MH/MIPUG I-1

Part and Chapter:	Evidence Prepared by Dale Friesen	**Page #:**	2-8
Topic:	Rate Rebalancing		
Subtopic			

PREAMBLE (IF ANY):

Figure 2.5 – Factors Influencing Rate Rebalancing

Factors Influencing Rate Rebalancing		
Demand	**Energy**	**Mechanism**
Revenues		
Increase Demand Rates	Decrease Energy Rates	Regulatory Changes
Increase Load Factor	Decease Load Factor	Consumption Behavior, Demand Response Programs, Electrification
Embedded Costs		
Lower Embedded Demand Costs	Higher Enbedded Energy Costs	Inflationary Pressures
Lower Demand Allocations - Coincident Peak and Non-Coincident Peak	Higher Energy Allocations	Consumption Behavior, Demand Response Programs, Electrification
Increase Load Factor	Decrease Load Factor	COSS Methodology

QUESTION:

Please explain if the mechanisms listed in the right-hand column of Figure 2.5 are intended to provide approaches that Manitoba Hydro could use to achieve the energy and demand changes that are as described in the left and middle columns. Otherwise please detail how one is intended to interpret Figure 2.5.

RATIONALE FOR QUESTION:

RESPONSE:

An underlying assumption in Figure 2.5 relates to the current circumstance, where Manitoba Hydro's demand rates are generally lower than unit costs and energy rates are generally higher than unit costs. These characteristics are shown for the GSL subclasses in Table 2.1 of MIPUG(Friesen) evidence [PDF p. 13]. This observation implies that rebalancing of rate component revenues and costs will require a decrease to unit demand costs and/or increase to demand rates, with an inverse adjustment to energy costs and rates. A review of Table A2 in Appendix 7.1 and approved rates as of April 1, 2024, shows a similar relationship within the GSSD and GSM rate classes experiencing demand charges.

The mechanisms noted in the right-hand column of Figure 2.5 are intended to highlight considerations related to revenues and costs that may influence measures taken to rebalance demand and energy component revenues to more closely match unit costs.

Revenues

- **Regulatory Changes (i.e. rate changes)** reflect rate applications that Manitoba Hydro may bring forward for review and approval by the Manitoba Public Utilities Board. These regulatory initiatives may include differentiated rate increases for the demand and energy component rates to more closely align with unit costs identified in a supporting PCOSS. They could also extend to classification changes or changes to the structure of rates.
- **Consumption Behavior** broadly reflects customer actions, taken independent of Manitoba Hydro or motivated through programming delivered by Manitoba Hydro (or Efficiency Manitoba), that modify consumption behavior and resulting demand and energy determinants and revenues. These actions influence rebalancing by changing

the ratio of demand/energy revenues, which may be illustrated through changes in consumption load factor. Decreasing load factors will increase the share of demand revenues, while increasing load factors will increase the share of energy revenues. A change in billing determinants may decrease or increase revenues derived from demand and/or energy charges.

Embedded Costs

- **Inflationary Cost Pressures** relate to capital investment and operational spending for demand and energy resources that may occur at differing rates based on the relative costs for provision of capacity and energy. These costs may include activities undertaken to address capacity and energy constraints in the Manitoba Hydro system, along with normal operational and maintenance spending required to ensure a continuous, safe, and reliable supply of energy for Manitobans. Independent of a change in components revenues, rebalancing may be impacted by a relative decrease in the share of unit costs for demand and corresponding increase in the share of unit costs for energy.

- **Consumption Behavior** impacts anticipated cost allocations of revenue requirements for demand and energy. The Coincident Peak (‘CP”) and Non-Coincident Peak (“NCP”) demand values used for allocation of demand costs differ from the billing determinants that drive revenues. As an example, lower CP and NCP demand values will decrease demand allocations, reducing embedded unit demand costs if demand billing determinants remain stable. Changes in the ratio between CP and NCP or changes in billing determinants for energy may also lead to further adjustments in unit costs.

- **COSS Methodology** relates to the classification of costs as demand or energy costs, and in some instances, as customer costs. Decisions regarding classification will impact allocated demand and energy costs and resulting unit costs for both components for consistent billing determinants.

MH/MIPUG I-2

Part and Chapter:	Evidence Prepared by Dale Friesen	**Page #:**	2-9
Topic:			
Subtopic			

PREAMBLE (IF ANY):

QUESTION:

Please explain what is meant by the statement at page 2-9,*"Decoupling energy consumption and peak demand behavior is a challenging endeavor that often requires widespread adoption of emerging technologies with non-standard consumption profiles. The widespread electrification of space and/or process heating may be such a trend."*

RATIONALE FOR QUESTION:

RESPONSE:

The statement at Page 2-9 is linked to a general perspective that the volume of useful work, or production output, is more closely aligned with energy consumption than capacity requirements or demand. This relationship can be observed in industry where intentional reductions in production output will often result in minimal change to peak billing demand despite a significant reduction in energy consumption. Intentionally reducing demand leads to a less predictable outcome, where small reductions in demand may result in large reductions in productive output or an inability to maintain production due to interruptions in the process. These sensitivities are related to the nature of the relationship between demand and energy within the process.

