2011 NSUARB-NG-HG-R-11

NOVA SCOTIA UTILITY AND REVIEW BOARD

IN THE MATTER OF AN APPLICATION BY HERITAGE GAS LIMITED FOR APPROVAL OF AMENDMENTS TO ITS SCHEDULE OF RATES, TOLLS AND CHARGES, PURSUANT TO SECTION 21 OF THE GAS DISTRIBUTION ACT

DIRECT EVIDENCE

OF

J. RICHARD HORNBY
SYNAPSE ENERGY ECONOMICS, INC.

ON BEHALF OF BOARD COUNSEL

SEPTEMBER 7, 2011

A. INTRODUCTION

Q. PLEASE STATE YOUR NAME, POSITION AND BUSINESS ADDRESS.

A. My name is J. Richard Hornby. I am a Senior Consultant at Synapse Energy Economics, 485 Massachusetts Avenue, Cambridge, MA 02139.

Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE.

A. My educational background and professional experience are detailed in Exhibit JRH-1 of this evidence. In summary, I have a Bachelor of Industrial Engineering from the Technical University of Nova Scotia, now the School of Engineering at Dalhousie University, and a Master of Science in Energy Technology and Policy from the Massachusetts Institute of Technology (MIT). Prior to becoming a regulatory consultant in 1986 I worked on Nova Scotia energy issues for several years, initially as a project engineer and then as a senior civil servant. Since becoming a regulatory consultant I have provided expert testimony and litigation support on a variety of gas and electric industry planning, feasibility and ratemaking issues in approximately 120 proceedings on behalf of a range of clients including utility regulators, consumer advocates, environmental groups, energy marketers, gas producers, and utilities.

Q. HAVE YOU FILED EVIDENCE PREVIOUSLY BEFORE THE BOARD?

A. Yes. In 2001 I filed evidence regarding proposed distribution service tariff rates in a Sempra proceeding, NSUARB-NG-SEMPRA-SEM-00-08.

Q. WHAT IS THE PURPOSE OF YOUR EVIDENCE IN THIS PROCEEDING?

A. I was retained by Board counsel to review the Cost of Service and Rate Design portion (section 16.0) of the general rate application filed by Heritage Gas Limited ('Heritage" or "the Company"). Board counsel has retained other consultants to review the other aspects of the Heritage application For the purpose of my testimony I have assumed Heritage's revenue requirements to be as proposed by the Company.

Q. WHAT DATA SOURCES DID YOU RELY UPON TO PREPARE YOUR REVIEW OF HERITAGE'S APPLICATION?

A. My review of the Heritage request is primarily based on the information presented in its application and its responses to various information requests.

Q. PLEASE SUMMARIZE THE MAJOR RATEMAKING GOALS UPON WHICH YOU BASED YOUR ANALYSES, CONCLUSIONS AND RECOMMENDATIONS.

A. My analyses, conclusions and recommendations are based upon Bonbright's eight goals or criteria of a sound rate structure.[1] Those criteria are:

1. The related, "practical" attributes of simplicity, understandability, public acceptability, and feasibility of application.

2. Freedom from controversies as to proper interpretation.

3. Effectiveness in yielding total revenue requirements under the fair-return standard.

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[1] Phillips, Charles F. Jr. *The Regulation of Public Utilities*, Public Utilities Reports, Arlington, VA, 1993, 434

4. Revenue stability from year to year.

5. Stability of the rates themselves, with a minimum of unexpected changes seriously adverse to existing customers.

6. Fairness of the specific rates in the apportionment of total costs of service among the different consumers.

7. Avoidance of “undue discrimination” in rate relationships.

8. Efficiency of the rate classes and rate blocks in discouraging wasteful use of service while promoting all justified types and amounts of use.

The Company refers to goals three to six on page 16-1 of its application, i.e. recovery of full cost of service, fairness between and within rate classes, stability of rate structure and avoidance of rate shock.

Since there are a range of alternative approaches that one can use to design rates I try to determine which rate design will best achieve those three criteria in a balanced manner. In this regard it is important to acknowledge that the choice of a particular rate design is not a mechanical or simple mathematical exercise. Instead the choice of a rate design often requires the exercise of judgment, because some of the major ratemaking goals are conflicting and thus one has to choose a rate design that produces a reasonable balancing or set of tradeoffs between those conflicting goals.

Q. PLEASE EXPLAIN HOW YOUR EVIDENCE IS ORGANIZED.

A. The remainder of my evidence begins with a summary of conclusions. It then presents my review of Heritage’s decision to continue with its existing three rate

classes rather than splitting Rate 1 into separate rate classes for residential customers and for non-residential customers with annual use up to 5,000 GJ. The final section of my testimony reviews Heritage's proposed cost allocation and rate design.

Q. HAVE YOU FILED EXHIBITS WITH YOUR EVIDENCE?

A. Yes, I have filed the following exhibits with this evidence:

JRH-1	Resume of J. Richard Hornby
JRH-2	Rate 1 Revenue to Cost Ratios at Various Levels of Annual Energy Use (Revenues at 2011 Rates, Heritage 2012 Revenue Requirements)
JRH-3	Distribution of Rate 1 Customers (2009) by Annual Use GJ
JRH-4	Rate 1A Revenue to Cost Ratios with, and without, Demand related costs and Site related Mains Costs (Revenues at 2011 Rates, Heritage 2012 Revenue Requirements)
JRH-5	Classification of Distribution Main Costs as Customer Related by Canadian Utilities
JRH-6	Heritage Revenues by Rate Class and Rate Component at Current and Proposed Rates
JRH-7	Comparison of Proposed Allocation of Revenue Requirements – Chymko and Synapse

B. SUMMARY OF CONCLUSIONS

Q. PLEASE SUMMARIZE THE COMPANY'S PROPOSED RATE CLASSES AND YOUR CONCLUSIONS REGARDING THAT PROPOSAL.

A. The Company examined, but dismissed, the possibility of creating a separate rate class for residential customers. My conclusions regarding that issue are as follows:

a) Heritage's proposal to continue providing service to customers with annual usage of up to 5,000 GJ under a single rate class, Rate 1, is not reasonable and should not be accepted by the Board; and

b) Heritage should replace its existing Rate 1 class with two new rate classes, one for residential customers and one for non-residential customers with annual usage of up to 5,000 GJ. (Consistent with the Company's application my evidence refers to these two new rate classes as Rate 1A and Rate 1B.) The upper bound of annual use for customers to be eligible for Rate 1A should be set at a level that will accommodate all residential customers.

The Company's cost of service study ('COSS') results indicate that its existing rates do not recover the full cost it incurred to connect customers with annual use less than 60 GJ to its system, and do not recover a material contribution to recovery of distribution main costs from customers with annual use less than 100 GJ. My conclusions regarding those results are as follows:

a) Heritage should periodically provide the Board documentation to verify that it is applying the economic analysis and special charges specified in

sections 3.1.4 and 3.3 of its distribution service rules in response to every request for connection; and

b) Heritage should develop a proposal for increasing the rates of existing customers using less than 100 GJ/year over time that will move their revenue to cost ('R/C') ratio closer to 1 while avoiding rate shock.

