AIRD BERLIS

Fred D. Cass
Direct: 416.865.7742
E-mail: fcass@airdberlis.com

April 19, 2018

Kirsten Walli
Board Secretary
Ontario Energy Board
2300 Yonge Street, Suite 2700
Toronto ON M4P 1E4

Dear Ms Walli:

Re: EB-2017-0306/EB-2017-0307; MAADs Application by Enbridge Gas Distribution Inc. and Union Gas Limited

In accordance with Procedural Order No. 5 issued by the Board in EB-2017-0306/EB-2017-0307, we have enclosed the Submissions of the Applicants on the Motion by the School Energy Coalition. We have also enclosed redacted versions of the three Reports referred to in the Submissions.

If you have any questions in this regard, please do not hesitate to contact us.

Yours truly,

AIRD & BERLIS LLP

Fred D. Cass

Encls.

EB-2017-0306
EB-2017-0307

ONTARIO ENERGY BOARD

IN THE MATTER OF the *Ontario Energy Board Act, 1998*, S.O. 1998, c.15 (Sched. B);

AND IN THE MATTER OF an Application by Enbridge Gas Distribution Inc. and Union Gas Limited, pursuant to section 43(1) of the *Ontario Energy Board Act, 1998*, for an order or orders granting leave to amalgamate as of January 1, 2019;

AND IN THE MATTER OF an Application by Enbridge Gas Distribution Inc. and Union Gas Limited, pursuant to section 36 of the *Ontario Energy Board Act, 1998*, for an order or orders approving a rate setting mechanism and associated parameters during the deferred rebasing period, effective January 1, 2019.

SUBMISSIONS ON MOTION
BY SCHOOL ENERGY COALITION

Introduction

1. The School Energy Coalition ("SEC") has made a motion to the Board In this proceeding for an order requiring the Applicants to provide responses to particular questions. Specifically, SEC seeks:

> (a) in response to a "clarified and narrowed version" of SEC Interrogatory #3, a list of all documents provided to the Competition Bureau regarding the Ontario distribution, transmission and storage market; and
>
> (b) in response to an "expanded version" of Interrogatory #7a from the Association of Power Producers of Ontario ("APPrO"), all information, reports, analysis or similar documents related to the effect of the merger on competition in the Ontario gas storage market.

2. The SEC motion was addressed by the Board in Procedural Order No. 5, issued on April 16, 2018. In Procedural Order No. 5, the Board said that it will hear the motion in part. With respect to the first part of the SEC motion, set out in paragraph 1(a), above, the Board indicated that it will not be assisted by a lengthy list of documents provided to the Competition Bureau. With respect to the second part of the SEC motion, set out in

paragraph 1(b), above, the Board said that it will hear the motion on the basis of the following request:

> all reports or analysis related to the effect of the amalgamation of Enbridge and Union on the storage market in Ontario.

3. Procedural Order No. 5 also provides context for the hearing of the motion. In particular, Procedural Order No. 5 sets out the following:

> (a) the Competition Bureau was reviewing the then proposed merger between Enbridge Inc., the parent company of Enbridge Gas Distribution Inc. ("EGD"), and Spectra Energy, the parent company of Union Gas Limited ("Union"), not the proposed amalgamation of EGD and Union;
>
> (b) the mandates of the Competition Bureau and the Board are different - the Board is charged with (amongst other things) protecting the interests of consumers;
>
> (c) while the Board has the power to consider some competition issues under section 29 of the *Ontario Energy Board Act, 1998*, this is not a section 29 proceeding; and
>
> (d) in this case, the Board will be considering storage in the context of Issue 6 on the Issues List, namely, "Would the proposed merger impact any other OEB policies, rules or orders (e.g. regulation of new storage, STAR)? If so, what are those impacts and how should the OEB address them?"

4. Having regard to the context provided by the Board in Procedural Order No. 5, the Applicants will respond to the motion request as framed by the Board in the Procedural Order.

Applicants' Response to the Motion

5. As stated above, Procedural Order No. 5 frames the motion request by reference to all reports or analysis related to the effect of the amalgamation of EGD and Union on the storage market in Ontario. The Applicants have not prepared or commissioned reports or analyses related specifically to the effect of the amalgamation of EGD and Union on the storage market in Ontario. However, third party reports were commissioned in connection with the Competition Bureau's review of the merger of Enbridge Inc. and Spectra Energy Corp. (the "EI/Spectra Merger").

6. The third party reports and analysis (the "Reports") submitted to the Competition Bureau in connection with the EI/Spectra merger were as follows:

(a) Analysis of Merchant Natural Gas Storage Competition in Ontario, dated January 30, 2017, by ICF;

(b) Statistical Analysis of Dawn Hub Gas Prices, dated January 31, 2017, by Charles River Associates; and

(c) Enbridge/Spectra: Section 96 Trade-off Analysis, dated February 8, 2017 by Charles River Associates.

7. Consistent with the mandate of the Competition Bureau to determine whether proposed mergers will have the effect of substantially lessening competition in the relevant markets, the Reports address the impact of the EI/Spectra Merger on competitive storage markets, including Ontario storage. In considering the impact of the EI/Spectra Merger on competition in the storage market, the analysis in the Reports includes Ontario storage owned and operated by EGD and Union as under common control.

8. Procedural Order No. 5 indicates that, in the view of the Board, materials relating to the impacts of the merger on Ontario's gas storage market "could be relevant" to this proceeding and thus the Procedural Order provides guidance to the Applicants in responding to the motion by SEC. As stated above, although the Reports were prepared in connection with the EI/Spectra Merger, the analysis in the Reports includes Ontario storage owned and operated by EGD and Union as under common control. Accordingly, the Applicants believe that the Reports fall within the category of materials identified by the Board in Procedural Order No. 5 that could be relevant to this proceeding.

9. The Reports contain commercially sensitive information, including, in particular, information about customers and their activities and specific cost information regarding EGD's unregulated storage business. For the reasons set out in these submissions, the Applicants will produce the Reports in a redacted and unredacted form. The Applicants request that the unredacted Reports be treated as confidential information in accordance with the Board's *Practice Direction on Confidential Filings*. The redacted versions of the Reports are included with these submissions.

All of which is respectfully submitted.

April 19, 2018

Fred D. Cass
Counsel for the Applicants.

Analysis of Merchant Natural Gas Storage Competition in Ontario

January 30, 2017 – Protected and Confidential

Submitted to:

Richard Annan
Goodmans LLP

Oliver Borgers
McCarthy Tetrault LLP

Submitted by:
Michael Sloan

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List of Exhibits

ES. Executive Summary

ICF has been asked to evaluate the impact of the merger of Enbridge Inc. ("Enbridge") and Spectra Energy Corp ("Spectra") on the competition for merchant natural gas storage services. Spectra owns two companies offering merchant storage services in Ontario, Union Gas Limited ("Union Gas" or "Union") and Market Hub Partners ("MHP"). Enbridge owns EGD Inc. ("EGD"), which also offers merchant storage services in Ontario. This evaluation includes a review of the current natural gas and natural gas storage marketplace, and the typical competitive dynamics for natural gas storage.

ES.1 Overall Conclusions

1) The storage market in which EGD and Union merchant storage competes is highly competitive.

a. About half (and likely more) of the customers that contract for Ontario merchant storage capacity also hold storage capacity in Michigan or New York.
b. The costs of using storage capacity outside of Ontario and delivering the gas to Dawn are competitive with the costs of storing gas at Dawn.
c. The price that customers are willing to pay for merchant storage services at Dawn is constrained by the seasonal value of natural gas at Dawn.

2) ***The merger of EGD's and Union's merchant storage operations would have little impact on the concentration of merchant storage services.***

a. Spectra currently holds 11.0% of the merchant storage capacity in the relevant geographic market. After the merger, the combined company would hold only 13.1% of the merchant storage capacity in the relevant geographic market.
b. The relevant geographic market includes Michigan and parts of Illinois, Indiana, New York and Pennsylvania.

3) Traders and Marketers, not End Users, Dominate the Merchant Storage at Dawn.

a. Traders and Marketers currently contract for about 69 Bcf of Ontario merchant storage capacity, representing more than 62% of the total merchant storage in Ontario.
b. Customers that use Ontario merchant storage to serve end-use load located in Ontario currently contract for only about 2.3 Bcf of Ontario merchant storage capacity, representing only about 2% of the total Ontario merchant storage capacity contracted.

ES.2 The Storage Market is Highly Competitive

Customers contracting for Ontario storage have competitive access to storage and to storage services in surrounding areas. About half (21 out of 43), and likely more,[1] of the merchant storage customers of Union and EGD also hold storage contracts with other storage providers in Michigan, New York, Illinois, or Iowa.

- At least 11 customers also hold storage capacity in Michigan.
- At least 9 customers also hold storage capacity in New York.
- At least 7 customers hold storage capacity in Illinois or Iowa.
- At least 6 customers also hold pipeline capacity on Vector Pipeline with receipt at the DTE Washington 10 interconnect and deliveries to Ontario. These companies are considered highly likely to hold storage capacity with DTE at Washington 10.

The degree to which Ontario merchant storage customers hold storage capacity in the surrounding regions demonstrates that the storage market is both interconnected and competitive. Given the ability of parties to access and contract for storage services within the broader regional market, Ontario storage must be priced in a manner that is competitive with other storage pricing and storage options.

The costs of storage services delivered to Dawn using storage capacity outside of Ontario are competitive with the costs of Dawn storage services offered by Union Gas and EGD.

Exhibit ES-1 shows the results of ICF's assessment of the cost of storage service provided at Dawn by Union and competing storage services for a Natural Gas Local Distribution Company (LDC) customer or customer with a similar load profile in Ontario near Dawn. The Exhibit shows the "delivered cost" of storage in Michigan delivered to Ontario including the total storage cost and pipeline transport cost based on publicly available data. The "net cost" factors in the cost recoupment from reselling pipeline transport capacity that would otherwise be unused. Importantly, transporting gas from New York storage to Parkway (near Toronto) is cheaper than transporting to Dawn (about US$0.14 per Dth). As such, in that scenario, New York storage is almost identical in cost to Dawn storage (US$0.89 per Dth vs. US$0.88 per Dth).The U.S. storage operators' ability to negotiate rates below the full tariff rates used in these examples also makes these fields more competitive. [2]

As can be seen, the U.S. options are competitive with the cost of merchant storage at Dawn.

[1] ICF used Index of Customer filings by FERC-regulated storage providers to determine which Ontario storage customers hold storage capacity in the U.S. However, many storage providers in Michigan and New York are not required to file an Index of Customers report. In addition, marketers and traders that offer synthetic storage services are not required to report transactions. Hence ICF's assessment of storage competition likely significantly understates the number of companies that hold storage in other regions.

[2] The prices paid for Merchant storage in Michigan are often negotiated and can differ from the public data.

Exhibit ES-1. Summary of Delivered Costs for Gas Storage to Dawn

	LDC - Delivered Cost	LDC - Basis and Pipeline Capacity Value	LDC - Net Cost
Washington 10	$1.022	$0.077	$0.945
ANR Storage	$0.802	$0.077	$0.726
Bluewater	$0.612	$0.077	$0.535
National Fuel Gas	$1.363	$0.447	$0.916
Union (1)	$0.761		$0.761

Source: ICF

1) There is no delivered cost from Union's gas storage field to Dawn, thus there is no attributable value of capacity releases for Union's storage or in gas procurement costs.

Source: ICF

The prices for Dawn merchant storage capacity have been consistent with, and moved up and down with, the seasonal value of natural gas at Dawn.

Exhibit ES-2 below shows the relationship between the seasonal value of natural gas at Dawn, calculated based on the difference between the futures price for the three winter months (Jan, February, March) and the three summer months (June, July, August) at Dawn, and the average contract price of storage received by Union Gas for new storage contracts signed in each year. The Exhibit indicates that the price that Ontario storage customers have been willing to pay for newly contracted storage capacity generally tracks the expected seasonal price of natural gas at Dawn. This linkage is to be expected given the alternative options to storage at Dawn, including the ability to purchase gas supply at Dawn and the ability to hedge prices based on the futures market. This provides evidence that the market value of natural gas dictates the price of merchant storage, underscoring the unlikelihood of the merged entity being able to set natural gas storage prices independent of these market factors.

Exhibit ES-2. Comparison of the Seasonal Value of Natural Gas to Ontario Merchant Storage Rates

Source: NYMEX (SNL), Union and EGD Semi Annual Storage Reports

ES.3 The Merger will not Significantly Impact Concentration in the Merchant Storage Market

EGD and Union compete in a broad geographic market

In its 2005/2006 Natural Gas Electricity Interface Review (NGEIR) decision, the Ontario Energy Board (OEB or Board) concluded that merchant storage in Ontario was sufficiently competitive, based on an assessment of competition within a competitive market region. According to the OEB, *"Ontario storage operators compete in a geographic market that includes Michigan and parts of Illinois, Indiana, New York and Pennsylvania. The Board finds that the market is competitive and that neither Union nor EGD have market power."*[3]

ICF's assessment of natural gas market changes since NGEIR indicates that the market has become more interconnected, largely as a result of the development of significant shale gas resources across North America but particularly in the Marcellus and Utica region. New York is now a major supplier of natural gas to Ontario, so New York storage is now upstream of Ontario, rather than downstream. Michigan and Ontario are more interconnected due to pipeline expansion and additional storage capacity in Michigan.

[3] Ontario Energy Board Decision with Reasons, EB-2005-0551 Natural Gas Electricity Interface Review (NGEIR Decision), November 7, 2006, page 3.

Charles River Associates (CRA) conducted a similar statistical analysis to that conducted in 2005 by Energy and Environmental Analysis, Inc (EEA) and Richard Schwindt.[4] CRA's analysis found that the competitive market region was similar or potentially somewhat larger than the competitive market region accepted by the OEB, based on an assessment that included analysis of natural gas price correlations between different regions. Based on CRA's statistical analysis of natural gas prices:

1) Summer-winter spreads in natural gas prices at Dawn are highly correlated with summer-winter spreads in natural gas prices in each of Chicago, Niagara, Consumers Energy Citygate, and MichCon Citygate.

2) Futures prices at Dawn are highly correlated with futures prices in each of Chicago, Niagara, Consumers Energy Citygate, and MichCon Citygate.

3) Natural gas spot prices at Dawn are highly correlated with natural gas spot prices in each of Alliance, Chicago, Niagara, Consumers Energy Citygate, and MichCon Citygate. This is true whether correlations are measured in spot price levels, or period-to-period changes in spot prices.

4) The transportation basis between Dawn and each of Alliance, Chicago, Niagara, Consumers Energy Citygate and MichCon Citygate has been decreasing over time. In 2016, the transportation basis was less than 2.7% of the average 2016 spot price at Dawn.

CRA's statistical results further support the conclusion that the relevant geographic market in which Dawn suppliers of storage compete should be considered to include storage in Michigan, Illinois and New York. Given this finding, the potential effect of the proposed merger of Enbridge and Spectra on merchant storage natural gas prices at Dawn should be considered within a relevant market that includes at least Ontario, Michigan, Illinois and New York. Within this geographic market, the combination of EGD's and Union's merchant storage would not result in an anticompetitive level of market concentration.

Based on these findings, ICF concludes that the regional storage market reviewed and defined by the OEB in NGEIR remains appropriate.

The merger of EGD's and Union's merchant storage operations will have little impact on the concentration of storage services.

Spectra currently holds 11.0% of the merchant storage capacity in the relevant geographic market. After the merger, the combined company will hold only 13.1% of the merchant storage capacity in the relevant geographic market.

[4] EEA was acquired by ICF in 2006. The primary author of this report for ICF, Michael Sloan, was one of the primary authors of the 2005 EEA/Schwindt report.

ES.4 Trader and Marketers Dominate Merchant Storage at Dawn

Traders and Marketers currently contract for about 69 Bcf of Ontario merchant storage capacity, representing more than 62% of merchant storage in Ontario.

- The majority of the traders and marketers currently holding Ontario merchant storage capacity also hold significant storage capacity in surrounding regions (Michigan and New York).
- Traders and marketers offer synthetic storage services to customers based on combinations of their contracted storage capacity, pipeline capacity and natural gas supply. These alternatives to merchant storage compete directly with Union's and EGD's storage services.
- Traders and marketers do not need to hold contracts for merchant storage capacity in order to offer synthetic storage services to customers. As such, Ontario based customers have access to storage services and options that include both merchant storage and contractual storage services offered by traders and marketers based on their portfolio of assets and contracts.
- Services offered by the pipelines providing direct service into Ontario can compete directly with Ontario storage capacity. These include services on Vector and TransCanada that provide short notice balancing services similar to the services provided by high deliverability storage.

The diversity of trader/marketer customers and storage options outside of Ontario ensure that Union and EGD will not be able to exercise market power over these types of customers.

ES.5 Other Factors Limiting the Potential Exercise of Market Power

- As illustrated above, most of the value of Ontario merchant storage is set by the seasonal value of natural gas. Ontario storage services can be replicated based on daily or monthly purchases at the Dawn Hub, with price volatility protection (if desired) provided by financial hedging. If there is an attempt to charge supra-competitive prices for storage, storage customers have the ability to source gas at Dawn without using storage services.
- The storage contracts that Union and EGD enter into with other LDCs, including LDCs in the U.S. Northeast and Gaz Metro in Quebec, are subject to discretional regulatory reviews. LDCs must justify storage options and costs against other options. A primary alternative to merchant storage is serving customer loads directly with pipeline capacity and winter natural gas supplies.
- As part of NGEIR, the OEB established a series of reporting requirements and complaint provisions under the Storage and Transportation Access Rule (STAR) designed to ensure that merchant storage could be monitored for indications of the exercise of market power, so regulatory mechanisms are in place to correct any potential competition problems.

1. Background on Natural Gas Storage

Natural gas storage is not in itself a final good or service. Customers require access to natural gas molecules rather than access to natural gas storage. Natural gas storage is one way of accessing natural gas molecules. Fundamentally, storage is a natural gas delivery/redelivery service. A storage customer delivers gas to a storage service provider (specific location and specific time) and the storage service provider redelivers gas (specific location and different point in time) as requested by the storage customer. Storage provides an alternative to buying gas only when needed for consumption, as well as an alternative to holding additional pipeline capacity upstream of the storage location.

Storage provides value to the extent that it reduces the overall cost of supplying natural gas or increases the value of the natural gas injected into storage.

1.1 Natural Gas Storage Functions

Gas storage services reflect the combination of two primary components:

- **Working gas capacity** refers to the amount of gas that can be used (i.e., cycled) during the course of the year and is the capacity over and above the amount of inaccessible base gas that must always remain in a storage facility in order for it to operate. (Base gas is used to maintain storage facility pressures.)
- **Deliverability** refers to the amount of gas that can be delivered from a storage field as a fraction of the amount of working gas present. Typically deliverability is about 1% to 2% per day of the working gas for seasonal storage, and up to about 10% or more for high deliverability storage.

Natural gas storage requirements differ by customer, since different customers require different levels of deliverability depending on how and why they contract for storage services. As long as the total storage requirements do not exceed the overall capabilities of the storage facility, storage operators can tailor their storage offerings to take advantage of these differences by offering different levels of deliverability to different customers from the same storage facility.

Different types of customers use natural gas storage or combine working gas capacity and deliverability in different ways:

Natural Gas LDCs: Most natural gas storage in Ontario and in most other regions is held and used by LDCs. These customers use storage to:

- Decrease the amount of long-haul pipeline capacity required to meet peak loads. Due to their highly seasonal load profiles, LDCs regularly use gas storage as a substitute for more costly supply options that would require higher levels of pipeline commitments. Merchant storage, under firm contracts, provides a reliable source of supplemental gas supply to meet winter demand, without requiring the LDC to hold sufficient pipeline capacity to meet peak load requirements.

- Minimize the cost of natural gas purchases by shifting purchases from high-priced periods (typically the winter and early spring) to low-priced periods (typically the summer and fall).
- Ensure reliability and security of supply.
- Balance natural gas requirements and supply by allowing gas to be injected into storage on a daily basis when utilization is low and vice versa. Natural gas storage is also used by LDCs and pipelines to manage flows and line pack on their systems across hundreds of receipt and delivery points.
- Support balancing receipts on a pipeline with deliveries for individual shippers.

The majority of LDC storage use is seasonal in nature, leading to a typical ratio of deliverability to space of between 0.8% and 1.5%.

Industrials: Industrial customers (e.g., manufacturing plants) use storage to:

- Mitigate price volatility (buy in summer and withdraw in winter).
- Ensure reliable supply.
- Decrease the amount of long-haul pipeline capacity required to meet peak loads.
- Balance natural gas supply and demand uncertainty, allowing natural gas to be injected into storage on a daily basis when utilization is low.

Because most industrials have relatively stable and predictable loads, they tend not to need storage services (for example, EGD has no Ontario-based industrial merchant customers). To the extent industrials use storage, they use it to minimize the costs of gas supply by taking advantage of seasonal differences in gas prices, and the ability to reduce long-haul pipeline costs. As a result, most industrials would hold relatively low (0.8% to 1.5%) deliverability to storage ratios.

Marketers/Traders: Natural gas marketers and traders employ storage assets as one component of many in their supply portfolios that can be leveraged to meet the needs of their customers. Marketers and traders typically serve a variety of types of customers, including LDCs, industrials and power generators —as well as other end-users— using a portfolio of natural gas services. This portfolio of services may include pipeline capacity, storage capacity, and gas supply purchase agreements. Marketers and traders use storage for a variety of different purposes, including:

- Increasing the flexibility of contracted pipeline capacity to serve customer loads.
- Providing customized storage services that allow marketers to capture opportunities created by serving a range of customers with different requirements and in different locations.
- Seasonal natural gas price arbitrage, which constitutes storing natural gas purchased during low-priced periods in the summer and fall for withdrawal and sale during high-priced periods in the winter and spring.
- Short term price arbitrage, representing the injecting of natural gas into storage when daily prices are low and withdrawing natural gas from storage when prices are higher.
- Balancing (allows gas to be injected into storage on a daily basis when utilization/business is low and vice versa).

Power Generators: A small number of power generators require natural gas with limited notice when they are dispatched to generate. Natural gas storage can be used to:

- Ensure gas supply availability at required pressures on short notice.
- Provide reliability/security of supply.
- Reduce natural gas cost volatility and uncertainty.

Power generators often have unpredictable natural gas use requirements that vary on a day to day, or hour to hour basis, because they are driven by daily or hourly requirements to generate rather than seasonal changes in load. As a result, these power generators typically find limited value in holding natural gas storage space, and prefer high deliverability and high flexibility service offerings, with a typical ratio of deliverability to space that can range from 2% to more than 10% depending on the storage offerings available.

1.2 Drivers of Storage Value

The value of storage is often broken down into two major components, intrinsic value and extrinsic value:

- **Intrinsic Value**: The intrinsic value of storage relies on the difference in price between when gas is injected in storage, typically in the summer, and when it is taken out of storage, typically in winter. Capturing the intrinsic value of storage requires only a level purchasing strategy that results in storage injections during periods when demand for gas is less than purchases, and withdrawals when demand for gas exceeds purchases. Market expectations regarding the intrinsic value of storage can be determined based on an assessment of natural gas futures market expectations regarding the differences between seasonal natural gas prices.
- **Extrinsic Value**: Gas prices tend to fluctuate and parties that trade gas and rely on storage to support daily trading put an additional value on gas storage to reflect the optionality storage provides to capture value from fluctuating gas prices. This value is often referred to as the extrinsic value of natural gas storage.

Trader/marketers are in the best position to realize the extrinsic value of storage. They can utilize a portfolio of pipeline and storage assets and gas supply contracts to provide shaped delivery services to their customers, who may have different requirements for gas over a week, month, or year. Thus a trader can provide a base supply with options for swing supply during peak times. Such services compete with merchant storage. Traders also provide synthetic storage contracts, in which the customer provides gas to the trader in the off-peak season and receives it later during the peak season for a carriage fee that can be less than the cost of merchant storage. The trader manages the risk of holding the long position in the market.

1.3 Who Uses Ontario Natural Gas Merchant Storage?

Based on the current STAR reports filed by the utilities with the OEB, Union has 40 different merchant storage customers (excluding EGD) with about 90 different contracts, and EGD has 12 different merchant storage customers with about 15 different contracts.

Terms of sale range from months to multi-years, with parameters ranging from standard to completely custom. Customers request the storage attributes that meet their needs, selecting term, capacity, and firm and interruptible deliverability quantities. Union and EGD primarily solicit business one-on-one, occasionally offering open seasons to draw in interest. As described above, the seasonal value of future natural gas prices is the significant factor in determining storage value in most of these negotiations.

Ontario natural gas storage capacity is used by different types of natural gas consumers, both inside and outside of Ontario. Exhibit 1-1 shows the volumes of working gas stored and the injection and withdrawal capacities by type of customer. Appendix A provides a full listing of the current merchant storage customers and contracts.

Exhibit 1-1. EGD and Union Natural Gas Storage Customers by Type and Volumes

	Contracted Storage Capacity (Bcf)
Traders and Marketers	69.1
LDCs	25.5
End-Users	10.1
Power Generators	4.8
Total	109.5

Source: Union & EGD Storage Index of Customer Data (January 2017)

Exhibit 1-2 below shows the shares of storage used by the various types of customers. The majority of merchant storage capacity offered by Union and EGD is held by trading and marketing firms, which predominately operate across the Great Lakes and Northeast as well as in Ontario.

Exhibit 1-2. EGD and Union Merchant Natural Gas Storage Customers by Type and % of Totals

	Contracted Storage Capacity (Bcf)
Traders and Marketers	63%
LDCs	23%
End-Users	9%
Power Generators	4%

Source: Union & EGD Storage Index of Customer Data (January 2017)

Traders/marketers contract for about 63% of the merchant storage. Customers with more predictable demand (LDCs and industrial end users) make up 32% of the merchant storage contracts. At only 4% of total storage, power generators account for a *de minimis proportion* of merchant gas storage capacity.

1.3.1 Traders and Marketers

Union and EGD sell approximately 63% of their merchant storage to traders/marketers who in turn use the storage to re-sell services to others (other marketers and end-users).

Traders/marketers use the contracted Ontario storage capacity to meet their customer requirements for natural gas delivery in the region by using the storage in conjunction with their broader portfolios of assets, trading gas in the daily market and supporting financial derivatives trading, and repackaging and selling natural gas storage-based services, including synthetic storage.

Traders/marketers are not required to report how they use the storage capacity. However Union and EGD are aware that the Ontario storage capacity contracted by marketers and traders is often sub-leased or repackaged and offered to other storage customers in direct competition to the storage capacity offered by Union Gas and EGD.

The EGD and Union storage capacity and deliverability held by the most active marketers/traders are shown below in Exhibit 1-3.

Exhibit 1-3. Trader/Marketers Holding Merchant Storage Capacity with EGD and Union

Storage Provider	Customer Name	Contracted Storage Capacity (Bcf)	Contracted Deliverability (Mcf)
Union Gas	BP Canada	0.50	6,000
Enbridge	Castleton Commodities	0.50	14,999
Union Gas	Castleton Commodities	7.00	237,688
Enbridge	Direct Energy Marketing Ltd.	0.50	12,500
Union Gas	EDF Trading	1.50	18,000
Union Gas	Emera Energy	0.50	6,000
Union Gas	Energy Source Natural Gas	0.03	360
Union Gas	Freepoint Commodities	0.50	6,000
Union Gas	Hartree Partners	0.75	9,000
Enbridge	Iberdrola Energy Services	5.88	117,529
Enbridge	J. Aron & Company	2.50	41,999
Union Gas	J. Aron & Company	7.50	90,001
Union Gas	Koch Canada	2.00	24,001
Union Gas	MIECO	0.50	6,000
Union Gas	NextEra Energy Power Marketing	0.14	1,704
Union Gas	NJR Energy Services	2.00	24,000
Enbridge	Petrochina International	1.70	45,000
Union Gas	Petrochina International	1.00	12,000
Union Gas	Powerex Corp.	6.50	78,001
Enbridge	Repsol Energy Canada	2.00	49,999
Union Gas	Repsol Energy Canada	2.00	24,001
Union Gas	Shell Energy	10.16	217,473
Union Gas	Suncor Energy Marketing	2.00	94,218

Union Gas	Tenaska Marketing	7.80	105,040
Enbridge	Tidal Energy*	0.25	9,999
Union Gas	Tidal Energy*	0.75	9,000
Union Gas	Twin Eagle Resources	1.00	12,000
Union Gas	Uniper Global Commodities	1.50	18,000
Union Gas	United Energy Trading	0.10	1,200
Total		69.06	1,291,710

Source: Union Gas & EGD Gas Storage Customer Reports (January 2017)
**Tidal Energy is affiliated with EGD.*

1.3.2 Natural Gas LDCs

Currently, LDCs in Ontario (other than Union and EGD) and in the United States contract for about 25.5 Bcf of merchant storage capacity, representing about 23% of the total merchant storage in Ontario. The Ontario storage capacity and deliverability held by the LDCs are shown in Exhibit 1-4.

Exhibit 1-4. LDC's Holding Merchant Storage Capacity with EGD and Union

Storage Provider	Customer Name	Contracted Storage Capacity (Bcf)	Contracted Deliverability (Mcfd)
Union Gas	Utilities Kingston	0.28	3,696
Enbridge	Utilities Kingston	0.14	2,275
Enbridge	Bay State Gas Company	1.82	26,500
Union Gas	Connecticut Natural Gas Corporation	1.23	14,786
Union Gas	Alta Gas	2.70	35
Union Gas	Gaz Metro Limited Partnership	12.53	150,419
Enbridge	St. Lawrence Gas	0.45	4,952
Union Gas	St. Lawrence Gas	0.45	4,952
Union Gas	The Southern Connecticut Gas Company	1.61	19,335
Union Gas	Yankee Gas Services Company	4.27	51,182
Total		25.49	278,133

Source: Union Gas & EGD Gas Storage Customer Reports (January 2017).
** St. Lawrence Gas is affiliated with EGD.*

1.3.3 Industrial Customers

Currently, only one industrial customer, Cargill, contracts for merchant storage capacity in Ontario. Cargill provides natural gas to a variety of different facilities across North America, and could also be considered a marketer or trader.

1.3.4 Power Generation Customers

Currently, power generators contract for about 4.8 Bcf of Ontario merchant storage. This accounts for less than 4% of the available merchant storage capacity.

1.4 Ontario Storage Customers (Other than EGD and Union)

A limited number of third party storage customers whose gas consuming facilities are physically located in Ontario acquire storage services from EGD and/or Union. In total, these customers currently contract for only 2.9 Bcf of storage capacity, or less than 3% of the total contracted Ontario merchant storage capacity.

1.4.1 Ontario LDCs and Retail Marketers (other than EGD and Union)

In addition to EGD and Union, which generally use their own storage capacity to serve their in-franchise loads,[5] one municipal LDC (Utilities Kingston), and two retail marketers (Direct Energy Marketing and Energy Source Natural Gas) each contract for merchant gas storage capacity in Ontario. Together, these customers contract for 1.0 Bcf of merchant storage capacity.

