

ANALYSIS OF THE IMPACT OF STORAGE DEREGULATION ON INDUSTRIAL GAS USERS

I. INTRODUCTION

1. The purpose of this discussion paper is to provide a high level analysis of the impact on industrial gas users in Ontario of complete forbearance by the Ontario Energy Board (the "Board") from regulating the storage services EGD and Union currently provide under the auspices of cost-based rates.

II. NATURAL GAS SUPPLY AND DELIVERY ARRANGEMENTS FOR INDUSTRIAL USERS

(A) Overview of Industrial Natural Gas Supply

2. Natural gas is a critical component of the operations of most of the member companies in the Industrial Gas Users Association ("IGUA") and the Association of Major Power Consumers in Ontario ("AMPCO"). For most industrials, gas is consumed in a fairly consistent pattern, with many plants operating 24 hours a day, seven days a week, although some operate for lesser periods. Few industrials cease operations on weekends. In aggregate, the industrial sector's load reflects a relatively stable or even demand profile.

3. Virtually all industrials purchase their own natural gas supplies, either at the Alberta border, at the Dawn hub, or at "the City Gate" [the point of delivery from the upstream pipeline to Union Gas Limited ("Union") or Enbridge Gas Distribution ("EGD") (jointly the Local Distribution Companies ("LDCs")), also known as the "LDC Receipt

Point”]. For gas purchased at Dawn or at the city gate, the seller typically holds the upstream pipeline transportation. Most industrials hold a “portfolio” of supply contracts, sometimes with more than one supplier, and their arrangements may reflect a variety of contract terms and conditions. Contracts between industrials and LDCs usually require the industrial to deliver his “Daily Contract Quantity” (“DCQ”) within a tight tolerance band [EGD: +/- 2%; Union: zero].

4. Some industrials contract for their own transportation on the upstream pipeline; some hold assignments from the LDC for capacity on the upstream pipeline, and some others rely upon the LDC to transport their natural gas purchases from the point of purchase on the upstream pipeline under T-Service arrangements. For industrial gas purchases made at the Alberta border and transported by the LDC, the LDC transports the gas under a “Western T-Service” contract, while gas delivered to the LDC at the Dawn Hub or at the City Gate is received and moved by the LDC under an “Ontario T-service” or a “Bundled Ontario T-Service” contract. The gas is then delivered by the LDC to the industrial’s plant(s) under either a firm or interruptible service.

5. Similarly, several industrials hold some storage, but the majority rely upon the LDCs to provide balancing and associated storage management.

(B) The Industrial - LDC Interrelationship

6. As noted, most industrials consume natural gas at a relatively constant level over the daily period of plant operations, although some degree of variation in consumption is usually experienced during a typical day, and from one day to the next. In contracting for gas supplies, industrial gas purchase contracts usually provide for deliveries at high

load factors, consistent over the 24-hour day. That is, the gas supply contracts provide for a uniform flow of gas from the supplier into the receipt pipeline. Each industrial's gas supply portfolio normally contains a number of separate contracts, usually of up to one year's length, although some longer term supply contracts exist. The industrial's total contracted supply will typically reflect the company's forecast of average requirements over the year, which recognizes that on some days it will consume more, and some days less, of its DCQ. On days where the industrial takes less gas from the LDC than the DCQ it has delivered to the LDC under the T-service contract, the LDC includes the volumes of gas not taken as part of the distribution supply pool. If that occurs in the summer, the LDC will usually divert the gas not taken into storage. On days when the industrial takes more than it has delivered to the LDC, the LDC makes up the difference from its distribution supply pool. If that occurs in the winter, the LDC will typically meet the requirement by drawing upon its storage. Thus the LDC provides a very valuable service to the industrial, acting in effect as a "bank" allowing the industrial to "deposit" excess gas on a day of lower consumption, and "withdraw" gas on days of higher than average consumption. Industrials must balance their gas supply accounts at least annually.

7. Another valuable service the LDCs provide industrial customers is the provision of timely and on-call accounting of current delivery, consumption and account volume balances. This is particularly important for companies with multiple plant operations and centralized energy management teams. Union has offered the UnionLine service for some time, while the recently developed Entrac service was EGD's response to customer requests for such timely information.

8. A critical element in the effective operation of the Ontario natural gas market is the curtailability of interruptible industrial customers by the utility. Union advises that it primarily calls curtailments when faced with pipeline restrictions or when storage withdrawal capability fall below a critical level. EGD issues curtailment notices when forecast peak demand is expected to exceed the volume of gas available to the utility from pipeline deliveries and storage withdrawals. While industrials would prefer to not be interrupted, the delivery rate savings available from interruptible service, compared to the cost of firm service, makes the interruptibility option attractive to industrials.

