



## Advanced Engine Components Limited (ASX: ACE)

### Australia

### A Natural Gas Vehicle Systems (NGVS) Manufacturing Company

Advanced Engine Components Limited (ASX: ACE) is an Australia-based company focused on the development and commercialization of its patented natural gas vehicle systems (NGVS). The system consists of a technology, which helps diesel and gasoline engines adapt to natural gas either at the time of production or in retro-fit (conversion). The company is expected to benefit from the increasing preference for natural gas on account of rising oil prices and security of supply, stringent emission standards and growing need for environment friendly vehicles. According to the International Association of Natural Gas Vehicles (IANGV), the number of natural gas (NG) vehicles is projected to grow at an annual rate of 18% from the current 8 million to 65 million by 2020. Currently, the company is focusing on the fastest growing Asia-Pacific market, particularly China, where it is commercializing the NGVS kits.

- The company has strategic alliances with First Auto Works (FAW) Group Corporation, Weifang Weichai Peterson Gas Co Ltd. and Dongfeng Nanchong Automobile Co Ltd., three of the leading original equipment manufacturers (OEMs), in China. Dongfeng Nanchong is a subsidiary of China's third-largest automotive manufacturer, Dongfeng Motor Group Co Ltd (HKG: 0489). Under the agreement, AEC would supply NGVS kits to the OEMs. The company expects to deliver at least 3000 kits during calendar year 2009. Moreover, sales are expected to rise on account of the growing alternative fuels market in China which is expected to be worth US\$1.8 billion by 2008.
- AEC also intends to sell 600 NG engines per year through a joint venture in Thailand. The company also expects its spare parts and consumables segment's revenues to grow exponentially, as the sales of its kits and engines increase. AEC aims to penetrate key high-growth Asian markets, such as Indonesia, India, Pakistan, Bangladesh, and Korea. We believe this could lead to rapid expansion of its business as these regions have a supportive infrastructure and conducive regulatory environment for the NGV market.
- According to industry sources, the cost of a new natural gas engine ranges between US\$20000 and US\$30000, while the cost of converting a diesel engine to natural gas engine in a heavy-duty vehicle could be maximum US\$15000. On the other hand, AEC's products are rationally priced and also conform to the Euro 4 emission standards, which most of the other conversion systems fail to comply.
- AEC's revenues have shown a moderate growth since a couple of years. The company's accumulated losses stood at around A\$16 million at the end of FY07. Therefore, AEC might take a few more years to report robust growth in profits. Moreover, on a broad spectrum, other fuel alternatives to natural gas, such as hydrogen gas and hybrid, might pose a threat to the NGV market.



<http://www.advancedengine.com>

**July 10, 2008**  
**Initiation of Coverage**

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Price (A\$)	
07/10/2008	\$0.15
<b>Price Target *</b>	<b>\$0.91</b>
52 week high	\$0.36
52 week low	\$0.06

Shares Outstanding (millions)	
Basic Shares	147.80
Options & Warrants	21.97
Fully Diluted	169.77

Capitalization (A\$ millions)	
Current Market Cap	22.17
<b>Target Market Cap*</b>	<b>133.97</b>

Key Financial Ratios	
Price/Equity (2008E)	1.21
Price/Sales (2008E)	4.85
Price/Cash flow (2008E)	63.94
Price/Book value (2008E)	8.97

\* Our target price and target market cap are aiming at a 24–48 month investment period. For details, please see financial forecasts and analysis.

## Investment Summary

We are initiating coverage on Advanced Engine Components Limited (ASX: ACE) and expect the company's market capitalization to reach A\$133.97 million over a 24–48 month horizon, with a corresponding target price of A\$0.91 per share.

AEC is an Australia-based NGVS manufacturer. The flagship patented system encompasses a technology, which helps engines adapt to natural gas. The technology also enables manufacturing of natural gas engines. The use of natural gas as an alternative fuel to gasoline and diesel has been increasing due to burgeoning prices of oil and stringent emission standards. IANGV expects the number of NG vehicles to grow 18% annually from the current 8 million to 65 million by 2020.

The company intends to target the strengthening NGV market in China for its NGVS kits. The annual alternative fuels market in the country is expected to be worth US\$1.8 billion by 2008. There are only 127,120 NG vehicles in China. This factor represents a huge untapped market potential. To capitalize on this opportunity, AEC has secured working agreements with three of the top five OEMs in China – FAW Group Corporation, Weifang Weichai Peterson Gas Co Ltd. and Dongfeng Nanchong Automobile Co Ltd – for the supply of its NGVS kits. The company expects to supply at least 3000 kits during calendar year 2009 to these OEMs which is likely to triple or quadruple its current sales. Moreover, AEC is jointly developing different versions of low-cost, low emission and high performance heavy-duty NG-powered engines with these OEMs. The company is also exploring opportunities to tap other Asia-Pacific markets, such as India and Korea..

In 2007, AEC initiated direct sales of complete natural gas engines that include its NGVS. The company is supplying a number of engines to Thailand and Indonesia. AEC is also pursuing a joint venture with Monika Motors Limited in Thailand, where commissioned NG engines are being sold. The joint venture targets to sell a minimum 600 engines every year. AEC aims to increase its current export of engines by fivefold within a couple of years. For this purpose, the company expects to enter several other markets, such as Pakistan and Bangladesh, whose appropriate regulatory environment and proper infrastructure make them receptive to natural gas vehicles. AEC's spare parts and consumables segment generates sales from France and Australia, China and Thailand, wherein around 1200 buses and trucks are using its NGVS. Every kit or engine sold also creates an ongoing market for the sale of spares and consumables. Consequently, revenues from this segment are likely to rise exponentially as the number of operating vehicles using AEC's kits and engines increase.

Apart from AEC there are many companies, such as Westport Innovation Inc (TSE: WPT), Alternative Fuel Systems (2004) Inc. (TSXV: AFX) and US Energy Initiatives Corporation (OTCBB: USEI), offering NG engine control and conversion systems. However, AEC owns a proven technology and its NGVS conforms to the Euro 3 and Euro 4 emission standards—a rare feature in most of the other available conversion systems. According to industry sources, the cost of a new natural gas engine ranges between US\$20000 and US\$30000, while the cost of converting a diesel engine to natural gas engine in a heavy-duty vehicle could be as high as US\$15000. On the other hand, AEC's products are competitively priced which is likely to help the company establish itself in the growing NGV industry.