Exhibit 1-5. Ontario LDC's and Retail Marketers Contracting for Storage from Union and EGD

Customer Name	Storage Provider	Storage Capacity Contracted (Bcf)	Deliverability Contracted (Mcfd)	Ratio of Deliverability to Space (%)	Start Date	End Date
Direct Energy Marketing	EGD	0.53	121,321	2.5%	1-Apr-16	31-Mar-19
Energy Source Natural Gas	Union Gas	0.03	40,000	1.2%	1-Apr-15	31-Mar-17
Utilities Kingston	EGD	0.15	11,999	1.2%	1-Apr-14	31-Mar-19
Utilities Kingston	Union Gas	0.05	750	1.2%	3/31/205	31-Mar-17
Utilities Kingston	Union Gas	0.2	286	1.2%	31-Mar-15	31-Mar-17
Utilities Kingston	Union Gas	0.05	750	1.5%	31-Mar-15	31-Mar-18
	Total	1.01	227,090	1.8%		

Source: Union and EGD Storage Index of Customers (January 2017)

1.4.2 Ontario Power Generators

Ontario power generators generally hold high deliverability storage necessary to meet large and unplanned swings in natural gas requirements. These power generators have been directed by the IESO to hold firm gas supply agreements in order to ensure availability of natural gas for the facilities when directed to run by the Ontario Independent Electricity System Operator (IESO) (formerly the Ontario Power Authority).

Many of the power generator contracts for storage are long term contracts. Approximately 10 years ago EGD and Union undertook capital projects and investments to increase its capability to provide higher storage deliverability services to Ontario power generators in response to the IESO's initiatives to expand gas generation in the province. The capital projects were secured with up to 20 year contracts signed with the power generators, who in turn had 20 year contracts with the IESO. As a result about 40% of the current storage capacity contracted by power generators is scheduled to expire in 2022 or later, with the remaining contracts expiring in 2018 and 2019. The current power generation storage customers are shown in Exhibit 1-6.

[5] EGD contracts for 16.4 Bcf of storage capacity from Union Gas to meet part of its in-franchise load requirements.

Exhibit 1-6. Ontario Power Generation Customers Contracting for Storage Services with EGD and Union

Storage Provider	Customer Name	Contracted Storage Capacity (Bcf)	Contracted Peak Deliverability (Mcf)	Contract Start Date	Contract End Date
Union Gas	Goreway Station Partnership	0.57	121,321	1-Jul-08	31-Oct-28
Union Gas	Greenfield Energy Centre	0.20	40,000	1-May-08	31-Oct-18
Enbridge	Greenfield Energy Centre	0.12	11,999	1-Jun-08	31-Mar-18
Enbridge	Greenfield South Power Corp.	0.15	15,571	1-Apr-16	31-Aug-19
Union Gas	TransCanada Power	0.00	33,264	1-Apr-15	31-Mar-17
Union Gas	Portlands Energy Centre	0.47	37,913	1-Jan-09	31-Mar-19
Union Gas	Thorold CoGen	0.16	41,704	1-Nov-08	31-Mar-19
Union Gas	York Energy Centre	0.17	83,080	1-Apr-12	31-Oct-22
Total		1.84	223,531		

Source: Union and EGD Gas Storage Index of Customers Report (January 2017)

1.4.3 Ontario Industrial Customers

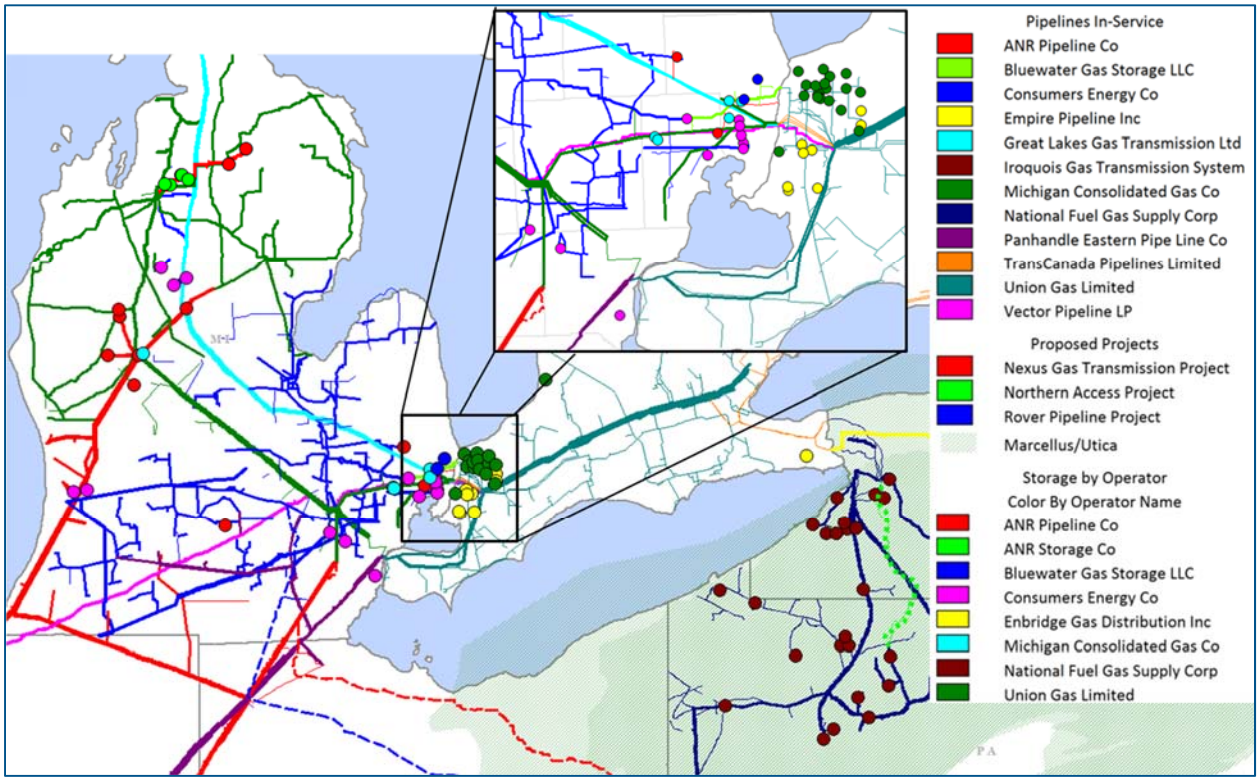
Neither EGD nor Union have any Ontario-based industrial merchant storage customers.

2 Gas Storage and Pipeline Assets Available to Ontario Consumers

2.1 Pipeline Infrastructure Assets

In this section we look at the pipeline assets in the region that are available to customers in Ontario. Exhibit 2-1 below presents a map of the infrastructure around Dawn (inset) and the pipeline network serving the broader geographic market, including storage facilities outside Ontario connected to the broader pipeline network.

Exhibit 2-1. Pipeline and Storage Infrastructure for Ontario



Source: ABB Velocity Suite

Several pipelines that are interconnected within the broader North American gas market also feed into Dawn. These pipelines are summarized in Exhibit 2-2 below.

- Link Pipeline from EGD's Tecumseh storage field which also receives gas at the St. Clair River from the ANR pipeline that reaches back into Michigan, the Mid-Continent and Texas.
- Bluewater Pipeline feeds into Union at the St. Clair River, connecting Union to the Bluewater storage facilities in Michigan as well as to Great Lakes Pipeline, ANR, DTE Gas Pipeline (aka MichCon), and Vector Pipeline. Bluewater also offers its merchant storage customers the ability to take possession of their gas at Dawn rather than in Michigan.
- TransCanada feeds directly into the Dawn storage hub after receiving gas upstream from Great Lakes Pipeline at St. Clair River.

- The Vector Pipeline is directly connected to Dawn and reaches back to the Chicago area where the pipeline interconnects with Alliance. Vector has receipt points with ANR, DTE, Northern Border, and Guardian, while at the Dawn end Vector connects with Union and EGD. Vector also interconnects with Bluewater Storage and Washington 10 Storage in Michigan.
- DTE Gas Pipeline (MichCon) directly connects with the Dawn storage hub through Union at the St. Clair River. DTE pipelines are connected to production in Michigan, DTE storage facilities in Michigan, Vector, Panhandle, and ANR pipelines.
- Union also connects with the Panhandle Eastern Pipeline at Ojibway, near Windsor. Panhandle provides access to gas production in the Gulf Coast and Mid-Continent regions.
- At the other end of the system, Union pipelines are interconnected with TransCanada's pipeline at Kirkwall. TransCanada's line connects with the Niagara Line (National Fuel Gas, Dominion and Tennessee Gas Pipeline) at Niagara and the Empire pipeline at Chippawa. Tennessee Gas Pipeline (a Kinder Morgan company), which connects with TransCanada at Niagara provides access into the major storage fields around Ellisburg, Pennsylvania, and Marcellus production. All of these pipelines are bi-directional, having recently been flowing gas from Ontario into New York. Today, the primary direction of flow is from New York to Ontario. This represents a major change since NGEIR was concluded.

The total pipeline capacity available to parties other than Union and EGD is shown below in Exhibit 2-2.

Exhibit 2-2. Pipeline Routes, Contracted Capacity, and Available Capacity into Ontario[6]

MMcfd	Michigan to Dawn				Northwest New York to Ontario				Total
Pipeline Route	Great Lakes (St. Clair) MI into Dawn	Vector St. Clair MI to Dawn	Panhandle to Union	Bluewater to Union	MichCon to Union	Niagara (TGP to ON)	Niagara (National Fuel to ON)	Empire into ON at Chippawa	
Pipeline Capacity	2,026	1,550	132	300	300	655	325	400	5,688
Pipeline	Great Lakes	Vector	Panhandle	Bluewater	MichCon	Tennessee Gas Pipeline	National Fuel Gas Supply	Empire Pipeline	
Owner	TransCanada	Enbridge (60%) & DTE Energy (40%)	Energy Transfer Partners	Plains GP Holdings, L.P.	DTE Energy	Kinder Morgan	National Fuel	National Fuel	
Operator	Great Lakes	Enbridge	Panhandle Eastern	Bluewater Gas Storage	DTE Energy	Tennessee Gas Pipeline	National Fuel	National Fuel	
Enbridge Contracted Capacity		275	10	NA					285
Union Gas Contracted Capacity		227	57						284
Third Party Contracted Capacity	538	1,054	50			448	320	385	2,795
Uncontracted Capacity Available	1488	0	15	NA	NA	207	5	15	1,730

Sources: ICF, Energy Velocity, FERC Index of Customer Data Q2 2016

Average seasonal flows on these corridors are shown below in Exhibit 2-3. These corridors are addressed in more detail in Section 4.

[6] This table includes only capacity from Lower Peninsula MI to ON, and Western NY to ON. While capacity may exist on the NY to ON corridor, ICF notes constraints both upstream & downstream of the Niagara border crossing.

Exhibit 2-3. Historical Pipeline Flows by Pipeline Route into Ontario

MMcfd	Michigan to Dawn[7]				Northwest New York to Ontario			
Pipeline Route	Great Lakes (St. Clair) MI into Dawn	Vector St. Clair MI to Dawn	Panhandle to Union	Bluewater to Union	MichCon to Union	Niagara (TGP to TCPL)	Niagara (National Fuel to TCPL)	Empire into TCPL at Chippawa
Pipeline Capacity	2,026	1,550	132	300	300	748	325	399
Historical Pipeline Flows[8]								
Summer 2016	-21	710	89	-9	70	624	313	160
Winter 2015-16	-136	1016	102	38	183	602	308	129
Summer (2012-16)	281	939	100	-1	83	393	234	23
Winter (2012-16)	45	1313	128	89	250	462	264	15

Sources: ICF, Point Logic Energy

2.2 Pipeline Capacity Availability into Ontario

Ontario consumers have several options for accessing transportation services in Michigan, New York, or elsewhere:

- they can acquire pipeline capacity by executing firm transportation contracts with pipelines to a storage field, where that capacity is available;
- they can contract for new pipeline capacity, either on new pipelines or on pipeline expansions such as those offered by Vector and others;
- they can use interruptible transportation services to access storage fields;
- they can use released pipeline capacity to access storage fields; or
- they can acquire service from a trader or marketer who holds capacity on the pipelines into Ontario and buy a delivery service, synthetic storage, or merchant storage.

This section addresses the availability of pipeline capacity into Ontario that is interconnected with storage fields in Michigan and New York. The principal pipelines are Great Lakes Gas Transmission and Vector for deliveries from Michigan and Tennessee Gas Pipeline and Natural Fuel Gas for deliveries from New York.

2.2.1 Great Lakes Gas Transmission (GLGT)

The largest pipeline into Dawn from Michigan is the GLGT, which connects with TransCanada at the Michigan/Ontario border and interconnects with Dawn. As can be seen in exhibit below, flows over GLGT to Ontario are substantially below capacity and have been declining over the period shown due to declining volumes moving out of Alberta on the TransCanada mainline. For substantial periods of time, the pipeline reverses flow. This reversal has been caused by bottlenecks on the TransCanada system at Kirkwall forcing gas on GLGT destined for Ontario to

[7] ANR's cross border capacity & flows are omitted due to lack of data.
[8] Pipeline Flows shown as negative values indicate a reversal of the prevailing flow, denoted in the "Pipeline Route" header row.

flow back to the TransCanada mainline at Emerson then north of the Great Lakes down into eastern Ontario, bypassing the bottleneck.[9] As a consequence GLGT is underutilized and it has substantial spare capacity to provide Ontario consumers with access to merchant storage in Michigan.

GLGT is interconnected with the following pipelines and storage fields.

- Bluewater Gas Storage (and pipeline) at Rattle Run or Muttonville. This interconnect provides access to Bluewater's Columbia 3 and Kimball 27 storage fields as well as to Consumers Energy's Ray Field through it's interconnect with Bluewater's pipeline.
- ANR Pipeline at Muttonville and the ANR Muttonville Field
- ANR Pipeline at South Chester and the South Chester storage field
- ANR Storage Co. at Deward where it interconnects with the Cold Springs 31 and 12 fields and Rapid River 35 field
- DTE Energy (MichCon) pipeline with interconnections to Belle River Mills field, Washington 10, and Washington 28 fields.

2.2.2 Vector Pipeline

Vector Pipeline currently has capacity of 1.55 Bcfd into Dawn. Flows over Vector are seen in Exhibit 2-5. Vector generally flows at less than full capacity.

Vector is widely used to deliver natural gas storage withdrawals from Michigan to Dawn because of its interconnections with multiple storage fields in Michigan:

- Bluewater Gas Storage at the Lenox interconnect, with access to Columbia III and Kimball 27 storage fields as well as the Consumers Energy Ray Field.
- DTE Energy at Lenox, with access Washington 10 and Washington 28 storage
- DTE Energy at Belle River Mills and the Belle River Mills storage field.

Recently, a significant amount of short term Vector capacity has been made available through regular open season offerings and through capacity release. After May 2017, Vector's available capacity is reserved for the Rover and Nexus pipelines.

While the interconnections with Rover and NEXUS will reduce short term firm capacity available on Vector, several other options are available to potential storage customers seeking access to Ontario via Vector.

- According to Vector: "In addition to accommodating the NEXUS and Rover capacity commitments, higher daily interruptible transportation capacity will be possible under certain pipeline conditions." Vector has also indicated the capability to further expand capacity into Ontario if requested, and if shippers are willing to contract for capacity. According to Vector, there is between 200-600 MDth/d of incremental capacity expansion potentially available. [10]

[9] When TransCanada's capacity additions on the eastern mainline this "around the horn" movement of gas will cease.
[10] Vector Pipeline Customer Meeting Presentation, October 1, 2015.

- Since NEXUS is not yet fully contracted and Rover is contracted primarily to producers seeking a market, we anticipate that a significant share of the Vector capacity contracted by parties other than Union and EGD will be available to other potential customers via capacity release, short term capacity offerings, and secondary market transactions.
- While the NEXUS and Rover contracts on Vector will decrease available short term firm capacity availability directly on Vector, they will provide an alternative contractual route into Ontario that provides additional direct access to storage in Michigan. According to Vector, NEXUS has access to about 1 Tcf of storage capacity.[11]

2.2.3 Tennessee Gas Pipeline (TGP)

TGP connects with TransCanada's pipeline at Niagara with 665 Mmcfd of capacity of which about 448 is contracted, leaving almost 220 Mmcfd of capacity available for shippers.

TGP is connected to a number of storage fields in New York and Pennsylvania that can be reached by Ontario shippers:

- Honeyoe Storage (NY)
- Arlington Storage, Thomas Corners (NY)
- Nashville Storage (NY)
- Colden Storage (NY)
- Stagecoach (PA)
- Ellisburg (PA)

2.2.4 National Fuel Gas Supply Corporation (NFG)

NFG has approximately 325 Mmcfd of capacity at Niagara to TransCanada, of which 320 Mmcfd is contracted.

NFG is well integrated with several natural gas storage fields in New York: Limestone, Zoar, Nashville, Colden, Derby, Holland, and Bennington.

2.2.5 Capacity Release

Capacity releases are a common way for holders of long-term firm pipeline capacity to recoup some costs when they are not fully using their contracted capacity, and for customers without long term firm contracts for pipeline capacity to secure firm pipeline capacity. Releases can be short term or longer term, and some releases are permanent. Traders and marketers are heavy users of released capacity. Asset management arrangements between traders/marketers and LDCs involve the latter releasing capacity to the former in return for city gate delivery service. This allows the LDC to recover costs of underutilized gas pipeline capacity and give the trader/marketer use of the asset to meet a variety of customers' needs.

[11] Vector Pipeline Customer Meeting Presentation, October 1, 2015.

For example, capacity release information for Vector shows that over the 2016-17 winter season, DTE, EGD, and Union released 192 Mmcfd of capacity in six separate release agreements for deliveries at St. Clair. These releases, which were taken by traders/marketers confirm that traders/marketers regularly use pipeline capacity release to secure firm pipeline capacity.

Capacity releases provide a way for a user in Ontario to firm up pipeline capacity without signing a long term contract for capacity, in lieu of using interruptible transportation.

2.3 Storage Infrastructure

These pipeline systems provide multiple routes to move natural gas into Dawn, and provide direct routes for a wide range of storage providers to compete with Ontario storage. The storage facilities directly connected to Ontario, and the pipelines that connect the storage fields to Ontario are shown in Exhibit 2-8 below.

Exhibit 2-4. All Gas Storage Fields/Operators in Regions Accessible to Ontario Consumers12

Operating Company	Parent Company	State / Province	Pipeline Access	Key Pipeline Interconnects	Total Capacity (MMcf)	Working Gas (MMcf)	Peak Delivery (MMcfd)	Share	
								Working Gas	Peak Delivery
Union Gas	Spectra Energy	Ontario	Union	Dawn Hub	224,727	160,600	3,231	11.7%	10.9%
EGD	EGD	Ontario	EGD/Union	Interconnected at Dawn & Great Lakes	152,400	114,00	2,517	8.3%	8.5%
Sarnia Airport Storage Pool LP	Spectra Energy / AltaGas	Ontario	Union	Dawn Hub	6,303	5,260	53	0.4%	0.2%
St. Clair Pool (MHP Partners)	Spectra Energy	Ontario	Union	Dawn Hub	1,384	1,100	11	0.1%	0.0%
Intragaz	Gaz Métro / Engie	Quebec	Trans Québec & Maritimes Pipeline	Trans Québec & Maritimes Pipeline		5,000	117	0.4%	0.4%
ANR Pipeline	TransCanada	Michigan	ANR	ANR to MichCon to St. Clair	243,752	135,130	4,018	9.9%	13.5%
ANR Storage	TransCanada	Michigan	ANR	ANR to MichCon to St. Clair	64,268	56,118	950	4.1%	3.2%
Blue Lake Storage	TransCanada	Michigan	ANR	ANR Pipeline, Blue Lake, and Eaton Rapids	54,119	47,086	700	3.4%	2.4%
Eaton Rapids Gas Storage	TransCanada	Michigan	ANR	ANR to MichCon to St. Clair	16,234	12,984	160	0.9%	0.5%
Bluewater Gas Storage	PAA Natural Gas Storage	Michigan	ANR, Great Lakes, Vector	ANR to MichCon to St. Clair	33,500	26,512	800	1.9%	2.7%
Consumers Energy	CMS Energy	Michigan	Consumers, MichCon	Consumers Energy to Bluewater	303,236	148,310	4,173	10.8%	14.0%
MichCon	DTE Energy	Michigan	MichCon, ANR	MichCon to St. Clair	200,071	139,866	3,925	10.2%	13.2%
Washington 10 Storage Corp.	DTE Energy	Michigan	Vector, MichCon	Vector to Dawn, DTE Gas to Dawn	106,285	90,113	450	6.6%	1.5%
Michigan Gas Utilities	WEC Energy Group	Michigan	MichCon	MichCon to St. Clair	7,272	3,900	123	0.3%	0.4%
Semco Energy Gas Co.	Semco Energy	Michigan	MichCon	MichCon to St. Clair	8,072	4,900	140	0.4%	0.5%
Southwest Gas Storage Co.	Energy Transfer	Michigan	Panhandle	Panhandle to Ojibway	31,100	17,690	410	1.3%	1.4%
Lee 8 Storage	TERM Storage	Michigan	Panhandle	Panhandle to Ojibway	3,718	3,114	50	0.2%	0.2%
National Fuel Gas Supply	National Fuel Gas Supply	New York	NFG, TCPL	Union to Kirkwall, TCPL to Niagara, NFG	205,800	91,700	1,697	6.7%	5.7%
Arlington Gas Storage	Arlington Gas Storage	New York	Tennessee Gas, Millennium	Tennessee Gas to Niagara	21,340	14,600	344	1.1%	1.2%
Honeoye	Honeoye Storage Corp.	New York	Tennessee Gas	Union to Kirkwall, TCPL to Niagara, NFG, Tennessee, Dominion	11,450	6,769	70	0.5%	0.2%
Natural Gas Pipeline of America	Kinder Morgan	Illinois	Vector	Vector to Dawn	201,500	81,900	1,940	6.0%	6.5%
Nicor Gas	Southern Company	Illinois	Vector	Vector to Dawn	466,266	149,700	2,800	10.9%	9.4%
Peoples Gas Light & Coke Co.	WEC Energy Group	Illinois	Vector	Vector to Dawn	175,565	38,800	800	2.8%	2.7%
Northern Indiana Public Service Co. NiSource	NiSource	Indiana	Vector	Vector to Dawn	34,367	7,900	143	0.6%	0.5%
Indiana Gas Company	Vectren	Indiana	ANR	ANR to MichCon to St. Clair	19,904	5,661	144	0.4%	0.5%
Total					2,592,633	1,368,713	29,766		

Sources: Company Sources, EIA 2015 Storage Capacity, Michigan PUC Storage Reports

[12] A more detailed accounting of the gas storage field operators that includes in-franchise and merchant capacity is included in Appendix B.

2.4 Summary of Supply Options Available to Ontario Customers

A customer with a fixed location in Ontario (i.e., one who is not a trader/marketer) who requires gas supply for its facility has several options, of which storage is but one (which explains why, in the aggregate, Union and EGD have only 9 such customers). The options are described below and assume the customer holds transportation to get from Dawn to its facility. We note that almost all commercial and industrial customers use cost-based, regulated in-franchise services rather than merchant storage services.[13]

- The customer can seek to acquire merchant storage. The options include EGD, Union, Bluewater, ANR, DTE and several other storage services in Michigan, New York and other states (see Exhibit 2-8). The costs of Union and EGD storage would include the fixed and variable charges for storage and deliverability. Looking at storage in New York and Michigan, the customer would also have to add in the incremental cost of transportation on pipelines to get to Dawn. However, our analysis demonstrates that the landed cost of getting the gas to Dawn is cost competitive with storing at Dawn. (See Section 4.3.)
- The customer can rely on spot market purchases to acquire incremental gas supply, buying it at Dawn, or another hub, and transporting it to its facility under firm or interruptible transportation. If the customer needs incremental gas supply in winter, this strategy has two risks: high prices during winter peak periods and delivery risk if the customer relies on interruptible transportation. The price risk can be managed with financial hedges or by acquiring transportation services from a marketer. The delivery risk can be mitigated by contracting for firm transportation.
- The customer can enter into a full requirements delivery contract with a trader/marketer for its supplies (i.e., the contract specifies firm deliveries and anticipates swings in demand over the base amount throughout the year). To meet a customer's swing demand in the winter, the trader/marketer will rely on its own pipeline and storage assets and gas supply portfolio, as well as the variability in its other customers' demand characteristics, to meet this customer's needs. Traders/marketers charge a premium over the spot price for this kind of swing service. Thus, the delivery risk is mitigated, and the price risk, depending on the contract terms, can be mitigated with financial hedges. Traders/marketers can also provide the hedging themselves and commit to fixed prices for winter supply, often tied to the forward price curve at the time of the contract.
- In a variation on the above option, the customer, if it holds firm pipeline capacity in Ontario, can enter into an agency and asset management agreement with a trader/marketer who agrees to make firm deliveries throughout the year. This service is cheaper than the full requirements delivery detailed directly above because the trader/marketer is allowed to use the customer's pipeline capacity for the trader/marketer's other accounts. Again, the trader/marketer would provide swing gas from its inventory of hard assets, customer profiles, and gas supply contracts.

[13] With the exception of by-pass customers, all commercial and industrial customers use in-franchise delivery services.

- The customer can enter into a synthetic storage contract with a trader/marketer, where the customer provides gas to the marketer in the off-peak months and receives gas back from the marketer in the winter months. For this, the customer pays the marketer a fee upon receipt of the gas. There are several trader/marketers who offer synthetic storage.
- A customer can choose to take gas delivery service through a LDC, which would give it access to cost-of-service pricing, but at the additional cost of distribution company charges.

3 Background on Storage Regulation in Ontario

Ownership and operation of natural gas storage in Ontario is regulated by the OEB. In 2005 and 2006, the OEB conducted NGEIR, an inquiry into the role of gas storage in the Ontario gas market. At that time there were several proposals before the OEB requesting market-based rates for merchant storage.

A major issue before the OEB was whether Union and EGD would be in a position to exercise market power in an unregulated merchant storage market. After reviewing the available evidence through a long and extensive regulatory proceeding, the OEB determined that gas storage in Ontario was highly integrated with storage services in Michigan and other surrounding states and that the storage providers in Ontario would not be able to sustain a small but significant and non-transitory increase in price (SSNIP) due to storage customers' access to the broader geographic market.

The Board concluded that:

> *"Ontario storage operators compete in a geographic market that includes Michigan and parts of Illinois, Indiana, New York and Pennsylvania. The Board finds that the market is competitive and that neither Union nor EGD have market power."*[14]

Accordingly, the OEB ceased regulating the rates charged by Union and EGD for merchant gas storage customers while segregating the in-franchise storage services that were to remain under cost-based pricing, regulated by the OEB. Similarly, third party storage operators of new storage were allowed to charge market-based rates for their storage services. Since NGEIR, the average rate for storage services provided by EGD and Union has declined, highlighting the lack of market power for Union or EGD, following the downward trend in seasonal natural gas prices in a marketer characterized by due to lower natural gas prices and reduced price volatility.

NGEIR included a detailed assessment of the storage market which adopted the principles found in the Competition Bureau's *Merger Enforcement Guidelines* (MEGs) as an analytical framework. Overall, the Board found that:

1) ***Identification of the Product Market:*** *"[T]he evidence supports the conclusion that there are non-storage products and services which provide reasonable substitutes for storage. These substitutes include commodity sales, swaps, exchanges, displacement, and delivery/redelivery services."* (NGEIR Decision page 33)

2) ***Identification of the Geographic market:*** *"[T]he geographic market extends beyond Ontario, even though there is a lack of uncontracted firm pipeline capacity. The Board is satisfied that there are reasonable alternative means for storage customers in Ontario to access a broad market area. This can be done through the secondary markets or through participating in open seasons for new firm capacity. The Board is also satisfied that there is access to suitable substitutes for Ontario storage available in the broader market because*

[14] Ontario Energy Board Decision with Reasons, EB-2005-0551 Natural Gas Electricity Interface Review (NGEIR Decision), November 7, 2006, page 3.

there is direct evidence that the alternatives are considered and are being used." (NGEIR Decision page 46).

"For these reasons, the Board agrees with EEA/Schwindt and concludes that the geographic market includes Ontario, Michigan, northern Illinois, northern Indiana, and the National Fuel Gas territory in western New York and Pennsylvania." (NGEIR Decision page 33).

3) ***Calculation of Market Concentration and Market Share:*** Within the relevant competitive geographic market, *"The Board finds that these results support the conclusion that neither Union nor EGD have market power in the storage market. The Board finds that the storage market is workably competitive."* (NGEIR Decision, page 48).

4. Merchant Storage Market is Competitive for Ontario Customers

In this section we present evidence that Ontario-based customers have a variety of competitive storage services to choose from. In particular, storage users in Ontario have a variety of options for services to meet swings in natural gas demand, including supply delivery products and competitive storage services around the Great Lakes. Buyers of storage services routinely consider these options and weigh their merits across a range of service characteristics. In addition, we show that the merger of Enbridge and Spectra does not substantially increase storage market share relative to Spectra's current market share.

4.1 Alternatives to Ontario Merchant Storage

This section more closely examines the uses of merchant storage, first by examining the make-up of the customers buying these services and then by discussing how storage is traded and used. However, it is important to note that traders/marketers utilize Ontario merchant storage that they contract from Union and EGD to directly compete with them.

Merchant storage is acquired by customers in three ways. Storage operators can solicit offers from customers by issuing open season notices of the availability of storage services. The storage operator will identify key storage parameters such as working gas available, deliverability, and may provide a notional price, subject to negotiation. The parties will negotiate a price and the storage service will be offered to the customers whose bids provide the highest net present value for the storage (i.e., price times term of service). Alternatively, large potential customers may issue RFPs to several storage service providers who will bid on the business. Also, customers may simply shop around for storage and make direct inquiries to storage providers.

Exhibit 4-1 lists the major storage services providers in the geographic market for which customer information was available. The largest users of storage are LDCs, trader/marketers, and pipelines' own accounts. Power generators and direct end users (industrial customers) make up a small percentage of customers. Traders and marketers are the largest segment of the storage customer base. Notably, this is also the case for Union and EGD, for which trader/marketers make up about 62% of the contracted merchant storage working gas capacity. Lastly, pipeline operators often contract for storage capacity to facilitate different gas delivery options on their own pipeline systems, such as park and loan services, no-notice services, and seasonal delivery services.

Exhibit 4-1.Customer Mix for Merchant Storage Operations in the Geographic Market (2016)

	LDC	Trader / Marketer	Pipeline / Infrastructure	Power Generator	End User
ANR Gas Storage	7%	37%	55%	1%	0%
ANR Pipeline	44%	46%	10%	0%	0%
Blue Lake	0%	1%	98%	0%	0%
Bluewater gas storage	47%	29%	24%	0%	0%
Honeoye Storage	0%	97%	0%	2%	1%
NFGD Gas Storage	72%	2%	27%	0%	0%
NGPL Gas Storage	59%	26%	14%	1%	0%
Panhandle Pipeline Storage	98%	2%	0%	0%	0%
Southwest Gas Storage	0%	0%	100%	0%	0%
Steuben and Thomas	4%	71%	25%	0%	0%

Source: FERC Index of Customer Data, Union Gas & EGD Gas Customer Report (Jan-2017)

Exhibit 4-2 lists the customers of Union and EGD that also hold storage contracts with other storage facilities. This is not a complete list, as it does not include all customers holding capacity on storage facilities not regulated by FERC.[15] However, it demonstrates the degree to which Ontario merchant storage customers also contract with other storage providers in the regional storage market. In total, these customers hold more than 110 Bcf of merchant storage capacity in Ontario, more than 87 Bcf of merchant storage capacity in Michigan, more than 16 Bcf of merchant storage capacity in New York, and more than 166 Bcf of merchant storage capacity in Iowa and Illinois. Six storage customers also hold pipeline capacity on Vector from the DTE Washington 10 storage interconnect into Ontario, indicating that these customers also likely hold storage capacity at Washington 10. It is important to note that EGD itself contracts for U.S. merchant storage to meet the needs of its utility business.