9. Many industrial customers with interruptible contracts also have a contract for firm service to cover their minimum requirements. Curtailment is accommodated by fuel switching or shutting down certain operations.

(C) Current Use of Storage by Industrial Customers

10. For most industrial gas users, reliability of the supply of natural gas is a top priority. Regardless of whether the gas is used for process or heating, it is important that it be available when needed. Storage is an important component of achieving reliability and in addition it reduces the cost of delivered gas for all consumers.

11. The sections of this discussion paper which follow describe how Ontario storage provides cost reductions for all Ontario gas consumers; provide an outline of the storage services currently offered by EGD and Union, and provide an overview of the manner in which industrial gas users are currently using storage services.

(a) Impact of Storage on the Cost of Transportation

12. The cost of transporting gas from Alberta to Ontario is based on the amount of pipeline capacity required to deliver the contracted volume to consumers in Ontario. If pipeline capacity were reserved to meet the peak winter day volume requirement, some capacity would be unused whenever demand fell below the peak. With storage, the pipeline capacity needed is reduced, theoretically by the amount that can be withdrawn each day from storage to supplement pipeline capacity. As a result, less investment in pipeline facilities is required, reducing the cost of transporting natural gas to the Province. These savings are passed on to all Ontario consumers through lower pipeline tolls.

13. The availability of Ontario storage facilities has allowed EGD and Union to offer bundled services at rates that are lower than what they would otherwise have to recover. They also give unbundled customers the opportunity to use storage which can allow these customers to reduce their gas supply costs. In addition, and in a similar way, some gas consumers outside Ontario have benefited from lower gas costs as storage capability in excess of Ontario requirements was made available to them.

(b) Storage Services Provided by EGD and Union

14. *EGD*: The storage owned by EGD is insufficient to meet the requirements of all of its customers, thus it has contracted with Union for additional storage capacity. System supply customers who contract with EGD for both the supply of gas and for delivery services take the gas they need each day from the system. For these customers, EGD is responsible for all acquisition and daily balancing, and it uses its

storage assets as part of its system gas management process. Consumers who elect to purchase gas directly from a marketer or a producer and who have elected to contract for bundled services from EGD will deliver that gas to EGD at a receipt point in Alberta or Ontario, typically at a volume that reflects their average daily demand. Again, EGD manages the upstream transportation and delivery of such gas supplies, offering daily balancing services that include the usage of its storage assets. While EGD offers unbundled services via its Rate 300 tariff, it currently has few if any such customers at present. However, the unbundled service tariffs are currently under review and may, in the future, allow unbundled customers access to EGD's storage services.

15. The cost of storage and daily balancing are included in EGD rates approved by the OEB. Since EGD rates are common across its franchised territory, the cost to similar customers in Ottawa, Toronto or Niagara Falls is the same for the same service.

16. *Union:* Union holds substantial storage assets in Ontario. For in-franchise system supply customers, it offers a service similar to that offered by EGD, whereby it provides the gas system supply customers use, and manages all of the transportation, distribution and balancing requirements for such service, using its storage assets as one tool for that purpose. Also like EGD, Union offers direct purchase customers a bundled service whereby it provides the upstream transportation, load balancing and delivery services required, and again, storage is one element of that service. Union also offers unbundled services across its franchised territory to a number of industrial and other large volume customers, who are able to control the storage used to meet their needs.

17. One distinction between the services offered by EGD and Union is found in the differences in the storage services offered by Union to customers in the Northern and Eastern Region compared to those offered in the Southern Region.

18. Customers being supplied under Rate 20 and Rate 100 in the Northern Region can get an allocation of storage and can use this with an unbundled or bundled storage rate. Unbundled storage service requires the customer to obtain and administer a separate contract for the transportation to and from storage. It is understood that there are no customers using the unbundled storage rate.

19. Union also offers bundled and unbundled storage services in its Southern Region. The T1 Rate is the storage and Transportation service for contract carriage customers and the U7 Rate is the Storage and Delivery service for unbundled customers.

20. Bundled storage service provides for the allocated capacity or space and transportation to and from Dawn with specified maximum daily injection and withdrawal rates. Injection and withdrawal are deemed to be at the Union receipt point used by the consumer but the consumer can also withdraw gas at Dawn. Withdrawals are firm throughout the winter.

