

Régie de l'énergie du Québec

Hydro-Québec Distribution's application  
for approval of tariffs effective 2006-2007

File R-3579-2005

**Testimony of Mr. Don Thorne**  
**President/CEO**  
**Milton Hydro Distribution Inc.**

On behalf of:

Groupe de recherche appliquée en macroécologie (GRAME)  
Stratégies énergétiques – Association québécoise de lutte contre la pollution  
atmosphérique (SÉ-AQLPA)

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**GRAME-3 doc. 1**  
**SÉ-AQLPA-6 doc. 1**

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Interview by Jean-François Lefebvre, GRAME

**Question by Mr. Lefebvre) Mr. Thorne, can you describe Milton Hydro and, with it's recent history, give us an idea of the transformation of the electricity market in Ontario?**

Answer by Mr. Thorne) Milton Hydro is one of roughly 90 electricity distributors in Ontario. There were over 300 distributors. Restructuring activities preceding the opening of the competitive electricity market in May of 2002 included reducing this number through mergers and acquisitions. I expect that the number of electricity distributors in Ontario will continue to decrease. Initially our role was restricted by regulation to distribution of electricity only excluding for example any retail activities (ex. Renting water heaters) or generation. In 2004 our role was expanded to include conservation and demand management. We have around 20 000 consumers, with growth rate of nearly 2 000 new consumers each year that is expected to increase to up to 5000 per year in the near future.

We were a non-profit hydro-electric commission essentially debt free, owned by our municipality and regulated by the former Ontario Hydro. In 2000, with the reorganization, we became a business corporation under the Ontario Business Corporations Act with the Town of Milton our sole shareholder with a right to earn up to a maximum rate of return as determined by our new regulator the Ontario Energy Board. Incorporation and the new rate regulations resulted in a change in our capital structure to 50 percent debt. With our revenue requirement now including return on equity, interest on debt and income taxes (i.e. Payments in Lieu of Taxes used to pay down the stranded debt) our distribution costs have essentially doubled.

The government decided to phase in this increased cost of the distribution on the consumer bill in three equal annual increments. We got the first and the second increases in 2001 and 2002 but then everything was frozen at the end of 2002. The Market opened here in May 2002. At that time all the consumers were exposed to the spot market.

If they had an interval meter, then their bill for energy was calculated based on the hourly Ontario energy price and their hourly consumption. At that time it was typical for only consumers with demands greater than 1000 kW to have interval meters. In Milton we had decided to provide these meters to all consumers with demands greater than 50 kW. We completed these conversions for the most part by market opening and then in early 2003 we mandated interval meters for all new construction including residential and also for existing small commercial/ industrial consumers ( <50 kW) when their conventional meters came up for re-verification.

If they didn't have an interval meter, or smart meter, then their bill was based on an average profile called the *net system load shape (each distributor's total load profile net of interval metered consumers)* that basically determined an average price for their consumption.

I should also mention that about 25% of consumers had signed up for fixed price electricity contracts with Retailers.

The summer of 2002 was a very hot summer. Prices went through the roof and the government decided to freeze electricity prices at a very low rate (4.3 ¢/kWh).

As Distributors we paid the market operator (Independent Electricity System Operator) for what flowed into our service area, and then collected from consumers. To fix the rate at 4.3 ¢/kWh while the market was higher obviously created a difference between what consumers paid and the cost of electricity. And that difference went to the Ontario Finance Corporation one of the successor companies of the former Ontario Hydro, increasing the stranded debt. Rates were not frozen for all consumers, only for those we

call the low volume, which are residential and small commercial, essentially consumers with demands less than 50 kW, and also “designated consumers”, who were for most part the municipal and government sector, including, for example, hospitals. In fact, approximately 50% of the provincial consumption was under the fixed rate structure.

If everybody had an interval meter, they would have been aware of what was happening with regard to their consumption and its cost. We had a very hot summer and most people received their bill some weeks after the peaks.

Recently, as you are aware the provincial government has stated that interval meters (smart meters) will be installed on all consumers by 2010 with 800,000 by 2007.

Returning to distribution utility rates the government didn't allow the 3<sup>rd</sup> increase that was necessary for the utilities to get their full rate of return until this year. However this increase was contingent on the first years worth of that increase (160 M\$) be used by distributors to fund local energy conservation and demand side management.

We now have 80 plus different energy efficiency programs. Despite the possibility that this might support development of some innovative approaches this makes no sense to me. They wanted a quick start given the tight supply situation in Ontario and the government desire to create a “Conservation Culture” in Ontario, but it is not clear to me at this point that consumers will get good value from these programs. There needs to be some province wide programs delivered locally through distributors or others. I expect with the recent creation of the Ontario Power Authority whose responsibilities include conservation and demand management this will happen.

**Q) What do you think of the smart metering technology?**

Mr. THORNE) For me, fundamentally, it's an interval meter. Historically, with conventional meters, you only know what you use between the times you read the meter.