We valued AEC based on the Discounted Cash Flow (DCF). The company's revenues are assumed to increase in the long-term following demand for its NGVS kits and engines as a result of strategic alliances with some of the leading OEMs. Furthermore, we calculated free cash flows and discounted them using a 13.19% cost of equity. We then added the discounted free cash flows, terminal value, and cash balances to arrive at the company's enterprise value. By dividing the enterprise value with the total number of outstanding shares, we arrived at a target price of A\$0.91 per share.

## Company Background & Business Strategy

Advanced Engine Components Limited (ASX: ACE) is an Australian company, primarily engaged in the development, production and commercialization of patented NGVS. The company was incorporated in 1984; since then, it has concentrated on the development of an efficient and cost effective NGVS. So far, AEC has spent A\$29 million on research and development (R&D) activities. The company's efforts have been recognized through many prestigious awards, including the Australian Energy Award, Western Australian Energy Efficiency Award and the C.Y.O.'Connor Award for Engineering Excellence.

In 2000, it was listed on the ASX under the symbol ACE. In 2002, the company commenced sales of its NGVS in Europe and Australia. Currently, there are 650 buses in France and Australia that use the NGVS. Furthermore, the company is focusing on the Asia-Pacific market, which is the fastest growing natural gas vehicle market. AEC has entered into working agreements with three of China's leading heavy duty vehicle manufacturers. The company has recently initiated sales of assembled natural gas vehicle engines, comprising NGVS. AEC sells spare parts and consumables for NGVS, and also provides after sales and technical services.

AEC is a parent entity and its organization structure comprises four controlled entities – Transcom NGVS Research Pty Ltd., AEC Vehicle Technology Pty Ltd, AEC China Holdings Ltd. and AEC China Ltd. Of these, AEC China Ltd is the key subsidiary, which looks after the management of operations and customer relationships.

Key features of the company's business strategy are:

- AEC is leveraging its patented technology for the development of NGVS and its various components. The company has secured patents for its technology in approximately 17 countries and has also applied for patents in other countries.
- The company's strategy is to get its products validated through various tests, trials and demonstrations. AEC is collaborating with various fleet operators and OEMs to conduct trials to prove the efficiency of its products.
- AEC targets a nascent stage, but rapidly growing natural gas vehicle market in Asia-Pacific, particularly China, Thailand and Indonesia. The company also aims to enter the Indian market in the next couple of years. This strategy would help it gain a significant market share in these high-growth regions.
- The company constantly invests in R&D innovations, which helps it modify and improve its products to meet specific manufacturer and customer requirements. For instance, AEC produces NGVS according to the specifications provided by the OEMs.
- AEC continues to seek strategic alliances with leading OEMs for the sale of its NGVS. The company's agreements with three of the leading OEMs in China are a case in point. AEC also seeks joint ventures and agreements for the production and marketing of natural gas engines in its target regions. For instance, the company's joint venture with Monica Motors Limited, Thailand.

## Corporate Events and Actions

- July 09, 2008 – Pursuant to the announcement on May 14, 2008, AEC issued 4.36 million shares at A\$0.20, which were underwritten by KGI Asia Limited. The company received total proceeds of A\$872,000 from this issue and intends to utilize the same for enhancing its working capital.
- June 18, 2008 – AEC announced the receipt of an order for over 300 natural gas vehicle system (NGVS) kits from Weifang Weichai Peterson Gas Co Ltd (Weichai). The NGVS kits, with sales value exceeding A\$1.1 million, are scheduled for delivery over a three-month period, commencing June 30, 2008. With this, the total number of NGVS kits delivered to Weichai stands at 671 (since July 2007).
- June 14, 2008 – The company received an order to build and deliver compressed natural gas (CNG) engines having a sales value of A\$425,000 to PT Arimbi Jaya Agung of Indonesia (AJA). The engines were scheduled for delivery by June 30, 2008. So far, AJA has purchased 65 CNG engines from AEC, which also includes the current order.
- May 30, 2008 – AEC appointed Hill Global Enterprises (HGE) to set up a formal sales operations process in China. The process includes recruiting and training a China-based sales manager, establishing sales targets and implementing a continuous improvement program.
- May 14, 2008 – The company announced that KGI Asia Limited (KGI) has agreed to underwrite the shortfall, if any, in the exercise of the 4.36 million options, expiring on June 30, 2008.
- May 08, 2008 – AEC received an order to build and deliver CNG engines for A\$500,000 to the Union Bus Service Company (Union Bus) in Thailand. The engines would be sold under a joint venture (JV) with Monika Motors Ltd. Until now, AEC has sold 172 CNG engines in Thailand through the JV.
- April 29, 2008 – The company announced it received an approval for a Commercial Ready Plus Grant from the Australian government (through AusIndustry). AEC would develop natural gas (NG) engines and vehicle technology to be used in Isuzu 295 and 510 hp engines, thereby complying with Euro 4 emission standards.
- November 23, 2007 – AEC successfully closed a rights issue by allotting 14.34 million fully paid ordinary shares and 7.17 million unlisted options; each option is exercisable at A\$0.13 on or before November 30, 2009.
- September 10, 2007 – The company announced the resignation of Mr. William Lee as Director, AEC.
- July 11, 2007 – AEC entered into a JV to build new NG powered vehicles and repower existing diesel vehicles with NG engines. The company's (21% interest) partners in the JV are Monika Motors Limited (51%), Consumers Distributing Limited (19%) and a Thailand-based individual (9%).
- July 06, 2007 – The company commenced a development and promotion strategy for Isuzu trucks in Australia. Through this strategy, AEC plans to develop LNG versions of the Isuzu 275 hp and 425 hp engines, compliant with Euro 4 emission standards, by early 2008. The company has already developed and tested different CNG versions of the 7.8 liter Isuzu engine and the first batch of the production vehicles has traveled more than 65000 kilometers.
- June 25, 2007 – AEC announced that CIM Special Situations Fund Limited, a UK-based institutional fund manager, exercised its option to acquire 5.56 million shares in the former for a consideration of A\$750,000. This exercise has increased CIM's shareholding in the company to 9%. In addition, CIM agreed to extend the repayment term of its existing loan of A\$750,000 to October 31, 2008, thus providing an additional working capital of A\$1.5 million to AEC.

## Management

### Board of Directors and Officers

#### Graham Keys, Non-executive Chairman

Mr. Keys is a former corporate finance partner of Ernst & Young. During his tenure, Mr. Keys was the project leader for a wide range of corporate advisory assignments, in all industries, for small, large, public and private companies.

He has served as Executive Director, and subsequently Managing Director, of a publicly listed company. Mr. Keys was also Non-executive Chairman of a public listed company and Executive Officer of two large private companies. He formed Norvest Corporate Pty Ltd, a specialist corporate advisory firm, in April 2000, and serves as its Managing Director.

