

Azure Dynamics

Hybrid electric components

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Michael L. Elwood, Vice-President, Marketing

Products

DC-DC converters, electric motors, batteries, parallel hybrid-electric powertrain, series hybrid-electric powertrain, motor controllers, traction motors and ultracapacitors

Plants

Canada, US

Sales

US\$7.7m (Year to 31.12.08)

Employees

125 (September 2008)

Azure Dynamics is a manufacturer of hybrid vehicle technology for light to heavy-duty commercial vehicles, including delivery vehicles and shuttle buses. The company develops control software, power electronics and helps in vehicle systems engineering and integration.

The company manufactures series and parallel hybrid electric powertrains and hybrid components including motor controllers, custom battery packs, ultracapacitors, DC-DC converters, traction motors and generators. The company has manufacturing plants in Boston (US) and Vancouver (Canada).

The company primarily has four hybrid platforms and products:

- G1 is a series hybrid platform for delivery vans and shuttle buses.
- P1 is a parallel hybrid platform for Class 3 to 5 trucks and buses. Azure Dynamics has an agreement with Ford to develop parallel hybrid powertrain on the Ford E-350 and E-450 commercial vehicle chassis.
- P2 is the parallel hybrid platform for Class 7 and 8 trucks, such as delivery vans and buses.
- Low Emission Electric Power system (LEEP) is a source of power for on-board vehicle auxiliary loads and off-vehicle power requirements.

The company supplies to Canada Post, FedEx, Purolator Courier, Smith Electric Vehicles, StarTrans, Utilimaster and United States Postal Services.

Recent Developments

Corporate strategy During 2008, Azure Dynamics worked towards positioning itself to become a major player in the hybrid electric commercial vehicle business in the future. Its partnership with Ford to hybridise their E-450 commercial vans continued to grow stronger, the manufacturing arrangement with Utilimaster progressed smoothly, and the new agreement with Johnson Controls-Saft resolved potential future battery supply problems.

Azure continued to form significant relationships with industry leaders to increase penetration into its target markets and advance its product development programs. Along with Ford Motor, StarTrans (a business division of Supreme Corporation), Utilimaster Corporation and Kidron, Azure also formed relationships with Altec and launched new products with key customers such as FedEx Express, AT&T and Purolator.

Azure's restructuring, announced in January 2009, included a 25% workforce reduction, cuts in discretionary spending, and a focused effort to share its product development costs with its partners. It also involved rationalisation of the product line to allow the company to concentrate its efforts on existing products and product programs. Additionally, the company is planning to access low cost loan from the US and Canadian governments to support the development of more fuel efficient vehicles.

Acquisition

- In January 2005, Azure Dynamics acquired Solectria Corporation, a US based hybrid electric powertrain and components supplier.

Joint-venture

- In January 2009, Azure Dynamics and Johnson Controls-Saft formed a joint-venture (JV) to supply lithium-ion hybrid batteries for commercial trucks in the North American market. The supply agreement extends for the next five years. Financial terms of the deal have not been disclosed. Under the

agreement, Johnson-Saft will supply 20,000 battery systems to Azure Dynamics, which will be the part of Azure Dynamics' Balance Hybrid Electric system and other future hybrid platforms. The batteries will be produced at the Johnson Controls headquarters at Glendale, Wisconsin (US). Production is expected to be increased in 2009 and 2010 and the trucks equipped with hybrid batteries are expected to roll out by end of 2010.

- In March 2008, Azure and Altec signed a Memorandum of Understanding to develop LEEP Lift™ systems for electric utility and telecom aerial lift trucks. According to the agreement, Altec integrated Azure's LEEP Lift™ systems into their utility and telecom truck bodies and Altec promised to market the systems through their existing sales and service network.

Investment

- In February 2004, Azure Dynamics established a new facility in Burnaby, British Columbia (Canada) to support its engineering and testing operations.

Divestment

- In May 2007, Azure Dynamics closed its head office in Toronto (Canada) and another office and service centre in Kenilworth (UK). The company opened its headquarters in some location in North America. This was done to better serve its customers, mainly Ford Motors.