Q. PLEASE SUMMARIZE THE COMPANY'S PROPOSED ALLOCATION OF ITS REQUESTED REVENUE REQUIREMENTS AMONG RATE CLASSES AND YOUR CONCLUSIONS AND RECOMMENDATIONS REGARDING THAT PROPOSAL.

A. The Company has requested a cumulative increase in its total, system-wide rate revenues of 25 percent over three years, 2012 through 2014. Based upon its cost allocation study Heritage is proposing to increase Rate 1 revenues by 24.5 percent (essentially the system-wide average), Rate 2 revenues by 20.8 percent (84 percent of the system wide average) and Rate 3 revenues by 34.5 percent (139 percent of the system wide average). My conclusions regarding that proposed cost allocation and rate design are as follows:

a. The COSS prepared by Chymko Consulting Limited ('Chymko") is not reasonable and should not be accepted by the Board. Specifically the Chymko COSS does not use a Rate 1A and a Rate 1 B to develop its recommended allocation of revenue requirements and rates. In addition the Chymko COSS allocates an unreasonable level of distribution main costs to Rate 1.

b. Subject to the Board approving Heritage's revenue requirements, the allocation of revenue requirements and rates recommended by Chymko and proposed by Heritage are not reasonable and should not be approved by the Board;

c. Heritage, through Chymko, should prepare an alternative COSS using a Rate 1A and a Rate 1B and classifying 54 percent of distribution main costs as energy related. Heritage should develop an allocation of revenue requirements and rates guided by the results of that COSS that will move the R/C ratio of each rate class closer to 1 while avoiding rate shock.

C. CREATION OF A RESIDENTIAL CUSTOMER RATE CLASS

Q. WHAT IS AT ISSUE WITH RESPECT TO THE CERATION OF A RESIDENTIAL CUSTOMER RATE CLASS?

A. The Company currently provides service under three rate classes. Eligibility for each rate class is determined by the customer's annual gas use. The three rate classes and usage levels are Rate 1 for customers using up to 5,000 GJ, Rate 2 for customers using between 5,000 GJ and 50,000GJ and Rate 3 for customers using over 50,000 GJ.

In its Order in the 2008 general tariff application proceeding the Board directed Heritage to consider two alternatives to its existing Rate 1 – creation of a separate rate class for residential customers with annual usage up to 150 GJ and changing the consumption boundary between Rate 1 and Rate 2. My discussion of this issue focuses upon the analyses of replacing Rate 1 with two new rate

classes, one for residential customers and one for commercial customers with annual usage less than 5,000 GJ.

In its analyses the Company refers to these two new rate classes as Rate 1A and Rate 1B. Those analyses assume Rate 1A will apply to customers with annual use of less than 150 GJ. I support the creation of a separate rate class for residential customers, but I see no reason to limit its upper bound to 150 GJ. The upper bound should be set at a level that will accommodate all residential customers, for example 200 GJ.

Q. PLEASE SUMMARIZE HERITAGE'S POSITION REGARDING THE CREATION OF A SEPARATE RATE CLASS FOR RESIDENTIAL CUSTOMERS.

A. The Company maintains, on page 16-11, that it is not appropriate to make any changes to the structure or composition of Rate 1 at this time. The Company's opposition to creating a separate rate class for residential customers is based on the magnitude by which the rates for such a class would have to increase from present levels in order to recover 100 percent of the costs allocated to that class under the Heritage COSS.

Q. PLEASE COMMENT ON HERITAGE'S OPPOSITION TO THE CREATION OF A SEPARATE RATE CLASS FOR RESIDENTIAL CUSTOMERS ON THE GROUNDS OF AVOIDING RATE SHOCK.

A. I agree with the ratemaking principle of avoiding rate shock. However, there are two reasons why Heritage can avoid rate shock associated with the creation of a separate rate class for residential customers.

First, the level of increases in rates needed to achieve revenues equal to fully allocated costs for a new residential rate class could be somewhat less than the amounts Heritage has presented. The Heritage estimates are based upon the results of Chymko's allocation of costs among rate classes. Later in my evidence I describe why certain of those allocations are not reasonable and why a lower amount of cost should be allocated to Rate 1A.

Second, even if the Board accepts Chymko's allocation of costs among rate classes, making the transition to a R/C ratio closer to 1 may not be as difficult as Chymko has assumed. Heritage could phase in the increases in rates needed to achieve revenues from existing residential customers closer to fully allocated costs over a number of years. Later in my evidence I describe one approach for making that transition.

Q. IS HERITAGE'S OPPOSITION TO THE CREATION OF A SEPARATE RATE CLASS FOR RESIDENTIAL CUSTOMERS CONSISTENT WITH ITS STATED RATEMAKING OBJECTIVES OF ACHIEVING FAIRNESS WITHIN AND BETWEEN RATE CLASSES?

A. No. Heritage's opposition to creating a separate rate class for residential customers is not consistent with its stated ratemaking objectives of fairness within rate classes and fairness between rate classes. Those inconsistencies are

demonstrated by the results of the Chymko analyses of creating a Rate 1A and a Rate 1B, which are presented on pages 16-51 through 16-59 of the application.

Exhibit___(JRH-2) summarizes the results of Chymko's analyses of creating a Rate1A and a Rate 1B. Please note that, for the purpose of discussing this issue, I accept the results of Chymko's allocation of costs among rate classes. Later in my evidence I describe why certain of Chymko's cost allocations are not reasonable.

The Chymko analyses indicate that the average annual use of Rate 1A customers would be approximately 65 GJ while the average annual use of Rate 1B customers would be approximately fifteen times greater at 915 GJ.[2] The first key result of those analyses is the significant mismatch between the Site related costs Chymko allocated to those potential rate classes and the fixed cost per month that Heritage is currently recovering from customers who would be in those potential rate classes. Chymko allocated $199/month of site related fixed costs to Rate 1A and $257/month to Rate 1B.[3] In contrast, Heritage is currently charging Rate 1 customers a fixed cost per month of $19.[4] Thus, the current Rate 1 fixed cost per month only recovers approximately 10 percent of the allocated sited related fixed costs. That result is inconsistent with Heritage's stated ratemaking objective of fairness within rate classes, i.e. setting the fixed monthly charge as close as possible to the corresponding average unit cost.

[2] Line 4, Exhibit___(JRH-2).

[3] Line 8, Exhibit___(JRH-2).

[4] Line 12, Exhibit___(JRH-2).

The second key result of the Chymko analyses is that revenues from Rate 1A would recover only approximately 29% of the total cost allocated to that potential rate class, while revenues from Rate 1B would recover 130 percent of the total cost allocated to it.[5] It is important to recognize that these R/C ratios would not be caused by the creation of a new Rate 1A and a new Rate 1B to replace the existing Rate 1. On the contrary those R/C ratios, if correct, are currently occurring under Rate 1. They are just not being reported. Thus, the implication of the Chymko result is that Rate 1 customers using less than 150 GJ per year are paying for approximately 29% of the cost of serving them while Rate 1 customers using more than 150 GJ per year are paying for approximately 130% of the cost of serving them. This cross-subsidization, if correct, is also inconsistent with Heritage's stated ratemaking objective of fairness within and between rate classes. For example, if Rate 1A and Rate 1B were separate rate classes Heritage's goal would be to have their R/C ratios fall within a range of 95 percent and 105 percent.

