

STAFF INTERROGATORY #14

INTERROGATORY

**Issue 2 – Cost Consequences**

Topic: Geothermal Energy Service (GES) Program – Calculation of Service Fees

Ref: Exhibit B / Tab 1 / Schedule 1 / pp. 27-28, #81 and #82

Preamble:

Enbridge Gas indicates that the estimated capital costs for the installation of the geothermal loops are based on unit costs for drilling and trenching. Further, the estimated capital costs will also include construction management, commissioning and quality assurance with contingencies based on geographical and geological construction uncertainties.

Enbridge Gas also indicates the operating and maintenance expenses for the program includes periodic inspection and maintenance, customer care and billing cost, overhead and management costs plus a one-time setup and development costs.

Questions:

- a) Please outline the unit costs for:
  - i) A Geothermal loop
  - ii) Drilling
  - iii) Trenching
  - iv) Construction
  - v) Commissioning
  - vi) Quality Assurance
  - vii) O&M expense (which would include customer care, billing costs, overhead, periodic inspection and maintenance, etc.)
- b) For the unit costs outlined in a) above, please discuss how these costs were determined and provide all supporting documentation including data, assumptions and analysis.
- c) For the unit costs outlined in a) above, please explain how these costs would change with different geography and geology in Ontario.

- d) Please explain whether the unit costs outlined in a) above, would change if Enbridge Gas installed a geothermal loop in an existing gas heated home vs. a new construction.
- e) Please describe the one-time setup and development costs (e.g., the amount and why this is needed)? Please explain how this cost will be recovered?
- f) For the O&M expenses outlined in a), please provide the costs for each of the following:
- Periodic inspection and maintenance
  - Customer case
  - Overhead and management
  - Billing
- g) Please explain whether Enbridge Gas has to modify its billing system to incorporate its GES Program? If so, what are the costs associated with this modification and how will this cost be recovered?

## RESPONSE

- a) i) The installation costs of loop for new construction is estimated to be \$3,000/Tonne of loop installed, and for retrofit market \$3,200/Tonne of loop installed
- ii) The unit cost above includes drilling
- iii) The unit cost above includes trenching
- iv) The unit cost above includes construction. There are also additional non-unit capital costs related to construction, in relation to construction supervision, inspection, customer connection, and work management during the construction period.
- v) See iv) above. In addition, the commissioning of the heat pump is performed by the heat pump contractor, and would be part of the heat pump installation contracted by the homeowner. However, Enbridge would have inspectors quality assuring the construction and commissioning process.
- vi) See responses to iv) and v) above
- viii) The O&M costs are a blend of unit costs and allocated costs. Unit costs include periodic inspection and maintenance, billing, customer care, and potential loop replacement. Allocated costs include finance and accounting, supply chain, administration, engineering and management costs. As more customers are added, the unit costs of O&M associated with the Geothermal Energy Service program will decrease as fixed costs are allocated across more customers.

- b) The capital costs were estimated based on the following assumptions:
- Majority of the customers would require a vertical loop
  - Costs from the Company's geothermal pilot indicated a loop cost per tonne of approximately \$2,850 per tonne.
  - Upon conversations with OGA and the drilling contractors, it was confirmed that the cost to drill vertical loops vary based on geography and can range from \$2,500 to \$4,500.
  - The Company is of the view that a \$3,000 per tonne of installed loop would constitute a reasonable estimate that will cover most geological conditions and also embed any cost savings from volumes.
  - For retrofit construction, this cost was increased to \$3,200 per tonne of installed loop to account for the one off nature of the installations and mobilization and demobilization of drilling equipment for single homes.
  - The indirect costs of construction include construction supervision and inspectors who would quality assure installations and witness commissioning as well as work management costs and customer connection costs.

The O&M Costs were determined by building a bottom up analysis of expected types of expenses. Some costs such as billing and customer care are unit costs per customer. Shared services such as finance, supply chain and accounts payables are based on estimated hours that will be billed to this line of business. The overhead and management expenses are provided in part (e) below.

The Company installs underground pipe and works with developers and contractors as part of its existing business. While building the DCF model for this proposed program, the Company has endeavored to use the same methodologies and estimated costs on a fully allocated basis. The Company sees the deployment and management of this program to be no different from an operational perspective to its current business.

- c) The Company has not undertaken an analysis on how these unit costs would vary between geographies.
- d) See response to part a i) and b). O&M expenses are not expected to change between a new construction and retrofit construction home.

- e) The one time development costs assumed are:
- Training customer care: \$30,000
  - Training inspectors: \$30,000
  - Set up of financial systems, Work Management Systems, Record keeping etc: \$100,000
  - Customer information systems: \$200,000

The service fee proposed for approval includes recovery of these costs.

- f) Enbridge's forecast O&M costs for the noted categories are set out below (all costs are based on fully allocated costs). All of these costs are included in the DCF model and will be recovered in the customer fees.

- **Periodic inspection and maintenance:** \$15/year per customer as well as \$100 one time per customer for potential loop replacements.
- **Customer care:** \$10/year/customer for first 2 years, \$5/year for years beyond 2<sup>nd</sup> year (It is expected that with a new technology and service, customers would require more customer care for the first 2 years).
- **Overhead and management:** The yearly overhead and management costs are approximately \$970,000 per year for the first three years, increasing to \$1,200,000 per year for the next seven years (as customer additions increase). After the first 10 years of the 40 year model, the costs drops to approximately \$370,000 per year for the management of the 18,000 customers included in the model.
- **Billing:** \$32/year per customer.

- g) In order to properly manage the program from a customer care perspective, the Company will need to make a small number of enhancements to add a new product/service within the existing CIS billing system. Changes like this require development and proper testing to ensure there are no other impacts. These enhancements will enable regular billing and typical account management activities like move in/out and collections both in the call centre and via the website. Total cost is estimated at \$200,000, as noted in the response to part e) above.