In Ontario, for commodity settlement purposes, we already have hourly electricity prices, so the interval meters we are going to use will read the consumer consumption by the hour and a person will know in which hour their consumption occurs and therefore their hourly cost.

*Depending on how smart the smart metering systems are that get installed many more functions are possible; for example you can use smart meters and associated communication networks to control equipment within homes; provide information such as price and consumption to in home displays, and automatically notify utilities of power outages. Basically, smart metering permits the measurement on some timing basis, thus people can make choices on when they consume, which at the very least allows development of rates structures that track costs better and, supports changes in consumption behaviours that lead to using the resource more efficiently.*

**Q) Can you tell us about programs or projects in which you have to control the demand?**

Mr. THORNE) The one program that the market in Ontario has for demand response that is currently available to retail consumers is called the *Transitional Demand Response Program*. It's a wholesale market program. The market operators systems were developed to settle with wholesale market participants not the millions of retail consumers supplied through distributors. So similar to how distributors act as settlement agents for services provided by the wholesale market to their retail consumers, Milton Hydro has developed the necessary systems and processes so that we can act as an Aggregator for our retail consumers so that they can participate in this wholesale market

program. In Milton only consumers with interval meters can choose to participate in this program.

Part of the government's smart metering plan is to create a central data repository where consumer data will be stored and electronically available to those who have approved access. I suspect that this resource will become fundamental to the development and implementation of province wide conservation and demand response programs and those Aggregators will play a new and essential role in the Ontario market.

The program Transitional Demand Response Program is a price based program that uses what is called the three hour ahead pre-dispatch price as the trigger, whenever this price is equal to or above 12 ¢/kWh. For example, at 9:00 I know that at 12:00 my price will be 15 ¢/kWh. So at 12:00, if you reduce your demand for an hour, for that hour, whatever you reduce it by, you will receive a payment of 15 ¢ for every kWh you reduce. We notify the consumers that are in the program by sending them a notification by E-Mail, so they can make a decision on whether they will participate or not. We then send the bill to the market operator based on the aggregate response of participating consumers; they pay us and then we distribute this payment to participants based on their individual response. The individual consumer response is based on a prescribed baseline calculation.

There are economic arguments against paying consumers not to consume. The original intent of the program was to create resources for the consumer to ultimately respond naturally to normal market prices without this extra amount. That was the intent

Particularly in Ontario, because we are in a supply "crunch", having significant demand response may become critical. And in any case what kind of a market only has a supply side. I think this type of program is going to continue and could be with us for a long time. So, in other words, I believe that incentives beyond the market price for consumers to reduce their demand will be with us for the foreseeable future.

So that's the financial incentives which are part of the solution but not the whole solution. The other part to create a conservation culture. It's not all about price, but price helps a lot.

**Q) How do you see this program for Quebec?**

Mr. THORNE) This type of program is not dependent on market structure. Various demand response programs have been around for a long time, but generally with the exception of direct load control programs (ex.: Water heaters, air conditioners) were only available to the very largest of consumers. What's interesting for me about this program is that it has the potential to engage for the first time the vast majority of load down to the smallest of consumers. However, enabling technologies, specifically, interval metering, are a prerequisite.

**Q) Does the fact that people have better information about their consumption with smart meters results in better and lower consumption?**

Mr. THORNE) Absolutely it does.

**Q) What will be the development of smart meter and time of use rates in the next future?**

Mr. THORNE) Today the prices charged for energy to low volume and designated consumers are still regulated except the structure has changed from a flat rate to a two tier. These rates have been designed to minimize the total revenue variance relative to market pricing for these consumer groups. The Ontario Energy Board has also developed

Time of Use prices that distributors will be required to charge consumers in this group who have interval meters starting May 1, 2006. These consumers with interval meters that are eligible to be on regulated rates can also choose to be billed on market pricing or enter into a contract with a Retailer.

Distributors are allowed to implement this Time of Use pricing prior to the mandatory date

In Milton what is happening is that we now have 3 000 or so residential consumers and about 500 small commercial/industrial consumers (<50kW) that have smart meters and the numbers are growing at 2 000 per year. We implemented Time of Use pricing on the 1<sup>st</sup> of November 2005. Our rates are in the document in annexe.

**Q) At least for the new construction and meters replacement, should Hydro-Québec implement smart meters to avoid the cost of changing those new equipments in the next five or six years?**

Mr. THORNE) Yes, that's a good strategy. That was our rationale. If you know you are going in this direction, why would you, on the new installations, put the old technology? Just put the new technology when available.

We basically started with this before the government gave us a role in energy conservation or developed their plan to implement interval meters province wide.

We think that with the provincial program there will be some volume reductions in costs. There will be group purchasing, for the more than four million units we will need.

The actual cost today for us is around 230 \$ per residential smart meter, including installation by a technician. It was over 300 \$ when we first started.