Q. IS HERITAGE'S OPPOSITION TO THE CREATION OF A SEPARATE RATE CLASS FOR RESIDENTIAL CUSTOMERS CONSISTENT WITH THE RATEMAKING OBJECTIVE OF ECONOMIC EFFICIENCY?

A. No. Heritage's opposition to the creation of a separate rate class for residential customers is not consistent with the ratemaking objective of economic efficiency. Currently Heritage is charging Rate 1 customers a variable rate of $7.443/GJ.

[5] Line 16, Exhibit___(JRH-2).

The variable charge is well above the marginal variable cost that Heritage incurs to deliver one more GJ to those customers, or avoids by delivering one less GJ to those customers. The variable charge is above the marginal variable cost because Heritage is recovering a large amount of site related fixed cost through the variable charge. With a separate Rate 1B Heritage has the opportunity to improve the accuracy of its price signal, and hence improve economic efficiency, over time by recovering less of its fixed costs through the variable charge and more of its fixed costs through its fixed cost per month. That more accurate price signal will increase the incentive of customers to use natural gas, as opposed to other energy sources, in various applications.

In order to shift recovery of fixed costs from the variable charge to the fixed cost per month Heritage would have to gradually increase the fixed cost per month for Rate 1B customers from the current $19 closer to the site related fixed cost per month of $257 per month. If Heritage continues with its existing Rate 1 it is very unlikely that it will be able to make that change in rate design.

Q. IS HERITAGE'S OPPOSITION TO THE CREATION OF A SEPARATE RATE CLASS FOR RESIDENTIAL CUSTOMERS CONSISTENT WITH GENERALLY ACCEPTED RATEMAKING PRACTICE?

A. No. The purpose of a rate class is to group customers of comparable size and service characteristics together for purposes of determining the costs of providing

service to that homogeneous group, and the rates that should be charged to recover those costs.[6] [7]

The customers currently in Rate 1 are not comparable in size. As indicated in Exhibit___(JRH-3), the annual use of customers on Rate 1 varies from less 50 GJ per year to over 4,500 GJ per year..

Moreover, even if there a few commercial customers with annual use comparable to residential customers, it would be more appropriate to place those customers in a separate rate class for small commercial customers. For example, NSPI has separate rates for residential customers (Domestic) and small commercial (Small General) even though the customers on those two rates have similar levels of annual electricity use per customer. Some utilities have separate rate classes for residential customers and for small commercial customers because certain policies apply to residential customers and not commercial customers. One common special policy applicable to residential customers is a prohibition on terminating service to residential customers in arrears during winter months.

Q. DO YOU EXPECT THE CREATION OF A SEPARATE RATE CLASS FOR RESIDENTIAL CUSTOMERS WILL HELP ACHIEVE THE RATEMAKING GOALS LISTED AT THE OUTSET OF YOUR EVIDENCE?

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[6] *Gas Rate Fundamentals*, Fourth Edition, American Gas Association, pages 132 and 140

[7] *Gas Distribution Rate Design Manual*, June 1989, National Association of Regulatory Utility Commissioners, page 16.

A. Yes. In addition to improving fairness within, and among, rate classes as well as improving economic efficiency, the creation of a separate rate class for residential customers should lead to a more accurate allocation of costs among rate classes and more transparency regarding policies and decisions regarding adding customers to its system. The results of the Chymko analyses of Rate 1A illustrate the importance of those objectives.

First, according to the Chymko analyses, it is reasonable to allocate every customer $122 per month of Site related mains cost regardless of whether the customer uses less 50 GJ per year or more than 50,000 GJ per year.[8] Second, Heritage apparently believes that a 29% R/C ratio for customers using less than 150 GJ per year is justified by an assumption that it will eventually start collecting a material contribution to the recovery of distribution main and other system-wide costs from that group of customers. For example, Chymko states as a general principle that "Adding new customers improves the utility's economies of scale and has the beneficial effect of lowering the average cost per customer for all customers".[9]

My review of the Chymko results regarding a potential Rate 1A provide valuable insights into the validity of those two Heritage positions. Specifically my review indicates that it may not be reasonable to allocate every customer $122 per month of Site related mains cost regardless of whether the customer uses

[8] $122 per month = $131.80 – $9.96 per Schedule 1.3, 2012 Unit Costs, page 16-73 of filing.

[9] Application, page 16-30, paragraph 44.

any annual quantity from less than 50 GJ to more than 50,000 GJ. My review also indicates that Heritage's proposed rate increases will not materially increase the contribution from customers using less than 150 GJ per year to recovery of distribution main and other system-wide costs.

Q. PLEASE DESCRIBE YOUR REVIEW OF THE CHYMKO ESTIMATES OF THE FULLY ALLOCATED COST OF SERVING RESIDENTIAL AND OTHER LOW USAGE CUSTOMERS.

A. My review of the Chymko estimates of the fully allocated cost of serving residential and other customers using less than 150 GJ per year is presented in Exhibit ___(JRH-4). The Exhibit analyzes the R/C ratios of Rate1A eligible customers using all of the costs Chymko allocated to that potential rate class as well as for a sub-set of costs excluding all Demand related costs Chymko allocated as well as the Site related mains costs it allocated. The Exhibit analyzes the R/C ratios for customers using 65 GJ per year, 27 GJ per year and 113 GJ per year. These levels of annual consumption represent the average annual use of all customers eligible for Rate 1A, of customer using less than 50 GJ per year and customers using between 100 and 150 GJ per year respectively.

- Column A of the Exhibit, titled *Heritage filing average customer eligible for potential Rate 1A*, presents the R/C ratio for a Rate 1A customer with annual use of 65 GJ based upon Chymko's allocation of costs to Rate 1A. According to the Chymko allocation, the fully allocated cost of serving that

customer is $222 per month while the revenues per month at current rates are $65 which results in an R/C ratio of 29 percent.[10]

- Column B of the Exhibit presents the R/C ratio for a Rate 1A customer with annual use of 65 GJ excluding all Demand related costs and all Site related mains costs allocated to Rate 1A. In other words the cost of serving that customer is limited to the allocated cost of the service line, meter and Company administrative costs. That sub-set of allocated costs is $62.36 per month while the revenues per month remain the same $65 which results in an R/C ratio of 104 percent.
- Columns C and D present presents the R/C ratios for Rate 1A customers with annual uses of 27 GJ and 113 GJ respectively, again excluding all Demand related costs and all Site related mains costs allocated to Rate 1A. Their results are R/C ratios of 62 percent and 156 percent respectively.

Q. PLEASE DISCUSS THE IMPLICATIONS OF YOUR REVIEW OF THE CHYMKO ESTIMATES OF THE FULLY ALLOCATED COST OF SERVING RESIDENTIAL AND OTHER CUSTOMERS WITH ANNUAL USE LESS THAN 150 GJ.

A. As noted earlier, my review of the Chymko results regarding a potential Rate 1A has implications for Chymko's allocation of Site related mains cost as well as for Heritage's strategy for materially increasing the contribution of customers with

[10] Lines 6, 10 and 11 of Exhibit___(JRH-4).

annual use less than 150 GJ to recovery of distribution main and other system-wide costs.

