

Gas Utility Growth Programs and DSM: Friends or Foes?

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ABSTRACT

Enbridge Gas Distribution, the largest natural gas utility in Canada, has been mandated by its regulator to deliver DSM programs to all customer classes since 1995, while continuing to pursue the corporate mandate of adding load and new customers to maximize the return on its investment of pipe in the ground – two seemingly conflicting objectives in the early days of DSM. In recent years, however, Enbridge’s program design strategy has evolved to a “more gas, more efficiently” perspective which aims to combine growth and DSM initiatives to optimize program and financial results.

Enbridge’s first program designed to optimize both growth and DSM objectives was the high efficiency furnace replacement program. Historically, Enbridge had not been able to provide strong financial incentives for furnace conversions, as the added distribution margin on a new gas furnace offset only a limited incentive budget. With additional incentive funding from the DSM budget, however, plus a migration in marketing focus towards promoting only high efficiency furnaces to potential conversion customers, the incentive amount was doubled and results improved. Both the added load and TRC (Total Resource Cost) value from the DSM savings contributed to the Company’s bottom line (Enbridge has a Shared Savings Mechanism incentive in place) and program fixed costs were shared across a greater number of participants.

With the success of this initial, fairly simple example of combining Growth and DSM objectives into one program, Enbridge proceeded in 2003 to launch a high efficiency furnace with ECM (electronically commutated motor) program which, although it saved less gas than a high efficiency furnace on its own (due the increased gas heat required to replace heat previously generated by the less efficient fan motor), the electricity savings resulting from the more efficient motor more than offset the loss of gas savings in the TRC calculation, thereby creating a “richer” DSM program than the original basic furnace program, with added load benefits as well.

These and other joint-objective program concepts will be presented in the final paper, along with some perspectives on organizational issues that need to be addressed to fully optimize this program delivery approach.

Introduction

At Enbridge Gas Distribution, as at many North American gas utilities, customer additions and load growth are still very much desirable business objectives, even in this era of energy conservation. Under cost of service regulation, as well as some forms of incentive regulation, the utility earns revenue as a function of the volume of gas that is delivered, and from this perspective, more is better. Typically, North American gas utilities are not constrained by distribution system limitations, and do not face generation constraints that most electricity utilities are dealing with. For these reasons, the move towards energy efficiency and conservation for natural gas has less to do with infrastructure and supply issues, and more to do with reducing greenhouse gas emissions and general environmental stewardship. The challenge for investor-owned gas utilities is how to respond to both drivers – the push from shareholders for increased profitability through increased gas throughput and customer growth, and the pressure to promote conservation from regulators and consumers – in a productive manner.

This paper is intended to present program ideas and concepts based on the experience of Enbridge Gas Distribution to other gas utilities that are faced with this challenging mandate of pursuing both utility growth programs and DSM programs at the same time. Not only should these objectives be viewed as complementary, but it is also possible to find productivity and efficiency gains in delivering on both, while maximizing customer value at the same time.

Background

Overview of Enbridge Gas Distribution

Enbridge Gas Distribution is Canada's largest natural gas distribution utility, serving 1.9 million customers in southern and eastern Ontario, including the Greater Toronto Area, the nation's capital of Ottawa, and the Niagara peninsula. Enbridge has experienced steady growth in customers for many years, averaging about 40,000 new customers per year, with a slowing of growth only in the last few years. Despite recent fluctuations in energy prices in Ontario, natural gas remains the most cost effective fuel choice for heating, water heating and other residential end uses, and natural gas appliances offer other comfort, lifestyle and environmental benefits over competing fuel choices like electricity, oil and propane. For these reasons, Enbridge has enjoyed favourable market conditions for growth in recent years, and a strong, positive reputation in the communities it serves. Enbridge has actively pursued this growth, both in terms of customer additions and load growth per customer, through various marketing initiatives promoting gas appliances and general "gas is good" marketing, to maximize the return on its investment in pipe in the ground.

In 2008, Enbridge entered into a five-year incentive regulation period after a primarily cost-of-service based regulatory history. The new regulatory model is a Revenue Cap per Customer model, which favours customer growth over load growth, and as a result, the utility's marketing focus has shifted away from promoting individual gas appliances and more towards converting homes from other fuels to gas to acquire new customers. Despite this shift in focus, Enbridge remains actively engaged in the promotion of natural gas as a cost effective, environmentally preferred fuel, and encourages maximization of initial load for new customers.

History of DSM at Enbridge Gas Distribution

The Ontario Energy Board (OEB) directed the gas utilities in Ontario to design and deliver their first DSM Plan in 1995. Since then, Enbridge has been delivering a growing, evolving portfolio of energy efficiency programs every year to all customer groups, with notable success. In 1997, the OEB approved a Lost Revenue Adjustment Mechanism (LRAM) to correct for revenue losses resulting from DSM activity, which had been a barrier to the aggressive promotion of DSM previously. In 1999, the OEB went one step further to remove barriers to DSM success by approving a Shared Savings Mechanism (SSM) incentive to Enbridge's shareholders for achievements in DSM. Since then, the SSM formula has evolved somewhat, but the basic principle of sharing some of the Total Resource Cost (TRC) societal benefits with the Company has remained.