[15] Gas Storage fields not regulated by the FERC are not required to post information on their Index of Customers. There is 403 Bcf of working gas storage capacity in Michigan held by non-FERC regulated storage fields. Of this amount 183 Bcf is held by Michigan LDCs for in-franchise use.

Exhibit 4-2. Union & EGD Merchant Storage Customers Holding Merchant Storage Capacity outside of Ontario (Bcf)

Customer Name	Customer Type	Contracted Storage Capacity in Ontario (Bcf)	Michigan				New York			Iowa/Illinois
			ANR Gas Storage	ANR Pipeline	Bluewater gas storage	Washington 10	Honeoye Storage	NFGD Gas	Steuben and Thomas	NGPL Gas Storage
AltaGas	LDC	2.7								
Bay State Gas Company	LDC	1.82						1.1		
BP Energy Group	Trader / Marketer	0.5	3.3	12.03		Yes				36.63
Cargill Limited	End User	10.1					0.03			
Castleton Commodities	Trader / Marketer	7.5		4.99	0.29					103
Centra	LDC	1.01								
Connecticut Natural Gas Corporation	LDC	1.23				Yes		1		
Direct Energy Marketing	Trader / Marketer	0.5						0.44		
EDF Trading	Trader / Marketer	1.5		3.25						
Emera Energy	Trader / Marketer	0.5							0.5	
Energy Source Natural Gas	Trader / Marketer	0.03								
Exelon Generation	Power Generator	2								
Freepoint Commodities	Trader / Marketer	0.5								
Gaz Metro	LDC	12.53								
Goreway Station Partnership	Power Generator	0.57								
Greenfield Energy Centre LP	Power Generator	0.32								
Greenfield South Power Corporation	Power Generator	0.15								
Hartree Partners	Trader / Marketer	0.75			0.99					
Iberdrola Energy Services	Trader / Marketer	5.88								
J. Aron & Company	Trader / Marketer	10	3.01	12.74						30.25
Koch Canada Energy Services	Trader / Marketer	2				Yes				
MIECO INC	Trader / Marketer	0.5								
NextEra Energy Power Marketing	Trader / Marketer	0.14								
NJR Energy Services Company	Trader / Marketer	2								
Noble Americas Gas & Power Corp.	Trader / Marketer	1								
Petrochina International	Trader / Marketer	2.7								
Portland Energy Centre	Power Generator	0.47								
Powerex Corp.	Trader / Marketer	6.5								
Repsol Energy Canada	Trader / Marketer	4					1.83		4.64	36
Shell Energy North America	Trader / Marketer	10.16		6					0.03	
St. Lawrence Gas	LDC	0.9								
Suncor Energy Marketing Inc.	Trader / Marketer	2			1.29					
Tenaska Marketing Canada	Trader / Marketer	7.8	1.8	15.11	3.39	Yes			3.83	32
The Southern Connecticut Gas Company	LDC	1.61				Yes				
Thorold CoGen L.P.	Power Generator	0.16								
Tidal Energy Marketing Inc.[16]	Trader / Marketer	1			0.03					
TransCanada Power	Power Generator	0.03								
Twin Eagle Resource Management	Trader / Marketer	1	2.5	5.1						24.11
Uniper Global Commodities	Trader / Marketer	1.5								20
United Energy Trading Canada	Trader / Marketer	0.1	11.54							
Utilities Kingston	LDC	0.42								
Yankee Gas Services Company	LDC	4.27				Yes		2.04		
York Energy Centre LP	Power Generator	0.17								
Total		111	22	59	6		2	5	9	282

Source: Union and EGD Gas Storage Index of Customer Report (January 2017), FERC Index of Customer Filings. 1). Due to the lack of data, no customer lists are available for U.S. Storage Facilities not under the jurisdiction of FERC, which includes facilities accounting for 403 Bcf of Michigan's 685.7 Bcf of gas storage capacity.

Ontario merchant storage customers also hold more than 1.5 Bcfd of firm pipeline capacity into Ontario from surrounding regions. Exhibit 4-3 lists the Union and EGD merchant storage customers that also hold firm pipeline capacity on major pipelines from Michigan and New York into Ontario. These customers hold the pipeline capacity needed to deliver natural gas from Michigan and New York storage into Ontario.

[16] Based on information from EGD, Tidal Energy Marketing holds 1,000,000 Mmbtu of storage capacity at Washington 10. This capacity is not included in Exhibit 4-2, since Washington 10 is not required to file an Index of Customers. Only capacity identified in public sources has been included in this table.

Exhibit 4-3. Union & EGD Merchant Storage Customers with Capacity on FERC Regulated Pipelines (MMcfd)

Customer Name	Customer Type	Michigan to Ontario			Northwest New York to Ontario		
		Great Lakes Gas Transmission	Vector Pipeline	Panhandle Eastern PipeLine	Empire Pipeline	Tennessee Gas Pipeline	Total into Ontario
Capacity into Ontario		*2025*	*1550*	*138*	*400*	*750*	
Bay State Gas Company	LDC					10	10
BP Energy Group	Trader / Marketer	150	330				480
Cargill Limited	End User	50					50
Connecticut Natural Gas Corporation	LDC		10			2	12
Direct Energy Marketing	Trader / Marketer			40			40
EDF Trading	Trader / Marketer	15					15
Emera Energy	Trader / Marketer		20	20			40
Exelon Generation	Power Generator	20					20
Freepoint Commodities	Trader / Marketer		25				25
J. Aron & Company	Trader / Marketer	100	95				195
Koch Canada Energy Services	Trader / Marketer		15				15
Noble Americas Gas & Power Corp.	Trader / Marketer		50				50
Shell Energy North America	Trader / Marketer		30		200	16	246
Tenaska Marketing Canada	Trader / Marketer	61	85				146
Twin Eagle Resource Management	Trader / Marketer	15	20				35
United Energy Trading Canada	Trader / Marketer	65					65
Yankee Gas Services Company	LDC		60			10	70
Total		476	740	60	200	38	1514

Source: Union and EGD Gas Storage Index of Customer Report (January 2017), Pipeline Index of Customer Data – Q12017

These exhibits highlight the key role that traders and marketers play in the gas market. They are intermediaries who assemble supplies of gas and portfolios of operating assets to provide services to a variety of customer types (LDCs, power generators, industrial customers) across a wide geographic area. One of the reasons why many industrial and power generation natural gas customers do not directly hold merchant storage capacity is that they can get variable or "swing" gas supply services from trader/marketers without having to make the long-term commitments for merchant storage. (As discussed later, they can also get variable gas services from pipelines.)

Michigan storage operations are significant. (Exhibit 4-4) In 2015 working gas storage totaled 685.7 Bcf with a peak deliverability of 17.6 Bcf/d. Of this capacity, LDCs hold 297 Bcf, of which 183 Bcf is held for in-franchise use (62 %) and 114 Bcf is available to merchant gas storage customers. Another 389 Bcf is held by pipeline companies[17] and independent storage operators, indicating that a total of 503 Bcf of working gas storage capacity is available for merchant gas storage use.

[17] Certain pipeline companies, including ANR Pipeline, contract for storage capacity from affiliated merchant storage providers in order to provide pipeline services. ANR Pipeline holds all of the storage capacity available from Blue Lake Storage, and much of the storage capacity available from ANR Storage. This storage capacity is used by ANR Pipeline to provide additional pipeline and storage services. We have included this capacity when determining the amount of available merchant storage.

Exhibit 4-4. Michigan Merchant Storage Capacity

Operating Company	Parent Company	Working Gas Capacity (MMcf)	In-Franchise Storage Use (MMcf)	Merchant Gas Storage Capacity (MMcf)
ANR Pipeline	TransCanada	135,130	0	135,130
ANR Storage	TransCanada	56,118	0	56,118
Blue Lake Storage	TransCanada	47,086	0	47,086
Eaton Rapids Gas Storage	TransCanada	12,984	0	12,984
Bluewater Gas Storage	PAA Natural Gas Storage	26,512	0	26,512
Consumers Energy	CMS Energy	148,310	107,000	41,310
Mich Con	DTE Energy	139,866	66,900	72,966
Washington 10 Storage Corp.	DTE Energy	90,113	0	90,113
Michigan Gas Utilities	WEC Energy Group	3,900	3,900	0
Semco Energy Gas Co.	Semco Energy	4,900	5,170	0
Southwest Gas Storage Co.	Energy Transfer	17,690	0	17,690
Lee 8 Storage	TERM Storage	3,114	0	3,114
	LDCs	296,976	182,970	114,276
	Total	685,723	182,970	502,753

Sources: Energy Information Administration (EIA) 914 Storage Report for 2015 and LDC Michigan PUC Regulatory Filings

4.2 Merchant Storage Prices Linked to Seasonal Gas Prices

As shown in Exhibit 4-5, the actual prices paid by third parties contracting for Ontario storage capacity have, on average, been consistent with, and moved up and down with, the intrinsic (i.e. seasonal price differential of summer versus winter natural gas prices) value of natural gas in storage at Dawn. This exhibit shows the seasonal value of natural gas at Dawn calculated based on the difference between the futures price for the three winter months (Jan, February, March) and the three summer months (June, July, August) at Dawn for the upcoming storage year. The seasonal value of natural gas is compared to the average contract price of storage received by Union and EGD for new storage contracts signed in each year. The chart shows that the price that Ontario storage customers have been willing to pay for storage capacity is highly linked to the expected seasonal price of natural gas.

This linkage is to be expected, given the alternative options to merchant gas storage at Dawn, including the ability to purchase gas supply at the Dawn Hub, and to hedge the prices based on the futures market. The close relationship between the value of storage and the seasonal value of natural gas highlights the inability of either Union or EGD to set natural gas storage prices independent of market factors.

Exhibit 4-5. Comparison of the Seasonal Value of Natural Gas to Ontario Merchant Storage Rates

Source: NYMEX (SNL), Union and EGD Semi Annual Storage Reports

Storage continues to be priced and valued in close relationship with competitive natural gas prices, specifically in relation to the seasonal value of natural gas price spreads. When spreads narrow, storage value declines. Spreads can narrow when there is ample gas supply flowing into a region, or there is an increase in gas pipeline capacity that provides customers with other options for meeting variable and seasonal demand. Thus merchant storage operators face effective competition from storage operators, pipeline capacity, new production, and trader/merchants offering shaped supply contracts and synthetic storage.

When seasonal price spreads increase, storage values typically increase as well. Seasonal values can increase when overall natural gas market conditions tighten, when pipeline constraints existing into a specific region (such as current conditions in New England), or based on changes in pipeline tariffs that impact the price of firm pipeline capacity options.

It is important to note that the seasonal value of natural gas at Dawn is driven by factors on a broad regional basis, rather than factors unique to Dawn. Recent changes, including the shift to production in Marcellus/Utica, which is located closer to the demand centers than Western Canada, have reduced the seasonal price spread – as has the overall growth in gas supply available to the region. These changes combine to suppress the value of natural gas storage in Ontario, as reflected in the average price of newly contracted storage.

4.3 Storage Cost Comparison

This section reviews the costs of some of the other merchant storage options in the geographic market accessible to Ontario customers. The analysis focuses on a LDC customer with a storage contract where deliverability is 1.5% of the working gas in storage, referred to as the Maximum Storage Quantity (MSQ). ICF assumes that an LDC will have one cycle per year (seasonal injection and withdrawal).

To represent a cross section of the available merchant storage alternatives for an Ontario-based customer, ICF selected five representative storage fields where storage cost data was available[18]; one in Ontario (Union), three in Michigan (ANR Storage, Washington 10, and Bluewater), and one in New York (National Fuel Gas)[19]. The overall list of storage fields for which information is accessible to customers in Ontario is much longer (Exhibit 2-4).

Exhibit 4-6 below lists the storage services analyzed by ICF. Using storage revenue estimates, ICF was able to estimate the average rate (revenue per Dth of storage capacity) for LDCs in 2016. This resulted in an average storage revenue (storage cost) of US$0.72/Dth of storage service.

Exhibit 4-6. Representative Annual Storage Service Rate

Provider	Service Type	Storage Capacity ($/Dt/mo)	Delivery Demand Charge ($/Dt/Mo)	Inject ($/Dt)	Withdraw ($/Dt)	Inject Fuel (%)	Withdraw Fuel (%)	Ave. Stor. Cost ($/Dt)
Washington 10	FSS S-1	0.024	2.479	0	0	0	0	0.732
ANR Storage	FSS	0.013	1.092	0.026	0.026	0.013	0.002	0.407
Bluewater	FSS, 50 Day	n/a	n/a	0.016	0	0.0145	0	0.526
National Fuel Gas	FSS	0.039	2.483	0.038	0.038	0.0046	0.0046	0.946
Union	Merchant	n/a	n/a	n/a	n/a	0.47	0.66	0.720

Source: FERC Tariff Filings: SEMCO's Gas Storage Costs from 2016-17 Gas Cost Recovery Plan (U-17942) for Bluewater: Union Gas, and Washington 10 Tariff sheet filed with Michigan PUC. Union Gas Storage Cost is based on Union Gas' 2016 Average Storage Rate. The Fuel, and Injection/Withdrawal charges are ICF assumptions. We have assumed that the Union Storage Cost ($0.496/Dth) was for a contract equivalent to 66 days.

Bluewater is a merchant storage facility that does not post storage rates. The rate estimate is based on a filing with the Michigan Public Service Commission (PSC), and represents a negotiated rate with SEMCO Energy.[20] Because it is a negotiated rate, we do not know how

[18] The merchant storage facilities generally do not post rates unless they are regulated by FERC (or the OEB) under cost-of-service rates, or are required to post negotiated rates, as in Ontario.
[19] New York storage is more competitive in the Toronto region than delivered to Dawn, since delivery from New York to Dawn requires additional pipeline capacity on Union that would not be needed for Toronto delivery, and delivery to Toronto from Dawn Storage requires additional pipeline capacity on Union that would not be needed for deliveries from New York storage.
[20] SEMCO Energy Company, Case No. U-17942, filed Dec. 18, 2015, testimony of Walter E. Fitzgerald, Exhibit A2.

representative it is for Bluewater rates to other customers. The storage rates for ANR Storage and National Fuel Gas are based on FERC-approved tariffs for firm storage service and represent the maximum allowable rate authorized by FERC. The storage rate for Washington 10 is based on the company's rate sheet reported with the Michigan PSC. These regulated rates represent the maximum storage rates, which can be, and likely are, discounted at the discretion of the storage operator during negotiations in order to be competitive with the market.

Each storage service will have a slightly different procurement cost for the injected gas. ICF has assumed that a storage field in Michigan will source its gas from MichCon, a storage field in New York would source gas at the Niagara index price, and an Ontario storage field would source gas from Dawn. Exhibit 4-7 shows the 2017/18 forward prices for Dawn, MichCon, and Niagara, broken out by season. The seasonal value is the difference between summer and winter prices and provides some indication of the value of storing gas in summer and withdrawing it in the winter. The geographic basis between the pricing points—MichCon, Niagara, and Dawn—are a key factor for assessing the value of transportation capacity between geographic points.

Exhibit 4-7. 2017/18 Forward Prices and Basis Differentials ($/Dth) (December 2017 Average)

	Dawn	MichCon	Niagara	Dawn to MichCon Basis	Dawn to Niagara Basis
Summer 2017	3.48	3.38	2.90	0.10	0.58
Winter 2017/18	3.87	3.64	3.29	0.23	0.58
Seasonal Value	0.39	0.26	0.38	0.13	0.00
Gas Year Average 2017/18	3.64	3.49	3.06	0.15	0.58

Source: NYMEX – Average of December 2016 Forward Prices

For each storage field we have evaluated, ICF has chosen a likely pipeline pathway for delivery to Dawn. For clarity each pipeline interconnect is shown in Exhibit 4-8 with the sum total of all routes. The firm transportation and variable charges (fuel and commodity) are sourced from the pipeline company's reported FERC tariffs for the allowed maximum rates for each pipeline segment of each pathway.

Exhibit 4-8. Pipeline Pathways from Storage Field to Delivery Point (1) (2)

Pathway	Segment 1	Segment 2	Segment 3	Total
Union to Dawn				
FT Rate ($/Dth/Day)				No Transport Costs Within Dawn
Fuel Rate (%)				No Transport Costs Within Dawn
National Fuel Gas (NY) to Dawn	Nat Fuel (On system storage to Niagara)	TCPL (Niagara to Kirkwall)	Union (Kirkwall to Dawn)	
FT Rate ($/Dth/Day)	0.13	0.175	0.038	0.337
Fuel Rate (%)	0.96%	0.33%	0.16%	1.45%

Pathway	Segment 1	Segment 2	Segment 3	Total
ANR Storage to Dawn	Great Lakes (Dewar to St. Clair)	TCPL (St. Clair to Dawn)		
FT Rate ($/Dth/Day)	0.190	0.118		0.308
Fuel Rate (%)	0.70%	0.32%		1.02%
Washington 10 to Dawn	Vector (Z2 to Border)	Vector Canada (Border to Dawn)		
FT Rate ($/Dth/Day)	0.256	0.019		0.274
Fuel Rate (%)	0.46%	0.00%		0.46%
Bluewater to Dawn via Vector	Vector (Z2 to Border)	Vector Canada (Border to Dawn)		
FT Rate ($/Dth/Day)	0.256	0.019		0.274
Fuel Rate (%)	0.46%	0.00%		0.46%
Bluewater to Dawn via Union	Bluewater to Dawn			
FT Rate ($/Dth/Day)	0.027			0.027
Fuel Rate (%)	0.24%			0.24%

Source: FERC Tariff Filings, Union Transportation Tariff Sheet
1) All Canadian reported tariffs (Union & TransCanada) are converted from CAD$ per GJ to US$ per Dth using an average 2016 USD/CAD currency exchange rate.

Exhibit 4-9 presents 'delivered costs' for each storage operator to Dawn for a LDC. The 'delivered cost' represents the cost of gas storage — assuming a one-cycle 1.5 % deliverability for a LDC — and the full cost of the firm transportation to get gas to the delivery point. These calculations have been performed on a per-unit (US$/Dth) basis and represent the full costs of gas storage without accounting for any potential benefits. Even without incorporating the benefits from releasing unused transportation capacity, the cost of Union storage is in line with U.S. options.

Exhibit 4-9. Comparative Storage Costs for an Ontario LDC with Dawn Delivery (US$/Dth)

	Storage Costs	Storage Fuel Costs	Pipeline Cost to Dawn	Pipeline Fuel to Dawn	Delivered Cost to Dawn
Washington 10	$0.732	$0.000	$0.274	$0.016	$1.022
ANR Storage	$0.407	$0.052	$0.308	$0.036	$0.802
Bluewater	$0.526	$0.051	$0.027	$0.008	$0.612
National Fuel Gas	$0.946	$0.028	$0.344	$0.044	$1.363
Union	$0.720	$0.041	$0.000	$0.000	$0.761

Source: ICF. Storage cost includes capacity, demand, injection and withdrawal. Pipeline cost is demand charge plus commodity charge.

The 'delivered cost' represents the undiscounted cost associated with purchasing the merchant gas storage and pipeline capacity. However, there is an inherent value associated with the assets that can serve to reduce the 'net cost' to a capacity holder. ICF has analyzed the value that a pipeline contract capacity holder can potentially realize for their firm transportation contracts on the secondary market as well as the benefits in the purchase cost of the gas injected into storage.

ICF has made the assumption that a LDC would be able to release its firm pipeline capacity 200 days over the course of the year, assuming that the LDC will likely only need firm pipeline capacity over the winter season and could market that capacity over the injection season.

To approximate a fair market value of the firm pipeline capacity, we have used the average summer (off-peak) basis between the pricing hubs, with transportation from the Michigan storage facilities to receiving the MichCon to Dawn basis, while New York receives the Niagara to Dawn basis. These values were based on the forward strip. Exhibit 4-10 shows the calculations ICF used assuming 200 days of released capacity for the LDC. Due to the higher basis differential between Niagara and Dawn as shown in the forwards, a gas storage customer at National Fuel Gas could generate the highest potential value from released pipeline capacity and reduction in the gas purchase cost, with a benefit of $0.316/Dth for a LDC. The total theoretical benefit would be the sum of the locational basis and the value from released capacity.

Exhibit 4-10. Calculation of Capacity Release Revenue per Dth of Pipeline Capacity (1) (US$/Dth)

	FT Demand Rate to Dawn ($/Dth/Day)	Location Basis ($/Dth)	LDC User Available Days to Release Capacity	Value from Released Capacity ($/Dth)
Washington 10	0.274	0.099	200	0.054
ANR Storage	0.308	0.099	200	0.054
Bluewater	0.027	0.099	200	0.054
National Fuel Gas	0.337	0.578	200	0.316
Union			200	

Source: ICF

1). Value of Released Pipeline Capacity Basis is equal to the number of days multiplied by the average annual basis on the pipeline route times the capacity divided by 365 to generate an annualized average daily benefit

Exhibit 4-11 presents the results of ICF's 'delivered cost' and 'net cost' analysis to Dawn. The 'net cost' shown for each storage operator and customer type includes the average benefits from released pipeline capacity and the reduction in gas procurement costs from each storage facility relative to Union (Dawn). There is limited data on the ability of storage customers to recoup pipeline costs, although we believe that the amount recouped is much less than the pipeline basis. We have estimated savings at 50% of the pipeline basis for this example, although the actual savings might be higher or lower than this amount.

Exhibit 4-11. Summary of Delivered Storage Costs to Dawn for an Ontario LDC (US$/Dth)

	LDC - Delivered Cost	LDC - Basis and Pipeline Capacity Value	LDC - Net Cost
Washington 10	$1.022	$0.077	$0.945
ANR Storage	$0.802	$0.077	$0.726
Bluewater	$0.612	$0.077	$0.535
National Fuel Gas	$1.363	$0.447	$0.916
Union (1)	$0.761		$0.761

Source: ICF

1) There is no delivered cost from Union's gas storage field to Dawn, thus there is no attributable value of capacity releases for Union's storage or in gas procurement costs.

On a 'net cost' basis, U.S. storage options become even more attractive as compared to Dawn. The 'landed cost' analysis performed by ICF suggest that Union is competitively priced compared to storage operators in New York and Michigan, and when factoring the benefits of holding pipeline capacity and gas supply procurement options, Union faces significant price competition on a 'net cost' basis.

At Dawn, National Fuel Gas storage remains more expensive even after a reasonable estimate for the value of pipeline capacity is accounted for. However, if the storage customer is located in Toronto, near Parkway, rather than near Dawn, the pipeline cost savings on the Union Gas system (about US$0.14 per Dth) of using New York storage would offset the increased cost, resulting in New York storage also being competitive with Dawn storage (US$0.89 for New York storage vs. US$0.88 per Dth for using Dawn storage).

4.4 Pipeline Capacity Availability into Ontario

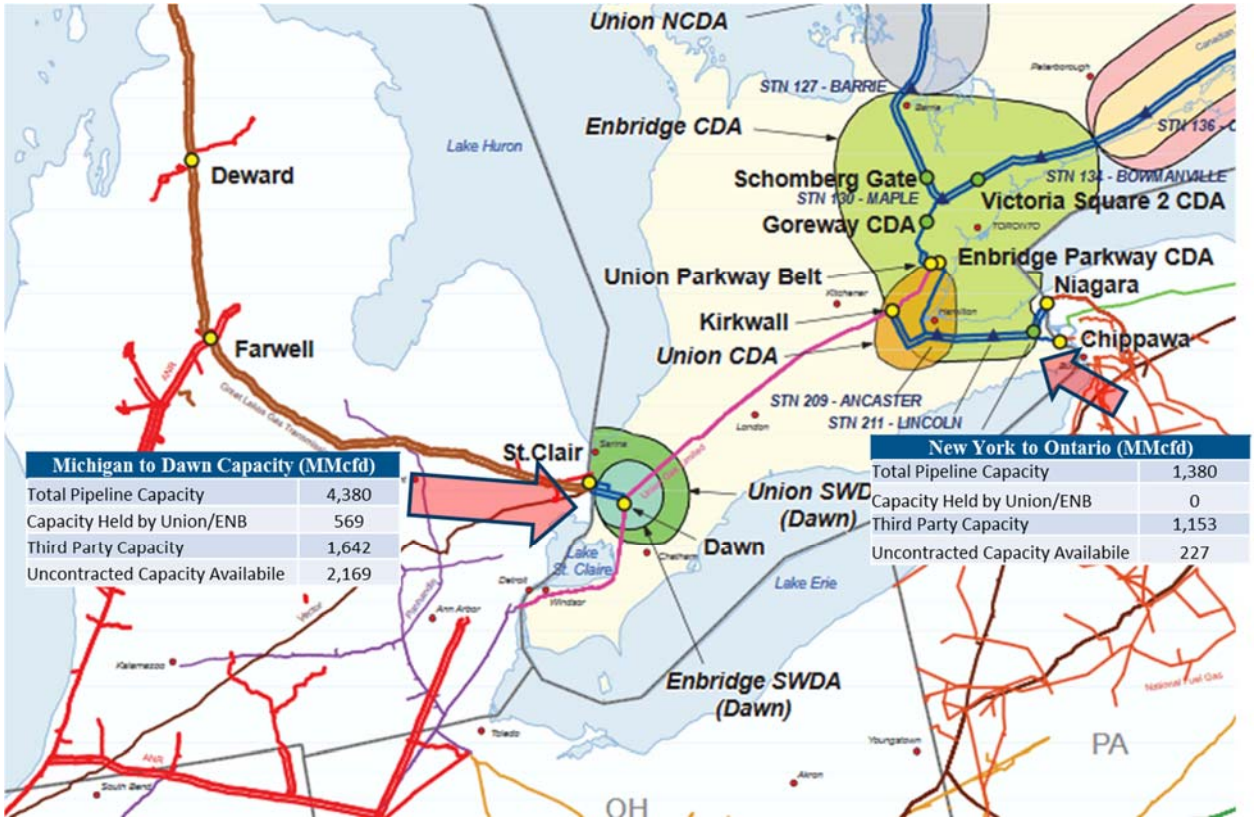
In terms of the product market, pipeline services also compete with storage where cycling gas and providing short-term daily swings in gas supply is the service sought by customers in Ontario. More generally, pipelines with ample capacity and connected to production provide a source of gas that can reduce the need for storage and affect the seasonal basis upon which storage value is based.

In recent years there has been an increase in pipeline capacity into the Ontario market, driven both by pipeline expansions as well as the reversal of traditional pipeline flows at Niagara and Chippawa. These expansions provide greater access to storage in New York and Michigan.

ICF has analyzed the pipeline routes into Ontario as well as firm capacity held by Union and EGD in order to calculate the available capacity for third parties. The current pipeline capacities as of 2016 are shown in Exhibit 4-12, which indicates there is 3,739 MMcfd of pipeline capacity not held by EGD or Union from Michigan, and 1,380 MMcfd from New York to Ontario.

While capacity into Ontario has increased from both Michigan and New York since NGEIR, the largest change has occurred between New York and Ontario. Natural gas now flows from New York into Ontario, a reversal of flows compared to 2006 when gas flowed to New York. This shift has changed the relationship between Ontario storage and New York storage. Since New York storage is now upstream of Ontario, and proximate to the strong production from Marcellus wells, the gas costs here are now typically below the cost of gas in Ontario. This difference in prices increases the competitiveness of New York to Ontario storage relative to when the NGEIR decision was reached in 2006. This increased competitiveness increases the geographically competitive market accessible by Ontario consumers.

Exhibit 4-22. Transportation Pathways to Dawn Area and Pipeline Capacity[21]



Source: ICF, FERC, Company Sources, EGD

Following the completion of the Rover and NEXUS interconnects with Vector Pipeline, there will be an additional 300 MMcfd of pipeline capacity between Michigan and Ontario. Following the completion of pipeline expansions from New York to Ontario in 2017 and 2018, there will be a total of 1,553 MMcfd of capacity between New York and Ontario.

4.5 Trader and Marketer Competition and Synthetic Storage

As the above review of market activities has shown, buyers of gas storage in Ontario have a number of options aside from the merchant storage available from Union and EGD. These other options provide effective competitive constraints on Ontario storage providers' prices and service offerings. In fact, EGD uses synthetic storage to meet the needs of its utility business.

Little direct information is available on the pricing of competing services provided by traders and marketers since this is sensitive commercial information. These entities typically respond to RFPs from customers and actively solicit business outside the RFP process. Their offerings can be extensive. As one example, we show the service offerings of Castleton Commodities

[21] ANR connection at US/Canada border omitted due to lack of data. While capacity may exist on the New York to Ontario corridor, ICF notes constraints both upstream & downstream of the Niagara border crossing.

International, a marketer active in Ontario that holds gas storage capacity with Union, EGD, and several storage operations in Michigan.[22] Castleton Commodities provides services in four areas of gas trading: wholesale gas marketing, asset management, producer services, and wholesale purchases and sales services. For the latter, Castleton Commodities' offerings include

- Intra-day, daily, monthly, and term, fixed, index, NYMEX supply pricing.
- Daily calls, swaps, options, collars.
- Park and loans.
- Firm storage and transportation.
- LNG and feed gas supply.
- Peaking services.
- Municipal natural gas prepays.
- Volumetric production payments.

Castleton Commodities' ability to provide these services relies on its own "proprietary deal flow, sourced through long-term relationships with leading industry participants, to provide baseload and peaking gas sales across multiple physical markets."[23]

Another marketer active in Ontario is NJR Energy Services. Like Castleton, NJR Energy Services holds capacity on multiple storage facilities (Union, Bluewater, Washington 10, ANR Storage, Stagecoach, and others) and pipelines through which it offers its customers "uninterrupted supplies."[24] NJR Energy Services offers baseload supplies, peaking gas, balancing services, and storage supplies.

NJR Energy Services and Castleton Commodities are only two of the many active traders and marketers in Ontario offering the same types of services.

One of the major offerings is so-called synthetic storage that competes directly with the merchant storage offered by Union and EGD (and which can employ Union and EGD storage services contracted to the marketer). As has been described, synthetic storage describes an agreement where a customer provides gas to the trader/marketer (in effect, injection) that will be redelivered later (in effect, withdrawal) for a fee that typically would be less than the full cost of holding storage capacity directly. The marketer then manages the trading position with the "borrowed" gas to ensure that with delivery later in the year, it recovers its costs and earns a profit. Union and EGD are aware of Ontario customers that have bought synthetic storage from marketers, directly in competition with the merchant storage offered by the companies. ICF believes this practice is widespread.

