

# Regenerative Brake Energy System

*“Fiba Canning anticipates a significant North American market for urban buses and refuse collection vehicles equipped with hydrostatic drive systems. Without the credibility provided by the Ministry of Environment and Energy’s backing and financial support, it is doubtful that the development and demonstration of this technology would have occurred.”*

Hugh Canning  
President, Fiba Canning Inc.  
Scarborough, Ontario



*Fiba Canning’s Refuse Collection Vehicle with Regenerative Brake Energy System*

## THE COMPANY

Fiba Canning supplies and installs compressors, conversion kits and storage units for compressed natural gas (CNG) and liquid natural gas (LNG) for the commercial and industrial market.

The company also develops and demonstrates new products for commercial and industrial heavy-duty vehicles.

## THE CHALLENGE

Refuse collection vehicles and urban transit buses account for a significant part of the traffic in many cities. These vehicles are often noisy and emit pollutants.

Alternative fuels, such as compressed natural gas burn more cleanly than diesel fuel.

There is a substantial market for vehicle technology which deals with the pollutants from heavy duty vehicles while improving their fuel economy.

## SOLUTION

Refuse collection vehicles and urban transit buses typically have a start-stop duty cycle which is ideally suited to a brake energy recovery and storage system. With this system, the energy developed when the driver steps on the brakes and slows the

vehicle down is recovered, stored and used later to accelerate the vehicle.

Fiba Canning and its partner Volvo Flygmotor designed, built, demonstrated and evaluated the performance of a CNG-powered refuse collection vehicle. It was equipped with brake energy storage, recovery propulsion system, and dual steering axles.

The company successfully demonstrated the refuse collection vehicle in Markham for one year.

When this technology is launched into the marketplace, it is expected to create 110 new jobs, generate annual revenues of about \$60 million and result in a capital investment of an estimated \$2.5 million.

## OPPORTUNITIES

This vehicle technology and associated benefits can also be used in urban transit buses.

The following benefits were demonstrated in the pilot project in Markham:

\* energy consumption was reduced by about 50 per cent;

\* exhaust emissions were reduced by about 65 per cent (Such emissions include nitrogen oxide, carbon monoxide, carbon dioxide, total hydrocarbons and particulates.)

\* noise level was lower by 30 per cent.

\* engine displacement was reduced by 30 per cent.

\* cost of engine maintenance was reduced by at least 50 per cent because there was less wear on the brakes and tires and less lubricating oil was needed.

Buses and refuse collection vehicles with this technology would cost about 10 per cent more than conventional diesel-powered vehicles. But if the vehicles were used constantly, then the typical payback period would be 12 to 18 months.

## FINANCIAL INFORMATION

### Project Costs

* Labor	\$ 393,396
* Recycling vehicle	\$ 364,564
* Field demonstration	\$ 203,976
<b>Total</b>	<b>\$ 961,936</b>



Assembly of refuse collection vehicle

## PARTNERSHIP IN POLLUTION PREVENTION AND RESOURCE CONSERVATION

Industrial companies located in Ontario may seek ministry/industry services that will help them to:

- \* reduce, reuse and recycle solid waste;
- \* reduce or eliminate liquid effluent and gaseous emissions;
- \* use energy and water more efficiently.

Equipment and services supply companies can benefit from the information provided on technologies identified for business development.

### FOR FURTHER INFORMATION, PLEASE CONTACT:

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### MINISTRY OF ENVIRONMENT AND ENERGY SERVICES

For further information on Ministry of Environment and Energy assistance to industry, please contact the Industry Conservation Branch at (416) 327-1492, Fax (416) 327-1261.

For more project profiles and other publications, visit the ministry's website at <http://www.ene.gov.on.ca>

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