The technology that we were using had the capability to measure not only electricity but also handle data from water and gas meters. But that's not the technology we are going forward with, because it is telephone based and telephone does not appear to be the future technology for smart metering at least in urban areas. Bell does not have the monopoly anymore. We now have cellular and cable technology in the communication business. We are starting to get consumers without Bell service.

We are currently piloting wireless technology that's described as a wireless mesh network and plan on implementing for new installations with the next couple of months. We expect that this technology will be at least one of the ones that the government will be approving in their plan.

Basically the meters pass data to each other wirelessly and ultimately to strategically located concentrators that are connected to public or private communication networks. These concentrators can also receive data from gas and water meters by connecting a wireless device to each of those similar to what's installed in the electricity meter. The concentrators pass over the data to the reading company. We receive the verified data from that company.

**Q) You made that choice, but maybe you could have done it by yourself?**

Mr. THORNE) We could have done it ourselves and have in the past during a pilot program, but we are a small company and the software is expensive to purchase and operate requiring a larger scale. That aside multiple suppliers for this service are developing in Ontario and philosophically and practically I have rarely found that it made sense to do in house what we could obtain competitively providing the systems and processes are designed such that on a going forward basis the cost of switching to alternative service providers is minimal.

**Q) What do you think about the drive through technology?**

Mr. THORNE) If I understand the system that you are referring to, it's an older technology aimed primarily at improving the accuracy and reliability of reading conventional meters over manual reading.

**Q) Can you tell us about the cost of the smart meter vs. their benefits?**

Mr. THORNE) The issue of smart metering is not about avoiding metering cost.

The value is about what folks do in term of making different choices regarding their energy and possibly other resources. That's the real, the biggest value.

The actual cost of getting the data from our smart meters exceeds staying with the old technology by about 3 times. I mean as compared to people walking around reading the meters. That does not include any savings like not having to do special meter reads when consumers move or when they or our staff questions the accuracy of the meter reading.

You get all the hourly consumption data for each day every day. What's that worth?

I think with volume and greater competition in smart metering the cost of the meters will be close to 100 \$ soon and I expect that the cost of retrieving the data will also drop.

In Milton today, and this is also part of the governments plan, all consumers with interval meters can view their historical, including previous day, load profiles over the Web. The software that we are using can also do some analysis. For example, the consumer can view their baseline profile. They can also download their hourly data.

A more sophisticated system will exist, in my view, when you can make complex analysis of that data, and push it to the consumer in a format that is easy to understand. The whole thing is a big challenge. The point is that with interval meter, the data, all of

this is possible. Without it, it's not possible. I don't think that everything that can be done has been tested or thought of yet, but the principles are very clear.

**Q) You mean you need the tools, the smart meter to be able to have flexibility in the way you make the pricing?**

Mr. THORNE) That's right. But maybe even more important is information, the feedback that you give to consumer. And it may not be only your kWh consumption profile. Ultimately it could be the impact your consumption is having on green house gasses or SMOG or how many kids are having an asthma attack today. Having the data may allow you to do that. It's a huge opportunity that's essentially untapped at this point. It's very early to say what all the benefits of having smart meters would be.

**Q) But is there a certitude that we have to go in that direction, without any doubt?**

Mr. THORNE) Yes. For me it's fundamental. There is no doubt.

There are costs, obviously. This is not happening for free, but I don't know how you get from where we are today to where we need to go without this kind of technology. Besides the improved price signal, there is a lot we can potentially do with feedback to change current social habits.

**Q) What could be the impact on low income consumers?**

Mr. THORNE) If I remember correctly, they made a study in Chicago where consumers of all income levels participated in an hourly pricing pilot project. In this study it was demonstrated that with the flat rate structure, the poor were subsidizing the rich. Because

of the use patterns of the poor compared to those who have hot tubs, air conditioning and everything else, it was proven that the poor were saving with hourly pricing, paying less than with the flat rate structure. With energy cost relative total income being more significant for low income consumers their motivation was also greater to reduce consumption during high price periods and savings relatively more significant.

The results of this study relative to low income consumers surprised me at the time and reminded me of the danger of making assumptions regarding the impact of moving to cost based pricing.

In Ontario, electric heating systems, because of their lower initial cost have been used extensively in subsidised housing projects. Electric heat consumers overall energy use is generally proportionately more in the off peak periods when prices are lower than non electric heat consumers.

For me, equity is another important reason for moving to pricing that reflects the time varying nature of electricity costs and it would seem that this would be a benefit to low income consumers.

**Q) Do you have residential consumers using electricity for heating?**

Mr. THORNE) In 2004 we had 15 000 residential consumers using gas for heating and 1 300 on electric heating. I can describe their average respective annual electrical consumption as follows:

	<b>In 2003</b>	<b>In 2004</b>
Natural Gas Heating	10 644 hWh	9 948 kWh
Electric Heating	25 332 kWh	23 604 kWh

**Q) Thank you very much.** ` Mr. THORNE) You are welcome.