Marketers also offer delivered gas services that compete with storage, as in the peaking service described above by Castleton Commodities. In essence, they use their own storage and

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[22] See Castleton Commodities International, http://www.cci.com/trading/natural-gas , accessed on Jan. 24, 2017. "CCI's U.S. Natural Gas business consistently ranks among the top marketers of natural gas in the U.S. transacting on approximately 100 pipelines and over 60 storage facilities to create a geographically diverse portfolio of natural gas assets. CCI's natural gas storage leases comprise one of the largest independent storage portfolios in North America."
[23] Ibid.
[24] See NJR Energy Services, http://www.njrenergyservices.com/energy-management-services/wholesale-supplies.asp , accessed Jan. 24, 2017.

pipeline capacity contracts with Union, EGD and others to provide customers with gas supply that swings with their customers' needs for gas. In many cases marketers will have asset agreements with LDCs, who release their pipeline capacity to the marketer in return for a delivered service. This reduces a LDCs gas supply costs by reducing their pipeline demand charges and allows the marketer to use this capacity to provide other delivery services to other customers. Such delivery contracts are common for power generators. ICF believes these types of activities in occur in Ontario given the large presence of traders and marketers and their contracted merchant storage capacity in the region as well as their pipeline capacity contracts.

Finally, a buyer of gas in Ontario with variable gas demand is able to buy gas directly in the spot market and manage price risk through the use of financial products, as those listed above for Castleton Commodities. Financial derivatives can compete with storage in managing seasonal price risk. Consider an end-use industrial transportation customer in Ontario that will need gas during the winter months. The customer can either, directly or (more likely) through a trader or marketer, buy gas in the summer and contract for storage capacity to use the gas during the winter months; or buy gas at the prevailing market price for the winter months and purchase a futures contract that gives the customer the right to buy gas at a specific price in a specific future month, such as January. If the price for January gas in the futures market is less than the current price of gas plus the cost of storage, the customer is better off with the futures contract. However, if the futures price is above the current cost of gas plus the cost of storage, the customer is better off storing the gas.

From the perspective of a seller of storage service, the nature of this competition is important. If the storage provider attempts to raise prices for storage, the seller risks driving customers to the futures market.

4.7 Summary of Findings

This section of the report summarizes ICF's conclusions on the geographic market and product market for storage services. We have demonstrated that:

1) Substantial amounts of merchant storage in Michigan and New York is accessible at competitive pricing and terms to Ontario customers, including pipeline delivery to Dawn.
2) A majority of Ontario storage services customers hold storage capacity in multiple storage fields across Michigan, New York and other U.S. states.
3) Pipeline capacity into Ontario, including interconnections with storage fields in the Great Lakes region, as well as gas production from Marcellus/Utica, are large and growing.
4) Multiple storage services are provided by traders and marketers to tailor deliveries to customers' needs.
5) Synthetic storage offered by traders and marketers has the same functionality as merchant storage.
6) Market purchases combined with financial hedges compete with merchant storage.
7) Services offered by pipelines that help customers manage swings in supply or demand, services particularly useful for power generators in Ontario.

Accordingly, the regional gas market around the Great Lakes is robust. There is considerable competition across all of the delivery services.

5 Competitive Analysis

5.1 Identification of Geographic Market

In 2006, the OEB reached a determination that the Ontario storage market was sufficiently competitive, based on an assessment of competition within a competitive market region. According to the OEB:

> *"Ontario storage operators compete in a geographic market that includes Michigan and parts of Illinois, Indiana, New York and Pennsylvania. The Board finds that the market is competitive and that neither Union nor EGD have market power."*[25]

ICF has updated the competitive market analysis conducted by EEA[26] for NGEIR proceeding. Since the original analysis was conducted, there has been both an increase in natural gas storage capacity and a substantial increase in interregional pipeline capacity within the competitive market region. For example, New York is now more interconnected with Ontario, with both increased pipeline capacity and ability for bi-directional pipeline flows, than at the time of NGEIR.

CRA conducted a similar statistical analysis to that conducted in 2005/06 by EEA during the NGEIR proceeding as well as additional statistical analysis, which is reported on separately.

CRA's statistical results further support the conclusion that the relevant geographic market in which Dawn suppliers of storage compete should be considered to include storage in Michigan, Illinois and New York. These findings have been echoed by the FERC in approval of market rate authority to the Bluewater gas storage facility in Michigan, where FERC found that the operative market included "Michigan, northern Indiana, northern Illinois, and Western Ontario."[27]

Given this finding, the potential effect of the proposed merger between Enbridge and Spectra on merchant storage natural gas prices at Dawn should be considered within a relevant market that includes Ontario, Michigan, Illinois and New York. Within this market region, the combination of EGD and Union storage would not result in an unacceptable level of market concentration.

5.2 Impact of Merger on Share Concentration

This section examines the impact of the merger between Enbridge and Spectra on the competitive merchant storage market using the same type of analysis conducted in 2005/06 as part of NGEIR. ICF has applied the competitive geographic market area that was outlined in NGEIR, and is supported by the CRA statistical analysis and landed cost analysis, to calculate the share concentration. This analysis does not include alternatives to merchant gas storage,

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[25] Ontario Energy Board Decision with Reasons, EB-2005-0551 Natural Gas Electricity Interface Review (NGEIR Decision), November 7, 2006, page 3.
[26] EEA was acquired by ICF in 2006. The primary author of this report for ICF, Michael Sloan, was one of the primary authors of the 2005 EEA report.
[27] Bluewater Gas Storage, Order Issuing Certificate and Approving Abandonment, CP351-000, CP367-000, CP368-000, Oct. 27, 2006.

such as the available services provided by pipelines and traders/marketers for storage services (Sections 4.4 and 4.5).

The merger of Spectra and Enbridge will have a very modest impact on share concentration due to the small share of the merchant storage market currently held by EGD. Spectra currently holds 11.0% of the merchant storage capacity in the relevant geographic market. After the merger, the combined company will hold only 13.1% of the merchant storage capacity in the relevant geographic market. Storage capacity in the relevant geographic market is listed by operating company and by parent company in Appendix B.

In combination with ICF's analysis of the qualitative competitive factors, the resultant concentration levels would not result in the combined entity having the ability to raise prices without a market response by customers seeking competitive alternatives.

As a result, the impact of the merger on market concentration is minor.

Appendix A - Union and Enbridge Gas Distribution Merchant Storage Customers

Exhibit A-1. Union Gas Merchant Storage Customer List (January 2017)

Customer Name	Contract Capacity (GJ)	Effective Date	End Date	Max. Daily Injection (GJ)	Max. Daily Withdrawal (GJ)	Affiliate
Yankee Gas Services Company	4,500,000	1-Apr-16	31-Mar-19	33,750	54,000	No
Gaz Metro Limited Partnership	4,425,000	31-Mar-15	31-Mar-18	33,188	53,100	No
Gaz Metro Limited Partnership	4,400,000	31-Mar-11	31-Mar-17	33,000	52,800	No
Gaz Metro Limited Partnership	4,400,000	31-Mar-15	31-Mar-17	33,000	52,800	No
Castleton Commodities Merchant Trading L.P.	3,165,168	1-Apr-13	31-Jul-18	37,982	37,982	No
Tenaska Marketing Canada - a division of TMV Corp.	3,165,168	1-Apr-16	31-Mar-19	0	37,982	No
AltaGas Ltd.	2,844,465	1-Apr-09	31-Mar-29	21,333	34,134	No
J. Aron & Company	2,110,112	31-Mar-12	31-Mar-17	23,211	25,321	No
Cargill Limited	2,110,112	15-Feb-13	31-Mar-17	0	40,176	No
Castleton Commodities Merchant Trading L.P.	2,110,112	1-Apr-13	31-Jul-18	25,321	25,321	No
Tenaska Marketing Canada - a division of TMV Corp.	2,110,112	9-May-14	30-Apr-17	15,826	25,321	No
NJR Energy Services Company	2,110,112	31-Mar-15	31-Mar-17	0	25,321	No
Shell Energy North America (Canada) Inc.	2,110,112	1-Apr-15	31-Mar-17	16,881	25,321	No
Powerex Corp.	2,110,112	31-Mar-15	31-Mar-17	0	25,321	No
Cargill Limited	2,110,112	1-Sep-16	31-Mar-19	70,337	25,321	No
Shell Energy North America (Canada) Inc.	1,899,101	1-Apr-16	31-Mar-18	0	27,432	No
The Southern Connecticut Gas Company	1,700,000	1-Apr-15	31-Mar-18	12,750	20,400	No
Tenaska Marketing Canada - a division of TMV Corp.	1,582,584	27-Sep-14	31-Mar-17	211,011	18,991	No
EDF Trading North America, LLC	1,582,584	31-Mar-16	31-Mar-18	0	18,991	No
Shell Energy North America (Canada) Inc.	1,430,555	1-Aug-15	31-Jul-17	0	17,167	No
Connecticut Natural Gas Corporation	1,300,000	1-Apr-15	31-Mar-18	9,750	15,600	No
J. Aron & Company	1,055,056	1-Jul-16	31-Mar-17	0	12,661	No
Koch Canada Energy Services, LP	1,055,056	31-Mar-16	31-Mar-17	0	12,661	No
Twin Eagle Resource Management Canada, LLC	1,055,056	1-Jul-16	31-Mar-17	0	12,661	No
Uniper Global Commodities North America LLC	1,055,056	1-Apr-16	31-Mar-17	35,133	12,661	No
Shell Energy North America (Canada) Inc.	1,055,056	1-Feb-13	30-Jun-17	12,661	26,588	No
Shell Energy North America (Canada) Inc.	1,055,056	1-Feb-13	30-Jun-17	65,414	12,661	No
Shell Energy North America (Canada) Inc.	1,055,056	1-Feb-13	30-Jun-17	65,414	94,955	No
Cargill Limited	1,055,056	1-Mar-13	31-Mar-17	0	86,515	No
Cargill Limited	1,055,056	1-Mar-13	31-Mar-17	0	21,396	No
J. Aron & Company	1,055,056	1-Apr-13	31-Mar-17	11,606	12,661	No
J. Aron & Company	1,055,056	1-Apr-13	31-Mar-17	11,606	12,661	No
J. Aron & Company	1,055,056	1-Apr-13	31-Mar-17	11,606	12,661	No
J. Aron & Company	1,055,056	1-Apr-13	31-Mar-17	11,606	12,661	No
Castleton Commodities Merchant Trading L.P.	1,055,056	4-May-13	31-Jul-18	12,661	12,661	No

Castleton Commodities Merchant Trading L.P.	1,055,056	4-May-13	31-Jul-18	12,661	174,810	No
Exelon Generation Company, LLC	1,055,056	1-Aug-13	30-Apr-17	36,927	25,321	No
Exelon Generation Company, LLC	1,055,056	1-May-14	30-Apr-17	36,927	25,321	No
Cargill Limited	1,055,056	13-Sep-14	31-Mar-17	105,506	21,824	No
Suncor Energy Marketing Inc.	1,055,056	13-Sep-14	31-Mar-17	21,532	86,744	No
Koch Canada Energy Services, LP	1,055,056	1-Apr-15	31-Mar-18	0	12,661	No
Powerex Corp.	1,055,056	31-Mar-15	31-Mar-18	0	12,661	No
PetroChina International (Canada) Trading Ltd.	1,055,056	1-Apr-15	31-Mar-18	0	12,661	No
Cargill Limited	1,055,056	1-Apr-15	31-Mar-17	0	12,661	No
Noble Americas Gas & Power Corp.	1,055,056	1-Apr-15	31-Mar-17	0	12,661	No
Repsol Energy Canada Ltd.	1,055,056	1-Apr-15	31-Mar-17	0	12,661	No
Repsol Energy Canada Ltd.	1,055,056	1-Apr-16	31-Mar-18	0	12,661	No
Powerex Corp.	1,055,056	1-Aug-15	31-Jul-17	0	12,661	No
Shell Energy North America (Canada) Inc.	1,055,056	1-Apr-16	31-Mar-18	0	12,661	No
Shell Energy North America (Canada) Inc.	1,055,056	10-Oct-15	31-Mar-18	105,506	12,661	No
Powerex Corp.	1,055,056	1-Apr-16	31-Mar-19	0	12,661	No
Cargill Limited	1,055,056	1-Apr-16	31-Mar-18	0	12,661	No
Powerex Corp.	1,055,056	1-Apr-16	31-Mar-19	0	12,661	No
Suncor Energy Marketing Inc.	1,055,056	1-Mar-16	31-Mar-18	34,034	12,661	No
Cargill Limited	1,055,056	1-Jul-16	30-Apr-19	0	12,661	No
Hartree Partners, LP	791,292	26-Feb-16	31-Mar-17	0	9,496	No
Goreway Station Partnership by its managing partner Goreway Power Station Holdings ULC	600,000	1-Jul-08	31-Oct-28	128,000	128,000	No
BP Canada Energy Group ULC	527,528	1-Apr-16	31-Mar-17	0	6,330	No
Uniper Global Commodities North America LLC	527,528	1-Jul-16	31-Mar-17	0	6,330	No
Tenaska Marketing Canada - a division of TMV Corp.	527,528	1-Apr-15	31-Mar-18	0	6,330	No
MIECO INC.	527,528	31-Oct-15	31-Mar-18	527,528	6,330	No
Freepoint Commodities LLC	527,528	1-Apr-16	31-Mar-18	0	6,330	No
Emera Energy Limited Partnership	527,528	31-Mar-16	31-Mar-18	16,881	6,330	No
Tidal Energy Marketing Inc.	527,528	1-Apr-16	31-Mar-18	0	6,330	Yes
Tenaska Marketing Canada - a division of TMV Corp.	527,528	1-Jul-16	30-Apr-19	17,017	6,330	No
Powerex Corp.	527,528	1-Sep-16	31-Mar-19	0	6,330	No
J. Aron & Company	527,528	30-Jul-16	31-Mar-19	6,330	6,330	No
Portlands Energy Centre L.P. by its General Partner, Portlands Energy Centre Inc.	500,000	1-Jan-09	31-Mar-19	40,000	40,000	No
St. Lawrence Gas Company, Inc.	475,000	31-Mar-15	31-Mar-17	4,750	5,225	No
Tidal Energy Marketing Inc.	263,764	1-Mar-16	31-Mar-17	0	3,165	No
Greenfield Energy Centre LP	211,011	1-May-08	31-Oct-18	42,202	42,202	No
1425445 Ontario Limited o/a Utilities Kingston	200,000	1-Apr-14	31-Mar-17	0	2,400	No
York Energy Centre LP	175,000	1-Apr-12	31-Oct-22	87,654	87,654	No
Thorold CoGen L.P. by its General Partner Northland Power Thorold Cogen GP Inc.	170,000	1-Nov-08	31-Mar-19	44,000	44,000	No
NextEra Energy Power Marketing, LLC	149,818	4-Jun-16	31-Mar-19	0	1,798	No
Cargill Limited	105,506	1-Jun-15	31-Mar-17	0	1,266	No
United Energy Trading Canada, ULC	105,506	1-Apr-16	31-Mar-18	0	1,266	No
1425445 Ontario Limited o/a Utilities Kingston	50,000	31-Mar-15	31-Mar-17	375	750	No
1425445 Ontario Limited o/a Utilities Kingston	50,000	31-Mar-15	31-Mar-18	375	750	No

Energy Source Natural Gas Inc.	31,652	31-Mar-16	31-Mar-17	0	380	No
Gaz Metro Limited Partnership	0	1-Apr-13	31-Mar-19	33,000	52,800	No
St. Clair Power, L.P.	0	1-Jan-13	31-Oct-27	28,380	28,380	No
TransCanada Power	0	1-Oct-14	14-Jan-20	35,200	35,200	No
St. Joseph's Healthcare, Hamilton	0	1-Jun-16	31-May-17	286	286	No

Source: Union Gas Storage Index of Customers (January 2017)

**Union Gas' customer list does not include its storage use for in-franchise customers or capacity contracted by Enbridge Gas Distribution.*

Exhibit A-2. EGD Merchant Storage Customer List (January 2017)

Customer Name	Contract Capacity (GJ)	Effective Date	End Date	Max. Daily Injection (GJ)	Max. Daily Withdrawal (GJ)	Affiliate
Iberdrola Energy Services, LLC (dba ENSTOR Energy Services, LLC)	4,200,000	1-Apr-16	31-Mar-18	63,000	84,000	No
Repsol Energy Canada Ltd.	2,110,112	1-Apr-15	31-Mar-17	42,202	52,752	No
Iberdrola Energy Services, LLC (dba ENSTOR Energy Services, LLC)	2,000,000	1-Apr-16	31-Mar-18	30,000	40,000	No
Bay State Gas Company (dba as Columbia Gas of Massachusetts)	1,920,202	1-Apr-16	31-Mar-22	10,551	27,959	No
Petrochina International (America), Inc.	1,793,595	1-Jun-14	31-May-17	22,156	47,477	No
J. Aron & Company	1,582,584	1-Apr-15	31-Mar-19	21,101	31,651	No
J. Aron & Company	1,055,056	1-Apr-13	31-Mar-17	10,550	12,660	No
Castleton Commodities Merchant Trading L.P.	527,528	1-May-15	30-Apr-17	10,550	15,825	No
Direct Energy Marketing Ltd.	527,528	1-Apr-15	31-Mar-18	10,550	13,188	No
St. Lawrence Gas	475,000	1-Apr-15	31-Mar-17	4,750	5,225	Yes
Tenaska Marketing Canada	317,382	1-Apr-16	31-Mar-19	7,935	15,869	No
Tidal Energy Marketing Inc.	263,764	1-Apr-16	31-Mar-19	7,385	10,550	Yes
Greenfield South Power Corporation	162,400	1-Apr-16	31-Aug-19	16,428	16,428	No
1425445 ONTARIO LIMITED (dba as Utilities kingston)	150,000	1-Apr-16	31-Mar-19	1,790	2,400	No
Greenfield Energy Centre LP	126,600	1-Jun-08	31-Mar-18	12,660	12,660	No

Source: Enbridge Gas Distribution Gas Storage Index of Customers (January 2017)

**Enbridge Gas Distribution Gas' customer list does not include its storage use for in-franchise customers. Enbridge Gas Distribution uses 97.7 Bcf of storage for its in-franchise use.*

Appendix B – Partial List of Storage Facilities in the Geographic Market

Exhibit B-1. Gas Storage Fields/Operators in Regions Accessible to Ontario Consumers – Merchant and LDC Storage by Operating Company

Operating Company	Parent Company	State / Province	Total Capacity (MMcf)	Working Gas Capacity (MMcf)	Peak Deliverability (MMcf)	Market Share	
						Working Gas	Peak Deliverability
Union Gas	Spectra Energy	Ontario	224,727	160,600	3,231	11.7%	10.9%
EGD	EGD	Ontario	152,400	114,000	2,517	8.3%	8.5%
Sarnia Airport Storage Pool LP	Spectra Energy/AltaGas	Ontario	6,303	5,260	53	0.4%	0.2%
St. Clair Pool (MHP Partners)	Spectra Energy	Ontario	1,384	1,100	11	0.1%	0.0%
Intragaz	Gaz Métro / Engie	Quebec		5,000	117	0.4%	0.4%
ANR Pipeline	TransCanada	Michigan	243,752	135,130	4,018	9.9%	13.5%
ANR Storage	TransCanada	Michigan	64,268	56,118	950	4.1%	3.2%
Blue Lake Storage	TransCanada	Michigan	54,119	47,086	700	3.4%	2.4%
Eaton Rapids Gas Storage	TransCanada	Michigan	16,234	12,984	160	0.9%	0.5%
Bluewater Gas Storage	PAA Natural Gas Storage	Michigan	33,500	26,512	800	1.9%	2.7%
Consumers Energy	CMS Energy	Michigan	303,236	148,310	4,173	10.8%	14.0%
Mich Con	DTE Energy	Michigan	200,071	139,866	3,925	10.2%	13.2%
Washington 10 Storage Corp.	DTE Energy	Michigan	106,285	90,113	450	6.6%	1.5%
Michigan Gas Utilities	WEC Energy Group	Michigan	7,272	3,900	123	0.3%	0.4%
Semco Energy Gas Co.	Semco Energy	Michigan	8,072	4,900	140	0.4%	0.5%
Southwest Gas Storage Co.	Energy Transfer	Michigan	31,100	17,690	410	1.3%	1.4%
Lee 8 Storage	TERM Storage	Michigan	3,718	3,114	50	0.2%	0.2%
National Fuel Gas Supply	National Fuel Gas Supply	New York	205,800	91,700	1,697	6.7%	5.7%
Arlington Gas Storage	Arlington Gas Storage	New York	21,340	14,600	344	1.1%	1.2%
Honeoye	Honeoye Storage Corp.	New York	11,450	6,769	70	0.5%	0.2%
Natural Gas Pipeline of America	Kinder Morgan	Illinois	201,500	81,900	1,940	6.0%	6.5%
Nicor Gas	Southern Company	Illinois	466,266	149,700	2,800	10.9%	9.4%
Peoples Gas Light & Coke Co.	WEC Energy Group	Illinois	175,565	38,800	800	2.8%	2.7%
Northern Indiana Public Service Co. NiSource	NiSource	Indiana	34,367	7,900	143	0.6%	0.5%
Indiana Gas Company	Vectren	Indiana	19,904	5,661	144	0.4%	0.5%
Total			2,592,633	1,368,713	29,766		
Combined EGD & Spectra Energy			381,663	278,330	5,786	20%	19%

Sources: Company Sources, EIA 2015 Storage Capacity, Michigan PUC Storage Reports, EGD and Union STAR reports.

Merchant Storage Peak Deliverability is not available for some storage providers that serve both in-franchise and merchant storage customers. For these providers, Peak deliverability for merchant storage customers is estimated based on the deliverability percentage for the entire provider.

Exhibit B-2. Gas Storage Fields/Operators in Regions Accessible to Ontario Consumers – Merchant and LDC Storage by Parent Company

Parent Company	State / Province	Total Capacity (MMcf)	Working Gas Capacity (MMcf)	Peak Deliverability (MMcf)	Market Share	
					Working Gas	Peak Deliverability
Spectra Energy	Ontario	229,263	164,330	3,269	12.0%	11.0%
EGD	Ontario	152,400	114,000	2,517	8.3%	8.5%
AltaGas	Ontario	3,151	2,630	27	0.2%	0.1%
Gaz Métro / Engie	Quebec	0	5,000	117	0.4%	0.4%
TransCanada	Michigan	378,373	251,318	5,828	18.4%	19.6%
PAA Natural Gas Storage	Michigan	33,500	26,512	800	1.9%	2.7%
CMS Energy	Michigan	303,236	148,310	4,173	10.8%	14.0%
DTE Energy	Michigan	306,356	229,979	4,375	16.8%	14.7%
WEC Energy Group	Michigan	182,837	42,700	923	3.1%	3.1%
Semco Energy	Michigan	8,072	4,900	140	0.4%	0.5%
Energy Transfer	Michigan	31,100	17,690	410	1.3%	1.4%
TERM Storage	Michigan	3,718	3,114	50	0.2%	0.2%
National Fuel Gas Supply	New York	205,800	91,700	1,697	6.7%	5.7%
Arlington Gas Storage	New York	21,340	14,600	344	1.1%	1.2%
Honeoye Storage Corp.	New York	11,450	6,769	70	0.5%	0.2%
Kinder Morgan	Illinois	201,500	81,900	1,940	6.0%	6.5%
Southern Company	Illinois	466,266	149,700	2,800	10.9%	9.4%
NiSource	Indiana	34,367	7,900	143	0.6%	0.5%
Vectren	Indiana	19,904	5,661	144	0.4%	0.5%
Total		2,592,633	1,368,713	29,766		
Combined EGD & Spectra Energy		381,663	278,330	5,786	20%	19%

Sources: Company Sources, EIA 2015 Storage Capacity, Michigan PUC Storage Reports, EGD and Union STAR reports.

Merchant Storage Peak Deliverability is not available for some storage providers that serve both in-franchise and merchant storage customers. For these providers, Peak deliverability for merchant storage customers is estimated based on the deliverability percentage for the entire provider.

Exhibit B-3. Gas Storage Fields/Operators in Regions Accessible to Ontario Consumers – Merchant Storage by Operating Company

Operating Company	Parent Company	State / Province	Total Working Gas (MMcf)	Available Merchant Storage Capacity MMcf)	Merchant Storage Peak Deliverability (MMcf)	Market Share	
						Working Gas Capacity	Peak Deliverability
Union Gas	Spectra Energy	Ontario	160,600	79,900	1,608	10.4%	10%
EGD	EGD	Ontario	114,000	16,300	360	2.1%	2%
Sarnia Airport Storage Pool LP	Spectra Energy/AltaGas	Ontario	5,260	5,260	53	0.7%	0%
St. Clair Pool (MHP Partners)	Spectra Energy	Ontario	1,100	1,100	11	0.1%	0%
Intragaz	Gaz Métro / Engie	Quebec	5,000	0	0	0.0%	0%
ANR Pipeline	TransCanada	Michigan	135,130	135,130	4,018	17.6%	25%
ANR Storage	TransCanada	Michigan	56,118	56,118	950	7.3%	6%
Blue Lake Storage	TransCanada	Michigan	47,086	47,086	700	6.1%	4%
Eaton Rapids Gas Storage	TransCanada	Michigan	12,984	12,984	160	1.7%	1%
Bluewater Gas Storage	PAA Natural Gas Storage	Michigan	26,512	26,512	800	3.5%	5%
Consumers Energy	CMS Energy	Michigan	148,310	41,310	1,162	5.4%	7%
Mich Con	DTE Energy	Michigan	139,866	72,966	2,048	9.5%	13%
Washington 10 Storage Corp.	DTE Energy	Michigan	90,113	90,113	450	11.8%	3%
Michigan Gas Utilities	WEC Energy Group	Michigan	3,900	0	0	0.0%	0%
Semco Energy Gas Co.	Semco Energy	Michigan	4,900	0	0	0.0%	0%
Southwest Gas Storage Co.	Energy Transfer	Michigan	17,690	17,690	410	2.3%	3%
Lee 8 Storage	TERM Storage	Michigan	3,114	3,114	50	0.4%	0%
National Fuel Gas Supply	National Fuel Gas Supply	New York	91,700	57,147	1,058	7.5%	7%
Arlington Gas Storage	Arlington Gas Storage	New York	14,600	14,600	344	1.9%	2%
Honeoye	Honeoye Storage Corp.	New York	6,769	6,769	70	0.9%	0%
Natural Gas Pipeline of America	Kinder Morgan	Illinois	81,900	81,900	1,940	10.7%	12%
Nicor Gas	Southern Company	Illinois	149,700	0	0	0.0%	0%
Peoples Gas Light & Coke Co.	WEC Energy Group	Illinois	38,800	0	0	0.0%	0%
Northern Indiana Public Service Co. NiSource	NiSource	Indiana	7,900	0	0	0.0%	0%
Indiana Gas Company	Vectren	Indiana	5,661	0	0	0.0%	0%
Total			1,368,713	765,999	16,192		
Combined EGD & Spectra Energy			278,330	99,930	2,024	13%	12%

Sources: Company Sources, EIA 2015 Storage Capacity, Michigan PUC Storage Reports

Merchant Storage Peak Delivery is calculated using the average split of Working Gas Capacity between In-Franchise and Merchant Storage customers

Exhibit B-4. Gas Storage Fields/Operators in Regions Accessible to Ontario Consumers – Merchant Storage by Parent Company

Parent Company	State / Province	Total Working Gas (MMcf)	Available Merchant Storage Capacity MMcf)	Merchant Storage Peak Deliverability (MMcf)	Market Share	
					Working Gas Capacity	Peak Deliverability
Spectra Energy	Ontario	164,330	83,630	1,664	11.0%	10%
EGD	Ontario	114,000	16,300	360	2.1%	2%
AltaGas	Ontario	2,630	0	0	0.0%	0%
Gaz Métro / Engie	Quebec	5,000	0	0	0.0%	0%
TransCanada	Michigan	251,318	251,318	5,828	32.9%	35%
PAA Natural Gas Storage	Michigan	26,512	26,512	800	3.5%	5%
CMS Energy	Michigan	148,310	41,310	1,162	5.4%	7%
DTE Energy	Michigan	229,979	163,079	3,102	21.4%	18%
WEC Energy Group	Michigan	42,700	0	0	0.0%	0%
Semco Energy	Michigan	4,900	0	0	0.0%	0%
Energy Transfer	Michigan	17,690	17,690	410	2.3%	2%
TERM Storage	Michigan	3,114	3,114	50	0.4%	0%
National Fuel Gas Supply	New York	91,700	57,147	1,058	7.5%	6%
Arlington Gas Storage	New York	14,600	14,600	344	1.9%	2%
Honeoye Storage Corp.	New York	6,769	6,769	70	0.9%	0%
Kinder Morgan	Illinois	81,900	81,900	1,940	10.7%	12%
Southern Company	Illinois	149,700	0	0	0.0%	0%
NiSource	Indiana	7,900	0	0	0.0%	0%
Vectren	Indiana	5,661	0	0	0.0%	0%
Total		1,368,713	763,369	16,788		
Combined EGD & Spectra Energy		280,960	99,930	2,024	13.1%	12.1%

Sources: Company Sources, EIA 2015 Storage Capacity, Michigan PUC Storage Reports, EGD and Union STAR reports.

Merchant Storage Peak Deliverability is not available for some storage providers that serve both in-franchise and merchant storage customers. For these providers, Peak deliverability for merchant storage customers is estimated based on the deliverability percentage for the entire provider.

Appendix C - Sample Storage RFP, National Fuel Gas Supply Corporation

Notice of Open Season 208

OS208 - Long Term Firm Storage and Firm Storage Transportation Capacity

STATUS IS:

CLOSED

4/6/2015: Capacity remains available on a post open season basis. Please contact your marketing representative for more information.

National Fuel Gas Supply Corporation

OPEN SEASON 208

LONG TERM FIRM STORAGE AND FIRM STORAGE TRANSPORTATION CAPACITY

National Fuel Gas Supply Corporation ("National") is pleased to announce the availability of 1,049,470 Dth of firm storage service and associated firm transportation service under its Firm Storage Service ("FSS") and Firm Storage Transportation ("FST") Rate Schedules.

OPEN SEASON TIMEFRAME:

Commences on March 13th, 2015 and expires at 4:00PM EST on Friday March 20th, 2015.

TERM REQUIREMENTS:

The Storage and Transportation Services would commence April 1, 2015 and continue through any subsequent March 31. There is no minimum or maximum term requirement.

CAPACITY:

CAPACITY	MDIQ (Dth/d)	MDWQ (Dth/d)
1,049,470	5,352	11,972

INJECTION & DELIVERY CHARACTERISTICS:

FSS SERVICE	MAXIMUM STORAGE QUANTITY (MSQ) INVENTORY	INJ/WD Rights	INJ/WD Quantities (Dth/d)
	From greater	1/196 of MSQ	5,352

Injection Period April 1 Oct 31	From greater than 79% to 100%	1/200 of MSQ	5,247
Withdrawal Period Nov 1 Mar 31	From greater than 55% to	1/88 of MSQ	11,972
	From greater than	1/151 of MSQ	6,950
	From greater than 0% to 20%	1/151 of MSQ	6,950

RATE INFORMATION:

Bids will be accepted under National's FSS and FST rate schedules. The maximum tariff rates under the FSS and FST Rate Schedules are listed in the tables below.