Exhibit___(JRH-4) demonstrates that revenues from customers with annual use less than approximately 60 GJ are not making any contribution to the Demand related costs and Site related mains costs allocated to them. In addition, it indicates that customers with annual use between 60 GJ and 150 GJ are making only a modest contribution recovery of those costs. However, the majority of the allocated costs not being recovered are Site related mains costs of $122 per month per site. Later in my evidence I explain why that amount is too high to allocate to Rate 1A.

Exhibit___(JRH-4) also indicates that Heritage's proposed rate increases will not materially increase the contribution from customers using less than 150 GJ per year to recovery of distribution main and other system-wide costs. As indicated in column A, the shortfall in recovery of Chymko allocated costs for a customer using 65 GJ per year is $156.51 per month.[11] If those allocated costs remained constant and the annual revenues from that customer increased by 10 percent, the customer contribution would only increase by $6.50/month and the shortfall would decrease to $150/month.

Q. PLEASE COMMENT ON THE FACT THAT HERITAGE'S CURRENT RATES DO NOT RECOVER ITS FULLY ALLOCATED CONNECTION COSTS FROM RESIDENTIAL CUSTOMERS WITH ANNUAL USE LESS THAN 60 GJ.

[11] $157 per month = $221.57 - $ 65.06 per Column A lines 6 and 10 of Exhibit___(JRH-4).

A. The analyses in Exhibit___(JRH-4) indicate that Heritage's current rates are not recovering 100 percent of Chymko's allocated costs of service lines, meter sets and administrative costs from customers with annual use less than approximately 60 GJ. These results are surprising since the Company has at least 488 customers using less than 50 GJ per year and since provision 3.1.4 of its *Distribution Service Rules* states that Heritage does not have to connect any customer if it determines the economic benefits will not justify the costs. In addition section 3.3 of its *Distribution Service Rules* indicates that even if an existing distribution main is available the Company has the right to ask a prospective residential customer for a contribution towards the cost of the service line if that prospective customer does not plan to use gas for space heating and water heating.

It appears that this shortfall is attributable to the fact that the Company only began begin applying the requirements in its Distribution Service Rules to every prospective customer in 2010, Response to Consumer Advocate -IR-30 b. However, it is not clear that Heritage is now applying those requirements to have prospective customer. For example, the feasibility analysis that Heritage provided in Response to Synapse Energy-IR-22 does not identify contributions in aid of construction from the 45 residential customers with annual use of 30 GJ.

D. COST ALLOCATION AND RATE DESIGN

Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR EVIDENCE?

A. In this section I present my review of the COSS prepared by Chymko and the rates Chymko is recommending based upon that study. The results of the Chymko COSS are described on pages 16-3 to 16-8 of the application. The study is described on pages 16-12 through16-39 of the application.

Q. PLEASE SUMMARIZE THE METHOD CHYMKO USED TO PREPARE ITS COSS.

A. Chymko prepared its COSS following the three standard steps, i.e., functionalization, classification and allocation.

- In the functionalization step Chymko grouped the Company's revenue requirements according to six functions - elevated pressure, regulating stations, mains, service, metering, accounting & sales and other revenue.
- In the classification step Chymko attempted to identify the major factors which cause the Company to incur the costs in each function. Chymko identified three major factors which cause the Company to incur these costs – demand, annual energy/volume and sites (customers).
- In the allocation step Chymko allocated the costs by function among the three rate classes using allocation factors corresponding to demand, annual energy/volume and sites.

Q. IS CHYMKO PROPOSING AN ALLOCATION OF REVENUE REQUIREMENTS AND DEVELOPMENT OF RATES BASED SOLELY UPON THE RESULTS OF

ITS COSS?

A. No. Chymko used the results of its COSS as a guide, in conjunction with consideration of other ratemaking criteria, to develop its recommended allocation of revenue requirements and rates.

Q. PLEASE SUMMARIZE CHYMKO'S RECOMMENDED ALLOCATION OF HERITAGE'S PROPOSED REVENUE REQUIREMENTS.

A. Heritage has proposed a cumulative increase in its total, system-wide rate revenues of 25 percent over three years, 2012 through 2014. Based upon its cost allocation study Heritage is proposing to increase its Rate 1 revenues by 24.5 percent, essentially equal to the system-wide average. The Company is proposing to increase Rate 2 revenues by 20.8 percent, 84 percent of the system wide average, and to increase Rate 3 revenues by 34.5 percent, 139 percent of the system wide average. The percentage increases in total bills in each Rate class are lower because the increases only apply to the distribution service portion of customer bills.

Q. DO YOU HAVE ANY CONCERNS REGARDING CHYMKO'S RECOMMENDED ALLOCATION OF REVENUE REQUIREMENTS?

A Yes.

First, as noted earlier, the Chymko COSS underlying its recommended allocation of revenue requirements does not include a Rate 1A and Rate 1B. Therefore Chymko has not provided a recommended allocation of revenue requirements, and associated rates, for a Rate1A and a Rate 1B.

Second, as noted earlier, Chymko has allocated every customer $122 per month of Site related mains cost regardless of whether the customer uses less 50 GJ per year or more than 50,000 GJ per year. This allocation results from Chymko's classification of distribution main costs as 54 percent site related, which leads to an unreasonable amount of distribution main costs allocated to Rate 1. (Chymko classified the remaining 46 percent of distribution main costs as demand related.) Since Heritage has incurred distribution main costs based largely upon the amount of energy related revenues expected from prospective customers, classifying 54 percent of distribution main costs as energy related produces a more equitable allocation of distribution main costs.

I have re-run the Chymko cost of service model in order to illustrate the impact of those two concerns.

Q. BEFORE EXPLAINING THE SPECIFIC BASIS FOR YOUR COMMENT REGARDING CHYMKO'S CLASSIFICATION OF HERITAGE DISTRIBUTION MAIN COSTS, PLEASE SUMMARIZE THE GENERAL DIFFICULTY OF CLASSIFYING AND ALLOCATING THAT CATEGORY OF COSTS.

A. Gas distribution main costs are generally difficult to classify and allocate because they are joint and common costs. The relative causality of those costs must be hypothesized and hence is the subject of disagreement among analysts. It is generally recognized that cost-of-service studies are not exact. Their development involves judgments as to data and methodology, about which competent analysts can and do disagree (page 131, Gas Rate Fundamentals, Fourth Edition, American Gas Association; page 20, Gas Distribution Rate

Design Manual, June 1989, National Association of Regulatory Utility Commissioners). Moreover, cost-of-service studies, despite their apparent complexity, often reflect rough approximations of actual relationships.

Distribution mains enable a utility to deliver gas in all hours of the year, including times of maximum demand, to customers in all rate classes. Because mains serve multiple purposes it is difficult to identify a strong cost causation link between those costs and any single cost causation factor, i.e. demand, energy, sites (customers). As a result, utilities use a variety of approaches to classify and allocate distribution main costs.

Chymko has identified three different methods of classifying distribution main costs, each of which are based on the same underlying premise that distribution main costs are partially demand related and partially site related. The three different methods are diameter-length, minimum plant and zero-intercept. The Chymko report indicates that Canadian utilities classify as much as 70 percent of distribution mains as site (customer) related and as little as 70 percent, Exhibit___(JRH-5). Each of those three methods assumes the site related portion of distribution main costs is the minimum amount that the utility incurs to extend its distribution system to serve every customer. Thus the cost causation assumption is that each customer has caused the utility to incur a minimum amount of distribution costs for the sole purpose of making distribution service physically available to that customer, regardless of that customer's actual usage.

