

Options to Reduce Grid Demand
by Encouraging the Installation
and Use of Standby Generators and Cogenerators
in Multi-Residential Dwellings and Commercial High
Rise Buildings

Submitted to

The Government of Ontario

By



and



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Introduction

The government achieved two important objectives with the introduction of the *Energy Pricing, Conservation and Supply Act, 2002* (the “Act”): 1) providing protection for residential and small business consumers, and 2) maintaining a viable wholesale market to ensure new generation.

The follow is a response to the Consultation Paper that supports new generation in the market and enhances competition. We believe the government must take steps to ensure a viable market in order to achieve these objectives. Our concern is that the government must put in measures beyond those contained in the *Energy Pricing, Conservation and Supply Act, 2002 (the “Energy Pricing Act”)* to offer price protection to customers and ensure system integrity is maintained.

This response puts forward an option that addresses this concern, while preserving and enhancing the generation market. We believe there is a significant and untapped opportunity to better utilizing localized generation at the customer level while significantly enhancing the generation constraints imminent in the future.

About Enersource and Ozz

For over 80 years Enersource Corporation has served the local community in Mississauga. They have become known as trendsetters in the electrical industry holding world-class records in the areas of safety reliability and operational excellence. All at a cost that has traditionally been lower than most other utilities in the Ontario market. They have set the pace for others to follow.

OZZ Corporation is an Ontario based, Canadian energy technology and Services Company, built upon 25 years of successful construction, utility services and energy efficiency experience through our subsidiary companies. Based in the Greater Toronto Area, OZZ serves customers across Ontario.

These two leaders in their field have recently joined forces to help the Government deliver on their Action Plan to lower hydro bills while enhancing supply and competition in the Ontario electricity marketplace. The benefits proposed in this paper outline a strategy to help the Government meet the promises set out in the Action Plan while maintaining long term stability in the electricity market and encouraging new sources of supply to ensure reliability in the grid is maintained.

Distributed Energy Resources – Distributed Generation

Distributed generation refers to small generation and/or co-generation, located at the end-user’s site. Depending on the market conditions, the generation can be sized to meet the partial load of the building, the total load, or even bypass the building’s load and supply

excess power back to the grid. Cogeneration systems utilize the steam created from the operation of the generator, assuming a load for the steam exists.

The term small with respect to distributed generation is relative. Typically these resources are less than the common wholesale energy blocks of 5 to 10MW. For the purposes of this document, distributed generation is defined as less than 5MW, and generally less than or equal to the load of the host site. In most applications the size of the generation will be significantly less than 5MW.

While the individual power sources are small, distributed generation, in aggregate represents a significant electric power potential and is the fastest available source of new generation. This is important as a recent IMO 18-month forecast projects a tight supply situation for the province. An LDC such as Enersource has the capability to manage and dispatch these small generators in a quick and efficient manner using existing technology.

From an environmental perspective, distributed generation also improves system efficiency. As the generation source is distributed and located at or near to the load, transmission and distribution constraints can be alleviated and losses avoided. Also natural gas fired systems with or without cogeneration represent a cleaner power source than the central power being displaced.

An Already Existing Generation Potential

The market for distributed generation, at this time and for the immediate future, revolves around the following 4 specific applications:

1. Seamless Backup Power
2. Load Levelling
3. Cogeneration
4. Independent Power

Seamless Back Up Power

Currently there exists a significant generation potential in both retrofit and new applications in the majority of commercial and industrial high-rise buildings. Under various code standards, these buildings are required by law to integrate some form of generation that is a back up to the system grid for operation of elevators, fire suppression systems and other critical services in emergency situations.

Codes stipulate that these systems be tested monthly under load and no load situations to ensure their operation is flawless during critical times. In reality, not all buildings are capable of meeting these code requirements. Most of these systems need to be manually activated resulting in downtime issues as well as reliability issues as the load is turned

over to the generator. Most back-up systems are designed independently of the buildings' electrical switchgear and therefore this manual operation is in place. In many power outage scenarios back up systems are not activated, since most outages are temporary and the resulting switch to the back-up system is considered risky.