FIRM STORAGE SERVICE (FSS):

Component	Maximum Tariff
Demand (monthly, applied to withdrawal deliverability)	$2.4826 per Dth/d
Capacity (monthly, applied to capacity)	$0.0381 per Dth
Injection/Withdrawal	$0.0391 per Dth
ACA Commodity Surcharge (injection and withdrawal)	$0.0012 per Dth

FIRM STORAGE TRANSPORTATION (FST):

Component	Maximum Tariff
Reservation (monthly, applied to MDWTQ)	$3.7805 per Dth/d
Commodity	$0.0135 per Dth
ACA Commodity Surcharge (applied to all transportation)	$0.0012 per Dth

FUEL and LOSS ALLOWANCE:

Storage Operating and LAUF Allowance, and Transportation Fuel and Company Use Retention and Transportation LAUF Retention will apply and will be subject to change under GT&C Section 41 of National's tariff.

For informational purposes, National's allowances as of April 1st, 2015 are as follows:

- FSS: Storage Operating and LAUF Allowance of 0.46% on injection, and 0.46% on withdrawal.
- FST: On withdrawal, there is no charged Transportation Fuel and Company Use Retention and Transportation LAUF Retention (collectively "Transportation Fuel/LAUF"). On injection and non-storage transportation, the current Transportation Fuel/LAUF is 0.96%.

AVAILABLE RECEIPT and DELIVERY POINTS:

Point Name	Meter Number	FST Injection Capacity (Dth/d)	FST Withdrawal Capacity (Dth/d)
TCPL Niagara	421079	5,352	
TGP Clarence	420497	5,352	
Empire pendleton	12003020	5,352	
TGP East Aurora	420077	5,352	
DTI Ellisburg Station	41202	5,352	
TGP Rose lake	420527	5,352	11,972
Transco leidy	7126		11,972
Transco Wharton	6325	5,352	11,972
Millennium	2078		11,972

Note: Successful bidders holding existing EFT contract(s) may be able to access points not listed in the table above by requesting and being granted contractual EFT modifications that change a non-storage receipt/delivery entitlement to a storage receipt/delivery entitlement. Please contact your NFGSC Marketing Representative for additional details.

BID FORMAT, BID RANKING, and CAPACITY AWARD:

Shippers may request all or part of the available capacity, and are allowed to revise their bids within the posting period. Requests for rate discounts will not be considered in this open season. Bids will be ranked according to the net present value (NPV), per unit of storage capacity, of the sums of the FSS capacity charges, FSS demand charges and FST reservation charges as derived above. The NPV calculation will incorporate length of contract term and will utilize an annual rate of 9.6% for discounting. The "Storage Component" of a bid shall be the NPV, per unit of storage capacity, of the FSS capacity charge and FSS demand charge. In the event that a customer bids for FSS service only and its bid is equal to the Storage Component of another bid or bids requesting both FSS and FST service ("Comparable Combined Service Bid"), the FSS only bid shall be considered equal in value to the Comparable Combined Service Bid with the highest value. In the event that National receives two or more bids of equal NPV per unit of storage capacity, a ratable capacity allocation shall

be determined, subject to other conditions in this posting. Bids that are prorated for any reason are considered to have been awarded at the reduced MSQ.

An NPV ranking will be established across all bids and capacity will then be awarded utilizing a highest-to-lowest NPV methodology.

The FST receipt and FST delivery point capacities represented in the Available Receipt & Delivery Point Table reflect the total capacity available based on the 88 Day Character of Service. Each awarded bid may reduce the amount of remaining FST receipt or FST delivery point capacity available for subsequent awards. Should this occur, National and bidder reserve the right to mutually agree to alternative primary FST points and/or a prorated amount of storage capacity.

CREDIT REQUIREMENTS:

Shippers will be required to demonstrate creditworthiness or provide a credit alternative acceptable to National.

EXECUTION OF AGREEMENTS:

Successful bidders will be required to execute and return the Service Agreements resulting from this Open Season within 30 days of receipt.

BID DOCUMENTS:

Two documents must be submitted with all Open Season requests: a Service Request Form, and a Bid Sheet. Both documents are available on our web site (www.nationalfuelgas.com) or by calling our Marketing Department @ 716.857.7740. The completed forms should be submitted online, via mail or fax as listed below:

National Fuel Gas Supply Corporation 6363 Main Street
Williamsville, NY 14221
PHONE: 716.857.7740
FAX: 716.857.7310

NFGSC Marketing Representatives:

Terry Falsone – 716.857.7602 Joe Kolis – 716.857.7520
Anthony Limina - 716.857.7924

CRA Charles River Associates

Memorandum

To: Oliver Borgers, Jonathan Bitran (McCarthy Tétrault)
Joe Matelis (Sullivan Cromwell)
Cal Goldman, Richard Annan (Goodmans)

From: Margaret Sanderson, John Hayes, Hitesh Makhija

Date: January 31, 2017

Subject: **STATISTICAL ANALYSIS OF DAWN HUB GAS PRICES**

This note discusses the results of our statistical analysis of natural gas pricing at Dawn. As storage prices are based on natural gas prices, this analysis is informative with respect to storage prices as well as natural gas prices for the reasons discussed herein. We understand that the Competition Bureau is interested in the extent to which natural gas storage facilities at Dawn are part of a geographic market that includes natural gas storage facilities in bordering U.S. states, such as Illinois, New York and Michigan.

Economic theory dictates that prices for a homogeneous product like natural gas would be equalized quickly across locations if gas could be moved almost instantaneously and without cost between locations. As it takes time and some cost is incurred to transport gas, prices across locations are not equivalent at all times. The extent to which prices at different locations diverge indicates how tightly arbitrage links the locations.

Different locations that are tightly linked by arbitrage opportunities comprise a single relevant market. This is because a hypothetical monopolist over the sale of natural gas at one location could not profitably raise the price at that location without causing customers to shift their purchases to other locations, thereby defeating the attempted price increase.

Correlation is a standard statistical tool that can be used to measure how closely prices in different locations track one another. There is a sizable economics literature on the use of correlations, and related statistical measures, to delineate antitrust markets.[1] Prices do not need to be identical at all locations within a relevant geographic market at all times, nor do adjustments to significant deviations – such as might be caused by a temporary pipeline closure – need to be instantaneous within a single relevant market. It is sufficient that prices track each other closely enough that a hypothetical monopolist could not profitably raise the price at one location without causing a substantial shift in purchases to other locations.

The price of storage is tightly linked to the price of gas. If the price of gas in the summer is low, customers can purchase in the summer and store the gas for use in the winter. Conversely, if the

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1 See, for example, George J. Stigler and Robert A. Sherwin (1985) "The Extent of the Market", *Journal of Law and Economics*, 28:555-585.

price in the summer is high, they can purchase a forward contract for delivery in the winter. In this manner, forward contracts act as a substitute for storage and prevent the price of storage from deviating too far from the differential between the summer-winter forward spread. Not surprisingly, Enbridge's pricing model for merchant storage uses summer-winter spreads in natural gas prices to set its storage prices at Dawn because the difference between the summer and winter prices of gas at a hub reflects the implicit seasonal value of storage. In the ICF report entitled *Analysis of Merchant Natural Gas Storage Competition in Ontario*,[2] Michael Sloan finds that the average storage prices under new contracts entered into by Union and Enbridge at Dawn track the seasonal value of natural gas, as measured by summer-winter spreads.[3]

This link between gas and storage prices means that one can delineate the scope of the relevant geographic market for *storage* by studying the extent to which prices for *gas* are correlated. Specifically, if gas prices across locations are correlated, storage prices must also be correlated. For this reason, evidence of highly correlated gas pricing was used by the Ontario Energy Board ("OEB") as part of its determination that sufficient competition existed at Dawn in 2005/2006 such that the OEB did not need to regulate Union Gas' prices for third-party merchant storage at Dawn even though Union was the only provider of such storage at that time.[4] In this report, we describe the results of a variety of statistical analyses that we have undertaken to extend the correlation analyses used by the OEB in reaching the NGEIR decision.

An additional analysis that we undertake measures the difference between gas prices at different hubs, which is generally referred to as the "transportation basis". The transportation basis reflects the implicit costs of transportation and storage. As such, it provides useful information on the cost of storing gas at a different location and then transporting the gas to Dawn. Our analysis of the transportation basis is a corollary to the analysis of the delivered cost to Dawn from various locations that is reported on by ICF in its report entitled *Analysis of Merchant Natural Gas Storage Competition in Ontario*.[5]

We focus on pricing at five nearby US hubs, which are Alliance (IL), Chicago (IL), Niagara (NY), Consumers Energy Citygate (MI), and MichCon Citygate (MI) for the analysis of natural gas spot prices and transportation basis. We lack sufficient data at Alliance to include it in the summer-winter spreads and futures prices correlation analysis. With respect to the pricing at Niagara, we note that the physical pipeline capacity linking Marcellus Shale region to Niagara as well as Niagara to Dawn is relatively recent following investments in pipeline capacity in 2012 and 2015.[6] As such the comparisons between Niagara and Dawn are more relevant after 2015.

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2 "Analysis of Merchant Natural Gas Storage Competition in Ontario," Michael Sloan, ICF, January 30, 2017 [hereafter referred to as the "ICF Report"].

3 ICF Report, Exhibit ES-2.

4 Ontario Energy Board Decision with Reasons, EB-2005-0551 Natural Gas Electricity Interface Review (NGEIR Decision), November 7, 2006.

5 ICF Report, Exhibit 4-9.

6 New York to Ontario exports of natural gas expanded significantly in late 2012 and late 2015. In 2012, National Fuel's Northern Access pipeline project and Tennessee Gas Pipeline Co.'s Northeast Supply Diversification project

Summary of Findings

We find that storage of natural gas for merchant customers at Dawn is not a stand-alone relevant geographic antitrust market. Instead, storage at Dawn competes with storage in Illinois, New York, and Michigan as measured in the pricing patterns that we observe at Alliance, Chicago, Niagara, Consumers Energy Citygate, and MichCon Citygate. In particular, we find that:

(1) Summer-winter spreads in natural gas prices at Dawn are highly correlated with summer-winter spreads in natural gas prices in each of Chicago, Niagara, Consumers Energy Citygate, and MichCon Citygate. These correlations are strong evidence that the merging firms cannot materially increase natural gas storage prices at Dawn (which are based on summer-winter spreads) without inviting arbitrage opportunities.

(2) Futures prices at Dawn are highly correlated with futures prices in each of Chicago, Niagara, Consumers Energy Citygate, and MichCon Citygate.

(3) Natural gas spot prices at Dawn are highly correlated with natural gas spot prices in each of Alliance, Chicago, Niagara, Consumers Energy Citygate, and MichCon Citygate. This is true whether correlations are measured in spot price levels, or period-to-period changes in spot prices.

(4) The transportation basis between Dawn and each of these US hubs has been decreasing over time. In 2016, the transportation basis was less than 2.7% of the average 2016 spot price at Dawn.

Given the low transportation basis and years of tightly linked pricing (whether of summer-winter spreads, futures prices, or spot prices) between Dawn and these five US hubs, the Dawn hub cannot be considered a stand-alone relevant geographic market for the storage of natural gas. The high correlations also indicate that there are no long term pipeline constraints between Dawn and these nearby US hubs. Therefore, the relevant geographic market in which Dawn suppliers of storage compete should include storage that is located in these hubs in Michigan, New York and Illinois.

increased pipeline capacity between the Marcellus Shale region and Niagara. In 2015, National Fuel's Northern Access pipeline project and Tennessee Gas Pipeline Co.'s Niagara Expansion Project also increased pipeline capacity between the Marcellus Shale region and Niagara. In 2015, Transcanada got approval for the Greater Golden Horseshoe Facilities Project which increased pipeline capacity between Niagara and Ontario. (see "National Fuel gas pipeline approved", David Robinson, March 4 2015, available at http://buffalonews.com/2015/03/04/national-fuel-gas-pipeline-approved/, "National Fuel Pipeline & Storage Expansion Initiatives", National Fuel Pipeline, available at http://www.natfuel.com/supply/docs/NorthernAccess.pdf, "Greater Golden Horseshoe Facilities Project", available at http://www.burlington.ca/en/your-city/resources/Council/Ward_3/Newsletter_Files/Mainline_Valve_207_Fact_Sheet.pdf, and "FERC approves 2 more Marcellus pipeline projects," Hannah Northey, September 16, 2011, available at http://www.eenews.net/greenwire/2011/09/16/stories/1059953776).

The remainder of this note provides detail on these statistical results. Section 1 describes the data used in the analysis. Section 2 describes the correlation analysis. Section 3 discusses the analysis of transportation basis.

1. Data

In this analysis we focus on the storage alternatives available in Illinois, New York and Michigan and as such we use the hubs of Chicago, Alliance, Niagara, Consumers Energy Citygate, and MichCon Citygate. Exhibit 1 (attached) lists the delivery locations of these five hubs.

Daily spot price data for each of Dawn, Alliance, Niagara, Chicago, Consumers Energy Citygate and MichCon Citygate were obtained from SNL Financial.[7] We have data on spot prices from January 1, 2010 to November 10, 2016.

Daily data on monthly futures prices at different hubs was also obtained from SNL Financial. So, for example, we have data on the daily price of the April 2018 futures contract at the Dawn hub. For Dawn, Niagara, Chicago and MichCon Citygate hubs, we have daily data on monthly futures prices from October 26, 2011 to December 20, 2016. For the Consumers Energy Citygate hub, we have daily futures data from January 17, 2014 to December 20, 2016.[8]

For the analysis that compares the spread between summer and winter prices at each hub, we define “summer” as the three months of June, July and August and “winter” as the three months of January, February and March. Our definition of “summer” and “winter” is the same as the definition used by Enbridge in its ordinary course of business. We tested the robustness of this definition, by using an alternative definition of “winter” which is November through March and “summer” which is April through October, and we do not obtain different results from those reported here.

2. Correlation Analysis

A. Correlation In Summer-Winter Spreads

To meet seasonal demand requirements, natural gas is injected into storage during summer and withdrawn from storage during winter. Therefore, the difference between the price of gas during the winter and summer provides a measure of the value of storage.[9] Consider, for example, a customer who wants to secure gas deliveries at Chicago in winter 2018. This customer can either purchase a winter 2018 Chicago futures contract, or a summer 2017 Chicago futures contract plus storage between summer 2017 and winter 2018. Hence, the difference between the winter 2018 and summer 2017 futures prices provides a measure of the value of storage at Chicago. If regions – here defined to be the hubs at Dawn and each of Chicago, Niagara, Consumers Energy Citygate, and MichCon Citygate – are closely linked by physical trading

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7 We use the term “spot price” to refer to day ahead prices published by SNL Financial. For example, the spot price of gas at Dawn on November 3, 2016 was set on November 2, 2016.

8 We do not have data on the futures price of gas at the Alliance Hub in Illinois.

9 ICF Report, p. vi.

opportunities, we expect to find summer-winter spreads across such regions to be highly correlated.

Exhibits 2A – 2D (attached) plot the monthly averages of these summer 2017 – winter 2018 spreads for Dawn compared to each of Chicago, Niagara, Consumers Energy Citygate, and MichCon Citygate.[10] It is useful to analyze the correlations between the spreads at Dawn and each of Chicago, MichCon Citygate and Consumers Energy Citygate during three distinct time periods:

i. Between January 2012 and December 2012, the summer 2017 – winter 2018 spreads at Dawn closely tracked the spreads at MichCon Citygate and Chicago hubs.[11] During this time period, the correlation coefficient between the spreads at Dawn and each of the MichCon Citygate and Chicago hubs was 0.81 and 0.94, respectively. During this period, the correlation between MichCon Citygate and Chicago, which likely belong to the same geographic market, was 0.87. Hence, the correlation between Dawn and Chicago was higher than the correlation between MichCon Citygate and Chicago and the correlation between Dawn and MichCon Citygate was only slightly smaller than the correlation between MichCon Citygate and Chicago.

ii. Between January 2013 and December 2014, there was an increase in the summer-winter spreads at Dawn and each of Chicago, MichCon Citygate and Consumers Energy Citygate. We are informed that this increase in spreads was largely driven by a National Energy Board ("NEB") decision that gave TransCanada Pipeline ("TCPL") greater discretion to price its transportation services.[12] TCPL increased pricing of its Interruptible Transportation ("IT") service and its Short Term Firm Transportation ("STFT") service in July 2013 following the NEB decision.[13] The rate change made it more expensive to transport gas between AECO and Dawn which caused storage levels at AECO to increase and storage levels at Dawn to decrease. The pricing changes by TCPL affected the broader region as spreads also rose in Chicago and Michigan. Spreads have since declined across storage hubs throughout the region.

iii. Between January 2015 and December 2016, the summer 2017 – winter 2018 spreads at Dawn are highly correlated with the spreads at MichCon Citygate, Consumers Energy Citygate, and Chicago. During this time, the correlation coefficient between the spreads at Dawn and each of the MichCon Citygate, Consumers Energy Citygate, and Chicago hubs was 0.88, 0.84 and 0.89, respectively. During this period, the correlation between

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10 Futures prices change daily. Hence, for each day, we can calculate the spread between summer 2017 and winter 2018 futures price. Exhibits 2A – 2D plot the monthly averages of these spreads.

11 We were not able to obtain data for futures prices at Consumers Energy Citygate hub in 2012 or 2013.

12 "Reasons for Decision - TransCanada PipeLines Ltd., NOVA Gas Transmission Ltd. and Foothills Pipe Lines Ltd," National Energy Board, March 2013, available at https://apps.neb-one.gc.ca/REGDOCS/Item/View/939799.

13 Dan Healing, "Pipe toll charges linked to natural gas price dive", *Calgary Herald*, July 23, 2013, available at www.calgaryherald.com/business/Pipe+toll+charges+linked+natural+price+dive/8696985/story.html?_lsa=7ea9-c3e6.

Consumers Energy Citygate and Chicago, which likely belong to the same geographic market was 0.91. Hence, the correlation coefficient between Dawn and MichCon was only slightly lower than the correlation between Consumers Energy Citygate and Chicago. Similarly, the correlation coefficient between Dawn and Chicago was only slightly lower than the correlation coefficient between Consumers Energy Citygate and Chicago.

Finally, as shown in Exhibit 2D, the summer 2017 – winter 2018 spreads at Dawn closely track the spreads at Niagara. During the entire time period, the correlation coefficient between summer-winter spreads at Dawn and Niagara is 0.90. Since the pipeline expansions between Niagara and Dawn, spreads are even more highly correlated than they were previously.

These correlations are strong evidence that the parties cannot materially increase natural gas storage prices at Dawn without inviting arbitrage opportunities from other competing storage locations in the Great Lakes region.

B. Correlation In Spot and Futures Prices of Natural Gas

Exhibits 3A – 3E (attached) graph the average monthly spot price at Dawn and each of Chicago, Alliance, Niagara, Consumers Energy Citygate and MichCon Citygate. Dawn average monthly spot prices are slightly higher than the average monthly spot prices at Chicago, Niagara, Consumers Energy Citygate and MichCon Citygate, and in recent years are nearly the same. As Exhibits 3A – 3E show, there was a large spike in natural gas spot prices in January and February of 2014. Prices increased at that time due to an early and prolonged cold winter that affected gas inventories at several hubs.[14] We are informed that as inventories were drawn down at Michigan hubs, local distribution companies bid up the price of gas at Dawn and other nearby hubs in order to maintain adequate supplies. As the charts indicate, the spike in prices affected multiple hubs throughout the area.

Exhibit 4 (attached) provides the natural gas daily spot price correlations of Dawn with each of Chicago, Alliance, Niagara, Consumers Energy Citygate and MichCon Citygate by year and for the full time period of 2010 to November 10, 2016. Exhibit 4 also lists correlations between Chicago and Alliance, MichCon and Consumers Energy as well as between MichCon and Chicago. As shown in Exhibit 1, the Chicago and Alliance hubs are based in Illinois and hence very likely belong to the same geographic market. Similarly, the MichCon and Consumers Energy hubs are both based in Michigan and very likely belong to the same geographic market. It is useful to compare correlations between Dawn and the five U.S. hubs of interest with the correlations between hubs that likely belong to the same geographic market. Exhibit 4 shows that very high correlations are observed between Dawn and each of Chicago, Alliance, Niagara, Consumers Energy Citygate and MichCon Citygate.[15] For example, for the full time period of

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14 "Cold weather led to record-high natural gas storage withdrawals", U.S. Energy Information Administration, January 17, 2014 available at http://www.eia.gov/todayinenergy/detail.php?id=14651.

15 Pipeline capacity between New York and Ontario increased in 2015 with the investments described in footnote 7. We understand that this caused the Dawn and Niagara gas markets to become more integrated. Hence, correlations between natural gas prices at Dawn and Niagara in 2015 and 2016 are higher than correlations in 2013 and 2014.

2010 to November 10, 2016, the correlation between Dawn and Alliance, Consumers Energy and MichCon hubs is greater than the correlation between Chicago and Alliance hubs. The correlation between Dawn and Chicago is only slightly lower than the correlation between the Chicago and Alliance hubs.

While strong correlation between price levels is an important indicator of potential integration between two geographic areas, a more stringent statistic is the correlation between *changes* in each price over time (the differences between price in the current period and the previous period, referred to as "first differences"). When two variables generally trend together but do not have an equilibrium relationship, a high correlation *in levels* may disappear when correlation is applied to *changes* in prices. To address this, Exhibit 5 (attached) reports the correlations of daily *changes* in natural gas spot prices between Dawn and each of Chicago, Alliance, Niagara, Consumers Energy Citygate and MichCon Citygate by year and for the full time period of 2010 to November 10, 2016. Exhibit 5 also lists correlations of daily price changes between Chicago and Alliance, MichCon and Consumers Energy as well as between MichCon and Chicago.

Correlations in first differences are somewhat lower than correlations in levels, which is to be expected but the correlations in first differences are very high, and have become even higher in recent years. Further, in 2015, correlations between Dawn and each of Chicago, Alliance, Niagara, Consumers Energy Citygate and MichCon Citygate are only slightly lower than the correlations between MichCon and Consumers Energy.

Next we consider correlations in futures prices from contracts originating on December 20, 2016. We have daily data on the price of a contract in each of Dawn, Niagara, Chicago, Consumers Energy Citygate, and MichCon Citygate as of December 20, 2016 to purchase natural gas at each of these hubs in the future with the contract expiring in each month from January 2017 to November 2021. Exhibits 6A – 6D (attached) provide charts of these future prices in Dawn and each of the US hubs. Exhibit 7 (attached) reports the correlation coefficients for the entire time period. Very high correlations in futures prices are observed, consistent with the results reported above. For example, over the entire time period, the correlations between Dawn and each of the five US hubs are close to the correlation between Chicago and Michigan.

These correlations are strong evidence that natural gas prices at Dawn cannot move independently without inviting arbitrage opportunities. Further, these correlations indicate that there are no long term pipeline constraints between Dawn and each of the five US hubs. Hence, these correlations are consistent with the conclusion that the merging firms cannot materially increase natural gas storage prices at Dawn without inviting arbitrage opportunities.

3. Analysis of Transportation Basis over Time

Low transportation costs between Dawn and each of the studied US hubs is additional support for the finding that Dawn is part of a broader geographic market that includes storage at these hubs in Illinois, New York, and Michigan. Exhibit 8A (attached) plots the difference between Dawn and Alliance spot prices. Exhibit 8B (attached) plots the difference between Dawn and Alliance spot prices excluding the anomalous spike in January-February 2014, along with a trend over time. As shown, the difference in spot prices has been declining over time. Exhibit 8C (attached) expresses the difference in spot prices as a percentage of spot prices at Dawn. In 2016, the

average difference in Dawn to Alliance spot prices is 2.7% of the 2016 average spot price at Dawn.

Exhibits 9A – 9C (attached) provide the same comparison between Chicago and Dawn. Exhibits 10A – 10C (attached) provide the comparison using Consumers Energy and Dawn. Exhibits 11A – 11C (attached) provide the comparison using MichCon and Dawn. Exhibits 12A – 12C (attached) provide the comparison using Niagara and Dawn.[16]

As each of these exhibits show, the difference in spot prices between Dawn and any of these nearby US hubs, which is a measure of the cost of transportation and storage between hubs, is a very small fraction of average spot prices at Dawn in 2016. Declining transportation basis and very low values for the transportation basis as of 2016 are inconsistent with pipeline congestion. If pipelines were fully contracted such that gas could not readily move from these nearby US hubs to Dawn then we would expect to find higher transportation basis between Dawn and the nearby US hubs. This is further statistical support for the conclusion that Dawn is part of a broader geographic market for the trading and storage of natural gas that includes storage in the nearby states of Illinois, New York and Michigan.

16 As noted earlier, the pipeline capacity from Niagara to Dawn was significantly expanded in 2015, such that since the second half of 2015, the transportation basis between Niagara and Dawn has been close to zero.

Exhibit 1

Natural Gas Facility Delivery Locations

Facilities	Facility Location	Delivery Locations
Alliance	Illinois	Deliveries from Alliance Pipeline into Vector Pipeline, Natural Gas Pipeline Co. of America, ANR Pipeline and Midwestern Gas Transmission at the tailgate of the Aux Sable plant in north-central Illinois at the terminus of Alliance. Deliveries into the Northern Indiana Public Service, Peoples Gas Light & Coke and Nicor Gas city-gates in the Chicago area are not included.
Chicago	Illinois	Deliveries into the Nicor Gas, Peoples Gas Light & Coke, North Shore Gas and Northern Indiana Public Service city-gates in the Chicago metropolitan area.
Consumers Energy	Michigan	Deliveries into all city-gates of Consumers Energy, which serves most of central Michigan and the areas around Saginaw Bay.
MichCon Citygate	Michigan	Deliveries into all city-gates of Michigan Consolidated Gas, which serves the Detroit and Grand Rapids areas and much of north and northeast Michigan. The main MichCon city-gates are located at interconnects with ANR Pipeline at Willow Run and Wolkfork, MI, Panhandle Eastern Pipe Line at River Rouge, Great Lakes Gas Transmission at Belle River, Union Gas at St. Clair Pipeline and Consumers Energy at Northville. MichCon also receives in-state production at Kalkaska.
Niagara	Niagara, NY	Cross-border deliveries to and from TransCanada PipeLines and the Niagara spur and loop lines, a border-crossing point between eastern Canada and the northeastern United States, north of Niagara Falls, NY Niagara Spur Loop line and Niagara Spur line interconnects are with Tennessee Gas Pipeline, National Fuel Gas Supply, Dominion Transmission and Texas Eastern Transmission.

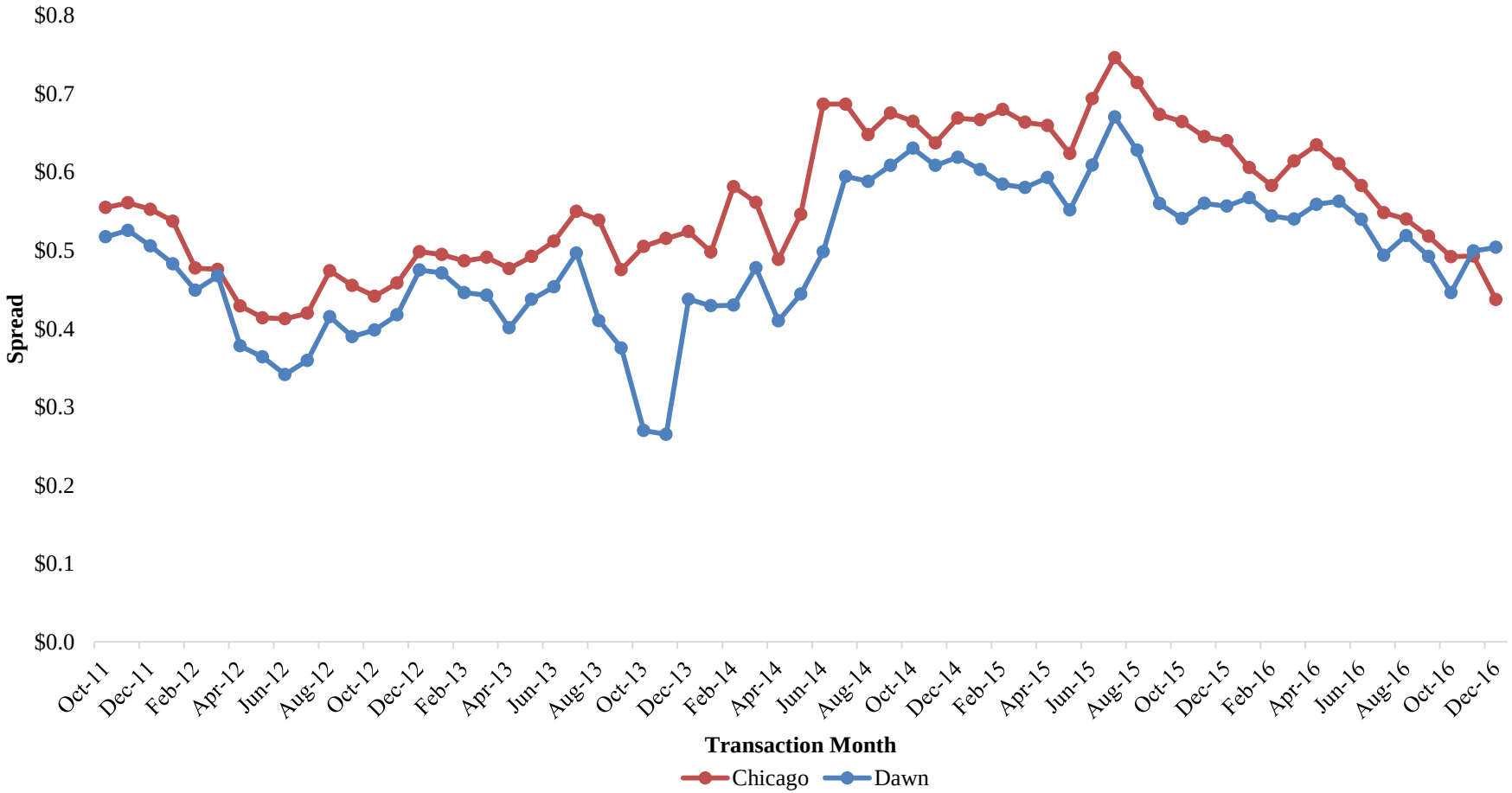
Source:

[a] S&P Global Platts, "Methodology and Specifications Guide: North American Natural Gas," Sep 2016, available at <https://www.platts.com/IM.Platts.Content/methodologyreferences/methodologyspecs/na_gas_methodology.pdf>.