He was appointed as Non-executive Director of AEC in May 2003 and Chairman in October 2004. During the last three years, Mr. Keys has also served as Director of Global Wine Ventures Ltd. He holds a BEc from Monash Univeristy and is a member of the Australian Institute of Company Directors (AICD)

#### Antony Middleton, Managing Director

Mr. Middleton has held senior management positions in government agencies, including Chairman and Chief Executive Officer of Transperth. He has also worked on various international engineering projects.

Mr. Middleton has been National Chairman and a Fellow of the Chartered Institute of Logistics and Transport, and Institution of Engineers in Australia in the past. He also served as Chairman of AEC from December 2002 until August 2003.

He holds a Bachelor of Engineering and Master of Business Administration from the University of Western Australia, and a Company Directors Diploma from the University of New England.

#### Albert Pun, Non-executive Director

Mr. Pun was appointed Non-executive Director of AEC in November 2006.

Apart from AEC, he is Director of Sage Capital Limited, a financial advisory company in Hong Kong providing strategic and financial advice to clients. Currently, he is the Chief Advisor of KGI Asia Limited, a regional investment bank in Hong Kong. Prior to joining Sage, Mr. Pun was the Chief Financial Officer and a member of the Board of Directors of KG Investment Holdings Limited, a regional financial services group in Hong Kong. Both KGI Asia Limited and KG Investment Holdings Limited are part of the Koos Group, which is one of the largest business groups in Taiwan.

Previously, Mr. Pun worked at Morgan Stanley Asia Limited as Vice-President. He holds a Master of Sciences and Bachelor of Social Sciences degrees from the University of Hong Kong.

#### Thomas Liu, Non-executive Director

Mr. Liu was appointed Non-executive Director in August 2003. He has also been Executive Director and Head of the real estate investment group at CDIB Capital Limited, a subsidiary of China Development Industrial Bank in Taiwan. In this role, he was responsible for identifying and making investments in real estate projects and assets in the greater China region.

Prior to joining CDIB, Mr. Liu was Managing Director of 698 Capital Holdings Limited and Chief Operating Officer of He Qiao, a real estate development company in Beijing, China. Previously, Mr. Liu was Vice-President, Corporate Finance, at KGI Asia Limited. He has also worked at PKF Consulting Limited, then a global leader in hospitality consultancy services. He holds a Master of Business Administration from the Kellogg School of Management, Northwestern University, Chicago, and the Hong Kong University of Science and Technology, as well as dual Bachelor of Science degrees from Boston University.

## Other Personnel

### Ms. Susan Hunter, Company Secretary

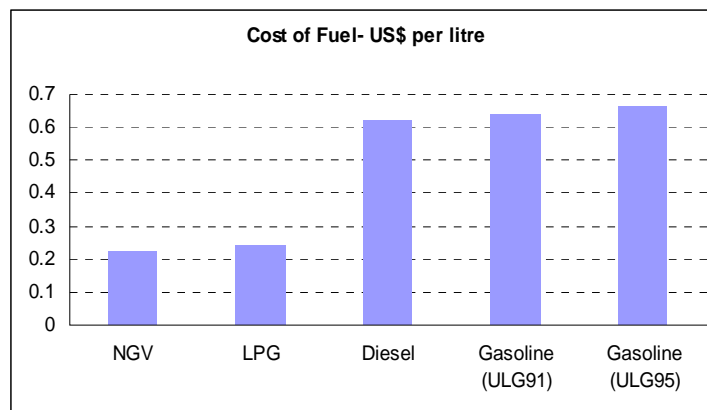
Ms. Hunter has over 13 years experience in the corporate finance industry. She is currently the Company Secretary for three companies listed on the Australian Stock Exchange, an AIM listed company and several unlisted companies. Ms. Hunter holds a Bachelor of Commerce degree from the University of Western Australia, majoring in accounting and finance. She is a Member of the Australian Institute of Chartered Accountants, a Fellow of the Financial Services Institute of Australasia, a member of the Australian Institute of Company Directors and a member of the Institute of Chartered Secretaries in Australia.

## Industry Overview

### Natural Gas Vehicles

Although natural gas is widely used as a fuel to heat homes, cook food and produce electricity; it is fast emerging as a cleaner and cheaper alternative to diesel and gasoline for all types of vehicles. According to IANGV, globally, the number of NG vehicles has increased to over 8 million, growing at an annual growth rate of 26%, from 1.7 million vehicles in 2001. The number is likely to rise further driven by record high oil prices, depleting oil reserves, stringent emission standards and growing need for environment-friendly vehicles. Furthermore, governments of almost all nations are promoting the use of natural gas vehicles by providing refueling infrastructure and various tax incentives to manufacturers and users of NG vehicles. According to IANGV estimates, NG vehicles are expected to increase to 65 million by 2020, at a conservative annual growth rate of 18%, and account for 9% of the global vehicle population. This factor could also reduce the dependency on oil by lowering the demand by 7 million barrels per day. According to the BP Statistical Review of World Energy 2007, global oil reserves stood at 1237.9 billion barrels, while natural gas reserves were as high as 177.4 trillion cubic meters.

**Chart 1: Cost of Natural Gas Vs Other Fuels**

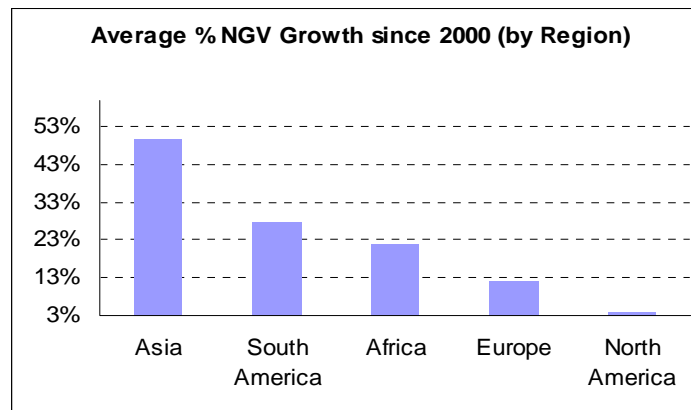


Source: NGV Global

The NGV market is largely concentrated in South America, followed by Asia-Pacific. The South American market is largely dominated by Argentina and Brazil. According to IANGV, of the total 3.5 million NG vehicles in South America, Argentina and Brazil alone accounted for 1.65 million and 1.43 million NG vehicles, respectively, as of June 2007. These two countries have large natural gas reserves and a strong OEM base. Moreover, the cost of converting diesel engines to NG is comparatively low in the two regions.

