CONTEXT OF RATE REFORM

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1. CONTEXT

A basic principle in setting electricity rates is to have the consumer pay the cost of supplying the service of one additional kWh. This is what will decide whether she maintains, reduces, cancels or time-shifts her consumption. The price signal thus has both an informational and motivational character. In this respect, a good price signal is likely to prompt customers to adopt habits and measures that favour energy conservation.

Over the past few years, the Régie has stressed the important role of price signals in encouraging the Distributor's customers to adopt rational and efficient behaviour with respect to electricity consumption. In its decision D-2006-34, it affirmed that it was vital and in the public interest for the Distributor's rate structures to better reflect long-term marginal costs. According to the Régie, the rate structure modifications proposed by the Distributor made it possible "*to gradually and prudently begin the reform of rate structures leading to a better price signal*."

In decision D-2007-12, the Régie again mentions the importance of making this kind of correction to rate structures. It asks the Distributor to present, in its 2008 rate filing, rate reform proposals that take into account "*the importance of long-term marginal costs, the policy implications of the present decision, and the implementation of the government's energy strategy*."[1] More specifically, this interim report on rate structures must include the following points:

- Monitoring of rate structures adapted to reflect long-term marginal costs (including smart meters);
- Lists of modifications that might be relevant within the Québec context; and
- The rate reform strategy and the implementation plan.

[1] D-2007-12, page 84.

More specifically, it asks the Distributor to present a proposal to reform residential rates that examines the options of seasonal and time-of-use rates, and to study the options of inclining rate structures for general rates as BC Hydro has done and quantify the costs and benefits.

In its recent energy strategy, the government of Quebec for its part indicated that it wanted measures to be taken to improve the electricity price signal, in order to support consumers' efforts to improve energy efficiency and to ensure better use of resources by encouraging consumers to use the right energy source at the right place.

> [Translation] *"Ideally, a better price signal improves the use of resources by giving a saved kilowatt-hour the same value for the consumer as for the distributor. It other words, a consumer should base his consumption decisions on a price that approaches as closely as possible the price paid by the distributor for the new supplies."*[2]

Among other things, the government wants Hydro-Québec to suggest to the Régie ways of increasing rate progressivity in the residential sector and gradually introducing rates that vary according to season and time of day.

The overhaul of electricity rates that the Distributor is proposing falls within these efforts and is in line with recent rate structure adjustments to improve the price signal. The proposed changes are based on the Distributor's rate principles and its cost structure.

This reform will have impacts on customers but they will be limited through a gradual introduction of the proposed measures. In the end, the reform will result in more efficient rate structures that better reflect the Distributor's costs and constraints, thus allowing customers to better understand the impact their behaviour has on electricity costs.

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[2] Gouvernement du Québec, *L'énergie pour construire le Québec de demain - La stratégie énergétique du Québec 2006-2015*, page 56 http://www.mrnfp.gouv.qc.ca/publications/energie/strategie/strategie-energetique-2006-2015.pdf

As the Régie had requested in its decision D-2007-12,[3] the Distributor presented its rate reform proposals to stakeholders and the Régie in a work session. Appendix A to the present document includes a report on this meeting, which took place on June 6, 2007.

The following sections as well as documents 3, 4 and 5 repeat the basic theory behind a good price signal, show the rate structures considered most efficient for transmitting this signal to its various customers, and describe the efforts of other distributors to improve the price signal. Exhibits HQD-12, documents 3, 4 and 5 respectively present the proposed reform for residential and general rates and a proposed pilot project for time-of-use pricing. The results of trail blazing by various electricity distributors in Canada and the United States are presented in HQD-12, document 6.

2. FOR A BETTER PRICE SIGNAL

Electricity rates constitute the main tool for informing consumers of the costs incurred by the Distributor in responding to their demand. Although price is not the only factor influencing a consumer's energy choices, prices must nevertheless be set in a way that encourages the efficient use of energy at the lowest cost to society. This will induce consumers to attempt, on the longer-term, to institute permanent solutions to reduce or better manage their consumption.

> [Translation] *"The principle of economic efficiency… implies passing on to each customer all costs that she causes to the electrical system however the electricity is being used. On the basis of this cost as reflected in the rate, each customer decides in decentralized fashion whether to maintain her demand or modify it. Economic efficiency is thus ensured …"*[4]
>
> [Translation] *"The customer makes his choices based on his own interest …It is therefore up to the company to inform him*

[3] D-2007-12, P. 84.

[4] Électricité de France, *Tarification de l'électricité en France: Principes et construction des barèmes*, DEPS Tarification, Cahier 30, June 1995, page 3.

> *of the economic consequences his decisions have for the community…The purpose of marginal cost pricing is defined as follows: using price signals to* motivate *consumers to use the electric facilities in the best interests of the general public."*[5]

According to theory, in order to encourage consumers to make efficient choices, prices must reflect the economic cost. The economic cost is the marginal cost of making available one additional unit of a good or service or, inversely, the savings achieved by reducing the supply of the good or service by one additional unit.

Marginal cost therefore plays an important role in the setting of prices to encourage efficient use of resources.

2.1. Long-Term and Short-Term Marginal Costs: The Theory

Two types of marginal costs are used when fixing rates: long-term and short-term marginal costs.

The long-term marginal cost is the additional cost of providing, transmitting and distributing one additional unit of demand, for a given year, assuming that it is possible to instantaneously change supply, transmission and distribution capacities. The long-term marginal cost therefore represents the cost of structures or long-term supply contracts that make it possible to satisfy this additional demand at the lowest cost.