(c) How Industrials are Using Union Storage

21. A number of Union's industrial customers have taken advantage of Union's bundled storage services and are now making decisions as to when to inject and withdraw from storage, whether or not to fill storage, and when and how fast to

withdraw from storage. This service enables the consumer to take advantage of pricing opportunities during the fill cycle and to use the stored volumes to optimize cost.

22. In general, to achieve operating flexibility a large industrial customer in the Northern Region will require:

1. A Firm Service Agreement under Rate 20 or Rate 100,
2. An assignment of capacity on TCPL,
3. A Customer Balancing Service (CBS) Agreement, and
4. A Bundled Storage Service Agreement.

23. Administration of these contracts involves only a daily nomination to Union as to the volumes that will be delivered into TCPL the next gas day, the volumes to be injected or withdrawn from storage and volumes to be delivered to the plant. Daily balancing is managed through the Customer Balancing Service ("CBS"), not through storage. In some cases the daily nomination may remain in effect until changed.

24. Peak day requirements are met through a combination of the TCPL capacity and withdrawal from storage, plus either interruptible capacity on TCPL or other peaking services and in some cases by fuel switching.

25. In the South, customers using the T1 Rate can contract discreetly for storage space, maximum daily injection and withdrawal rate, and transportation. The consumer will then nominate the volumes that will be delivered to the Union receipt point each day based on forecast of consumption and its storage requirements. If the intention is to inject into storage the amount nominated will be higher than the expected consumption and if gas is to be withdrawn from storage the amount nominated will be lower than the

expected consumption. As nominations stay in effect until changed nominations may remain unchanged for several days or weeks.

26. The consumer who controls storage can decide when to inject and withdraw from storage, whether or not to fill storage, as well as when and how fast to withdraw from storage. This allows the consumer to take advantage of pricing opportunities during the fill cycle and to use the stored volumes as and when required to optimize cost.

27. The U7 Rate offers slightly more flexibility in using storage but there would probably be more administration required since the delivery service is a separate component of this rate.

28. The above demonstrates that Union has developed rates that meet the needs of their customers. The key elements they offer are the advantages of a reliable delivery service that is equivalent to firm service, flexibility to manage storage to optimize cost, and minimum administration hassle. It is important to recognize that the use of gas by industrial customers is generally incidental to their main purpose. Such customers generally could not justify employing someone to undertake extensive management of gas supply and delivery contracts.

III. COMPLETE DEREGULATION OF THE STORAGE BUSINESSES OF EGD AND UNION IN ONTARIO

(A) Introduction

29. The high level impact analysis which follows contemplates a scenario where the Board completely refrains from regulating the storage services EGD and Union currently provide. In this context, complete forbearance is interpreted to mean no regulation. In this scenario, EGD and Union can charge whatever prices the market will pay.

30. The complete forbearance scenario should be distinguished from the situation where the Board permits EGD and Union to operate under the auspices of Board approved rates. In this situation, the Board continues to exercise regulatory oversight and maintains full supervisory power over all cost revenues and returns associated with the storage activities. Based on the foregoing, a distinction can be made between “market prices” which result when there is a complete absence of regulatory oversight and “market-based rates” which contemplates continuing regulatory oversight of all costs, revenues and returns associated with the activities being priced.

31. If the Board completely forbears from regulating all of the storage services EGD and Union currently provide, then the probability is that both EGD and Union will transfer their storage businesses to affiliates with the result that everyone, including the remaining EGD and Union distribution utilities, will be required to bid for the storage services available from those affiliates.

32. In this scenario, some market participants bidding for storage services may not be cost constrained. An example might be power generators who apparently have a

“reasonable and predictable rate of return over 20 years, with the power authority acting as a guarantor.” (Toronto Star Feb 3, 2006) If indeed all storage space was to be sold via a bid system with capacity going to the highest bidders, a worst case scenario would be that all, or at least a substantial portion, of Ontario storage would be contracted to other than the two utilities.

33. Should Ontario storage at cost-based rates no longer be available to Ontario industrial consumers, they would undoubtedly find it necessary to rethink their strategy for meeting the peak day demand. It is expected that industrials would have several options available to them, all of which would involve increased costs and, in most cases, increased workload to administer additional contracts. We note that these options could change depending on the level of forbearance decided by the Board, and their urgency, or timing, could vary if there is a transition period. The following illustrates some of the options that will likely be available to an industrial customer who no longer has access to EGD or Union storage at cost-based rates.

Option 1: Bid for Ontario storage at market based rates in “open seasons”.

Option 2: Increase the volume of upstream transportation [likely on TCPL] to meet peak day demand, and possibly increase the volume of gas under purchase contract.

Option 3. Contract for storage outside Ontario and for appropriate transportation.