### Increasing Demand for NG Vehicles in Asia-Pacific

Despite South America being the largest NGV industry, the NGV market in Asia-Pacific has increased 50% in the last five years as compared to 28.5% in South America. The rapid economic development in the region has raised energy consumption. Moreover, industrialization, particularly the fastest growing automobile industry, has contributed to growing vehicular pollution. Therefore, most of the Asian countries intend to shift to NG as a means to provide energy security and control pollution. According to Asia Pacific Natural Gas Vehicles Association (ANGVA) estimates, there would be approximately 40 million natural gas vehicles by 2020 in Asia alone. In Asia, Pakistan dominates the NGV industry with 1.55 million NG vehicles (as of June 2007). In addition to the general factors, various favorable government policies drive the market. The Pakistan government has exempted all taxes and duties on the machinery and equipment used for CNG refueling and conversion.

**Chart 2: Region Wise NGV Growth (in %) since 2000**


Source: IANGV

China is also emerging as an attractive market for NG vehicles. Currently, there are only 127,120 NG vehicles; however, factors such as abundant natural gas reserves and a thriving automobile industry are paving way for a well-developed and high margin NGV sector. China is the world's largest market for heavy and medium-duty trucks, and transit buses. According to CEIC data, in 2007, total truck sales stood at around 1.5 million units, accounting for 16.9% of the total automobile sales in the country. Moreover, sales of heavy-duty trucks contributed roughly 33% of total truck sales. However, the increase in sales of heavy-duty trucks leads to air pollution, which needs to be combated through raising the level of emission standards for vehicles. According to a recent data from China's Bureau of Statistics, none of the 47 major cities in the country adhered to Level 1 air quality standards and only less than 40% of the cities met the Level 2 standards. Therefore, natural gas is considered an ultimate solution to these challenges as it is a low-cost and low emission fuel. The Chinese government has also proposed a Fuel Tax Regulation under which NG vehicles are expected to pay half the tax compared to vehicles driven by gasoline or diesel. The China Clean Auto Leading Group provides financial assistance to OEMs to encourage them to manufacture NG vehicles. According to Ecoworld, the annual alternative fuels market in China is projected to grow to US\$1.8 billion by 2008. Moreover, natural gas consumption in China is expected to increase up to 200 billion cubic meters (bcm) and account for 10% of the total domestic energy demand, thus reducing dependence on oil and coal.

Apart from China, Thailand is also a rapidly growing market for NG vehicles. The number of NG vehicles in the country is expected to increase ten-fold from the current 30000 vehicles to 300,000 by 2010. Furthermore, as a result of the rising use of NG vehicles in India, Korea, and Japan, Asia-Pacific is set to become the largest NGV market worldwide. AEC is commercializing its products in the Asia-Pacific region, particularly China.

### Original Equipment Manufacturers of NGV

Over the years, most of the OEMs have been responding to various government incentives and attractive scenario for the NG vehicles segment. As a result, there has been tremendous increase in the production of natural gas engines and NGVS, which convert diesel or gasoline engines to NG engines. The cost of manufacturing a natural gas vehicle is high; therefore, manufacturers sell them at higher prices compared to conventional vehicles. Light duty NG vehicles cost an additional US\$6000, while the cost of heavy duty vehicles is US\$40000. However, these costs can be recovered by lower running costs such as maintenance costs, fuel costs and also through the fuel economy of a vehicle. According to Sterling Truck Corp., the use of natural gas could save annual fuel and operating costs by up to US\$6000 for a heavy motor vehicle.

Currently, Fiat Group (BIT: F) is the largest OEM in the NG vehicles segment. It sold over 30000 vehicles in Europe in 2006. Ford Motor Company (NYSE: F), Volkswagen AG (FRA: VOW) and General Motors Corporation (NYSE: GM) are the other leading OEMs. Major OEMs in Asia are largely concentrated in China. Chery Automobile Co Ltd, ChangAn Automobile Group Co, Ltd., FAW Group Corporation, Weifang Weichai Peterson Gas Co Ltd., and Dongfeng Nanchong Automobile Co Ltd, are among the leading OEMs in China. Generally, most of the OEMs enter into collaborative agreements with other companies manufacturing engines, and various spare parts and components. These companies supply different technologies and tools to manufacture NG vehicles to OEMs. For instance, Cummins Westport Inc., a JV between Westport Innovation Inc (TSE: WPT) and Cummins Inc. (NYSE: CMI), sells engines to OEMs across the globe. Moreover, Westport Inc also has an agreement with Ford Motor Company (NYSE: F), wherein it supplies components such as fuel injectors to the latter. AEC is

also emerging as a leading player in the sale of NGVS, and associated components and spare parts to some of the major OEMs, particularly in China. Apart from AEC, there are various other companies, such as Alternative Fuel Systems (2004) Inc. (TSXV: AFX), Canada, and US Energy Initiatives Corporation (OTCBB: USEI) offering engine control and conversion systems.

### **Challenges Faced by the Industry**

The advancement of the NG industry calls for proper infrastructure, such as storage, transportation (pipelines and tankers), liquefaction or regasification for liquefied natural gas (LNG), and setting up of large number of refueling stations, across the globe. However, the infrastructure for NG vehicles is still not as well-developed as for conventional vehicles. Moreover, several other low-cost and clean vehicles, such as hydrogen and hybrid vehicles, are entering the markets. This factor might pose a threat to the industry.

## Products

The use of natural gas vehicles has been increasing due to significant rise in oil prices and growing environmental concerns over the use of diesel and petroleum. As a result, AEC is emerging as a leading natural gas vehicle systems (NGVS) manufacturer. The company has a comprehensive portfolio of products, including NGVS, associated spare parts, such as Engine Control Unit (ECU) and gas injector, and various technical services. Moreover, in 2007, AEC commenced direct sales of NG engines to vehicle manufacturers.