The short-term marginal cost of one additional kWh is the additional supply, transmission and distribution cost that this additional supply gives rise to, leaving supply, transmission and distribution capacities unchanged. It therefore represents the variable cost of satisfying an additional demand.

Generally speaking, theory suggests using long-term marginal costs when determining the basic rate structures.

[5] Ibid., pages 4 and 5.

> *"..the long-run marginalists emphasize the need for a relatively stable and continuous level or trend of rates, in the belief that the rates which have the most important effects on the demand for and provisions for utility services are rates that may be expected to persist over a considerable period of time. Hence, the most important marginal costs for the purposes of rate control are the persistent long-run variety rather than the very short-lived marginal costs that may fall almost to zero in some brief period of time, only to rise to several times average total costs soon thereafter."*[6]
>
> *"The advantages of stability and predictability of long-run rates may well more than offset the advantages of the more flexible rates that would be required to promote the best available use of the existing capacity of the utility plant."*[7]

Furthermore, the long-term price signal is even more important for the customer when making investment choices.

> *"It is these longer-run, anticipated rates, when compared with anticipated prices for substitute product or service, on which individuals must rely in making rational decisions whether to install oil-heating or gas-heating furnaces; whether to buy gas ranges or electric ranges for the kitchen; whether to locate an aluminium-reduction plant near the source of hydroelectric power, near a conventional fossil fuel plant, or to locate it instead near the source of nuclear power, etc."*[8]

For their part, short term marginal costs are generally used as a basis of calculation for determining the pricing level for rate options that aim at maintaining the short-term balance of supply and demand.

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[6] Bonbright, James C, Albert L. Danielsen and David K. Kamerschen, *Principles of Public Utility Rates*, Public Utilities Report, Inc, 2nd edition, 1988. Page 456.
[7] Ibid., page 456.
[8] Ibid., page 465.

2.2. The Reflection of Marginal Costs in the Distributor's Rate Structures

The level of electricity rates in Quebec is established on the basis of average costs, but it is important that the rate structure reflect marginal costs in order to bring about the appropriate economic choices. Long-term marginal costs should therefore not replace revenue requirement in calculating rate levels but rather indicate the direction and scope of structural changes to be made over a long-term horizon.

The Distributor's avoided costs, on the basis of which the rate structures will be gradually modified, are presented in exhibit HQD-14, document 3,

Fixed and Variable Components

The concept of differing rates consists in reflecting costs between their fixed and variable components in order to reflect the special features of the service supplied in each rate category. This makes it possible to treat in similar fashion customers who exhibit similar consumption characteristics.

From the point of view of rates, costs are expressed in terms of capacity, energy and subscription costs. Capacity billing generally makes it possible to recover the costs of equipment required to meet peak demand. These facilities and services have to be maintained and therefore billed even when there is no consumption in kWh. Certain other expenses depend on the quantity of energy delivered. These represent variable costs that are generally recovered in the energy component of rates. Other expenses are mainly related to the number of customers served, independently of their consumption level. When significant, these costs are normally recovered in the form of a subscription charge.

Reflection of Marginal Costs

There are a wide variety of means of using marginal costs to establish rate structures in order to obtain a useful price signal. The Distributor's policy aims at better efficiency and takes Quebec's particular context into account.

For residential customers, a relatively homogeneous clientele, the basic structure generally used is simple. Marginal costs are reflected through a two-tier structure, with a first-tier price below marginal cost and a second-tier price that tends over the years to reach the long-term marginal cost level, which makes it possible to recover revenue requirement and provide an efficient price signal. Long-term marginal costs are used to provide customers with a clear indication of the cost of their marginal consumption, and apply to the elastic portion of the rate, which customers will be able to act on.

The issue of using electricity for heating has often been raised, the main argument being that a poor price signal may lead customers to opt for electrical heating. Within a context of high fuel prices, customers might even be tempted to convert their heating system from fuel to electricity. This decision implies, for each customer, a huge additional cost unequalled among all other residential uses of electricity.[9] Since at the margin, all kWh are sold at a loss by the Distributor, each case of substitution generates a revenue shortfall that is relatively significant and, more importantly, recurrent, and that is ultimately assumed by all customers. It is therefore important, considering the particular nature of heating costs, to ensure that customers are given the correct signal when facing a choice of heating system. In its energy strategy, the government claims to be concerned by this situation.

> [Translation] *"The new more progressive electricity rate structure will send Québec consumers a better price signal when they have to choose the energy source to use for heating. This new rate structure will thus motivate them to "use the right energy in the right place." We must indeed wonder if it is always advisable to systematically heat with electricity."*[10]

[9] On an annual basis, heating represents about half the kWh consumed by a customer who heats with electricity.
[10] Gouvernement du Québec, op. cit., p. 58.

In the general rates, the marginal cost signal currently results on the one hand in the application of a larger portion of the rate increases to the energy component of the rate than to the capacity component, which has the consequence of gradually increasing the portion of energy costs in customer billings compared with capacity costs. The mechanism for determining the capacity to be billed makes it possible to take seasonality into account in the general rate structures.

Despite this, although a sliding scale of energy prices within the general rates ensures continuity between rates, it still leads to poor understanding the price signal among customers. In addition, the complexity of the rate structure increases dilution of the price signal.

Within a context where marginal costs exceed average cost, there is therefore a margin of manoeuvre to adjust rate structures so that they reflect the reality of the costs the Distributor faces as clearly as possible.

The rate options for their part target specific objectives, for example, the shifting of costs and filling of gaps. They target customers whose consumption profile is compatible with the objectives sought while avoiding disrupting basic structures.