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BUSINESS **9609/32**

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Asian Electric Vehicles (AEV)

Akira Morrison graduated from university with a degree in electrical engineering. He made his fortune in technology start-ups in country K in Asia. Akira lived in the capital city and he became increasingly concerned about pollution from cars. He started to research the problem, and was soon convinced that electric vehicles were the solution. Akira planned to start a business called AEV that would produce electric cars. It was difficult to attract investors as it was generally accepted that competition from car manufacturers and problems with the existing battery technology made success unlikely. However, Akira approached venture capitalists for finance in return for equity and, along with his own substantial investment, AEV began operations as a private limited company in 2010. It converted to a public limited company in 2011, with Akira as Chief Executive Officer (CEO).

Product development – launching the AEV4

AEV's first three products were luxury cars with prices ranging from $70 000 to $100 000. Demand for these cars has been high but customers have had to wait months for delivery. From the start, Akira recognised that there were two key problems faced by his business:

- the short distance that cars can travel on one battery charge
- limited facilities within some countries to allow charging of car batteries.

A high proportion of AEV's investment into research and development has been to improve battery performance. Working in partnership with the University of Technology, AEV has increased the distance the vehicles can travel with its advanced battery technology. Over 9 years, AEV has cut battery costs by 75% and achieved a 500% increase in the amount of energy stored in each battery. Fig. 1 shows AEV's capital expenditure and research and development expenditure.

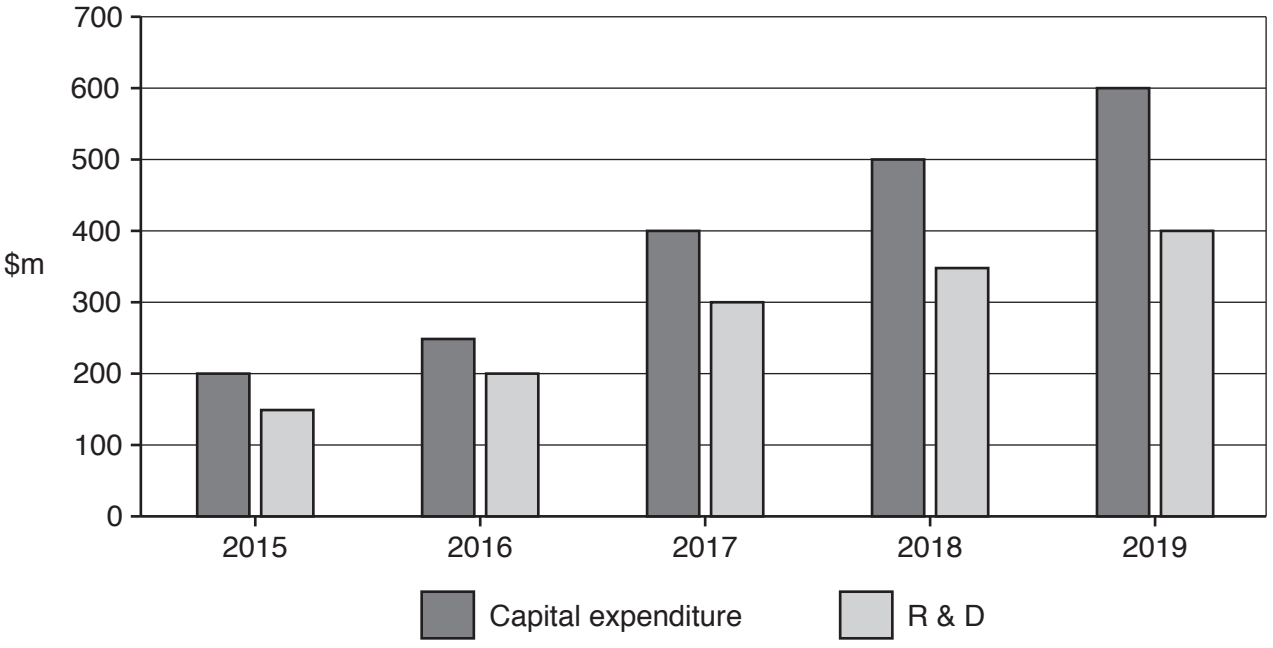


Fig. 1: AEV investment ($m)

At the launch party of AEV's new model, the AEV4, in September 2019, Akira told the media: 'Today is a historic moment for AEV. The AEV4 will transform the company from a niche producer of electric sports cars into the biggest mass producer of electric cars in the world.'

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Production problems

In 2012 AEV bought a car factory in country K that was about to be closed. Akira converted the outdated factory into an advanced manufacturing centre called CellX. This is AEV's only manufacturing base. Although it is capital intensive, AEV now employs 2000 workers on the CellX car production line and associated battery production. 80% of the workforce are trade union members.