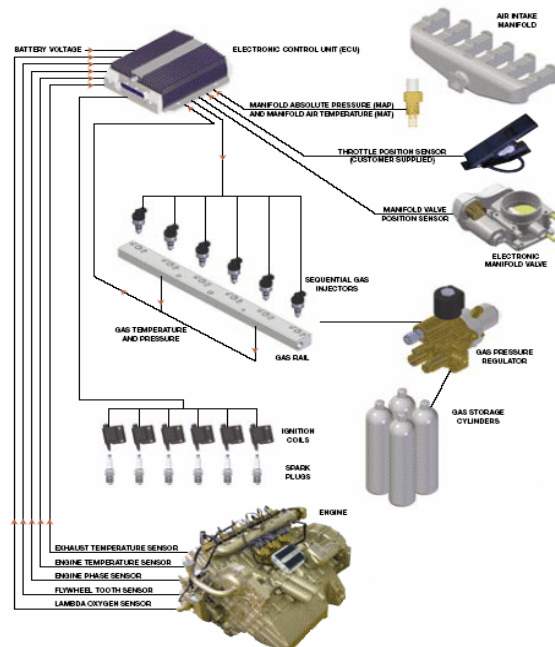
### Natural Gas Vehicle Systems (NGVS)

NGVS, AEC's flagship product based on its patented technology, is a multi-point sequential, microprocessor controlled electronic gas injection system, which enables engines on the production line or retro-fit (i.e. conversion) to use natural gas. The most important part of the system is the ECU, which continually measures a wide range of engine operating parameters, including manifold absolute pressure, manifold air temperature, gas temperature and pressure, engine speed, and throttle position.

The salient features of the product are described below:

- The most competitive factor of AEC's NGVS is that they are tailor-made according to the requirements of engines and other specifications provided by the original equipment manufacturers (OEMs).
- Each cylinder in the NGVS is operated at exactly the same air fuel ratio. Therefore, the engine can be operated at higher power outputs without any mechanical damage.
- The system is mounted on engine with minimal wiring and piping; as a result, the change to an engine's original profile is minimized. Moreover, the system is easy to install and highly fuel efficient.
- Engines built-in with NGVS conform to the Euro 3 and Euro 4 emission standards. Furthermore, the company is pursuing a research and development (R&D) program to further upgrade its system and comply with the Euro 5 standards, which is expected to be applicable in the European Union (EU) from 2010.

**Picture 1: AEC NGVS system**



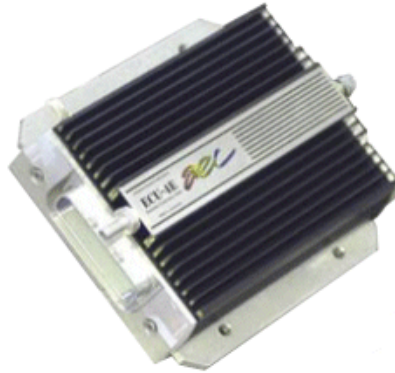
Source: Company

The NGVS system is ideally suitable for heavy fleet vehicles, such as trucks and buses, due to its low emission levels and fuel costs. Therefore, it is likely to attract OEMs planning to install NGVS in the heavy-duty clean fuel vehicle engines.

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### Picture 2: AEC Engine Control Unit (ECU)

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*Source: Company*

In 1991, NGVS were used for demonstration in bus fleets in Australia. The systems were first commercialized in 2002 in Europe when NGVS kits were fitted into the Renault engines of 600 buses of Irisbus (an Iveco Group Company), a leading vehicle manufacturer in France. The company entered the Asia-Pacific region, particularly China, to leverage the opportunities in the rapidly developing natural gas vehicle industry. In China, AEC has consecutively entered into strategic partnerships or agreements with three of China's top five manufacturers of heavy duty engines for buses and trucks. These are First Auto Works (FAW) Group Corporation, Weifang Weichai Peterson Gas Co Ltd. and Dongfeng Nanchong Automobile Co Ltd, a subsidiary of China's third-largest automotive manufacturer Dongfeng Motor Group Co Ltd (HKG: 0489).

In April 2006, the company commenced sales of NGVS kits to FAW. AEC increased the sales of NGVS by subsequently commencing supply to Weifang and Dongfeng. Recently, the company entered into a working agreement with another Chinese engine builder. The latter is a distributor of engines assembled from components from various sources, including engine components from FAW. So far, AEC has adapted engines of various capacities – from 3.2 liters to 11.6 liters – on behalf of these companies. The company has customized its NGVS to cater to customers' specific market requirements. The four manufacturers have specified a total of 18 different engine versions, most of which have been developed and certified to be compliant with Euro 3 emission standards. These companies have over 70 trucks and buses undergoing various trials using these engines. Currently, AEC has an annual manufacturing capacity of 4000 kits which is likely to rise as demand grows. The company expects to supply a total of 3000 kits to these OEMs annually. However, considering the overall size of the natural gas vehicle market, each of the four Chinese customers has a capacity to buy 3000 units per year. Apart from China, AEC plans to capture the Indian market in the near future.

### NG Engines

In 2007, AEC commenced sales of complete NG engines. The company purchases base engines from its Chinese OEM customers that are built-up and commissioned as NG engines using its NGVS. In Q4 07, AEC sold over 60 NG engines in Thailand. The company has also entered into an agreement with AJA for the supply of CNG engines. Moreover, AEC has received orders for around 75 and 32 NG engines from Thailand and Indonesia, respectively, in Q2 08. Furthermore, several manufacturers in Bangladesh and Pakistan have approached AEC for the supply of NG engines.

### Spare Parts and Consumables

AEC's patented spare parts and consumables comprise various NGVS components, such as gas injectors, gas pressure regulators and ECUs. Currently, after NGVS, spare parts and consumables is AEC's key secondary market. Currently, about 1200 buses and trucks operating in France, Australia, China and Thailand use the NGVS kits. Therefore, they constantly require after sales services and spare parts. Interestingly, every kit or unit that is sold also creates an ongoing market for the sale of spares and consumables for a number of years. AEC expects that every kit could generate double its original sales value through sales of its spares and consumables.

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**Picture 3: AEC Gas Injector**

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*Source: Company*

### **Joint Ventures**

To exploit the Thailand market for its NG engines, in July 2007, the company entered into a JV with Monika Motors Ltd (51%), Consumers Distributing Limited (19%) and a Thailand-based individual (9%). AEC has a 21% interest in the JV.

Initially, the JV is likely to purchase ready NG engines from ACE's China-based NGVS customers and sell the same. Once the infrastructure and operating facilities are in place, the company would use only AEC's base engines and NGVS components, and then assemble them to create NG engines under the Monika brand in Thailand. The assembling is expected to result in significant import duty reductions in Thailand. Union Bus, a bus operator in Thailand, has entered into a contract with the JV to purchase NG engines. The JV has sold 172 NG engines in Thailand so far. In addition, the company has repowered several diesel buses and trucks with CNG engines in the country. The JV targets an initial sale of minimum 600 engines per year.

In addition to the JV, AEC has agreements with various manufacturers for supplying NGVS and NG engines. The company has developed, commissioned and tested CNG and LNG versions of the 7.8 liter engines with Isuzu Australia Limited (IAL), a wholly owned subsidiary of Isuzu Motors Limited (TYO: 7202), in Japan. AEC plans to develop more such CNG and LNG versions for different Isuzu engines.