With full DSM cost recovery, an LRAM, and an SSM in place at Enbridge, senior management has recognized DSM activity as a legitimate, profitable business activity which has benefits for all stakeholders in society, including the shareholder. At Enbridge, DSM is now on par with traditional utility growth activities in terms of attracting talented, highly skilled employees as well as senior management attention as a business activity to cultivate and grow.

DSM Organizational Structure at Enbridge

When DSM began at Enbridge in 1995, a small, cross-functional team of experienced utility managers was organized into the first DSM Department. Over the first four years of program delivery, the department grew slightly, added some planning and evaluation expertise, but essentially remained a segregated department from the rest of the utility marketing team. Shortly after the approval of the SSM in 1999, however, utility senior management recognized that utility growth and DSM could be viewed as complementary, rather than competing objectives; that it was profitable to pursue both to maximize revenue. It was becoming clear that customers placed a high value on energy conservation, and that the utility could provide conservation education and opportunities while still positioning natural gas as the economically and environmentally preferred fuel. In other words – choose gas, and choose the most efficient gas technology.

A fully integrated utility marketing department was created; each member of the team with performance objectives related to both DSM and utility growth. This model persists today at Enbridge. Program Managers are tasked with design and delivery of programs that encourage conversion to natural gas, while also promoting the most efficient gas technology available.

DSM and Utility Growth – Complementary Objectives

Program Successes

Furnaces/ECM motors. Since furnaces are the single largest gas-consuming appliance in most residential dwellings¹, and there has been a wide variety of furnace efficiency levels available on the market in Ontario for many years, the promotion of high efficiency furnaces as a DSM program has been a very logical area of focus in the residential portfolio. Enbridge has offered financial incentives to customers who purchase an ENERGY STAR[®] furnace for several years; at times, this offer is augmented by furnace manufacturers and/or the Federal Government, resulting in healthy, meaningful rebates for customers who choose high efficiency for home heating. Although recent updates to free rider rates are reducing the cost effectiveness of this program in 2008 and 2009 (when the program is expected to conclude), historically this has been a highly cost effective program which could support significant investment in promotion and incentives.

In 2003, Enbridge implemented an enhancement to the high efficiency furnace program, with Electronically Commutated Motors (ECM). ECM's offer improved furnace motor operating efficiency, thereby saving electricity on the motor use. There is also a resulting increase in gas consumption (over non-ECM furnaces) resulting from the increased gas required to replace the heat previously generated by the less efficient fan motor. There is still a net decrease in gas demand in comparison to a mid-efficiency furnace, but not as great as with a stand alone furnace. The program offered an increased consumer rebate over the base high efficiency furnace program, justified by the enhanced energy bill savings with an ECM.

With this program enhancement, the utility benefitted from the increased load impact, and consumers benefitted from overall energy bill savings. Society benefitted from the higher TRC value of this enhanced program (with electricity savings considered).

Water Heater Conversions/Tankless Water Heaters. Traditional, storage-tank gas water heating is second only to space heating in terms of size of load for a typical residential customer. Furthermore, water heating load is valuable base load, which cushions the impact of the more weather-sensitive loads on the bottom line. Until about 10 years ago, Enbridge owned and operated a water heater rental business and

¹ Gas pool heaters may consume a comparable amount of gas, but exist in only a small minority of customers' homes.

almost 100 percent of gas water heating customers rented their tanks from Enbridge. Enbridge service reps and installers only had to mention the rental program to new customers and gas water heat was almost a sure thing, in addition to space heat for those new customers. However, in 1999 the utility “unbundled” its retail and service businesses to an unregulated affiliate, which was eventually sold off. Since then, gas water heater market share has been declining.

Because of the strategic importance of gas water heating, Enbridge has been encouraging and incenting conversion of water heaters from electricity to gas, as a utility growth activity for many years. Initiatives have included both consumer and contractor rebates, as well as general radio and print advertising promoting the benefits of natural gas water heating.

Until recently, high efficiency or condensing water heaters were the only technology option for a possible DSM program on water heating, and the incremental cost of these options was too great to pass the standard TRC cost effectiveness screening. More recently, tankless water heaters have begun to penetrate the North American market, thereby creating an opportunity for Enbridge to bolster water heater conversions with an injection of utility DSM funding to promote the tankless technology, which consumes anywhere from one-quarter to one-third less gas than a traditional storage style tank. Enbridge is in the process of launching a tankless water heater DSM program that it will take to the replacement market as well as the conversion market early in 2009. The conversion incentive will only be available to consumers who switch to gas water heating and choose the tankless option.

With the recent creation of an ENERGY STAR classification for gas water heaters, more water heater technology options may be available for DSM support in the same way as the tankless technology, making gas water heating a much more attractive conversion opportunity for residential consumers.

