world's first Smart Digital LED, combines RGB LED, LED Driver, and advanced ISELED® communication protocol into a single package, paving the way for innovative applications such as car projection lighting and smart illumination.

### ***EV capacity expansion***

In response to the growth opportunities in the EV sector, D&O is actively expanding its capacity to meet the projected demand in the next 10 years.

The company plans to construct a third plant, Plant 3, situated between its two existing manufacturing plants, with a total built-up area of approximately 360,000 square feet. This 10-storey plant, expected to be completed by 2025, is a strategic move to cope with the anticipated surge in global car sales and EV penetration.

## Disclaimer & Disclosure of Conflict of Interest

The information contained in this report is based on data obtained from data and sources believed to be reliable at the time of issue of this report. However, the data and/or sources have not been independently verified and as such, no representation, express or implied, are made as to the accuracy, adequacy, completeness or reliability of the information or opinions in this report.

This report may contain forward-looking statements which are often but not always identified by the use of words such as “believe”, “estimate”, “intend” and “expect” and statements that an event or result “may”, “will” or “might” occur or be achieved and other similar expressions. Such forward-looking statements are based on assumptions made and information currently available to Mercury Securities Sdn Bhd. (“Mercury Securities”) and are subject to known and unknown risks, uncertainties and other factors which may cause the actual results, performance or achievement to be materially different from any future results, performance or achievement, expressed or implied by such forward-looking statements. Caution should be taken with respect to such statements and recipients of this report should not place undue reliance on any such forward-looking statements. Mercury Securities expressly disclaims any obligation to update or revise any forward-looking statements, whether as a result of new information, future events or circumstances after the date of this publication or to reflect the occurrence of unanticipated events.

Accordingly, neither Mercury Securities nor any of its holding company, related companies, directors, employees, agents and/or associates nor person connected to it accept any liability whatsoever for any direct, indirect, or consequential losses (including loss of profits) or damages that may arise from the use or reliance on the information or opinions in this publication. Any information, opinions or recommendations contained herein are subject to change at any time without prior notice. Mercury Securities has no obligation to update its opinion or the information in this report.

This report does not have regard to the specific investment objectives, financial situation and particular needs of any specific person. Accordingly, investors are advised to make their own independent evaluation of the information contained in this report and seek advice from, amongst others, tax, accounting, financial planner, legal or other business professionals regarding the appropriateness of investing in any securities or the investment strategies discussed or recommended in this report. Nothing in this report constitutes investment, legal, accounting or tax advice or a representation that any investment or strategy is suitable or appropriate to your individual circumstances or otherwise represents a personal recommendation to you. This report is not intended, and should not under no circumstances be considered as an offer to sell or a solicitation of any offer or a solicitation or expression of views to influence any one to buy or sell the securities referred to herein or any related financial instruments.

Mercury Securities and its holding company, related companies, directors, employees, agents, associates and/or person connected with it may, from time to time, hold any positions in the securities and/or capital market products (including but not limited to shares, warrants and/or derivatives), trade or otherwise effect transactions for its own account or the account of its customers or be materially interested in any securities mentioned herein or any securities related thereto, and may further act as market maker or have assumed underwriting commitment or deal

with such securities and provide advisory, investment, share margin facility or other services for or do business with any companies or entities mentioned in this report. In reviewing the report, investors should be aware that any or all of the foregoing among other things, may give rise to real or potential conflict of interests and should exercise their own judgement before making any investment decisions.

This research report is being supplied to you on a strictly confidential basis solely for your information and is made strictly on the basis that it will remain confidential. All materials presented in this report, unless specifically indicated otherwise, are under copyright to Mercury Securities. This research report and its contents may not be reproduced, stored in a retrieval system, redistributed, transmitted, or passed on, directly or indirectly, to any person or published in whole or in part, or altered in any way, for any purpose.

This report may provide the addresses of, or contain hyperlinks to websites. Mercury Securities takes no responsibility for the content contained therein. Such addresses or hyperlinks (including addresses or hyperlinks to Mercury Securities own website material) are provided solely for your convenience. The information and the content of the linked site do not in any way form part of this report. Accessing such website or following such link through the report or Mercury Securities' website shall be at your own risk.

This report is not directed to or intended for distribution or publication outside Malaysia. If you are outside Malaysia, you should have regard to the laws of the jurisdiction in which you are located.

The views expressed in this research report accurately reflect the analyst's personal views about any and all of the subject securities or issuers; and no part of the research analyst's compensation was, is or will be, directly or indirectly, related to the specific recommendations or views expressed in the report.

## **Published & Printed By:**

MERCURY SECURITIES SDN BHD

Registration No. 198401000672 (113193-W)

L-7-2, No 2, Jalan Solaris, Solaris Mont' Kiara, 50480 Kuala Lumpur

Telephone: (603) - 6203 7227

Website: [www.mercurysecurities.com.my](http://www.mercurysecurities.com.my)

Email: [mercurykl@mersec.com.my](mailto:mercurykl@mersec.com.my)