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**Time Matters to the Price of Power**

For most people in New Brunswick, the idea of time based pricing of electricity seems pretty foreign. We're used to a flat rate per kilowatt-hour for the electricity we use. However, just like any other product we use, the cost of generating that electricity varies quite dramatically based on how it was made – we just don't see it at our end. At certain times we are paying significantly more than it costs to generate, and at other times, we are paying significantly less – i.e. the utility is losing money selling it to us.

Unlike other products though, we can't (yet) economically store electricity in large quantities, so it has to be produced as and when it is needed. During the year, we tend to use more electricity in the peak of summer and the peak of winter for air conditioning and heating than we on a mild September day. In the course of a day, we go through cycles too – people tend to get up, go to work, eat, and go to bed at roughly the same time - and so the electricity demand curve mirrors our personal activity levels.

Using Ontario as an example (publicly available data), we can see that in 2009, electricity demand was 10.7GW at a minimum and 24.4GW at a maximum – an increase of over 125%. The larger that the margin becomes between minimum and maximum, the more expensive our electricity becomes, as we have to recoup the building cost for these power stations that aren't used very often. In fact in 2009, while Ontario had enough installed capacity to be able to supply the 24.4GW of electricity, the electricity demand only exceeded 20GW for approximately 20 days during the year.

By flattening the electricity demand curve we would be able to operate fewer power stations more frequently, and thus reduce (or at least limit increases to) the cost of our electricity supply.

One method of doing this is through time based pricing. When electricity demand is low, our electricity is generally produced from sources that are the cheapest to run (such as nuclear and coal), and so the cost of generating that electricity is low. As demand increases, increasing expensive to operate power plants are brought online to meet the temporary need, such as natural gas and oil. Time base pricing would see that the price we pay for electricity more accurately reflect the cost of generating it – so using power in the middle of the day in August (peak period) would cost more than using power in the middle of the night in September (off-peak period).

This would accomplish two things. First, people and companies would start to shift their behavior patterns to match the new pricing profile. Dishwashing or laundry could be saved until the late evening or early morning. Power intensive industries could reschedule certain activities to obtain cheaper electricity. This would have the effect of lowering the peak demand, and increasing the off-peak demand.

Second, it would hopefully reduce overall energy consumption. Air conditioners and heaters might get adjusted a couple of degrees during the day when no-one is actually in the house due to the higher cost of electricity.

Some new technologies are needed, and some are on their way, such as smart meters capable of recording the amount of electricity and time of use, which would also be capable of displaying the current power rate to consumers to aid in decision-making. Smart appliances are on the horizon, such as washers and dryers that automatically run when electricity is at its cheapest, and fridges that will delay compressor cycles at peak price times. Future electric vehicles have the potential to charge themselves during off-peak hours, and re-sell electricity to the grid during peak hours for a profit, thus acting as a giant national battery of sorts.

Jurisdictions such as California and Ontario have already rolled out time based pricing, with 3.6 million customers in Ontario expected to be on the new system by mid-2011. Ontario has three price bands for electricity (not including transmission and distribution) – On-Peak at 9.1 cents per kWh, Mid-Peak at 7.6 cents, and Off-Peak at 4.2 cents. Without wading into the NB Power debate here, it would be interesting to know how the deal will affect the future of time based pricing in New Brunswick, regardless of which way it goes.

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