Gas Fireplaces/Enerchoice and Electronic Spark Ignition. With an annual load about half the size of a typical gas water heater load, a gas fireplace is a difficult end use to promote from a utility growth standpoint, because the added distribution margin from a fireplace load is not enough to offset the cost of a meaningful rebate or financial incentive. Especially now, since Enbridge has been operating under a revenue cap per customer regulatory model with an average use true-up account, any added load to an existing customer is of no immediate financial benefit to the Company. Although customers will invest in a gas service line for space or water heat, it is very uncommon for a homeowner to convert to gas just for a fireplace, which is the scenario that would be required for Enbridge to earn a return on investment in gas fireplace promotion. How then, to ensure that gas fireplaces maintain a presence in the market, and dominance over electric and wood options, with no support from the gas utilities?

The answer lies in finding a conservation or energy efficiency angle with gas fireplaces, which would enable Enbridge and other gas utilities to direct DSM funding towards fireplace promotion. Historically, gas fireplaces have been shown to be highly inefficient. In fact, many of the high end models with large flames and showy displays are some of the worst in terms of efficiency. Furthermore, the motivation to buy a particular gas fireplace typically has more to do with aesthetics and décor than potential energy bill savings.

There is currently no ENERGY STAR rating for gas fireplaces. However, in British Columbia, an ENERGY STAR-like labeling system called EnerChoice has been developed jointly by the Hearth, Patio and Barbeque Association, Terason Gas, and the provincial and federal governments, which identifies the top 25% tier of fireplaces in terms of efficiency. Enbridge and other stakeholders in Ontario are working to bring the program to our province, to enable us to promote the most efficient gas fireplaces through DSM funding and get rewarded both in terms of SSM and retained market share for an important gas end use.

Electronic Spark Ignition fireplaces are also finding a place in the Ontario market. These units present an additional opportunity to incent energy efficiency and gas appliances at the same time.

Natural Gas Forklifts/Reduced Make-up Air. Opportunities to link DSM and utility growth programs extend to the commercial and industrial sector as well. An interesting example is the conversion of propane forklifts to natural gas forklifts. Forklift fuel costs for the customer can be reduced by approximately 23%² by converting a fleet from propane to natural gas. As with other utility fuel switching programs, however, the incentive cost required to sufficiently buy down the incremental equipment cost for the customer to make the switch is typically too great to be offset by added distribution margin. In other words, it is hard to make this type of fuel switching program profitable for the utility.

An interesting feature of natural gas forklifts, however, is the dramatic reduction in Carbon Monoxide (CO) emissions over the propane units. With 95% reduction in CO emissions, along with tightening workplace safety regulations around CO exposure, natural gas forklifts are an attractive investment for some very real non-financial benefits as well. From a natural gas utility perspective, there is a DSM opportunity in this feature of natural gas forklifts – reduced ventilation and make-up air requirements. It is possible, in fact, that natural gas forklifts may require no make-up air equipment at all to meet Ontario Ministry of Labour air quality standards, resulting in saved capital costs as well as operating costs.

Enbridge offers financial incentives to convert propane forklifts to natural gas out of its traditional utility marketing budget, augmented by DSM-funded incentives related to the natural gas savings resulting from reduced make-up air requirements. The result is a healthy financial incentive package for the customer that draws attention to a number of cost, air quality and environmental benefits of conversion.

Program Challenges

For any program which clearly benefits the utility in more than one way – profitability both in terms of added distribution margin as well as shared savings from DSM – the utility is under tighter scrutiny from its regulator and other stakeholders to validate that the programs are not cross-subsidizing each other, and that there is true customer and/or societal value from the program. In the examples provided above, as in any other Enbridge growth initiative that also has a DSM opportunity, Enbridge ensures that it is promoting the equipment or appliance only as an alternative to other fuels. In that scenario, since natural gas consistently has a price advantage and often an environmental advantage over all competing traditional fuels in Ontario³, the customer value in that initiative is clear.

Looking Forward – What’s Next?

The energy industry is changing rapidly – increased price volatility, increased focus on greenhouse gas emissions and global warming, emergence of renewable energy sources as mainstream options for consumers, and innovation in utility regulatory models are all active, and sometimes competing forces in the industry today. Despite having a regulatory model which, for the next four years at least, renders Enbridge financially indifferent to increases or decreases in average load, there is an entrenched recognition in the utility that we need to continue to promote natural gas as a safe, cost effective, cleaner burning fuel than many of our competing fuels. Until Enbridge is prepared to re-invent itself as an “energy services” company rather than a natural gas distribution utility, natural gas distribution is our core business and should be protected, and where appropriate for the shareholder and society, enhanced.

² Based on July, 2007 gas and propane rates

³ Electricity, oil, propane, wood

This means that Enbridge will continue to look for innovative ways to promote natural gas as a clean-burning, economical, versatile fuel choice, particularly in applications of potential lost opportunity, such as in the builder market, where the emergence of renewable energy sources such as solar and geothermal are making significant progress. With the loss of even just the water heating load in a typical residential subdivision, the profitability of piping gas to the development is potentially in question, so load retention is of critical importance. The continued development and promotion of energy efficient gas technologies and programs through DSM clearly helps position natural gas as a “green” choice for builders and consumers, and helps to maintain the overall value of gas to the customer.