Contracts

- In April 2009, Azure Dynamics received sixteen orders for its Low Emission Electric Power (LEEP™ Freeze) system, which is an integral part of Kidron's UltraTemp cold plate transport refrigeration solution. Kidron is a division of VT Specialised Vehicles Corporation.
- In August 2008, Azure Dynamics won an initial order for three units from Con Edison of New York for its Balance™ Hybrid Electric system integrated on Ford's E450 chassis.
- In July 2008, Azure Dynamics received orders for two Hybrid Electric CitiBus's from the West Harlem Art Fund, Inc (WHAF). WHAF is a ten-year old community-based, cultural arts and preservation organisation serving northern Manhattan in New York City.
- In June 2008, Azure Dynamics secured an order from the Pennsylvania Department of Transportation for 10 hybrid buses with an option for 15 additional buses at a later date. The powertrain, with a GM Vortec 4.8L engine, offers over a 40% improvement in fuel economy, and a 30% reduction in carbon emissions in city conditions.
- In May 2008, Azure Dynamics received an order from AT&T for 15 gasoline parallel hybrid electric Ford E-450.
- In February 2008, Azure Dynamics entered into an agreement with Utilimaster Corporation. Under the agreement, Azure will provide P1 hybrid electric powertrain which Utilimaster will integrate into the Ford E-series.
- In May 2007, Azure signed an agreement with FedEx to supply a parallel hybrid-electric test vehicle. Azure will supply 20 pre-production parallel hybrid electric Ford E-450 delivery vans to FedEx.
- In April 2007, Azure Dynamics signed a supply agreement with Electro Autos Eficaces of Mexico. The company will supply 1,000 drive systems which will be integrated into Nissan Tsuru platform. Tsuru, which is generally used as municipal fleet in Mexico City, is being converted from gasoline power vehicles to electric vehicles.
- In October 2006, Azure Dynamics signed an agreement with Ford to jointly develop hybrid electric drive technology for Ford's E-350 and E-450 commercial vehicle chassis. Ford agreed to assist Azure in powertrain development.
- In August 2006, Azure entered into an agreement with StarTrans, a division of Supreme Corporation, to develop hybrid electric CitiBus for urban transit applications. The company will supply its hybrid cab-chassis on which StarTrans will assemble its shuttle bus body. StarTrans will use its HD Senator Series model line of shuttle buses.
- In May 2006, Azure Dynamics received a purchase order from Smith Electric Vehicles, a part of the Tanfield Group Plc, for 20 electric powertrain systems. The order is a follow-on order to the supply agreement between Azure and Smith Electric Vehicles signed in June 2005.

- In 2006, Azure received a purchase order from Canada-based Purolator Courier Ltd for 115 hybrid electric delivery vehicles. This is a result of a five-year supply contract that was signed between these two companies in 2003. The five year contract was valued at about US\$90m.

New Product Developments In 2008, Azure Dynamics engineering and R&D expenses totalled US\$21.5m (including US\$11.6m in product development costs) compared with US\$17.8m in 2007 (including US\$10m in product development costs).

Financial Overview For the financial year ended 31 December 2008, Azure Dynamics sales increased to US\$7.7m compared with US\$2.8m in the same period in 2007. Net loss was US\$38.9m over a net loss of US\$30.2m in 2007. As at 31 December 2008, the company's cash and cash equivalents totalled US\$13.8m and working capital totalled US\$19.8m compared with cash and cash equivalents of US\$24.1m and working capital of US\$32.3m as at 31 December 2007.

Azure Dynamics sales for the first quarter ended 31 March 2009 totalled US\$0.6m compared with US\$0.4m in the first quarter of 2008, mainly attributable to the sale of one Azure Citibus™ shuttle bus recorded in 2008 compared to six Balance™ Hybrid Electric systems and one LEEP™ Freeze system recorded in 2009. Net loss was US\$7.4m compared with a net loss of US\$7.9m in the first quarter of 2008.

During the first quarter, the company continued to focus on the development of its Balance™ Hybrid Electric program and component development, as well as ongoing production activities associated with the Series Hybrid shuttle buses and electric components. As at 31 March 2009, the company's net cash and cash equivalents reached US\$7.9m and working capital totalled US\$13.1m over cash and cash equivalents of US\$13.7m and working capital of US\$25.1m as at 31 March 2008.

Year	Net Sales (US\$m)	Operating Income (US\$m)	Net Income (US\$m)	R & D Expenditure (US\$m)	No. of Employees
2008	7.7	-	(38.9)	21.5	125
2007	2.8	-	(30.2)	17.8	-
2006	5.8	(23.8)	(23.4)	13.5	112
2005	4.6	22.2)	(21.9)	11.4	109
2004	-	-	(8.2)	-	-

Outlook Azure Dynamics has not attained financial viability yet. The company has been incurring losses since its inception, mainly due to high product development costs. The company believes that its products will qualify for federal funding assistance from a variety of programs announced by the Obama administration in 2009. The addition of federal support could greatly accelerate the company's production ramp.

In the future, demand for hybrid vehicles is expected to grow as environmental and fuel-saving concerns rise among consumers as well as numerous OEMs. Azure Dynamics is a leading supplier of hybrid systems for commercial vehicles, with clients such as AT&T, Con Edison, FedEx Express and Purolator Couriers. The new supply agreement with Johnson Controls-Saft will further strengthen Azure's position in the hybrid drives market.