Distribution main cost can also be classified using a fourth approach, as partially demand related and partially energy related. The cost causation assumption underlying this method is gas utility decisions to invest in distribution mains is primarily driven by the energy related revenues the utility expects to collect from prospective customers. That cost causation link reflects a major difference between electric utilities and gas utilities. Electric distribution utilities are typically obligated to connect every prospective customer to their grid. In contrast, most gas utilities do not have an obligation to extend their distribution mains in order to make gas service available to customers whose revenues will not cover the cost of that extension.

Q. PLEASE EXPLAIN THE SPECIFIC BASIS FOR YOUR DISAGREEMENT WITH CHYMKO'S CLASSIFICATION OF 54 PERCENT OF HERITAGE DISTRIBUTION MAIN COSTS AS SITE RELATED.

A. Chymko's classification of 54 percent of Heritage distribution main costs as site related is not consistent with the evidence regarding the major factors which have driven Heritage's investments in distribution mains.

Chymko assumes a cost causation link between the number of Heritage sites (customers) and its distribution main costs. However, in response to a request for all analyses and evidence underlying this assumption, Chymko stated that it is "…implicitly assuming that such a relationship exists", Response to Synapse-IR-21. That response does not prove the existence or strength of the assumed cost causation link.

In contrast, there is substantial empirical evidence demonstrating that Heritage decisions to incur distribution costs are "caused" or driven by the annual energy use of prospective customers and the revenues it expects to recover from those customers. First, Heritage has had a policy of preparing an economic feasibility analysis of proposed extensions of its distribution mains for several years. Second, the Board requires Heritage to demonstrate the economic feasibility of proposed extensions. Third, the Company's *Gas Distribution Rules* have several provisions to ensure Heritage recovers the cost of incurring the cost of distribution main extensions, provision 3.1.4 and 3.3.6. Fourth, Heritage recovers approximately 80 percent of its revenues as a function of customer annual energy use, i.e. from their variable rate revenues, as shown in Exhibit___(JRH-6). Fifth, Heritage has indicated that it would not invest in distribution main extensions in the absence of large use customers (Responses to Synapse-IR-7 e and IR- 22)

Classifying 54 percent of Heritage distribution main costs as energy related is consistent with the ratemaking objectives I listed at the outset of my testimony. Under this approach each customer will be expected to contribute to the recovery of distribution main costs, but the amount of each customer's expected contribution will be consistent with that customer's actual annual use of the system.

Q. PLEASE SUMMARIZE YOUR RECOMMENDED ALLOCATION OF REVENUE REQUIREMENTS BASED UPON YOUR RE-RUN OF THE CHYMKO COST OF SERVICE MODEL.

A. My recommended allocation begins with the same total annual revenue requirements for 2012 through 2014 as Chymko. It allocates those revenue requirements using a Rate 1A and a Rate 1B in addition to Rate 2 and Rate 3. The only other difference from the Chymko allocation is the classification of 54 percent of distribution main costs as energy related rather than site related. The key results of my re-run are presented in Exhibit___(JRH-7).

Based upon that re-run, my analysis produces a lower cumulative increase than Chymko for the equivalent of Rate 1, i.e., 18.2 percent versus 24.5 percent. However, in order to move Rate 1A revenues closer to allocated costs, the cumulative increase for Rate 1A would be 26.0 percent by 2014. The cumulative increase for Rate 1B would be somewhat lower, at 21.0 percent by 2014. In order to minimize rate shock to the other rate classes Rate 1B had to have an increase of this magnitude. Rate 2 and Rate 3 have cumulative increases by 2014 of 34.9 percent and 37.9 percent respectively. These cumulative increases are within 150 percent of the system-wide cumulative increase, which is a guideline I use as a limit on rate shock.

The percentage increases in total bills of customers in each Rate class would be lower because these increases only apply to the distribution service portion of customer bills. Exhibit__(JRH-7), page 3 provides illustrative estimates of bill impacts for the same representative customers in each rate class as used by Chymko.

These revenue requirements begin the process of moving the revenues of each rate class closer to allocated costs, as I have allocated those costs.

However, that process must be accomplished gradually in order to minimize rate shock.

In developing rates to collect these revenue requirements I have generally kept the fixed cost per month at the levels proposed by Chymko. The one exception is Rate 1B, whose current fixed cost per month is about a tenth of the site related costs. My analysis raises the Rate 1B fixed cost per month from $19 in 2011 to $100 by 2014.

Q. DID YOU EXERCISE JUDGMENT WHEN ALLOCATING REVENUE REQUIREMENTS AND RATES TO COLLECT THOSE REVENUE REQUIREMENTS?

A. Yes. My allocation of revenue requirements was guided by the results of my re-run of the Chymko cost of service model as well as by the other principles of ratemaking. It is certainly possible that other parties may have useful suggestions regarding the specific level of increases each rate class should experience each year as well as regarding the specific changes in rates that should be adopted to collect those revenue requirements.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.

List of Exhibits

James Richard Hornby

PROFESSIONAL EXPERIENCE

Synapse Energy Economics, Inc., Cambridge, MA.
Senior Consultant, 2006 to present.
Provides analysis and expert testimony regarding planning, market structure, ratemaking and supply contracting issues in the electricity and natural gas industries.

Charles River Associates (formerly Tabors Caramanis & Associates), Cambridge, MA.
Principal, 2004-2006, *Senior Consultant,* 1998–2004.
Provided expert testimony and litigation support in energy contract price arbitration proceedings and various utility ratemaking proceedings. Managed a major productivity improvement and planning project for two electric distribution companies in Abu Dhabi. Analyzed a range of market structure and contracting issues in wholesale electricity markets.

Tellus Institute, Boston, MA.
Vice President and Director of Energy Group, 1997–1998.
Presented expert testimony on rates for unbundled retail services in restructured retail markets and analyzed the options for purchasing electricity and gas in those markets.
Manager of Natural Gas Program, 1986–1997.
Prepared testimony and reports on a range of gas industry issues including market structure, unbundled services, ratemaking, strategic planning, market analyses, and supply planning.

Nova Scotia Department of Mines and Energy, Halifax, Canada.

Member, Canada-Nova Scotia Offshore Oil and Gas Board, 1983–1986.
Member of a federal-provincial board responsible for regulating petroleum industry exploration and development activity offshore Nova Scotia.

Assistant Deputy Minister of Energy 1983–1986.
Responsible for analysis and implementation of provincial energy policies and programs, as well as for Energy Division budget and staff. Directed preparation of comprehensive energy plan emphasizing energy efficiency and use of provincial energy resources. Senior technical advisor on provincial team responsible for negotiating and implementing a federal/provincial fiscal, regulatory, and legislative regime to govern offshore oil and gas. Also served as Director of Energy Resources (1982-1983) and Assistant to the Deputy Minister. (1981-1982)

Nova Scotia Research Foundation, Dartmouth, Canada, *Consultant,* 1978–1981.
Canadian Keyes Fibre, Hantsport, Canada, *Project Engineer,* 1975–1977.
Imperial Group Limited, Bristol, England, *Management Consultant,* 1973–1975.