## Financial Forecast and Analysis

### SUMMARY

We valued Advanced Engine Components Limited (ASX: ACE) using the Discounted Cash Flow method. This returned a 24–48 month price target of A\$0.91 per share, which is more than six times the current stock price of A\$0.15 per share.

### DCF Approach

AEC is currently earning revenues from the sale of NGVS kits, engines, and spares and consumables. We expect the company would continue to earn revenues from its current stream of products and therefore forecasted revenues for 2008–14.

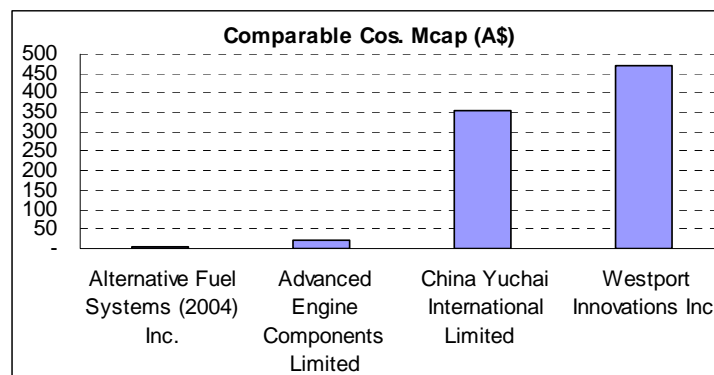
We have made the following assumptions for the DCF model:

- We expect AEC’s revenues to grow by 300% in FY09 on account of increase in sales of NGVS kits and engines by four to five times. For FY10, we have assumed revenue growth of 100% for the kits and engines, which could stabilize to 50%, going forward.
- We expect revenues from spare and consumables to grow on the basis of increase in number of operating vehicles that use AEC’s products. The growth rate for the number of vehicles has been assumed in proportion to the number of kits and engines.
- The prices of NGVS kits and engines are taken as A\$3000 and A\$10000, respectively. For the spares and consumables, for FY 2008, we have considered a price of US\$2300 per operating vehicle as the sales were pre dominantly in France and Australia where these products command a higher price. From FY 2009 onwards, we have taken a price of A\$1400 per operating vehicle as currently the company’s primary target market is Asia-Pacific where the price is expected to be lower.
- Going forward, as the company strengthens its operating efficiency, we expect R&D expenses and other operating expenses to grow at a declining rate.

Based on these assumptions, we projected the annual revenues and costs to arrive at AEC’s net income over the explicit forecast period. We determined the free cash flows accruing to AEC during the forecast period. Beyond this period, projections were made by assuming a terminal growth rate of 3%. We then discounted the free cash flows and terminal value by 13.19% or the cost of equity. Our cost of equity was based on a risk-free rate of 4%, risk premium of 8.67% and beta of 1.06. We then added the discounted free cash flows, terminal value, and cash balances to arrive at the company’s enterprise value. As of the date of valuation, AEC had approximately 147.80 million outstanding shares. By dividing the enterprise value with the total number of outstanding shares, we arrived at a target price of A\$0.91 per share.

The chart below depicts the market capitalization of AEC and some of the comparable companies. It indicates the vast growth potential for AEC.

**Chart 3: Comparable Companies**



Source: Khandaker Research and Bloomberg

## Conclusion

AEC is an attractive investment proposition for investors keen on benefiting from the rapid growth in the natural gas vehicle industry. The company has formed important alliances with some of the major OEMs and expects to generate profits through increased sales of its patented NGVS kits and engines. Moreover, AEC's current target markets in Asia-Pacific, which are growing rapidly, strengthen our bullish outlook. We expect AEC's stock to reach a target price of A\$0.91 per share at a corresponding market capitalization of A\$133.97 million over a 24–48 month investment horizon.

**Exhibit 1: Income Statement**

Consolidated Income Statement- AEC										
Particulars	2005A	2006A	2007A	2008E	2009E	2010E	2011E	2012E	2013E	2014E
<b>Revenues</b>										
Sales Revenue	1,766,338	2,570,712	3,076,717	4,575,000	15,975,000	31,222,000	49,514,000	78,915,500	123,017,750	18917112500%
Cost of goods sold	706,364	1,107,971	2,328,268	2,935,500	11,124,000	22,040,110	34,661,640	54,755,733	85,140,605	13107190313%
<b>Gross Profit</b>	<b>1,059,974</b>	<b>1,462,741</b>	<b>748,449</b>	<b>1,639,500</b>	<b>4,851,000</b>	<b>9,181,890</b>	<b>14,852,360</b>	<b>24,159,768</b>	<b>37,877,145</b>	<b>5809922188%</b>
Distribution expenses	22,347	36,141	83,900	102,023	68,693	78,055	103,979	134,156	159,923	170,254
as a % of revenue	1.27%	1.41%	2.73%	2.23%	0.43%	0.25%	0.21%	0.17%	0.13%	0.09%
Marketing expenses	17,402	24,217	52,914	46,657	146,941	249,720	371,266	552,267	799,394	1,134,687
as a % of revenue	0.99%	0.94%	1.72%	1.02%	0.92%	0.80%	0.75%	0.70%	0.65%	0.60%
Occupancy expenses	194,753	233,666	271,211	209,848	350,252	363,357	432,791	546,800	679,947	391,402
as a % of COGS	27.57%	21.09%	11.65%	7.15%	3.15%	1.65%	1.25%	1.00%	0.80%	0.30%
Corporate costs	497,962	296,672	320,449	274,521	479,324	530,918	693,424	789,518	738,673	1,135,898
as a % of revenue	28.19%	11.54%	6.54%	6.00%	3.00%	1.70%	1.40%	1.00%	0.60%	0.60%
Administration expenses	832,646	1,247,719	1,515,319	736,327	787,972	789,814	826,171	1,031,341	1,263,086	1,289,131
as a % of revenue	117.88%	112.61%	65.08%	25.08%	7.08%	3.58%	2.38%	1.88%	1.48%	0.98%
Development expenses	684,306	756,073	1,139,653	928,480	1,536,632	2,005,457	2,397,700	2,837,334	3,504,803	5,000,230
Other Expenses	-	-	300,000	194,201	196,493	243,450	299,228	451,411	688,642	1,053,446
<b>Income/ loss before interest and tax</b>	<b>(1,189,442)</b>	<b>(1,131,747)</b>	<b>(2,934,997)</b>	<b>(852,556)</b>	<b>1,284,694</b>	<b>4,921,119</b>	<b>9,727,802</b>	<b>17,816,941</b>	<b>30,042,676</b>	<b>47,924,175</b>
Other revenue from continuing operations	51,094	87,791	238,655	15,278	104,379	148,730	242,004	433,378	576,280	883,478
Financial Costs	367,839	347,029	435,103	247,381	359,881	472,381	442,202	289,325	138,862	31,085
<b>Profit before tax</b>	<b>(1,506,187)</b>	<b>(1,390,985)</b>	<b>(3,131,445)</b>	<b>(1,084,659)</b>	<b>1,029,191</b>	<b>4,597,468</b>	<b>9,527,604</b>	<b>17,960,994</b>	<b>30,480,094</b>	<b>48,776,568</b>
Income tax refund/(expense)	(4,525)	4,531	-	-	-	-	-	(5,388,298)	(9,144,028)	(14,632,970)
<b>30% Income Tax</b>										
<b>Net Profit/ (Loss) attributable to members of the parent entity</b>	<b>(1,510,712)</b>	<b>(1,386,454)</b>	<b>(3,131,445)</b>	<b>(1,084,659)</b>	<b>1,029,191</b>	<b>4,597,468</b>	<b>9,527,604</b>	<b>12,572,696</b>	<b>21,336,066</b>	<b>34,143,598</b>
Weighted average number of ordinary shares	47,871,205	89,960,019	112,743,598	138,426,107	147,800,000	147,800,000	147,800,000	147,800,000	147,800,000	147,800,000
Number of diluted shares (includes options)				160,392,733	169,766,626	169,766,626	169,766,626	169,766,626	169,766,626	169,766,626
Basic profit/(loss) per share	(0.032)	(0.015)	(0.028)	(0.008)	0.007	0.031	0.064	0.085	0.144	0.231
Diluted profit/(loss) per share	(0.032)	(0.015)	(0.028)	(0.007)	0.006	0.027	0.056	0.074	0.126	0.201