34. In order to develop estimates of the operating and potential cost impacts of a complete forbearance scenario, consider hypothetical customers with the following characteristics located in Union Gas North, Union Gas South and the EGD franchised

territories, which are located in the Central Delivery Area (“CDA”) and the Eastern Delivery Area (“EDA”) served by the transmission system of TransCanada PipeLines Limited (“TCPL”):

Annual Demand	6,000,000 GJ
FT Capacity	16,438 GJ/d
Peak Day	28,000 GJ/d
Storage Space	500,000 GJ
Max. Day In and Out	6,000 GJ/d

35. If the bidder successfully secures EGD or Union storage as a result of the bidding process, then, from an operational perspective, the EGD and Union storage for which the industrial customer acquires under Option 1 will involve no change to current practices. However, there are a number of uncertainties associated with this Option. It is uncertain if a bid submitted by an industrial consumer will secure any storage capacity, or, if the bidder would have to commit to a very high storage rate in order to ensure securing capacity. It is also uncertain if the contracts that EGD and Union offer would be acceptable to industrial customers with respect to conditions such as the term offered and any renewal rights.

36. Operational requirements for Option 2, where the industrial customer increases its upstream transportation commitments in order to meet its peak day demand, would involve replacing storage with upstream transportation to provide firm transportation of gas supplies to meet peak day volume requirements. With Option 2, there would be little change to the operational requirements since storage would effectively be replaced with upstream transportation. Nominations would now be for firm transportation of gas

supplies to meet peak day volume requirements. In this case there is uncertainty as to the current availability of capacity on TCPL and the contract term to which customers may have to commit. Today, TCPL is virtually fully contracted downstream of Manitoba, and to provide new capacity, TCPL might have to add facilities. In such circumstances, TCPL requires parties seeking new contract volumes to contract for a term of 10 years. To most industrials, that is a prohibitive commitment, and is unacceptable.

37. Even if an industrial accepted the risk associated with signing a 10-year contract with TCPL, this option requires the end users to contract for capacity to meet peak load requirements, and possibly also for stand-by gas supplies. This means that, not only would the consumer be faced with higher transportation and gas supply costs, if it has to carry excess contracted supplies and capacity unusable on off-peak days, but also that the consumer would have to spend considerably more administrative or management time. The additional time would be spent in correctly attempting to mitigate the cost of unused supplies or transportation capacity by selling these in the secondary market on all off-peak days. Industrials are in business to produce the products they manufacture and sell, not to engage in the arbitrage of transportation or gas supplies in the secondary market. The commitment to the higher costs for supplies and transportation with only the possibility that a portion of the cost of the unwanted supplies or capacity will be recovered may be a sufficient deterrent for most consumers.

38. Option 3, where the industrial customer contracts for storage outside Ontario and for appropriate transportation, involves both changes to operations and more uncertainty. Apparently, there is little or no un-contracted storage capacity available, at this time, anywhere within a reasonable distance from Ontario. If an industrial user is to

acquire such capacity, then it will probably only be able to obtain the capacity by bidding for it at the next open season conducted by the storage services provider. Accordingly, the cost of this option is currently unknown but certainly high in comparison to the cost-based rates for the storage services EGD and Union currently provide to industrials. As in the case of Option 1, which is storage provided by EGD or Union, when bidding in an open season there is considerable uncertainty as to cost, term and renewal rights. In the case of Option 3, which involves bidding for storage services from a services provider other than EGD and Union, before a bid can be made, the bidder needs to determine whether transportation is available to link the storage to the distribution systems in which the plant of the industrial gas user is located.

39. The map below shows the location of Washington 10, one of the storage facilities in Michigan, its proximity to the Ontario border and the pipelines, including Vector, that connect to Dawn or Tecumseh (if EGD installs the new connection between Vector and the Sombra Compression Station). It is, however, understood that Vector and all other pipelines connecting Michigan storage to Dawn are fully subscribed. Maps are also included in the Union Gas evidence in this proceeding (Tab 2 pages 8 & 10) from which the location of Washington 10 relative to the EGD and Union franchised territories can be seen.



40. To evaluate the operating requirements and the cost impact of using storage outside of Ontario it is been assumed that Washington 10 Storage facility and the Vector Pipeline are both available and that delivery of gas to and from Washington 10 to receipt points in Ontario will involve administration of the following contracts:

- A storage contract with DTE Gas Storage Company,
- A firm service contract with Vector from Washington 10 to the international border with provision for firm backhaul,
- A firm service contract with Vector from the international border to the interconnect with Dawn or Tecumseh, with provision for backhaul, and possibly;
- Firm service contracts with either EGD or Union for transportation from Vector to Tecumseh or Dawn.