EDUCATION

M.S., Technology and Policy (Energy), Massachusetts Institute of Technology, 1979.
B.Eng., Industrial Engineering (with Distinction), Dalhousie University, Canada, 1973.

Exhibit ___(JRH-2)

Rate 1 Revenue to Cost Ratios at Various Levels of Annual Energy Use (Revenues at 2011 Rates, Heritage 2012 Revenue Requirements)

	Line / Column	Potential Rate 1A	Potential Rate 1B	Existing Rate 1
		A	B	C
Load Data (2012)				
Sites (year end)	1	2,274	1,613	3,887
NCP Demand (GJ/day)	2	1,492	11,475	12,967
Annual Energy (GJ × 1000)	3	148,719	1,475,113	1,623,833
Annual Energy per year-end site	**4 = 3 /1**	**65**	**915**	**418**
Sites - Billed	5	24,146	17,441	41,587
Annual bills per year-end site	6 = 4 / 1	10.62	10.81	10.70
Monthly energy per year-end site per bill (GJ)	7 = 3/1	6	85	39
Chymko 2012 Cost of Service per Bill				
Site related ($/bill)	8	**$ 199.09**	**$ 257.25**	**$ 224.23**
Demand related ($/bill)	9	$ 21.52	$ 229.11	$ 108.58
Energy related ($/bill)	10	$ 0.96	$ 13.17	$ 6.08
Total ($/bill)	11 = 8+9+10	$ 221.57	$ 499.53	$ 338.89
Revenues per Bill at 2011 rates				
from Fixed Monthly ($/bill)	12	**$ 19.22**	**$ 19.22**	**$ 19.22**
from Demand charge ($/bill)	13	$ -	$ -	$ -
from Variable Rate ($/bill)	14	$ 45.84	$ 629.51	$ 290.62
Total ($/bill)	15 = 12+13+14	$ 65.06	$ 648.73	$ 309.84
Revenue to Cost Ratio	16 = 15 / 11	**29%**	**130%**	**91%**

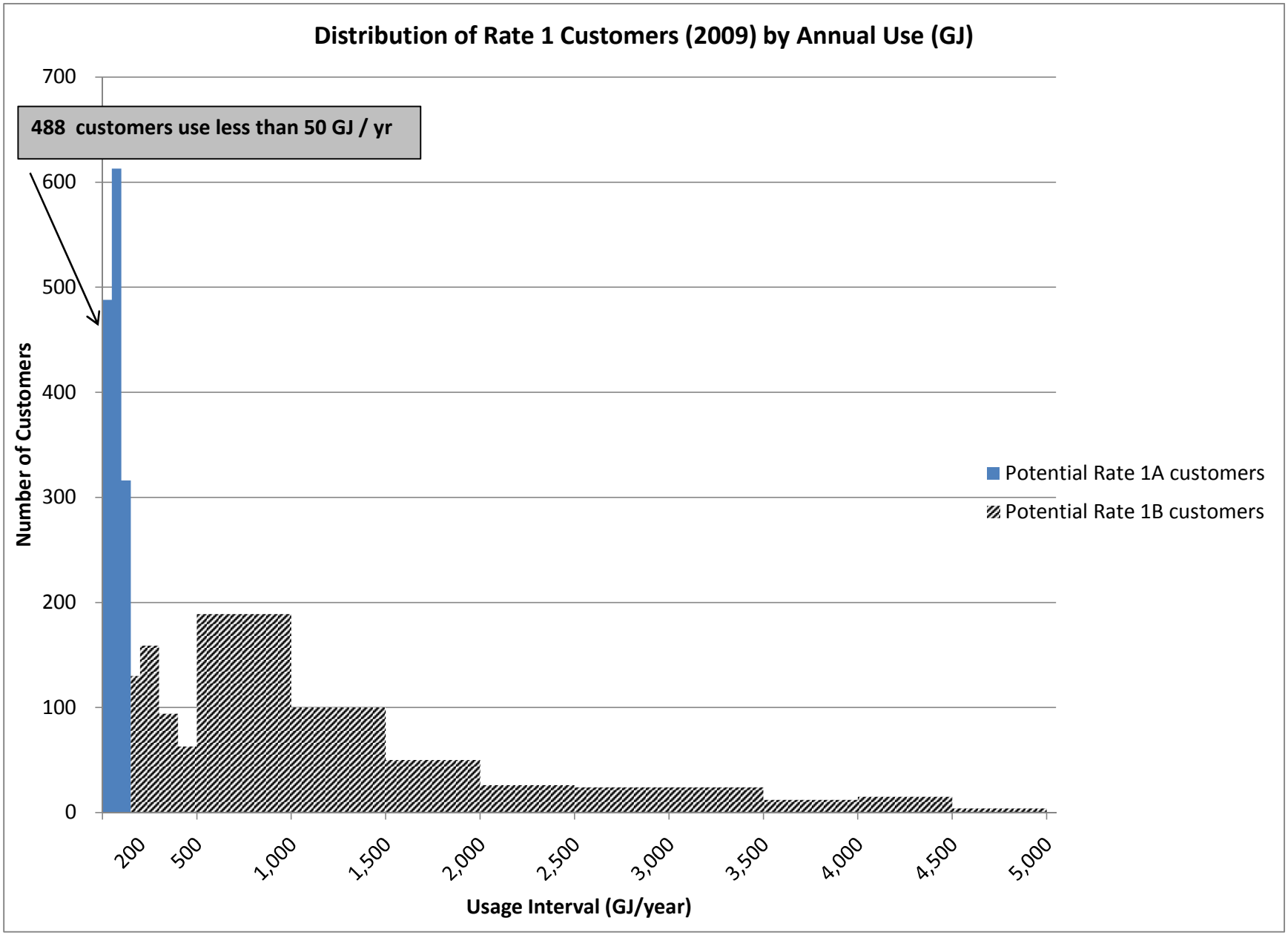
Notes references are to Tables in Heritage filing unless noted otherwise

1, 2,3 Table 24

5 Schedule *3.2alt 1, HG 2011 Cost Allocation & Rates (15 Jun 11)*

8 to 11 Column A from Table 25

		Potential Rate 1A	Potential Rate 1B	Existing Rate 1
9	Line 6 * Demand Unit Cost ($/GJ)	$ 3.49	$ 2.71	$ 2.78
10	Line 6 * Energy Unit Cost ($/GJ)	$ 0.16	$ 0.16	$ 0.16
12	Fixed Charge	19.220	19.220	19.220
14	Line 6 * Delivery Charge ($/GJ)	7.443	7.443	7.443



Sources: Application, Schedule A page 16-61 and workbook to Exhibit JRH - 3

Rate 1A Revenue to Cost Ratios with, and without, Demand related costs and Site related Mains Costs (Revenues at 2011 Rates, Heritage 2012 Revenue Requirements)