Source: Khandaker Research



**Exhibit 2: Balance Sheet**

<b>CONSOLIDATED BALANCE SHEET- AEC</b>										
<b>Particulars</b>	<b>2005A</b>	<b>2006A</b>	<b>2007A</b>	<b>2008E</b>	<b>2009E</b>	<b>2010E</b>	<b>2011E</b>	<b>2012E</b>	<b>2013E</b>	<b>2014E</b>
<b>Current Assets</b>										
Cash and cash equivalents	1,308,116	1,088,013	611,139	4,175,157	5,949,201	9,680,150	17,335,123	23,051,196	35,339,136	56,660,450
Trade and other receivables	779,547	1,505,175	923,318	250,685	875,342	1,710,795	2,713,096	4,324,137	6,740,699	10,365,541
Inventories	380,486	599,164	1,465,230	1,467,750	2,224,800	4,408,022	6,932,328	10,951,147	17,028,121	26,214,381
<b>Total Current Assets</b>	<b>2,468,149</b>	<b>3,192,352</b>	<b>2,999,687</b>	<b>5,893,592</b>	<b>9,049,343</b>	<b>15,798,967</b>	<b>26,980,547</b>	<b>38,326,479</b>	<b>59,107,955</b>	<b>93,240,372</b>
<b>Non-Current Assets</b>										
Other financial assets										
Plant and equipment	905,447	937,546	782,683	607,328	442,785	605,220	1,009,092	2,467,436	4,755,823	8,280,318
Intangible assets	672,423	1,892,389	2,833,844	3,141,860	3,366,830	3,555,416	2,656,622	2,208,247	2,427,481	3,153,908
<b>Total Non Current Assets</b>	<b>1,577,870</b>	<b>2,829,935</b>	<b>3,616,527</b>	<b>3,749,189</b>	<b>3,809,614</b>	<b>4,160,637</b>	<b>3,665,714</b>	<b>4,675,682</b>	<b>7,183,304</b>	<b>11,434,226</b>
<b>Total Assets</b>	<b>4,046,019</b>	<b>6,022,287</b>	<b>6,616,214</b>	<b>9,642,780</b>	<b>12,858,958</b>	<b>19,959,604</b>	<b>30,646,261</b>	<b>43,002,161</b>	<b>66,291,259</b>	<b>104,674,598</b>
<b>Current Liabilities</b>										
Trade and other payables	699,591	889,639	1,130,964	1,319,819	2,256,806	3,509,984	5,004,364	6,486,205	10,111,048	15,548,312
Borrowings	1,225,215	1,153,926	1,126,634	1,326,634	1,676,634	1,676,634	1,341,307	938,915	563,349	338,009
Provisions	165,749	166,569	183,217	183,217	183,217	183,217	183,217	183,217	183,217	183,217
<b>Total current liabilities</b>	<b>2,090,555</b>	<b>2,210,134</b>	<b>2,440,815</b>	<b>2,829,670</b>	<b>4,116,657</b>	<b>5,369,835</b>	<b>6,528,888</b>	<b>7,608,338</b>	<b>10,857,614</b>	<b>16,069,538</b>
<b>Non Current Liabilities</b>										
Borrowings	1,734,001	3,746,507	3,731,224	4,331,224	5,231,224	6,481,224	6,481,224	5,184,979	3,888,734	2,916,551
Provision	18,058	17,685	11,134	11,134	11,134	11,134	11,134	11,134	11,134	11,134
<b>Total non current liabilities</b>	<b>1,752,059</b>	<b>3,764,192</b>	<b>3,742,358</b>	<b>4,342,358</b>	<b>5,242,358</b>	<b>6,492,358</b>	<b>6,492,358</b>	<b>5,196,113</b>	<b>3,899,868</b>	<b>2,927,685</b>
<b>Total Liabilities</b>	<b>3,842,614</b>	<b>5,974,326</b>	<b>6,183,173</b>	<b>7,172,028</b>	<b>9,359,015</b>	<b>11,862,193</b>	<b>13,021,246</b>	<b>12,804,451</b>	<b>14,757,482</b>	<b>18,997,223</b>
<b>Shareholder's Equity</b>										
Contributed Equity	10,589,551	11,743,748	15,257,939	18,380,309	18,380,309	18,380,309	18,380,309	18,380,309	18,380,309	18,380,309
Reserves	960,442	1,037,255	1,039,589	1,039,589	1,039,589	1,039,589	1,039,589	1,039,589	1,039,589	1,039,589
Accumulated losses/Retained Earnings	(11,346,588)	(12,733,042)	(15,864,487)	(16,949,146)	(15,919,955)	(11,322,487)	(1,794,884)	10,777,813	32,113,879	66,257,477
<b>Total Equity</b>	<b>203,405</b>	<b>47,961</b>	<b>433,041</b>	<b>2,470,752</b>	<b>3,499,943</b>	<b>8,097,411</b>	<b>17,625,014</b>	<b>30,197,711</b>	<b>51,533,777</b>	<b>85,677,375</b>
<b>Total Equity and Liabilities</b>	<b>4,046,019</b>	<b>6,022,287</b>	<b>6,616,214</b>	<b>9,642,780</b>	<b>12,858,958</b>	<b>19,959,604</b>	<b>30,646,261</b>	<b>43,002,161</b>	<b>66,291,259</b>	<b>104,674,598</b>