Exhibit 2A

Spread Between Summer 2017 & Winter 2018 Futures Price

Dawn & Chicago Hubs



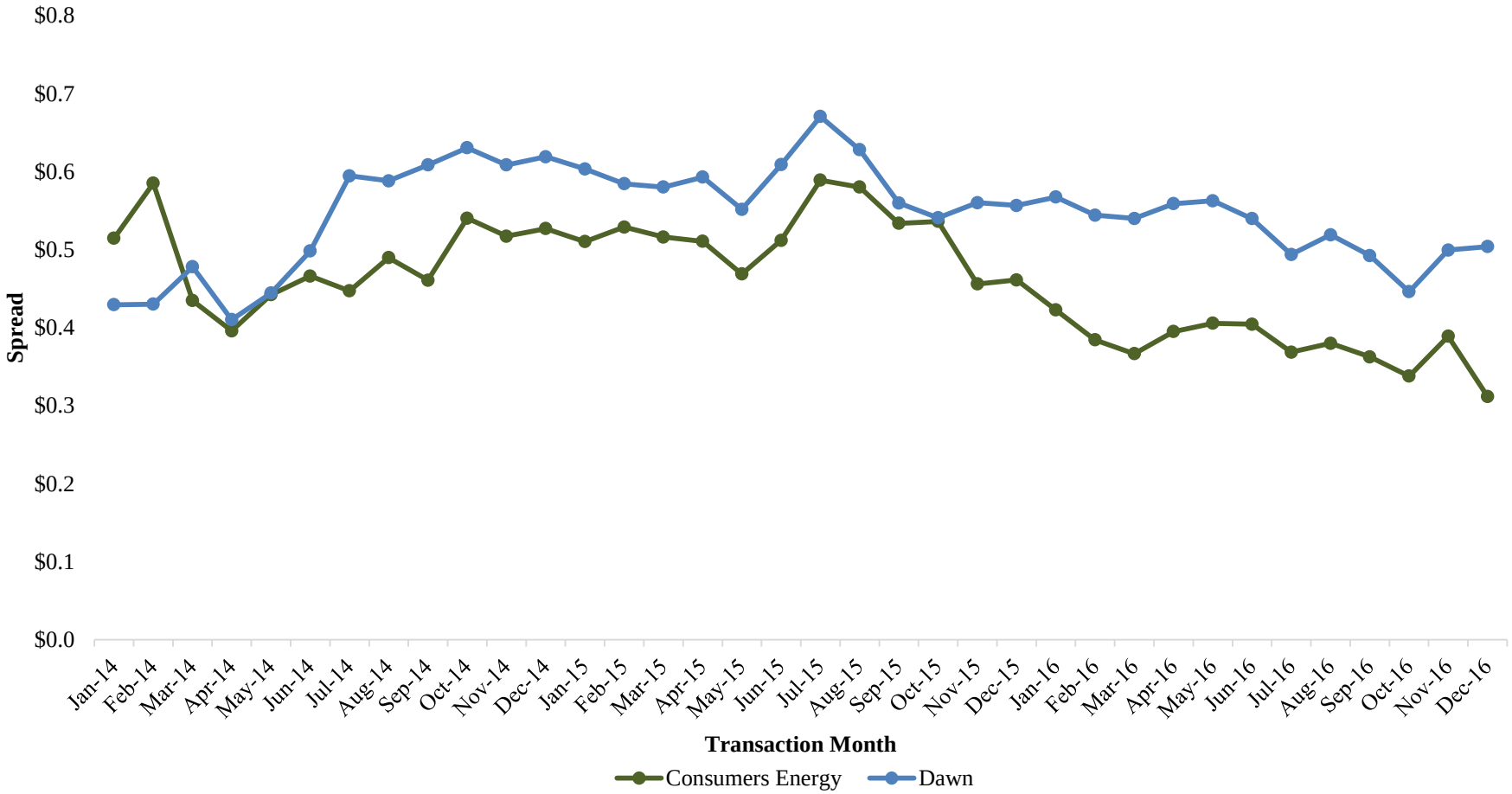
Notes: [1] The months of June, July and August are considered summer months. The months of January, February and March are considered winter months. [2] For each trading day, we calculate the average price of the futures contracts in the summer months (i.e. June 2017, July 2017 and August 2017) and the average price of futures contracts in the winter months (i.e. January 2018, February 2018 and March 2018). The daily summer-winter spread is calculated as the difference between these average summer and winter futures prices. For each hub, we calculate the monthly average of these daily spreads.

Source: Monthly Natural Gas Forward Prices, OTC Global Holdings (OTCGH), accessed through SNL Financial on 12/20/2016.

Exhibit 2B

Spread Between Summer 2017 & Winter 2018 Futures Price

Dawn & Consumers Energy Hubs



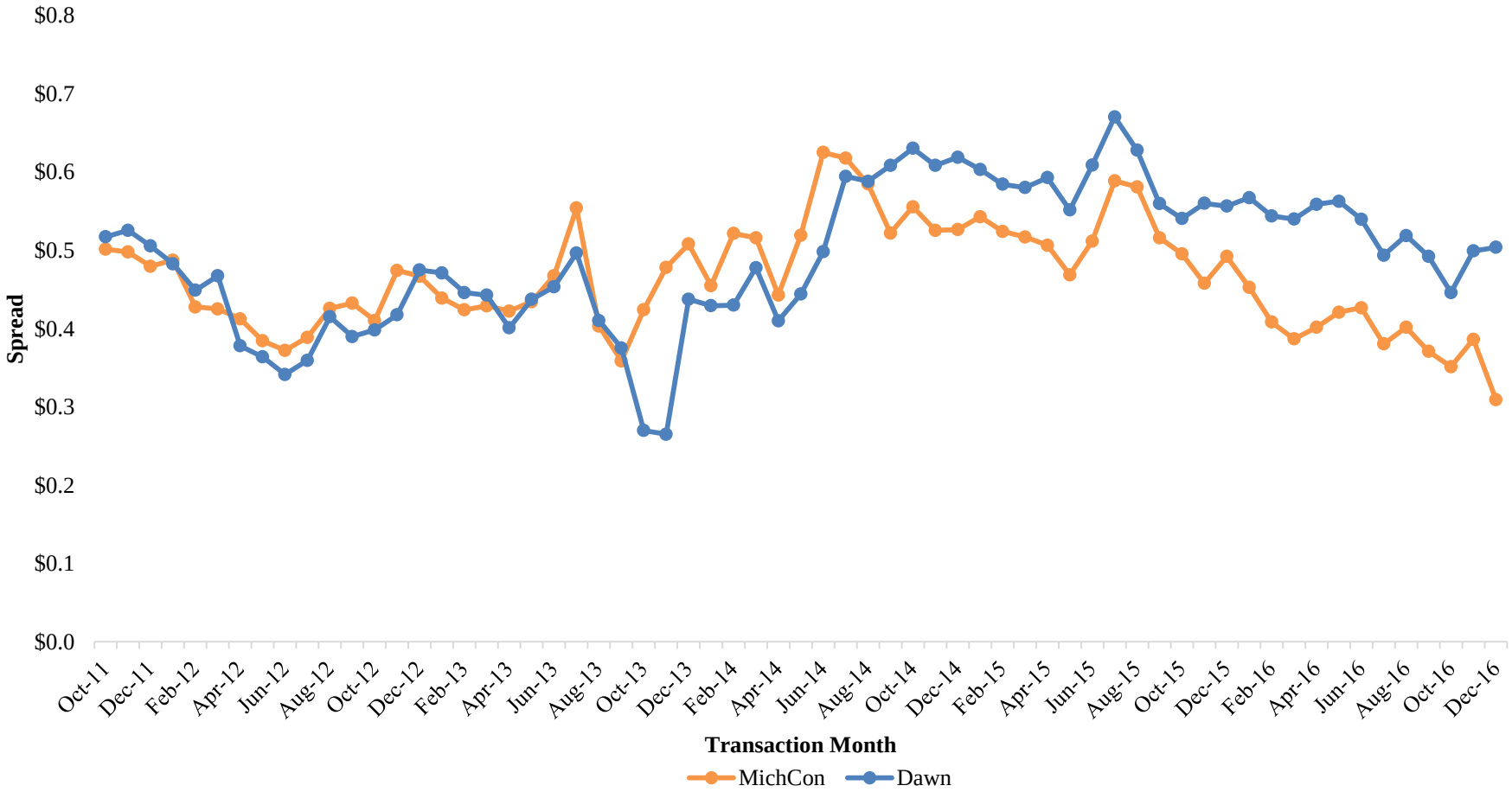
Notes: [1] The months of June, July and August are considered summer months. The months of January, February and March are considered winter months. [2] For each trading day, we calculate the average price of the futures contracts in the summer months (i.e. June 2017, July 2017 and August 2017) and the average price of futures contracts in the winter months (i.e. January 2018, February 2018 and March 2018). The daily summer-winter spread is calculated as the difference between these average summer and winter futures prices. For each hub, we calculate the monthly average of these daily spreads.

Source: Monthly Natural Gas Forward Prices, OTC Global Holdings (OTCGH), accessed through SNL Financial on 12/20/2016.

Exhibit 2C

Spread Between Summer 2017 & Winter 2018 Futures Price

Dawn & MichCon Hubs



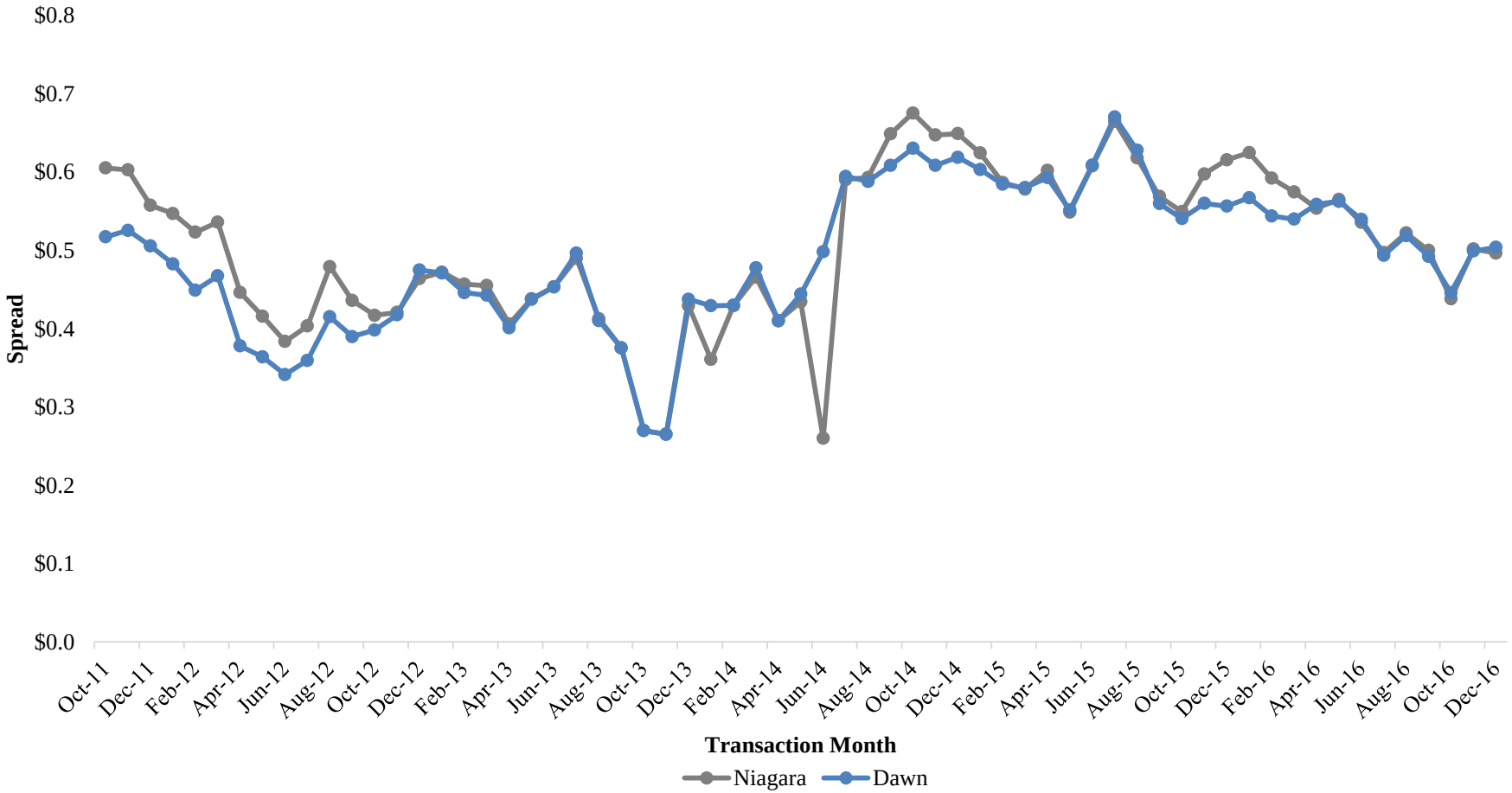
Notes: [1] The months of June, July and August are considered summer months. The months of January, February and March are considered winter months. [2] For each trading day, we calculate the average price of the futures contracts in the summer months (i.e. June 2017, July 2017 and August 2017) and the average price of futures contracts in the winter months (i.e. January 2018, February 2018 and March 2018). The daily summer-winter spread is calculated as the difference between these average summer and winter futures prices. For each hub, we calculate the monthly average of these daily spreads.

Source: Monthly Natural Gas Forward Prices, OTC Global Holdings (OTCGH), accessed through SNL Financial on 12/20/2016.

Exhibit 2D

Spread Between Summer 2017 & Winter 2018 Futures Price

Dawn & Niagara Hubs



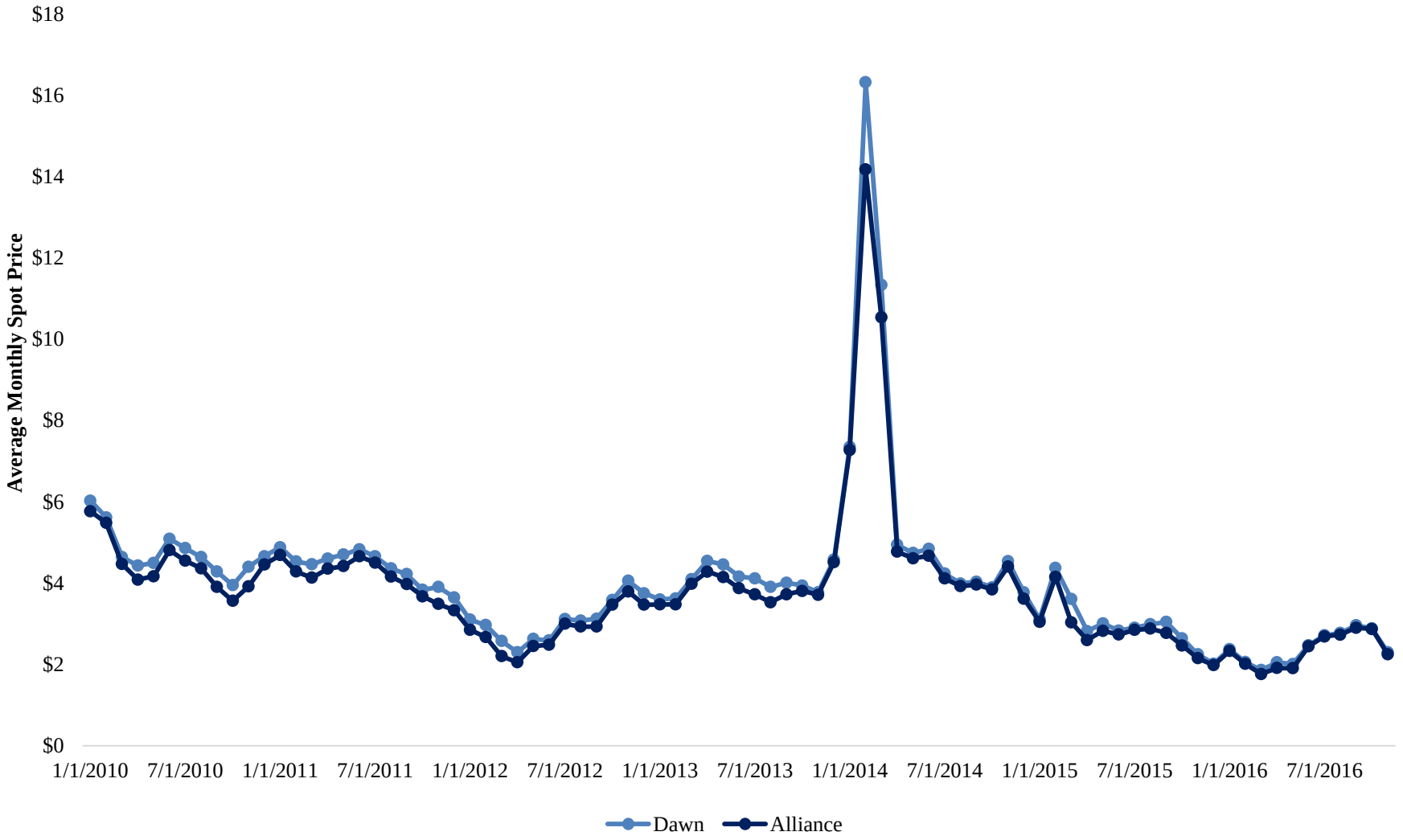
Notes: [1] The months of June, July and August are considered summer months. The months of January, February and March are considered winter months. [2] For each trading day, we calculate the average price of the futures contracts in the summer months (i.e. June 2017, July 2017 and August 2017) and the average price of futures contracts in the winter months (i.e. January 2018, February 2018 and March 2018). The daily summer-winter spread is calculated as the difference between these average summer and winter futures prices. For each hub, we calculate the monthly average of these daily spreads.

Source: Monthly Natural Gas Forward Prices, OTC Global Holdings (OTCGH), accessed through SNL Financial on 12/20/2016.

Exhibit 3A

Average Monthly Spot Price at Dawn and Alliance

USD/MMBtu, January 1st, 2010 - November 10th, 2016



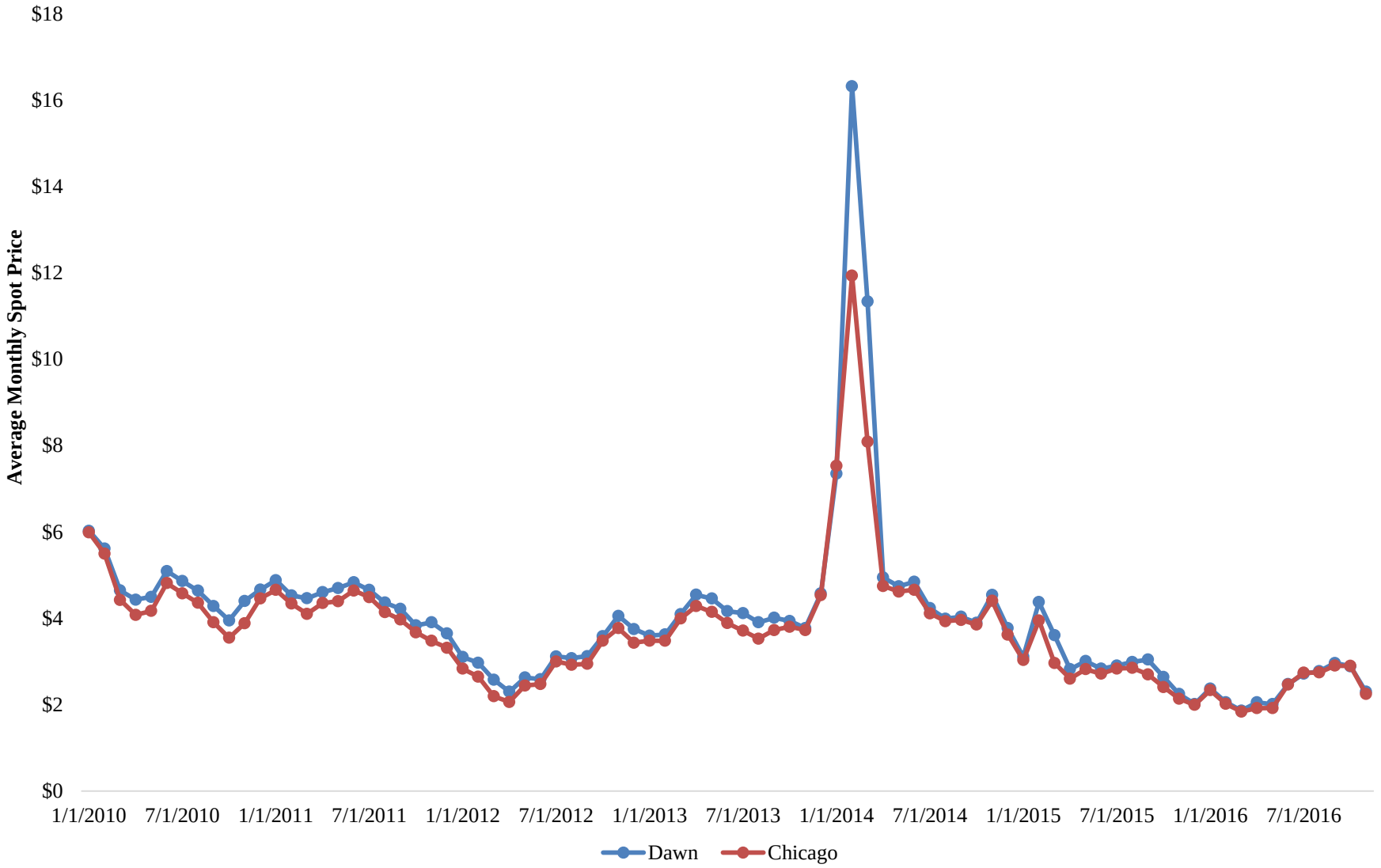
Notes: [1] Monthly average price is calculated using data on daily prices.

Source: [a] SNL Energy Natural Gas Day Ahead Indexes, SNL Financial, accessed on 11/23/2016.

Exhibit 3B

Average Monthly Spot Price at Dawn and Chicago

USD/MMBtu, January 1st, 2010 - November 10th, 2016



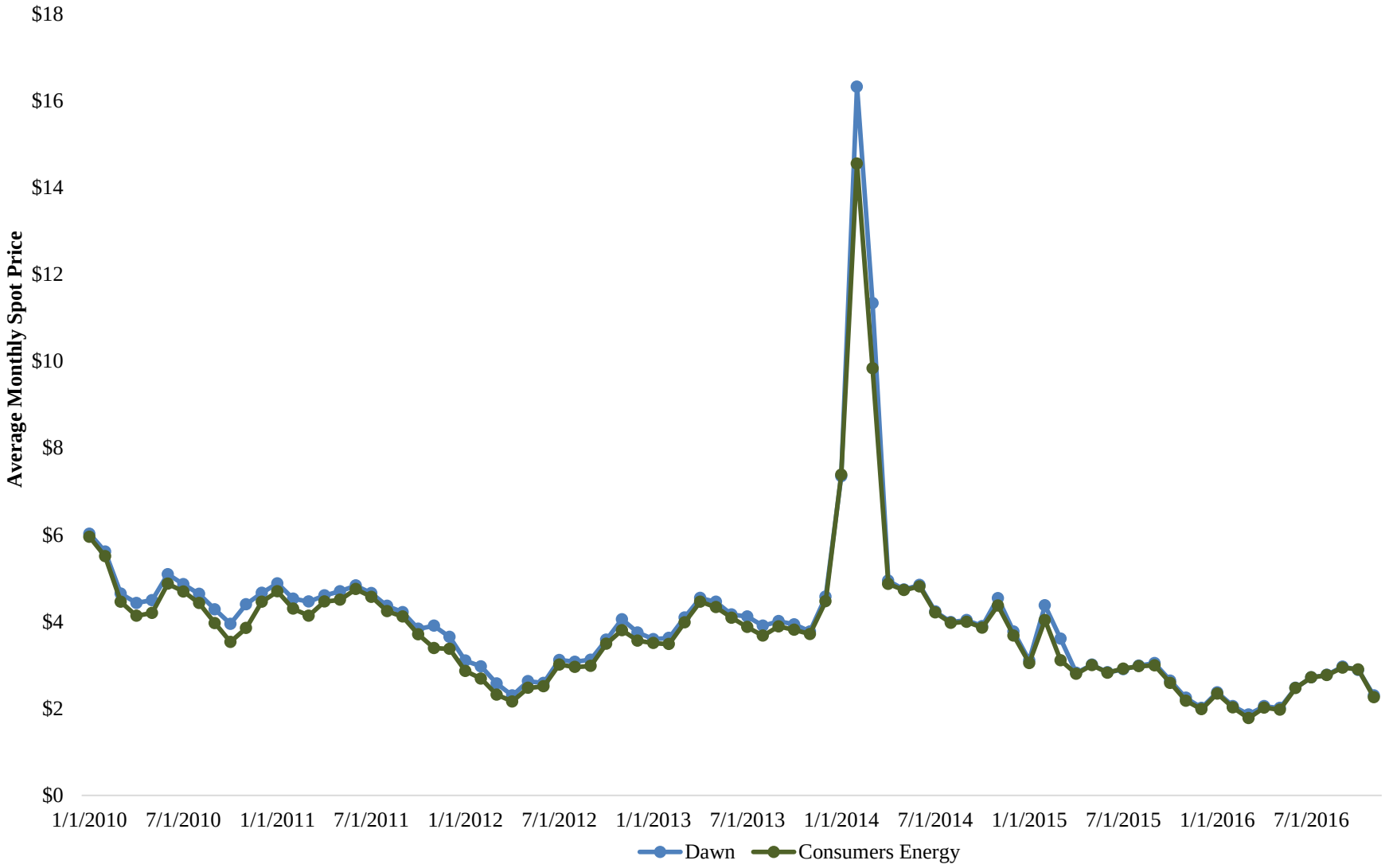
Notes: [1] Monthly average price is calculated using data on daily prices.

Source: [a] SNL Energy Natural Gas Day Ahead Indexes, SNL Financial, accessed on 11/23/2016.

Exhibit 3C

Average Monthly Spot Price at Dawn and Consumers Energy

USD/MMBtu, January 1st, 2010 - November 10th, 2016



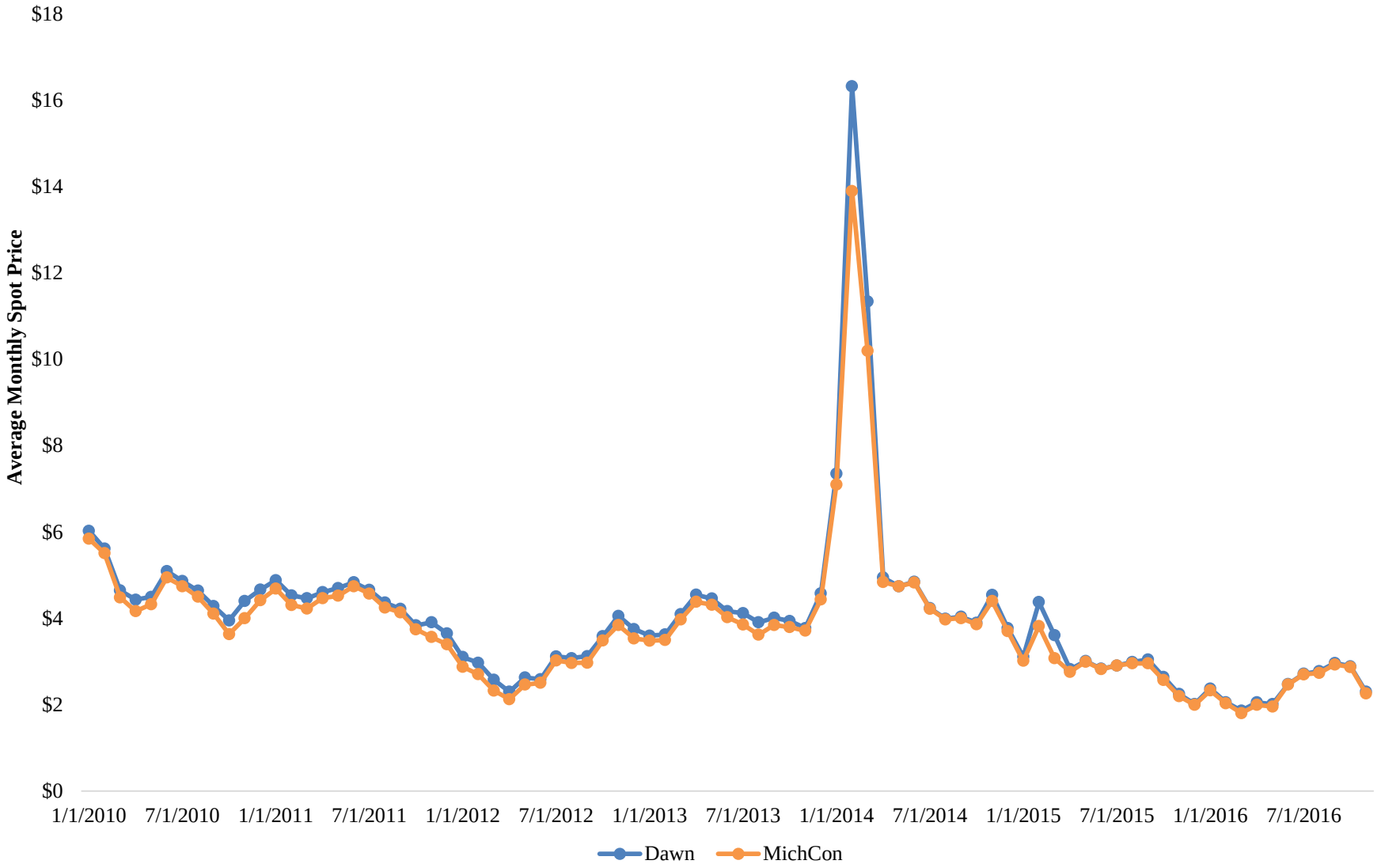
Notes: [1] Monthly average price is calculated using data on daily prices.

Source: [a] SNL Energy Natural Gas Day Ahead Indexes, SNL Financial, accessed on 11/23/2016.

Exhibit 3D

Average Monthly Spot Price at Dawn and MichCon Citygate

USD/MMBtu, January 1st, 2010 - November 10th, 2016



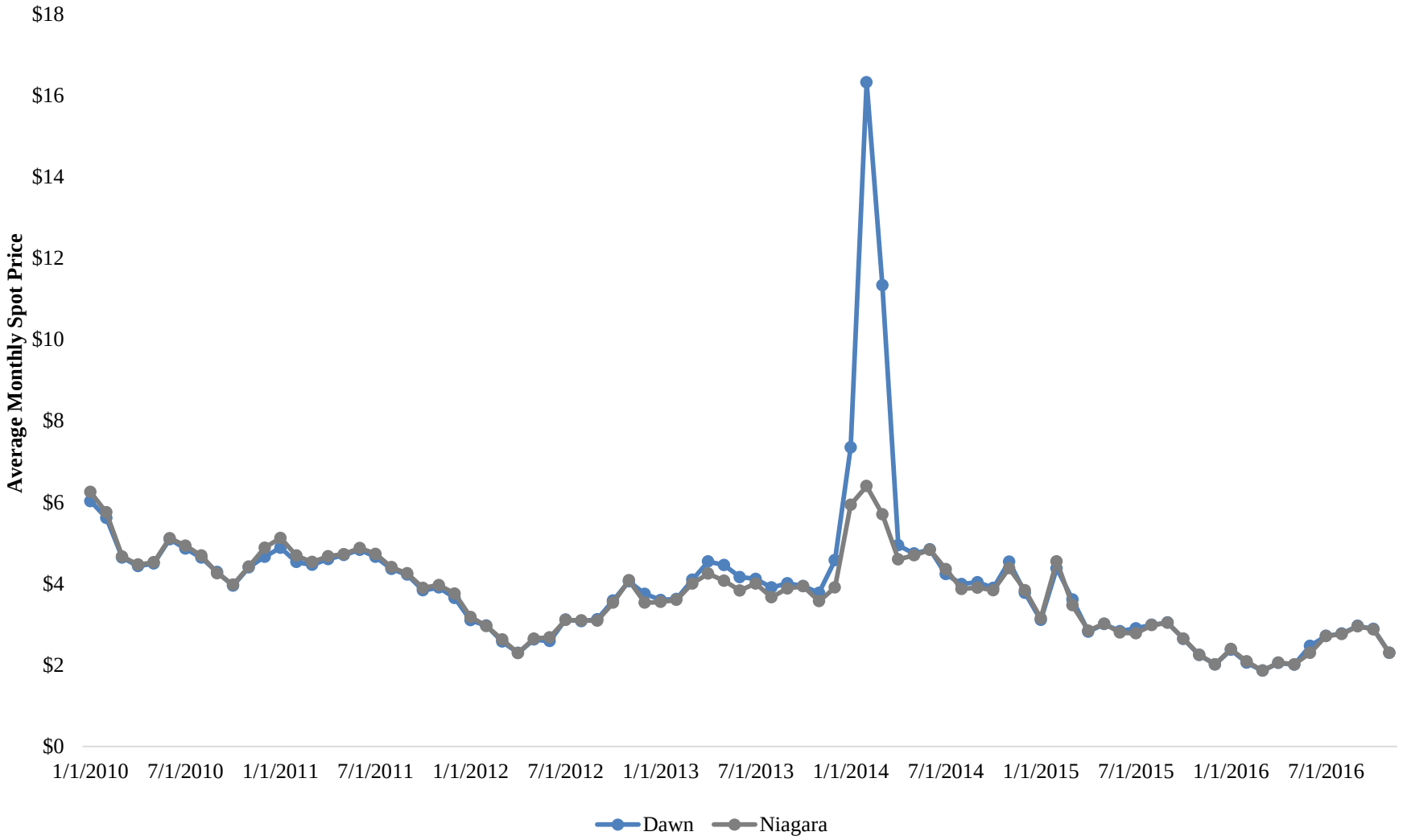
Notes: [1] Monthly average price is calculated using data on daily prices.