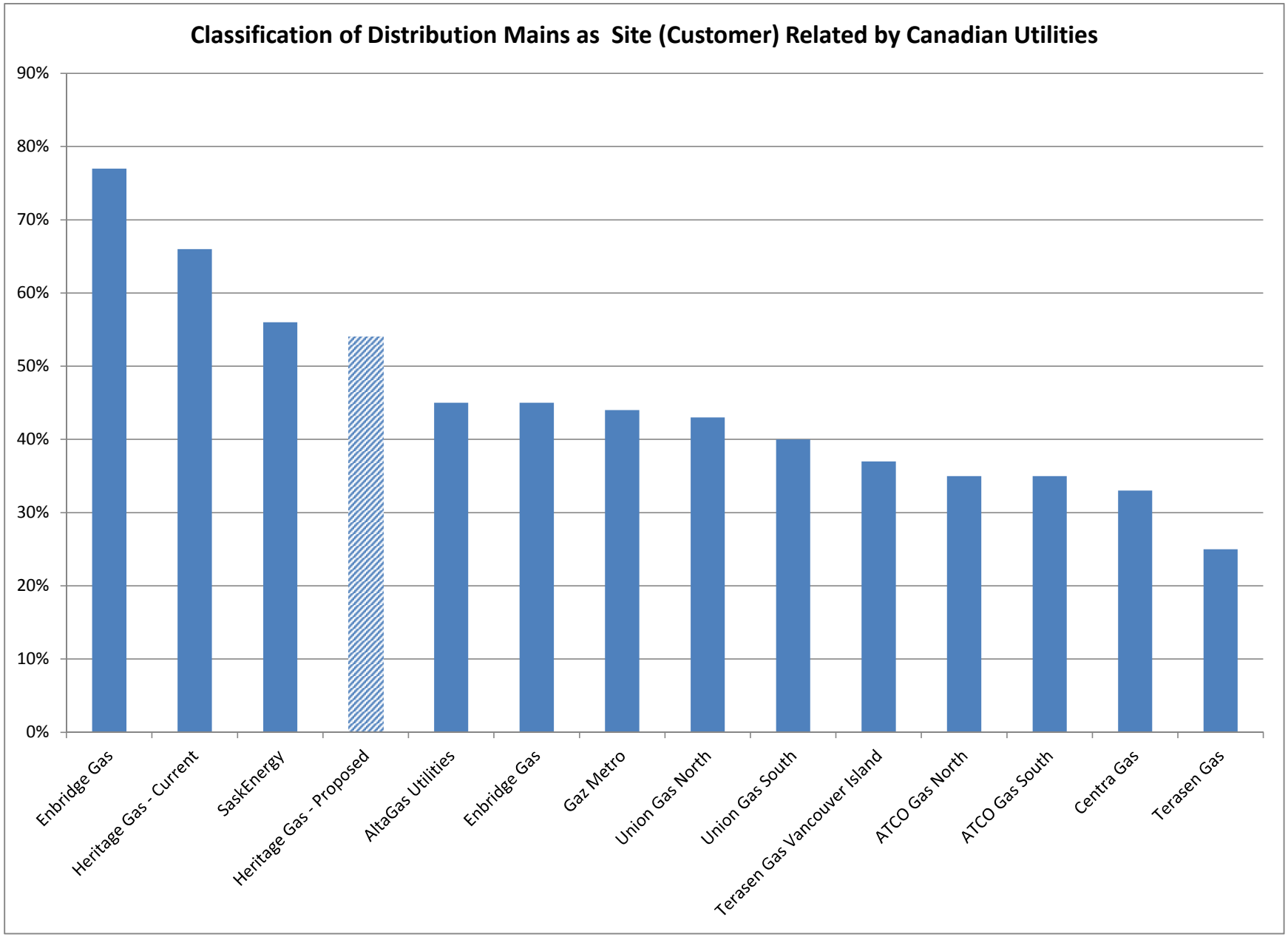
	Line / Column	Heritage filing	Heritage filing excluding all Demand related costs and all Site related mains costs		
		A	B	C	D
Customers eligible for potential Rate 1A		**Average customer eligible for potential Rate 1A**	**Average customer eligible for potential Rate 1A**	**Customers using 0 to 49 GJ**	**Customers using 100 to 149 GJ**
Energy Use level					
Annual Energy per year-end site	**1**	**65**	**65**	**27**	**113**
Energy per monthly bill year-end site (GJ)	2 = 1 / 10.62	6	6	3	11
HG Cost of Service per Monthly Bill in 2012					
Site related ($/bill)	3	$ 199.09	$ 61.40	$ 61.40	$ 61.40
Demand related ($/bill)	4	$ 21.52	$ -	$ -	$ -
Energy related ($/bill)	5	$ 0.96	$ 0.96	$ 0.40	$ 1.66
Total ($/bill)	6 = 3+4+5	**$ 221.57**	**$ 62.36**	**$ 61.79**	**$ 63.06**
Revenues per Monthly Bill at 2011 rates					
from Fixed Monthly ($/bill)	7	$ 19.22	$ 19.22	$ 19.22	$ 19.22
from Demand charge ($/bill)	8	$ -	$ -	$ -	0
from Variable Rate ($/bill)	9	$ 45.84	$ 45.84	$ 18.93	$ 79.21
Total ($/bill)	10 = 7+ 8 +9	$ 65.06	$ 65.06	$ 38.15	$ 98.43
Revenue to Cost Ratio	11 = 110 / 6	**29%**	**104%**	**62%**	**156%**

Note

1 Schedule A, *HG 2011 Cost Allocation & Rates (15 Jun 11) alt1*

3 to 11 Column A data from Exhibit___(JRH-2)

3, 4 Column B to D values derived in Workbook to Exhibit JRH-4



Sources : Application, pages 16-135 to 16-140, and Workbook to Exhibit JRH-5

Heritage Revenues by Rate Class and Rate Component at Current and Proposed Rates

Annual Revenues	Line / Column	Rate 1	Rate 2	Rate 3	Total Company
		A	B	C	
2011 rates					
from Fixed Monthly ($/bill)	1	$ 799,302	$ 1,181,380	$ 191,572	$ 2,172,255
from Demand charge ($/bill)	2	$ -	$ -	$ 2,332,386	$ 2,332,388
from Variable Rate ($/bill)	3	$ 12,086,185	$ 4,432,436	$ 197,448	$ 16,716,073
Total ($/bill)	4 = 1 + 2+ 3	$ 12,885,488	$ 5,613,816	$ 2,721,406	$ 21,220,710
Portion of Revenues from Variable Rate	5 = 3 / 4	**94%**	**79%**	**7%**	**79%**
Proposed 2012 rates					
from Fixed Monthly ($/bill)	6	$ 923,827	$ 1,181,380	$ 191,572	$ 2,296,785
from Demand charge ($/bill)	7	$ -	$ -	$ 2,925,497	$ 2,925,504
from Variable Rate ($/bill)	8	$ 12,988,561	$ 4,879,825	$ 201,093	$ 18,069,488
Total ($/bill)	9 = 6 + 7+ 8	$ 13,912,387	$ 6,061,206	$ 3,318,162	$ 23,291,755
Portion of Revenues from Variable Rate	10 =8 / 9	**93%**	**81%**	**6%**	**78%**

Source - Schedule 1.1, 2012 Rate Design, page 16-66 of Application.