41. Administration of these contracts, with the need to monitor and control flows to and from this storage, would be an additional complication for an industrial consumer. No allowance has been made for any costs associated with this added workload.

42. It is assumed that the backhaul provisions would allow storage to be filled from Dawn and this storage to be used for daily balancing. It is also assumed that from Tecumseh or Dawn the current EGD or Union Rates could be used for delivery of gas to each customer. It should be noted, however, that there is no assurance that storage space or transportation capacity will be available or that the above contracts could ever be negotiated. The primary purpose in making these assumptions is to allow a reasonably simple cost assessment of the incremental costs resulting from using storage outside Ontario so that these costs can be compared to and expressed as a percentage of the estimated cost of storage services currently provided by EGD and Union under the auspices of cost-based rates.

43. The comparisons on Table 1 below show the incremental cost increases that the hypothetical customers would face in each location expressed as a percentage increase over and above current costs under the auspices of cost-based rates. It should be noted that these costs are illustrative only and actual cost increases would vary depending on a number of factors, including any Rate changes introduced by TCPL, EGD or Union.

Table 1			
Incremental Cost Increases as a Proportion of Cost-Based Rates			
Option 1		Range of Net Increase	
Customer in Union North		100.00%	200.00%
Customer in Union South & East		100.00%	200.00%
Customer in EGD		67.00%	150.00%
Option 2		Cost With Storage	Cost Without Storage
Customer in Union North	\$5,289,885	\$7,266,727	37.37%
Customer in Union South & East	\$5,939,402	\$9,283,168	56.30%
Customer in EGD	\$6,022,524	\$9,283,168	54.14%
Option 3		Range of Net Increase	
Customer in Union North		865%	980%
Customer in Union South & East		866%	981%
Customer in EGD		842%	947%

44. The increases shown under Option 1 are based on the difference between the current cost of storage for EGD and Union and the expected higher cost of storage at market based rates. It is understood that the current cost of Union storage is about \$0.50/GJ and that EGD storage is about \$0.60/GJ. Market based rates are assumed to be between \$1.00GJ and \$1.50/GJ. As there is some uncertainty as to what market based rates might be Union Undertaking 16 filed in this proceeding has been used to develop an estimate of market based rates. Undertaking 16 includes a calculation of the intrinsic value of storage but it notes that the extrinsic value to individual consumers will change the value. The Union calculation produced an intrinsic value of \$0.917US/mmBtu (or \$0.983Cdn/GJ) as of that date. To allow for the extrinsic factors it has been assumed that the market based price would be between \$1.00Cdn/GJ and \$1.50Cdn/GJ. This assumption is supported by anecdotal evidence that market based

rates are between two and three times cost based rates. It is recognized that actual rates will vary due to the extrinsic factors noted in the Union undertaking but it is assumed that competition will ensure that market based rates for EGD, Union and Michigan will be similar.

45. The costs shown in Option 2 are the costs the hypothetical customer would incur if a combination of transportation and storage is used at current rates and the cost if only firm transportation was used to meet peak day demand. The Incremental cost increase in Table 1 assumes that there is no resale of unused gas or transportation capacity. To the extent that the consumer is prepared to invest time and effort to arrange such resale the cost increase shown in Table 1 might be reduced.

46. Option 3 shows the increased cost of storage if storage outside Ontario is used to effectively replace the storage currently being used by the hypothetical customer but that all other delivery services provided by EGD and Union will remain unchanged. The increased cost include the incremental cost of market based rates plus the cost of transportation between Michigan storage and either Dawn or Tecumseh storage.

47. From the Table, it can be seen that the incremental costs which an industrial customer is likely to incur in each of the three (3) options considered are a significant multiple of the costs which it is estimated they currently pay for the storage services EGD and Union provide under the auspices of cost-based rates.

(B) Conclusions

48. The foregoing high-level analysis indicates that even if upstream transportation and/or non-Ontario storage and related transportation is available, which is highly unlikely in current circumstances, forbearance by the OEB from regulating the cost-based storage services rates currently provided by EGD and Union will operate to impose very significant cost increases on industrial gas users. Industrial gas users will be required to pay materially more for storage services which are less attractive than the storage services currently provided by EGD and Union under the auspices of cost-based rates. In current circumstances, storage service options, which are price competitive with the storage services currently provided by EGD and Union under the auspices of cost-based rates, do not exist and are unavailable. In these circumstances, there is no rational basis for the Board to forbear from continuing to regulate the storage services EGD and Union provide under the auspices of cost-based rates.

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