Source: Khandaker Research

**Exhibit 3: Cash Flow Statement**

<b>CONSOLIDATED CASH FLOW STATEMENT- AEC</b>										
<b>Particulars</b>	<b>2005A</b>	<b>2006A</b>	<b>2007A</b>	<b>2008E</b>	<b>2009E</b>	<b>2010E</b>	<b>2011E</b>	<b>2012E</b>	<b>2013E</b>	<b>2014E</b>
<b>Cash Flow from Operating activities</b>										
Profit/(Loss) before interest and tax	(1,510,712)	(1,386,454)	(3,131,445)	(1,084,659)	1,029,191	4,597,468	9,527,604	12,572,696	21,336,066	34,143,598
(Profit)/loss on sale of non-current assets	(3,094)									
Depreciation & Amortization of non-current assets	195,279	213,179	349,969	572,435	930,024	1,366,188	2,089,274	2,320,265	2,683,727	3,732,099
Amortisation of convertible note equity										
Doubtful debts provision	44,302	35,495	-	-	-	-	-	-	-	-
Deemed loss of goodwill on disposal of investment			300,000	-	-	-	-	-	-	-
Provision for diminution of loan										
Unrealised foreign exchange (gain)/loss	13,201	(2,025)	39,565	-	-	-	-	-	-	-
Share options expensed		86,250	-	-	-	-	-	-	-	-
Amounts set aside for provisions	(702,024)	(11,871)	-	-	-	-	-	-	-	-
<b>Net Cash (used in) operating activities before changes in net assets and liabilities</b>										
(Increase)/decrease in assets:										
Current Receivables	478,756	(347,285)	60,406	672,633	(624,658)	(835,452)	(1,002,301)	(1,611,041)	(2,416,562)	(3,624,842)
Current Inventories	37,850	(228,115)	(866,066)	(2,520)	(757,050)	(2,183,222)	(2,524,306)	(4,018,819)	(6,076,975)	(9,186,260)
Increase/(decrease) in liabilities:										
Current Payables	(772,968)	(15,164)	241,325	188,855	936,986	1,253,178	1,494,380	1,481,842	3,624,842	5,437,264
Current interest bearing liabilities	262,022	252,996	-	-	-	-	-	-	-	-
Current and Non-current Provisions			10,097	-	-	-	-	-	-	-
<b>Net cash used in operating activities</b>	<b>(1,957,388)</b>	<b>(1,402,994)</b>	<b>(2,996,149)</b>	<b>346,744</b>	<b>1,514,494</b>	<b>4,198,160</b>	<b>9,584,650</b>	<b>10,744,944</b>	<b>19,151,100</b>	<b>30,501,859</b>
<b>Cash Flows from Investing activities</b>										
Payments for plant & equipment	(69,382)	(245,278)	(62,189)	(18,847)	(31,950)	(405,886)	(703,099)	(1,909,755)	(2,977,030)	(4,577,941)
Payment for capitalised development costs	(672,426)	(919,962)	(852,921)	(686,250)	(958,500)	(1,311,324)	(891,252)	(1,420,479)	(2,214,320)	(3,405,080)
Payment for Investments		(150,000)	-	-	-	-	-	-	-	-
Proceeds from disposal of plant & equipment	14,519	-	-	-	-	-	-	-	-	-
<b>Net Cash from Investing Activities</b>	<b>(727,289)</b>	<b>(1,315,240)</b>	<b>(915,110)</b>	<b>(705,097)</b>	<b>(990,450)</b>	<b>(1,717,210)</b>	<b>(1,594,351)</b>	<b>(3,330,234)</b>	<b>(5,191,349)</b>	<b>(7,983,021)</b>
<b>Cash Flow from Financing activities</b>										
Proceeds from issue of shares	4,350,000	1,543,051	3,670,374	3,122,370	-	-	-	-	-	-
Transaction costs associated with issue of shares	(493,007)	(123,854)	(211,383)	-	-	-	-	-	-	-
Proceeds from borrowings	210,000	1,500,000	-	800,000	1,250,000	1,250,000	-	-	-	-
Proceeds from term loans	336,453	109,950	477,293	-	-	-	-	-	-	-
Repayments of term loans/ Borrowings	(460,897)	(400,181)	(442,635)	-	-	-	(335,327)	(1,698,637)	(1,671,811)	(1,197,523)
Payments of finance lease liabilities	(147,083)	(126,855)	(77,233)	-	-	-	-	-	-	-
<b>Net Cash from Financing Activities</b>	<b>3,795,466</b>	<b>2,502,111</b>	<b>3,416,416</b>	<b>3,922,370</b>	<b>1,250,000</b>	<b>1,250,000</b>	<b>(335,327)</b>	<b>(1,698,637)</b>	<b>(1,671,811)</b>	<b>(1,197,523)</b>
<b>Net Increase/(Decrease) in cash</b>	<b>1,110,789</b>	<b>(216,123)</b>	<b>(494,843)</b>	<b>3,564,018</b>	<b>1,774,044</b>	<b>3,730,950</b>	<b>7,654,972</b>	<b>5,716,073</b>	<b>12,287,940</b>	<b>21,321,314</b>
Cash & cash equivalents at the beginning of year	197,327	1,308,116	1,088,013	611,139	4,175,157	5,949,201	9,680,150	17,335,123	23,051,196	35,339,136
Effects of exchange rate changes on cash and cash equivalents		(3,980)	17,969	-	-	-	-	-	-	-
<b>Cash &amp; cash equivalents at the end of year</b>	<b>1,308,116</b>	<b>1,088,013</b>	<b>611,139</b>	<b>4,175,157</b>	<b>5,949,201</b>	<b>9,680,150</b>	<b>17,335,123</b>	<b>23,051,196</b>	<b>35,339,136</b>	<b>56,660,450</b>

Source: Khandaker Research

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