In order to meet and ensure code compliance, many buildings are in a position to modify and potentially upgrade their systems and controls. This provides an excellent potential retrofit opportunity to modify these systems for what we term as seamless back-up power.

In a seamless back up system, the generator design is integrated with storage, switchgear, and controls to provide a seamless transfer between back-up and grid power. This would allow these systems to be brought on line not only in power outage situations but to curtail load during high price periods or when imports are being considered. The technology for this type of application already exists. Some modifications to the existing codes would be required to make this mandatory especially in new construction. The added cost would be negligible and considered incremental to the project. These generators could be managed through a program that is administered by the utility corporation. The unregulated affiliate of the corporation has the capability to run a full turnkey program. They can use existing control room technology to dispatch generators; meters to monitor and measure load displaced; and billing systems to properly operate and manage the settlement process

Currently in the GTA it is estimated there is more than 800MW of installed back-up power available through small generators. That's enough load to power a city almost the size of Hamilton (950MW peak).

The Enersource/OZZ approach being proposed is to call on this capacity for short critical periods of price peaks and to offset imports. This power can also be bid into the reserve market and used in the event of a major generator failure. This equipment should be operated 12 to 30 hours per year. In the seamless power strategy, this equipment would run marginally more with the added advantage of the transition from grid to back-up power being automated and seamless to the customer.

In some retrofits, it may be cost effective to modify the back-up system sufficiently to allow considerably more hours of operation - essentially a load levelling strategy. Applications currently exist to allow for a dual fuel (gas /diesel) retrofit on existing units.

Load Levelling

Load levelling is an enhancement of the above seamless power that could increase value of the system to the grid. In this type of application, the generator would be controlled in a manner that would allow it to be utilized when the grid cost of power is above the cost of operation of the generator. For gas-fired reciprocating engines this is expected to result in several hundred hours of operation annually. It is estimated that the market prices would be significantly high enough to make this type of generation financially attractive.

Since a considerable amount of hours of operation are expected, this type of system would need to meet the current standards for noise and exhaust emissions, making this more of a new construction option. Basically in new construction the back-up power unit (or larger) would be moved to a location, likely on or near the roof, where it would be less expensive to exhaust. As well, the units would be either natural gas or dual fuel (natural gas and diesel) engines.

Cogeneration

Traditionally, cogeneration was only considered in large industrial applications. New technologies, service offerings, and the market conditions have this viability threshold down to smaller installation where coincident electrical and heating (and potentially cooling) load exist.

By adding cogeneration options to the load levelling design, additional cost effective operating hours are available. As well, cogeneration, due to the efficiency of utilizing the rejected heat, represents a cleaner and greener power source.

One of the fastest growing markets for this application is the high-rise residential construction where heating requirements in relation to electric requirements are well matched and domestic hot water needs provide a heat load for the cogeneration all year. The new multi-residential opportunity is discussed more fully below.

Independent Power

The independent power opportunity is specifically for campuses (industrial, institutional, and educational) and imbedded distributors or mini-grids. This is a growing market trend that will continue as new technologies mature and market conditions dictate.

Generation Proposal

Enersource and OZZ believe that distributed generation based on enabling back-up generation systems in retrofit and new projects, presents a significant opportunity for new generation to be brought to market quicker than other types of generation projects.

With respect to new projects, our proposal is to work together with developers of condominium and other projects where back-up generation is installed or will be required. Enersource/OZZ along with other partners, including the host site would own, maintain, and operate the generator. In the event of outages or emergencies, back-up power would be provided. Simultaneously this capacity would be available to the grid when prices dictate or as in-province reserve. By operating in this manner the host site is assured of a more reliable back-up system and the generation asset can be utilized as a benefit to the provinces electricity supply.