Industrial processes typically demonstrate a relationship between demand and energy (i.e. load factor) that is quite stable at an optimized level of production output. Attempting to change that relationship may result in less optimal use of process equipment and energy. Fundamental changes in technology and processes may decrease or increase demand requirements in comparison to energy consumption, establishing a new normalized relationship between demand and energy going forward. Changes in lighting technology and electrification of space and water heating are examples of major technological shifts that have changed, or are changing, the electric system load shape.

The seasonal nature of space heating requirements at northern latitudes provides a relevant example of how these changes evolve. Space heating requirements create a relationship between demand and energy that results in a lower annual load factor than traditional electric base loads. Given the magnitude of heating loads in northern climates, widespread electrification (i.e. fuel switching from natural gas or other fuels) is expected to change the annual load factor of electric consumption in Manitoba, where peak system demand will increase at a higher rate than annual energy consumption. This change is expected to have the effect of reducing the annual load factor of consumption on the electric system.

MH/MIPUG I-3

Part and Chapter:	Evidence Prepared by Dale Friesen	**Page #:**	3-7
Topic:			
Subtopic			

PREAMBLE (IF ANY):

On page 3-7, Mr. Friesen states:

> *This response reflects the desired response that Manitoba Hydro suggested, and the Board may have anticipated when approving the changes to the definition in 2023/24.*
>
> *The most optimistic response would have been a 10% reduction in on-peak demand with a return to prior demand levels during the off-peak period, the maximum allowed based on the 90% off-peak cap. This approach would decrease production by about 3.5%, which is not generally a desired outcome.*

QUESTION:

Please explain how Mr. Friesen calculated the estimated 3.5% decrease in production? Has this statement been informed through customer consultations and if yes, how many customers has Mr. Friesen spoken with?

RATIONALE FOR QUESTION:

RESPONSE:

As noted in response to MH/MIPUG I-2, the volume of useful work (i.e. production output) is more closely related to energy consumption than demand. The response also recognizes that industrial processes typically demonstrate a normalized relationship between demand and energy (i.e. load factors) that is quite stable at an optimal level of production output. Changing that relationship may result in less optimal use of process equipment and energy.

The 3.5% reduction noted on Page 3-7 reflects an approximate 3.5% reduction in energy consumption under a 10% reduction in on-peak demand, assuming a consistent consumption load factor between the on- and off-peak periods. Given the 90% off-peak cap, there is no opportunity to make up this consumption (or lost production) in the off-peak periods.

Reducing demand will consistently result in a reduction in energy consumption. The approximate 3.5% decrease in energy consumption was determined using a best-case scenario where load factor remains consistent with changes in demand levels. This scenario is most likely to occur in industrial processes that have high average load factors above 0.85 – 0.90, as the relationship between demand and energy is often quite linear and stable across a range of demand levels.

The outcome is more variable for industrial processes with lower load factors, where a short-duration high demand component of the process often creates an output that then moves to another stage of the process with lower levels of demand lasting for longer durations. Reducing the demand for the short-duration process may result in a significant reduction in overall productive output that exceeds the 3.5% noted on Page 3-7.

This relationship was observed during the economic downturn in 2008/09, where some industrials attempting to match production to declining market demand, were unable to reduce their electrical demand without upsetting critical production processes. Their response to this constraint was to shut down or significantly curtail operations for a period within each billing period, with minimal energy consumption during these shutdown periods and no production output. In response, Manitoba Hydro developed a demand relief program to assist these customers with deferral of demand charges. The development of this program involved a comprehensive examination of the relative changes in demand and energy behavior as industrial enterprises responded to changing market conditions requiring lower levels of production output.

Findings from the analysis undertaken in 2008/09 are evident in the way some industrials engage in demand response opportunities across other jurisdictions. In some industries, a demand response event will require industrial customers to shut down or significantly curtail production processes due to a lack of flexibility in process demand requirements. In these instances, customers have made a conscious decision that the financial returns gained from the demand response action are sufficient to offset the value of lost production. Examples of these responses exist within the Ontario Independent Electricity System Operator ("IESO")

Industrial Conservation Initiative ("ICI").[1] Under this initiative, transmission-connected industrial customers voluntarily curtail operations to reduce Global Adjustment allocations associated with the five peak annual hours of system demand. In some instances, achieving these reductions may require multiple curtailments, totaling 100 to 200 hours or more, annually. Customers justify the cost of lost production during these self-initiated curtailments based on the strong financial reward mechanism built into the Global Adjustment methodology.

[1] https://www.ieso.ca/-/media/Files/IESO/Document-Library/global-adjustment/ICI-Backgrounder.pdf