Source: [a] SNL Energy Natural Gas Day Ahead Indexes, SNL Financial, accessed on 11/23/2016.

Exhibit 3E

Average Monthly Spot Price at Dawn and Niagara

USD/MMBtu, January 1st, 2010 - November 10th, 2016



Notes: [1] Monthly average price is calculated using data on daily prices.

Source: [a] SNL Energy Natural Gas Day Ahead Indexes, SNL Financial, accessed on 11/23/2016.

Exhibit 4

Natural Gas Spot Price Correlations Across Storage Hubs

Levels

Facilities	2010-11/10/2016	2010	2011	2012	2013	2014	2015	2016 (Through 11/10)
Dawn-Alliance	0.982	0.981	0.972	0.981	0.923	0.978	0.957	0.993
Dawn-Chicago	0.954	0.982	0.973	0.978	0.915	0.944	0.952	0.990
Dawn-Consumers Energy	0.975	0.985	0.965	0.988	0.979	0.968	0.950	0.997
Dawn-MichCon	0.977	0.989	0.981	0.990	0.978	0.971	0.954	0.996
Dawn-Niagara	0.660	0.991	0.986	0.975	0.715	0.585	0.976	0.971
Chicago-Alliance	0.970	0.995	0.992	0.998	0.997	0.966	0.996	0.996
Chicago-MichCon	0.970	0.985	0.985	0.995	0.960	0.963	0.976	0.994
Consumers Energy-MichCon	0.995	0.994	0.992	0.999	0.995	0.994	0.983	0.998

Notes:

[1] Annual correlations are calculated using data on daily natural gas prices.

Source:

[a] SNL Energy Natural Gas Day Ahead Indexes, SNL Financial, accessed on 11/23/2016.

Exhibit 5

Natural Gas Spot Price Correlations Across Storage Hubs

First Differences

Facilities	2010-11/10/2016	2010	2011	2012	2013	2014	2015	2016 (Through 11/10)
Dawn-Alliance	0.955	0.735	0.721	0.828	0.797	0.957	0.940	0.889
Dawn-Chicago	0.910	0.732	0.820	0.793	0.774	0.910	0.935	0.875
Dawn-Consumers Energy	0.849	0.812	0.842	0.848	0.858	0.846	0.932	0.923
Dawn-MichCon	0.889	0.892	0.895	0.865	0.866	0.889	0.940	0.923
Dawn-Niagara	0.607	0.899	0.850	0.603	0.447	0.625	0.933	0.658
Chicago-Alliance	0.949	0.851	0.822	0.950	0.956	0.948	0.989	0.916
Chicago-MichCon	0.926	0.823	0.867	0.898	0.850	0.927	0.981	0.915
Consumers Energy-MichCon	0.978	0.907	0.908	0.956	0.938	0.981	0.976	0.956

Notes:

[1] Annual correlations are calculated using data on daily differences in natural gas prices.

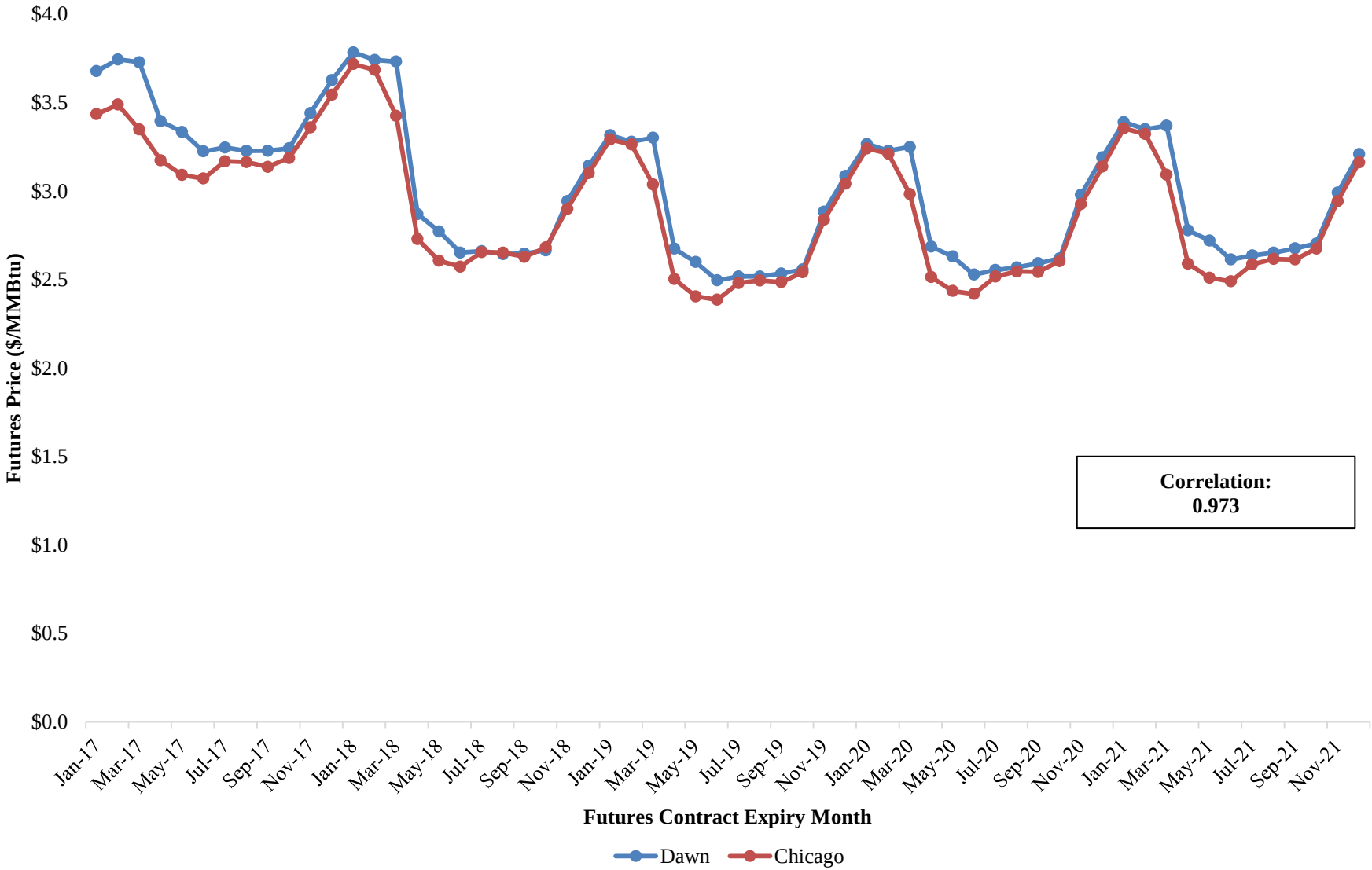
Source:

[a] SNL Energy Natural Gas Day Ahead Indexes, SNL Financial, accessed on 11/23/2016.

Exhibit 6A

Futures Prices from Contracts Originating on December 20th, 2016

Dawn & Chicago Hubs

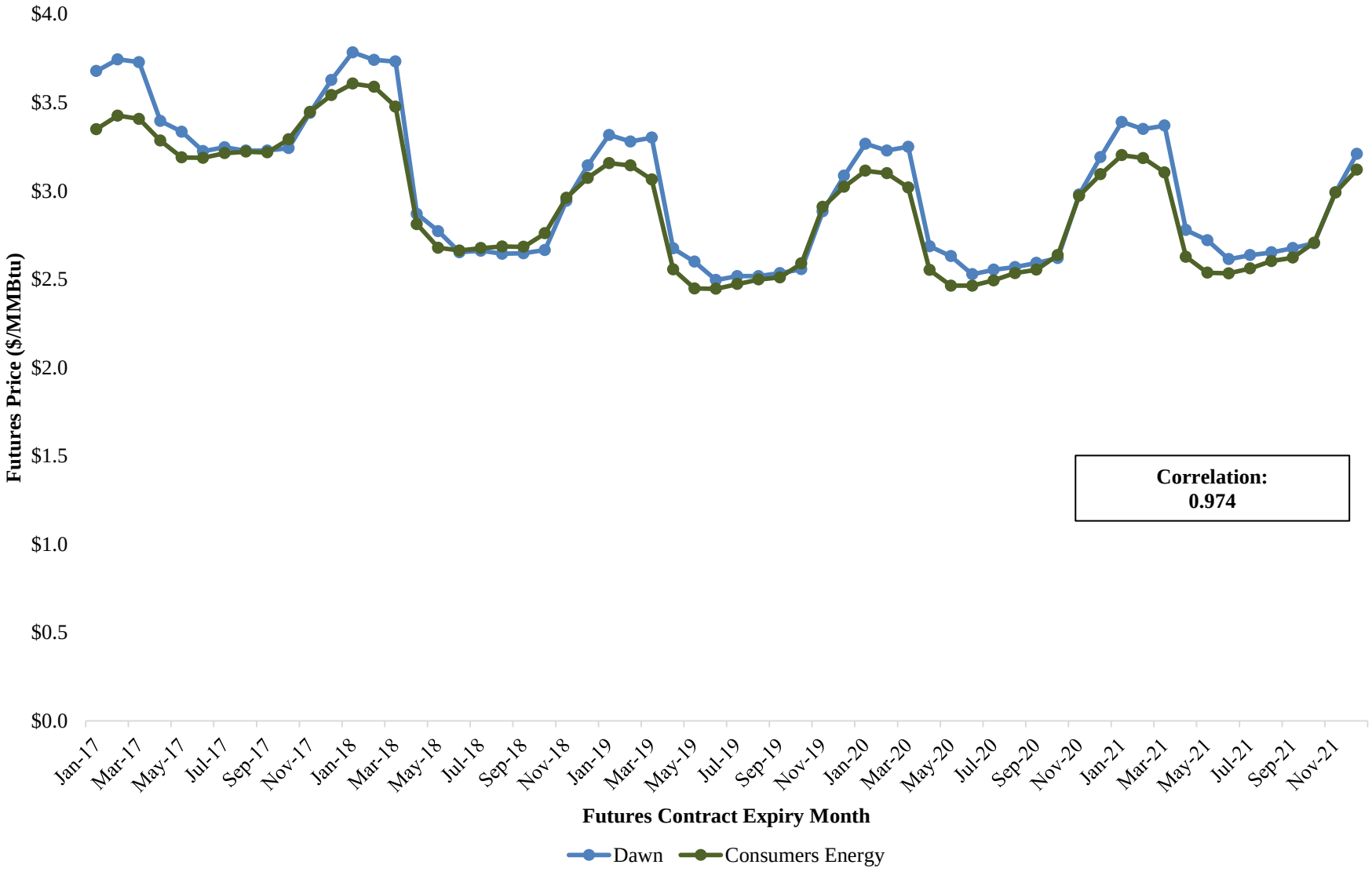


Source: Monthly Natural Gas Forward Prices, OTC Global Holdings (OTCGH), accessed through SNL Financial on 12/20/2016.

Exhibit 6B

Futures Prices from Contracts Originating on December 20th, 2016

Dawn & Consumers Energy Hubs

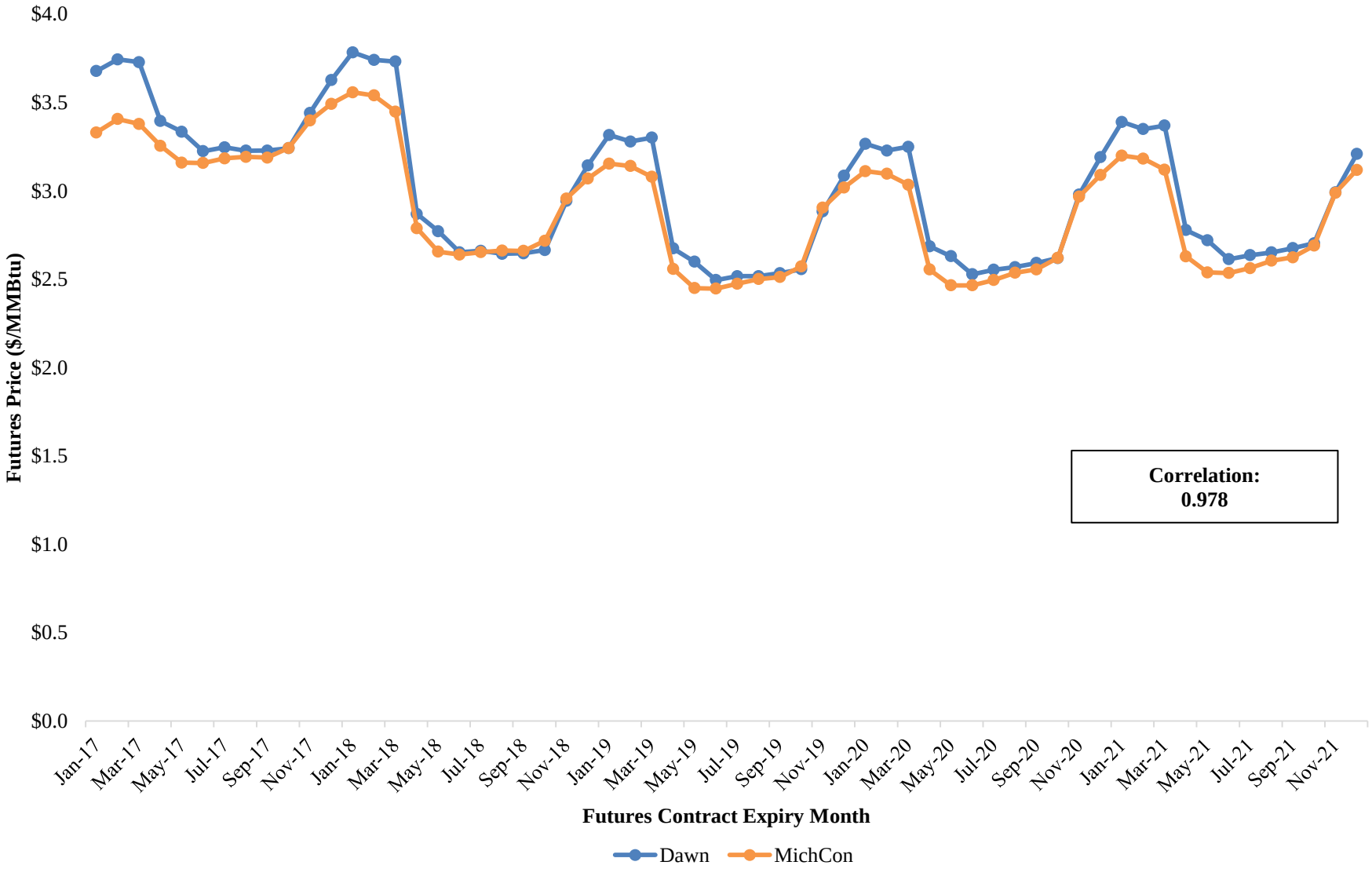


Source: Monthly Natural Gas Forward Prices, OTC Global Holdings (OTCGH), accessed through SNL Financial on 12/20/2016.

Exhibit 6C

Futures Prices from Contracts Originating on December 20th, 2016

Dawn & MichCon Hubs

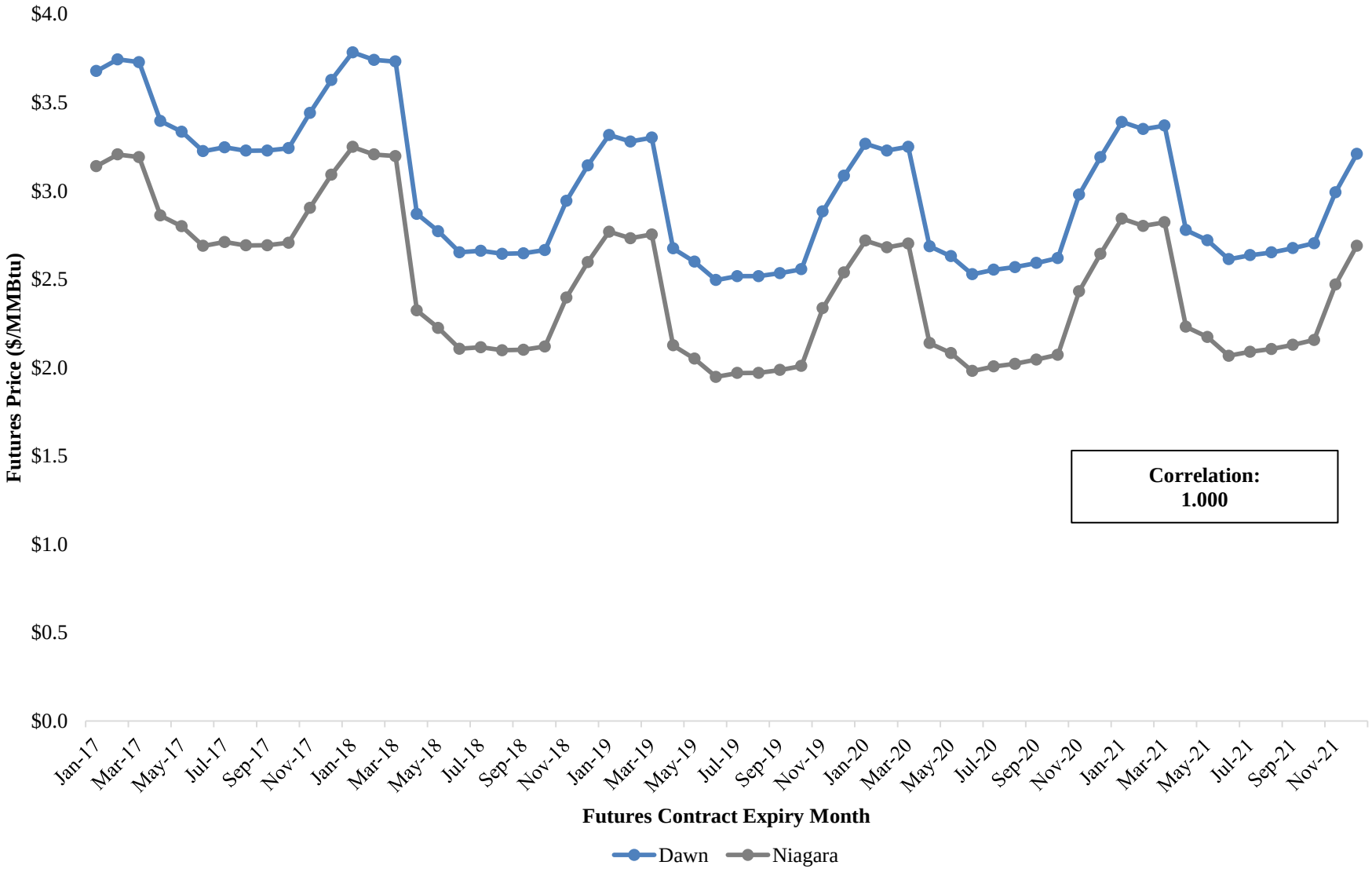


Source: Monthly Natural Gas Forward Prices, OTC Global Holdings (OTCGH), accessed through SNL Financial on 12/20/2016.

Exhibit 6D

Futures Prices from Contracts Originating on December 20th, 2016

Dawn & Niagara Hubs



Source: Monthly Natural Gas Forward Prices, OTC Global Holdings (OTCGH), accessed through SNL Financial on 12/20/2016.

Exhibit 7

Natural Gas Futures Price Correlations

Levels

Facilities	2017-2021	2017	2018	2019	2020	2021
Dawn-Chicago	0.973	0.877	0.982	0.970	0.966	0.965
Dawn-Consumers Energy	0.974	0.794	0.992	0.976	0.976	0.971
Dawn-MichCon	0.978	0.839	0.992	0.980	0.980	0.974
Dawn-Niagara	1.000	1.000	1.000	1.000	1.000	1.000
Chicago-MichCon	0.987	0.954	0.994	0.988	0.987	0.986
Consumers Energy-MichCon	0.999	0.996	0.999	1.000	1.000	1.000

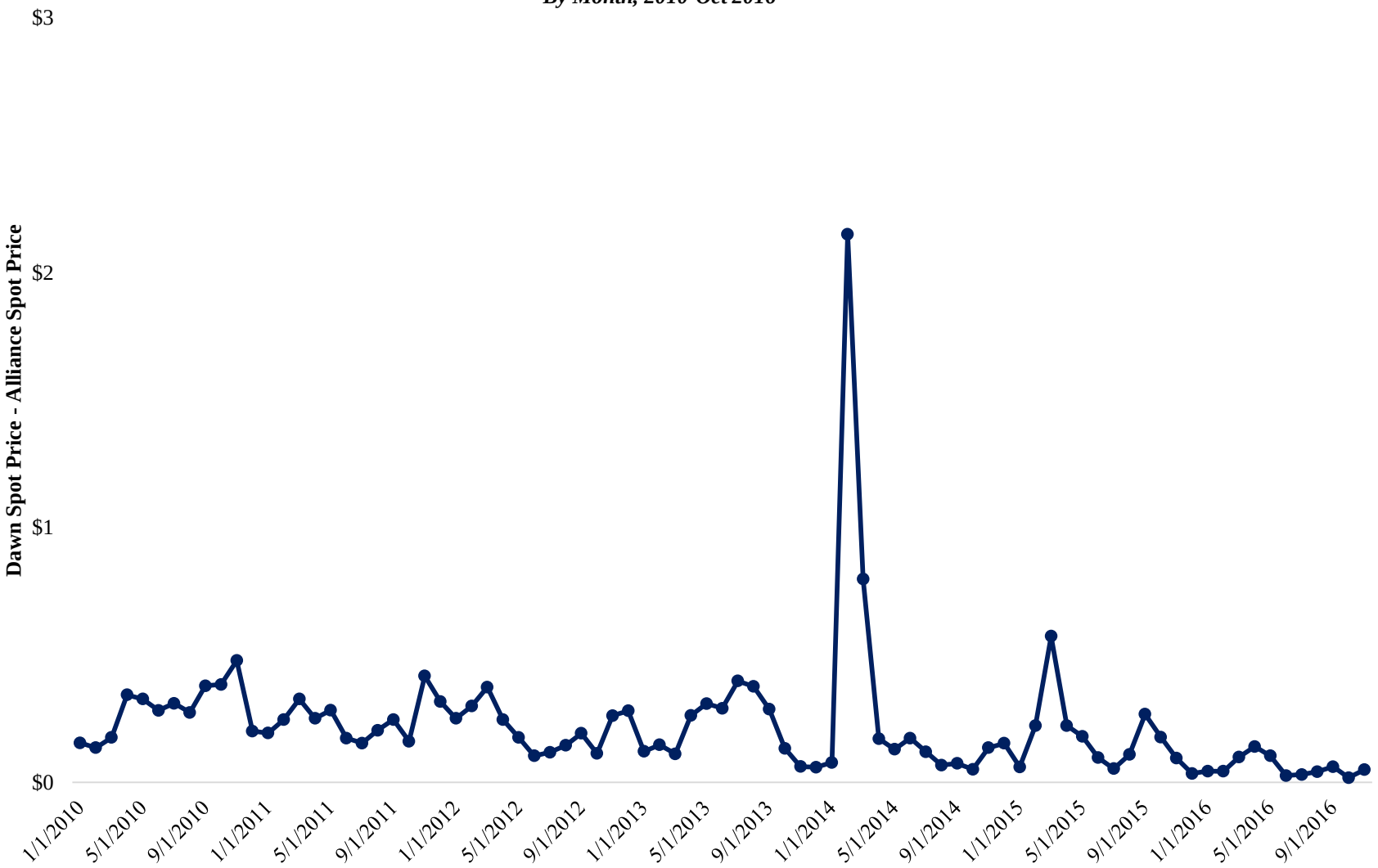
Source:

[a] Monthly Natural Gas Forward Prices, OTC Global Holdings (OTCGH), accessed through SNL Financial on 12/20/2016.

Exhibit 8A

Difference Between Dawn & Alliance Spot Price

By Month, 2010-Oct 2016



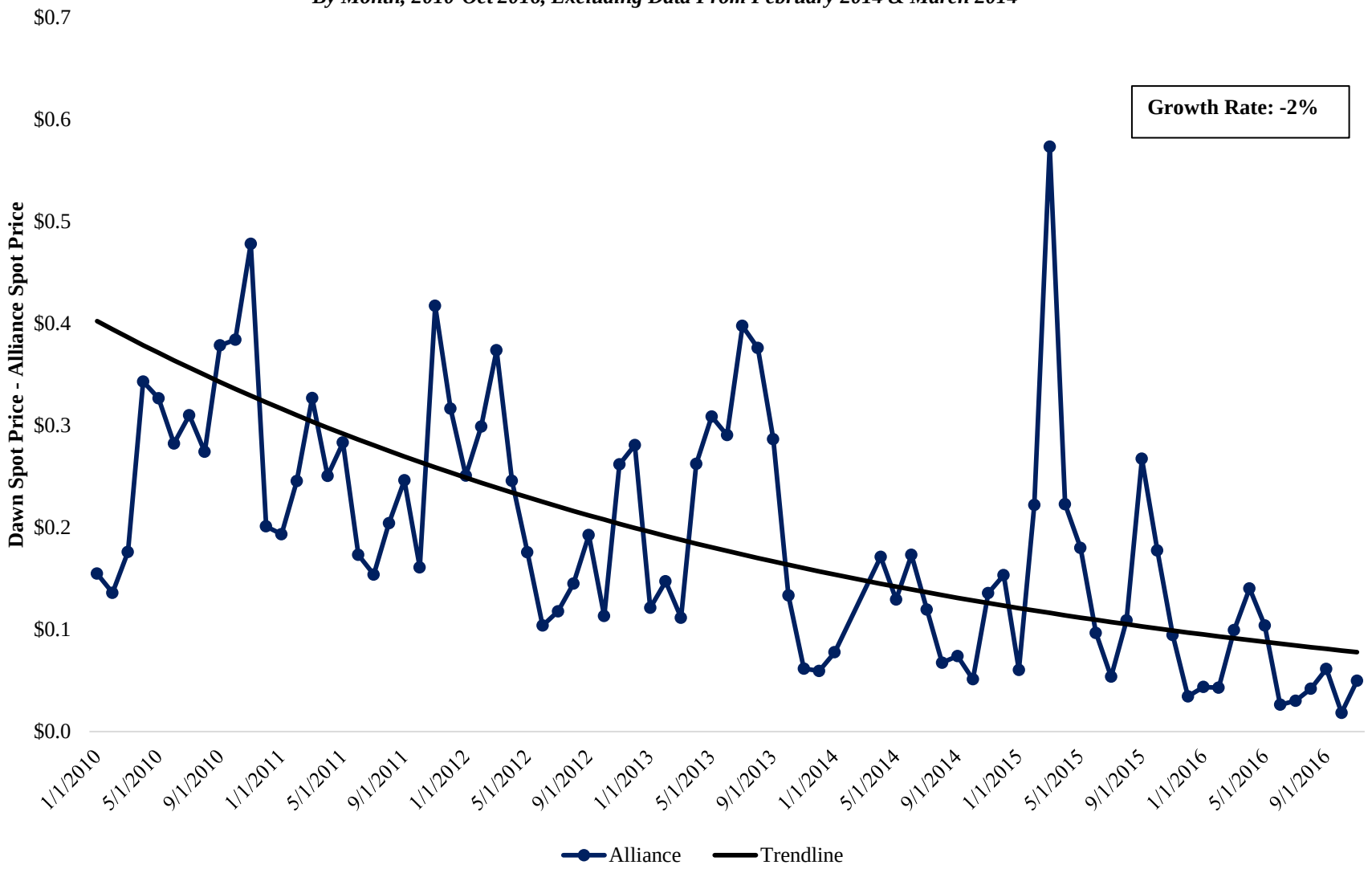
Notes: [1] Monthly average price differences are calculated using data on daily prices.

Source: [a] SNL Energy Natural Gas Day Ahead Indexes, SNL Financial, accessed on 11/23/2016.

Exhibit 8B

Difference Between Dawn & Alliance Spot Price

By Month, 2010-Oct 2016, Excluding Data From February 2014 & March 2014



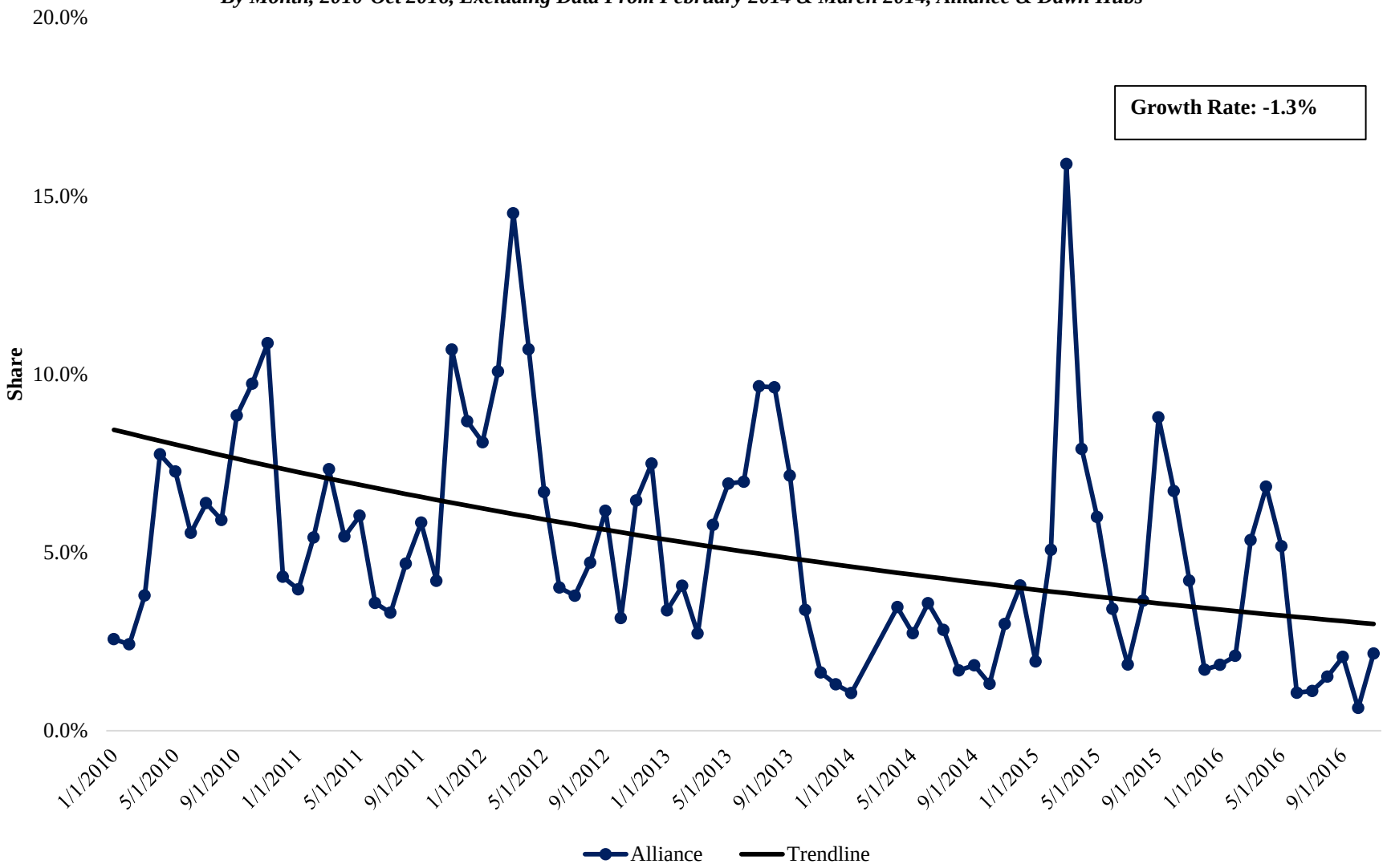
Notes: [1] Monthly average price differences are calculated using data on daily prices. [2] Growth rate estimated by regressing log(basis) against month. Months where the basis was negative were excluded from this regression.