Comparison of Proposed Allocations of Revenue Requirements - Chymko and Synapse

Chymko

Revenue Based on Rate Recommendations

Year	Rate 1	Rate 2	Rate 3	Total
2011	$ 10,474,691	$ 4,994,013	$ 2,598,787	$ 18,067,490
2012	$ 13,912,387	$ 6,061,206	$ 3,318,162	$ 23,291,755
2013	$ 17,656,814	$ 6,971,793	$ 3,975,964	$ 28,604,571
2014	$ 21,222,410	$ 7,518,447	$ 4,171,179	$ 32,912,035

Year-Over-Year Rate Increases

Year	Rate 1	Rate 2	Rate 3	Average
2012	8.0 %	8.0 %	21.9 %	9.8 %
2013	9.8 %	9.8 %	7.6 %	9.5 %
2014	6.7 %	3.0 %	4.9 %	5.6 %
Cumulative	**24.5%**	**20.8%**	**34.5%**	**24.9%**
Cumulative change relative to system-wide	**98%**	**84%**	**139%**	**100%**

Revenue to Cost Ratio

Year	Rate 1	Rate 2	Rate 3	Total
2012	98.7 %	102.7 %	100.6 %	100.0 %
2013	98.2 %	104.7 %	100.4 %	100.0 %
2014	99.0 %	103.0 %	100.1 %	100.0 %

Synapse

Revenue Based on Rate Recommendations

Year	Rate 1A (<150 GJ)	Rate 1B (150-5,000 GJ)	Rate 1 Equivalent	Rate 2	Rate 3	Total
2011	$ 1,431,342	$ 9,043,348	$ 10,474,691	$ 4,994,013	$ 2,598,787	$ 18,067,490
2012	$ 1,728,105	$ 11,880,207	$ 13,608,312	$ 6,366,048	$ 3,317,394	$ 23,291,755
2013	$ 2,309,877	$ 14,416,184	$ 16,726,061	$ 7,779,322	$ 4,099,188	$ 28,604,571
2014	$ 3,140,562	$ 16,937,515	$ 20,078,077	$ 8,529,811	$ 4,304,148	$ 32,912,035

Year-Over-Year Rate Increases

Year	Rate 1A (<150 GJ)	Rate 1B (150-5,000 GJ)	Rate 1 Equivalent	Rate 2	Rate 3	Average
2012	10.0%	5.0%	5.6%	13.4%	21.9%	9.8%
2013	8.0%	8.0%	6.3%	16.7%	11.0%	9.6%
2014	8.0%	8.0%	6.3%	4.8%	5.0%	5.7%
Cumulative	**26.0%**	**21.0%**	**18.2%**	**34.9%**	**37.9%**	**25.1%**
Cumulative change relative to system-wide	**104%**	**84%**	**72%**	**139%**	**151%**	**100%**

Revenue to Cost Ratio

Year	Rate 1A (<150 GJ)	Rate 1B (150-5,000 GJ)	Rate 1 Equivalent	Rate 2	Rate 3	Total
2012	78.9%	148.9%	133.8%	80.4%	63.8%	100.0%
2013	77.7%	143.1%	128.2%	85.0%	64.0%	100.0%
2014	**80.7%**	**142.3%**	**127.1%**	**83.4%**	**62.5%**	**100.0%**

Sources

Chymko Schedule 1.0, page 16-65 of Application.
Synapse Schedule 1, *Re-run HG 2011 Cost Allocation & Rates (15 Jun 11) energy alt1*

Comparison of Proposed Allocations of Revenue Requirements - Chymko and Synapse

Recommended Rates

Chymko

Fixed Monthly Rate ($/Mo)

Year	Rate 1	Rate 2	Rate 3
2011	$ 19.22	$ 562.83	$ 1,995.54
2012	$ 22.21	$ 562.83	$ 1,995.54
2013	$ 23.07	$ 562.83	$ 1,995.54
2014	$ 23.07	$ 562.83	$ 1,995.54

Variable Rate ($/GJ)

Year	Rate 1	Rate 2	Rate 3
2011	$ 7.443	$ 2.156	$ 0.114
2012	$ 7.999	$ 2.374	$ 0.116
2013	$ 8.819	$ 2.663	$ 0.116
2014	$ 9.456	$ 2.762	$ 0.116

Demand Rate ($/GJ/Mo)

Year	Rate 1	Rate 2	Rate 3
2011			$ 23.14
2012			$ 29.02
2013			$ 31.53
2014			$ 33.27

Synapse

Fixed Monthly Rate ($/Mo)

Year	Rate 1A (<150 GJ)	Rate 1B (150-5,000 GJ)	Rate 2	Rate 3
2011	19.220	19.220	562.830	1,995.540
2012	19.220	38.440	562.830	1,995.540
2013	19.220	76.000	562.830	1,995.540
2014	19.220	100.000	562.830	1,995.540

Variable Rate ($/GJ)

Year	Rate 1A (<150 GJ)	Rate 1B (150-5,000 GJ)	Rate 2	Rate 3
2011	7.443	7.443	2.156	0.114
2012	8.499	7.599	2.522	0.117
2013	9.434	7.628	3.039	0.181
2014	10.442	7.845	3.212	0.188

Demand Rate ($/GJ/Mo)

Year	Rate 1A (<150 GJ)	Rate 1B (150-5,000 GJ)	Rate 2	Rate 3
2011			-	23.136
2012			-	29.000
2013			-	31.534
2014			-	33.236

Sources

Chymko Schedule 1.0, page 16-65 of Application.

Synapse Schedule 1, *Re-run HG 2011 Cost Allocation & Rates (15 Jun 11) energy alt1*

Impact of Proposed Rate Increases

Rate 1A Customers

Typical Residential Customer with Annual Consumption of 100 GJs:

Year	Monthly Increase Without Commodity	Percentage Increase	Monthly Increase With Commodity	Percentage Increase
2012	$ 8.80	10.8%	$ 8.80	6.9%
2013	$ 7.79	8.6%	$ 7.79	5.7%
2014	$ 8.40	8.6%	$ 8.40	5.8%

Rate 1B Customers

Typical Small Business Customer with Annual Consumption of 600 GJs:

Year	Monthly Increase Without Commodity	Percentage Increase	Monthly Increase With Commodity	Percentage Increase
2012	$ 27.03	6.9%	$ 27.03	4.0%
2013	$ 39.01	9.3%	$ 39.01	5.6%
2014	$ 34.83	7.6%	$ 34.83	4.7%

Rate Class 2 Customers

Annual Consumption - 11,000 GJs:

Year	Monthly Increase Without Commodity	Percentage Increase	Monthly Increase With Commodity	Percentage Increase
2012	$ 335.40	13.2%	$ 335.40	4.3%
2013	$ 473.67	16.5%	$ 473.67	5.9%
2014	$ 159.36	4.8%	$ 159.36	1.9%

Rate Class 3 Customers

Annual Consumption - 195,000 GJs:

Year	Monthly Increase Without Commodity	Percentage Increase	Monthly Increase With Commodity	Percentage Increase
2012	$ 4,736.47	21.2%	$ 4,736.47	4.4%
2013	$ 3,063.06	11.3%	$ 3,063.06	2.7%
2014	$ 1,480.37	4.9%	$ 1,480.37	1.3%

Sources Table 16.7 of application
Response Synapse-IR-4