Production delays and quality problems have affected the supply of AEV cars. To increase car production, employees are required to work long hours with compulsory overtime. They have complained about the difficulty of achieving the high production targets. In 2018, ambulances were called to the factory more than 20 times for employees suffering from work-related health problems. These problems have been reported in the media. A company spokesperson has reassured the media that factory safety has improved in 2019 and that AEV cares about employee welfare.

Akira is worried about the impact of labour turnover at the CellX manufacturing centre. Further details are in Table 1.

Table 1: Employee data for CellX

Year	Total employees	Employees leaving
2017	1300	165
2018	1500	250

AEV's supply chain – future of CellX manufacturing centre

Electric cars are dependent on batteries. Manufacturing batteries is dependent on the supply of rare natural materials. Before its launch, the AEV4 had pre-orders of 300 000 units. AEV is unable to meet this demand due to a lack of capacity and supply constraints. Materials for the batteries produced at AEV's CellX manufacturing centre are imported from country C.

Akira has plans to expand the CellX manufacturing centre. This is crucial to Akira's target of selling 400 000 cars per year by 2021, which is 4 times the forecast production level for 2019. The expansion will double the size of the workforce. The Human Resources Director is preparing a workforce plan to contribute towards a successful expansion.

The external environment

There is growing global concern over pollution caused by cars. Recent scientific reports have highlighted the impact of this on health. Air pollution in major cities regularly exceeds international guidelines on safe limits. In response, the Government of country K has announced that sales of new diesel cars will be banned from 2030. Some other countries are also planning similar regulations. In 2019, the Government of country K increased the rate of tax on petrol (gasoline) and diesel fuels. Country K's exchange rate has appreciated during 2019.

Country C is the biggest market for electric cars in the world. However, AEV only gained a 5% share of the electric car market, with sales of 10 000 vehicles in the 12 months to September 2019. Country C imposes a 30% tax on all car imports.

Raising finance

AEV has received $1bn in government grants since 2010. It converted to a public limited company in 2011 to help provide finance for production of AEV1, its first car design. Akira has announced that AEV is to raise a further $500m share capital in November to expand the CellX centre. Akira has always invested in new products rather than paying a dividend. The dividend proposed for 2019 will be the first ever payment to shareholders.

Akira reported in the most recent shareholder update that: 'The Board of Directors has the task of ensuring that management is working towards maximising shareholder value. AEV's immediate goal is to continue expanding in the electric car market. The impressive rise in AEV's share price, since the AEV4 was announced, reflects the long-term potential of the company. The current share price gives AEV a market capitalisation greater than any other manufacturing company in country K.'

Strategic options

Akira is considering further opportunities for AEV's expansion. There are currently two options being considered.

Option 1: Establish a joint venture with CVG Motor Corporation based in country C. AEV has been negotiating with the government and CVG to build a factory in country C. This would enable production of the AEV4 in country C. The market in country C is highly competitive, where there are 10 established manufacturers of electric cars. Akira believes that a new factory could be producing cars within 12 months once negotiations are completed. Investment costs would be split equally between AEV and CVG.

Option 2: Develop a large electric truck. The target market would be businesses. It would be manufactured at the CellX centre. AEV engineers believe that they will be able to develop the first large electric truck to enter the market. Initial planning suggests that customers could take delivery of their first trucks in early 2022.

Information regarding these two strategic options is shown in Table 2. Both options involve risk and Akira is aware that implementation of either option will be difficult and that planning will be essential. Therefore, he has decided only one option can be chosen.

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Table 2: Information comparing the two strategic options

	Option 1: Joint venture with CVG (AEV's share)	Option 2: Develop large electric truck
Estimated initial investment	$800m	$1.5bn
Forecast annual return (12 years)	$80m	$120m
Expected monetary value	$600m	$1.1bn
Estimated risk of strategy failure	15%	20%
Major driving force	Improved access to country C market	Competitive advantage: first to enter the market
Major constraining force	Culture difference with CVG	Research fails to develop battery technology

Appendix 1: Financial data

	September 30 2019	September 30 2018
Number of issued ordinary shares	70m	60m
Total equity	$2.5bn	$2bn
Non-current liabilities	$3bn	$2.4bn
Revenue (for the year ending)	$4.8bn	$2.4bn
Cost of sales (for the year ending)	$3.6bn	$1.92bn
Operating profit (for the year ending)	$60m	$(200m)
Profit for the year (for the year ending)	$48m	$(210m)
Total dividends (proposed)	$10m	None
Market share price	$130	$100
Current ratio	1.2	1.3
Net cash flow from operating activities (for the year ending)	$(200m)	$(80m)

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