Source: [a] SNL Energy Natural Gas Day Ahead Indexes, SNL Financial, accessed on 11/23/2016.

Exhibit 8C

Spot Price Difference As Share of Dawn Spot Price

By Month, 2010-Oct 2016, Excluding Data From February 2014 & March 2014, Alliance & Dawn Hubs



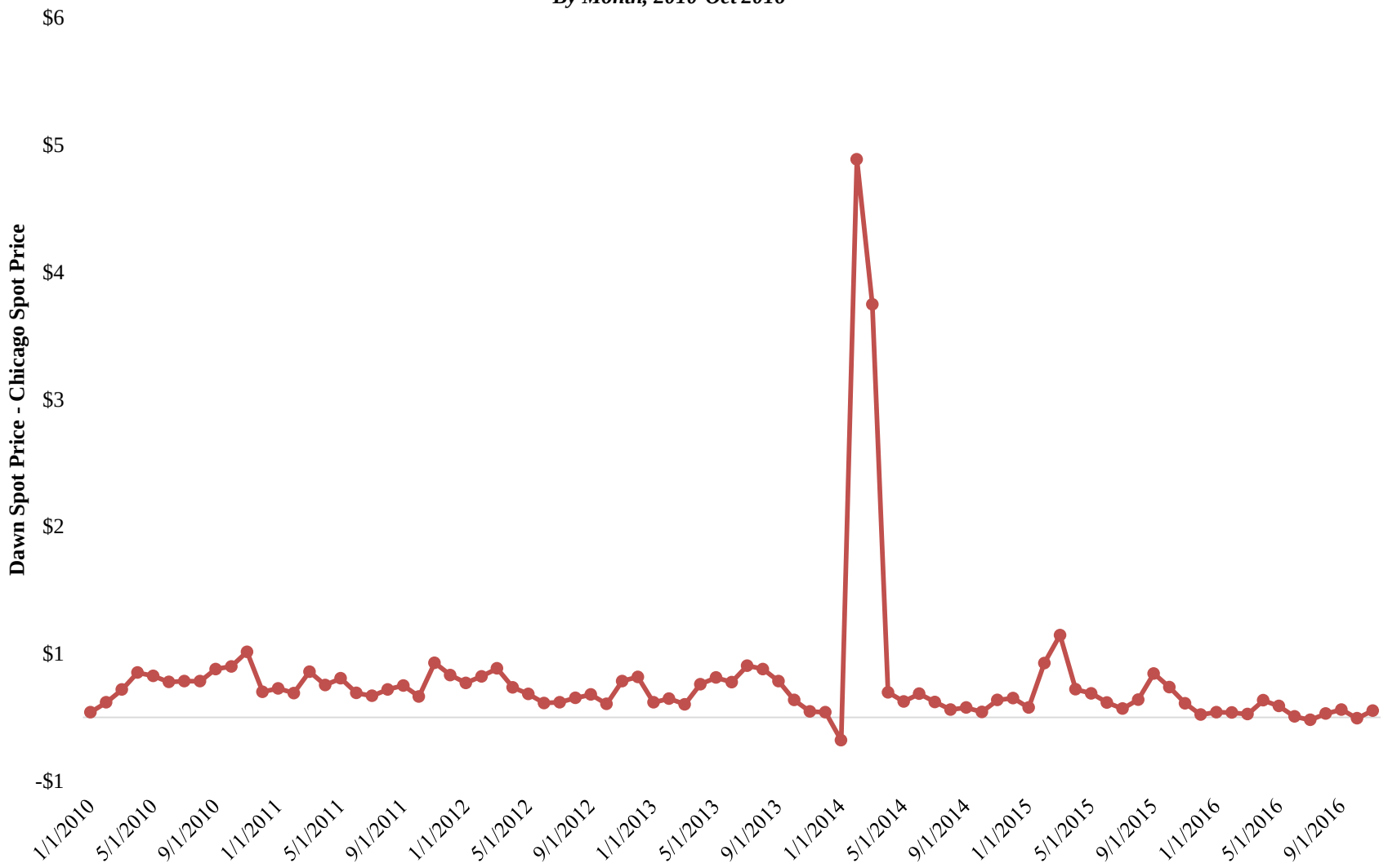
Notes: [1] Monthly average price differences are calculated using data on daily prices. [2] Growth rate estimated by regressing log(share) against month. Months where the share was negative were excluded from this regression

Source: [a] SNL Energy Natural Gas Day Ahead Indexes, SNL Financial, accessed on 11/23/2016.

Exhibit 9A

Difference Between Dawn & Chicago Spot Price

By Month, 2010-Oct 2016



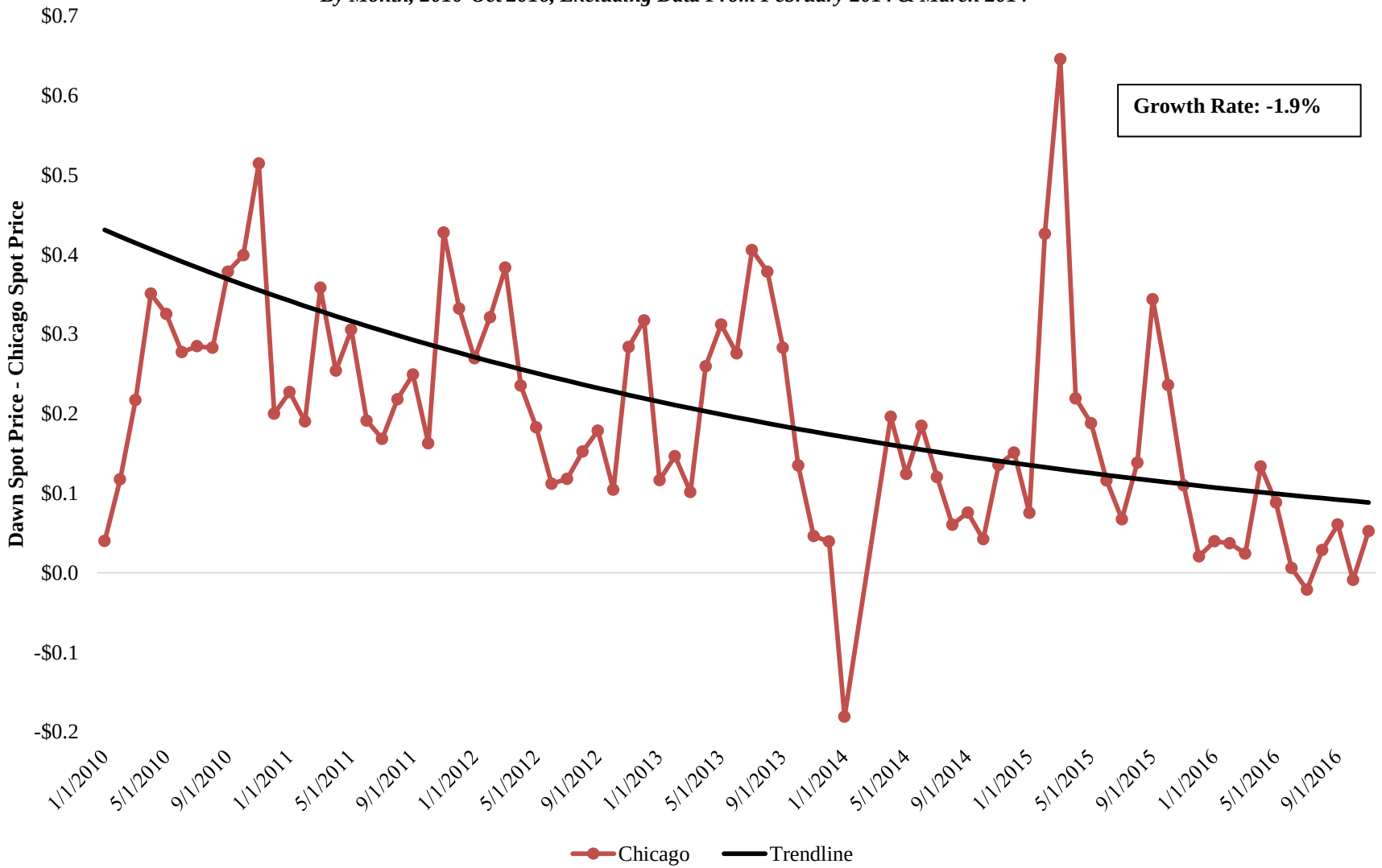
Notes: [1] Monthly average price differences are calculated using data on daily prices.

Source: [a] SNL Energy Natural Gas Day Ahead Indexes, SNL Financial, accessed on 11/23/2016.

Exhibit 9B

Difference Between Dawn & Chicago Spot Price

By Month, 2010-Oct 2016, Excluding Data From February 2014 & March 2014



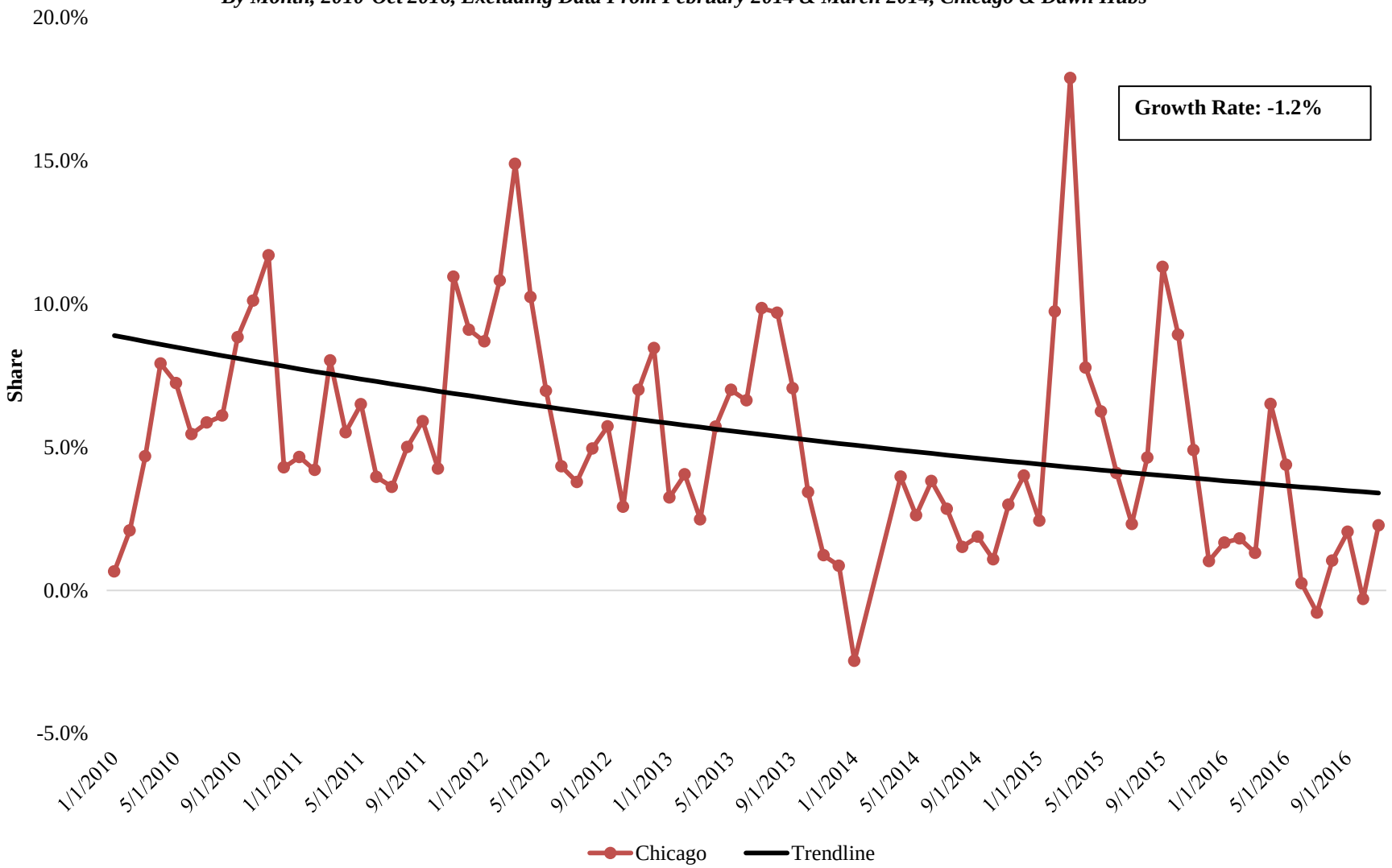
Notes: [1] Monthly average price differences are calculated using data on daily prices. [2] Growth rate estimated by regressing log(basis) against month. Months where the basis was negative were excluded from this regression.

Source: [a] SNL Energy Natural Gas Day Ahead Indexes, SNL Financial, accessed on 11/23/2016.

Exhibit 9C

Spot Price Difference As Share of Dawn Spot Price

By Month, 2010-Oct 2016, Excluding Data From February 2014 & March 2014, Chicago & Dawn Hubs



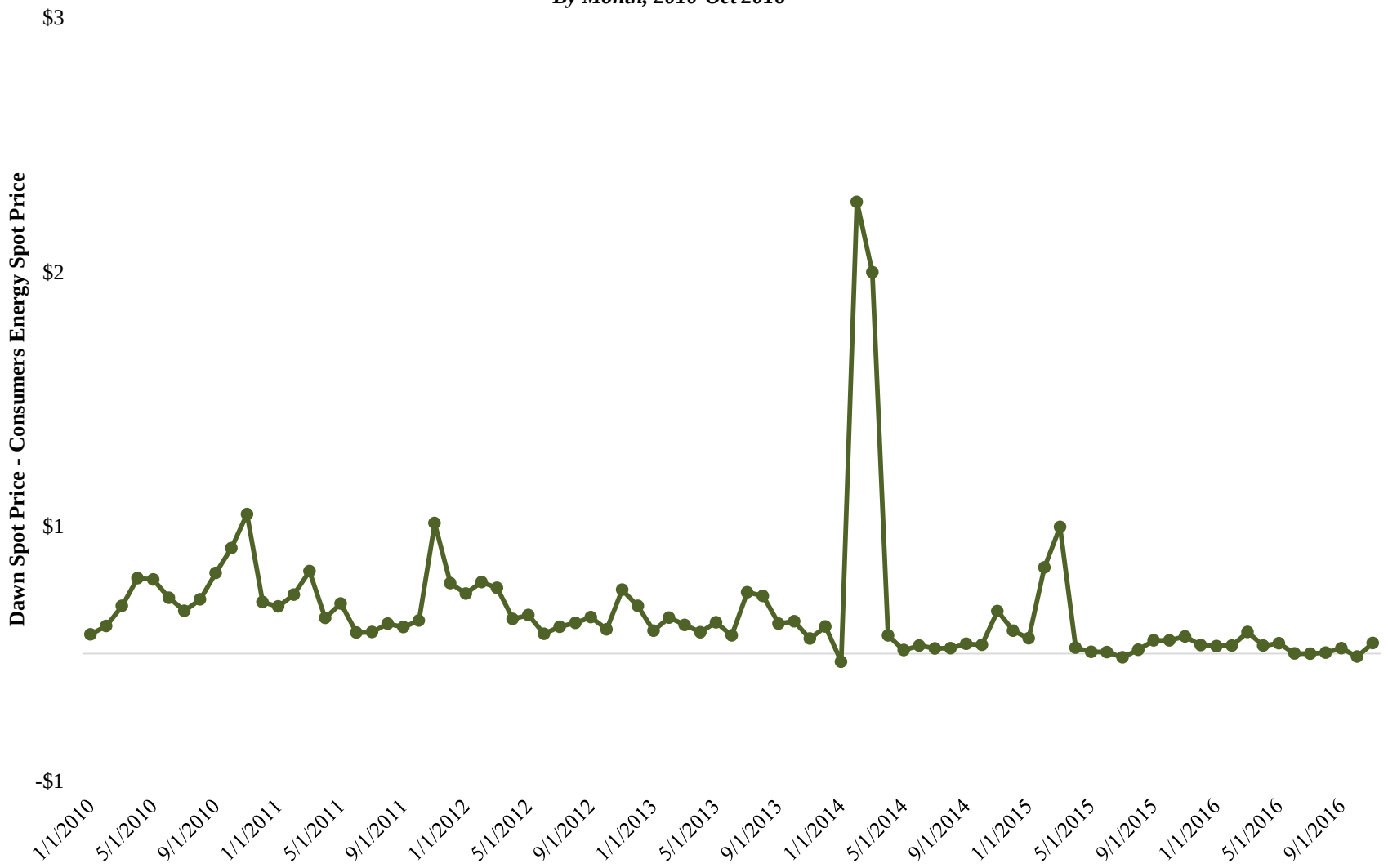
Notes: [1] Monthly average price differences are calculated using data on daily prices. [2] Growth rate estimated by regressing log(share) against month. Months where the share was negative were excluded from this regression.

Source: [a] SNL Energy Natural Gas Day Ahead Indexes, SNL Financial, accessed on 11/23/2016.

Exhibit 10A

Difference Between Dawn & Consumers Energy Spot Price

By Month, 2010-Oct 2016



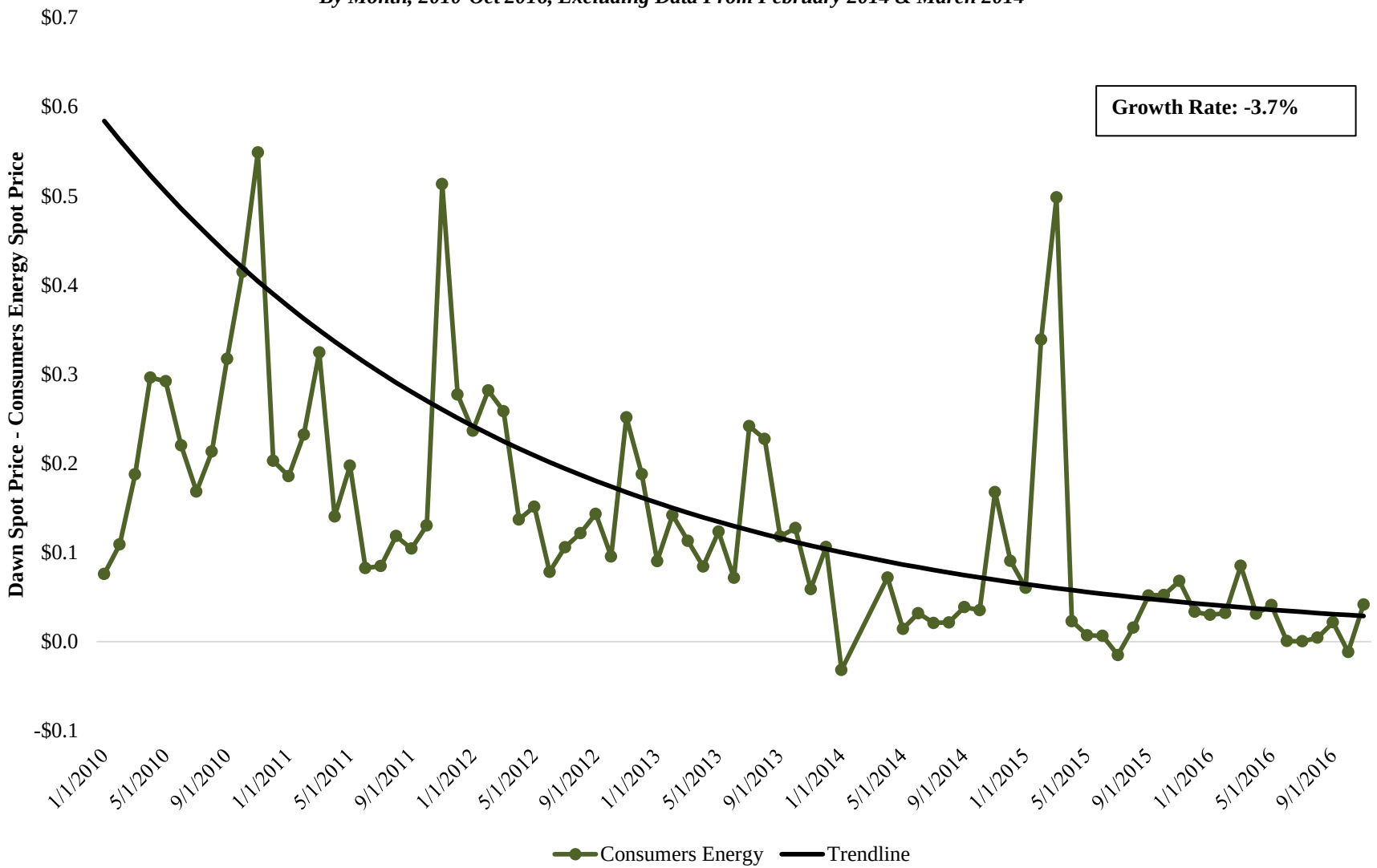
Notes: [1] Monthly average price differences are calculated using data on daily prices.

Source: [a] SNL Energy Natural Gas Day Ahead Indexes, SNL Financial, accessed on 11/23/2016.

Exhibit 10B

Difference Between Dawn & Consumers Energy Spot Price

By Month, 2010-Oct 2016, Excluding Data From February 2014 & March 2014



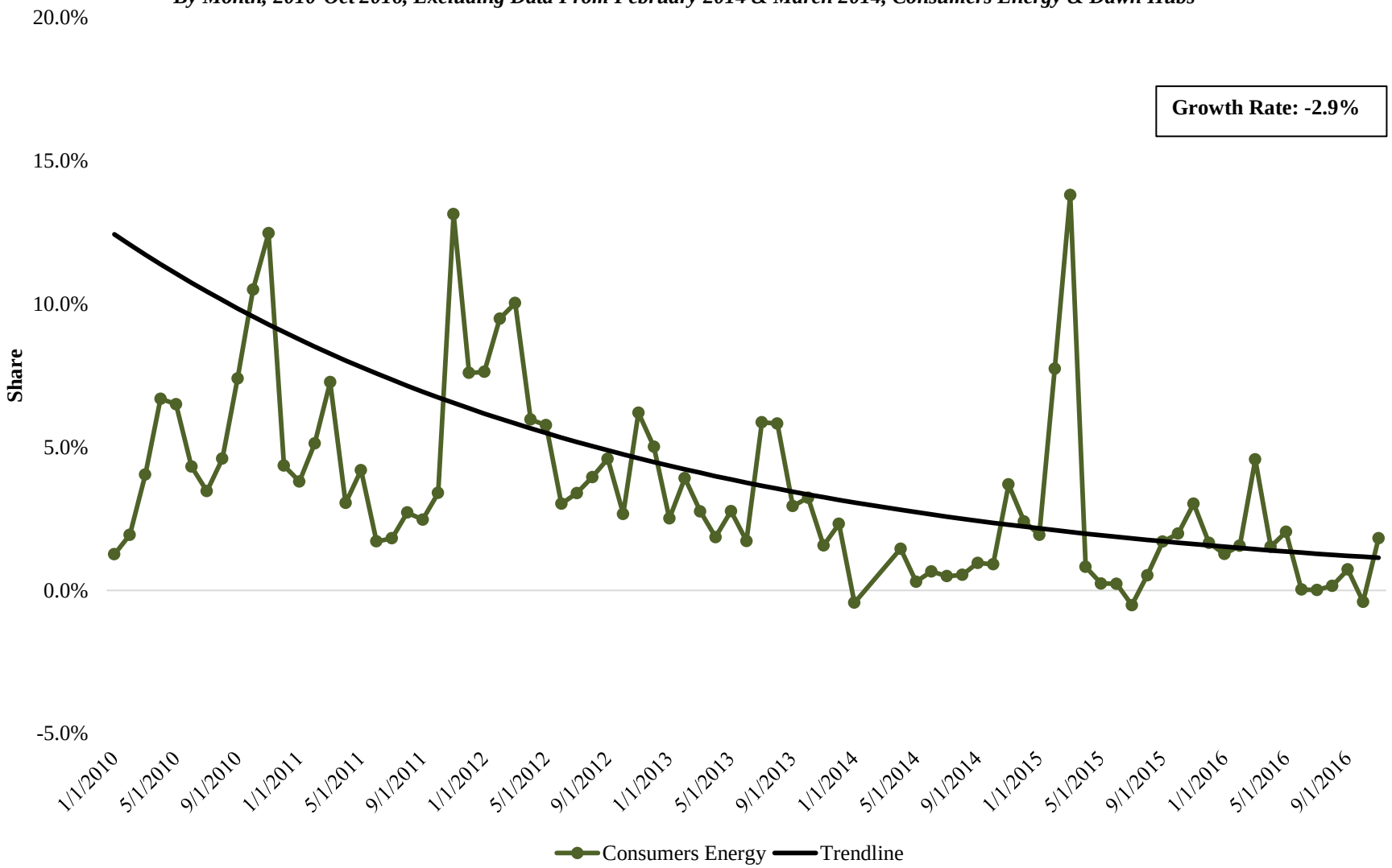
Notes: [1] Monthly average price differences are calculated using data on daily prices. [2] Growth rate estimated by regressing log(basis) against month. Months where the basis was negative were excluded from this regression.

Source: [a] SNL Energy Natural Gas Day Ahead Indexes, SNL Financial, accessed on 11/23/2016.

Exhibit 10C

Spot Price Difference As Share of Dawn Spot Price

By Month, 2010-Oct 2016, Excluding Data From February 2014 & March 2014, Consumers Energy & Dawn Hubs



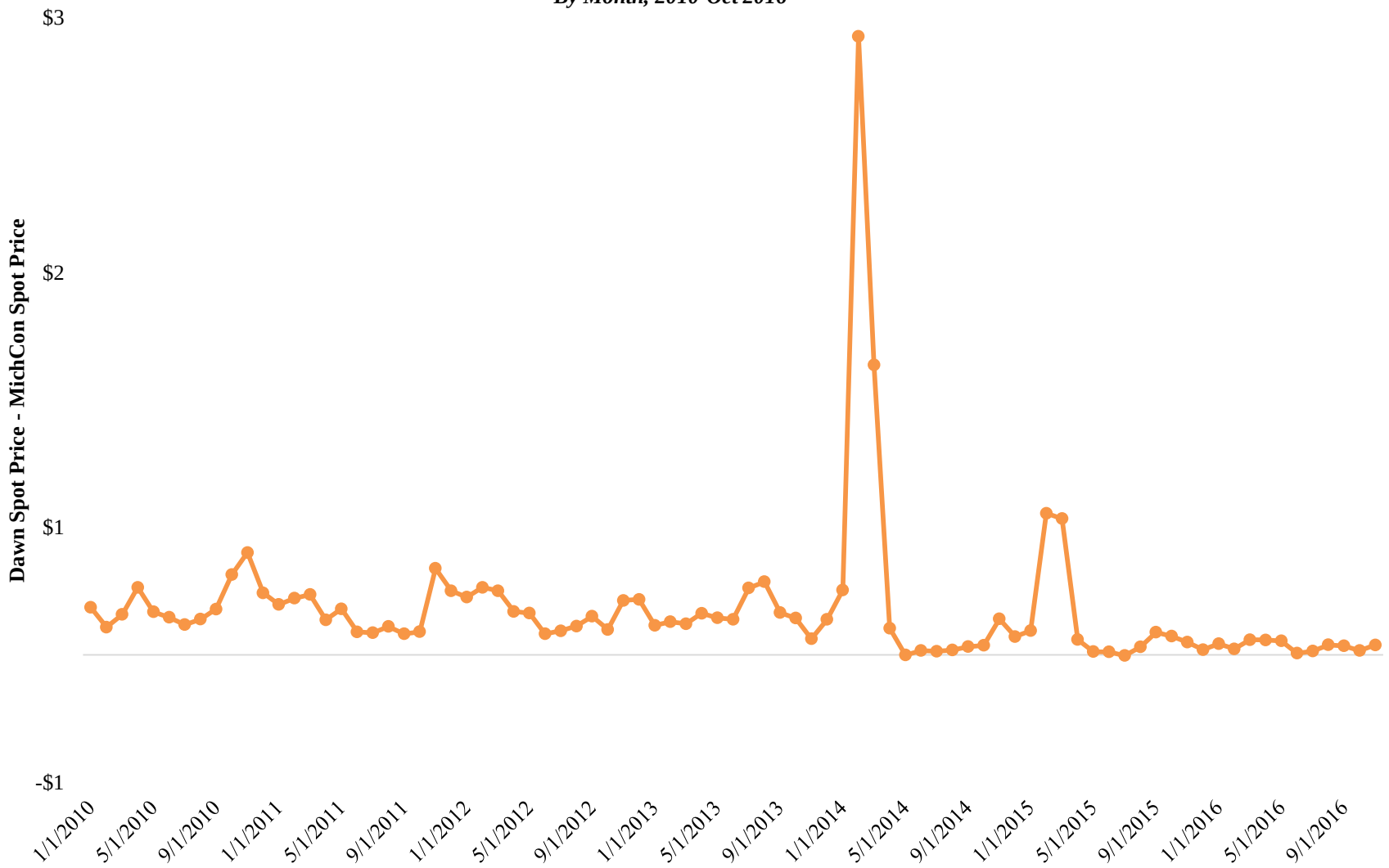
Notes: [1] Monthly average price differences are calculated using data on daily prices. [2] Growth rate estimated by regressing log(share) against month. Months where the share was negative were excluded from this regression.

Source: [a] SNL Energy Natural Gas Day Ahead Indexes, SNL Financial, accessed on 11/23/2016.

Exhibit 11A

Difference Between Dawn & MichCon Spot Price

By Month, 2010-Oct 2016



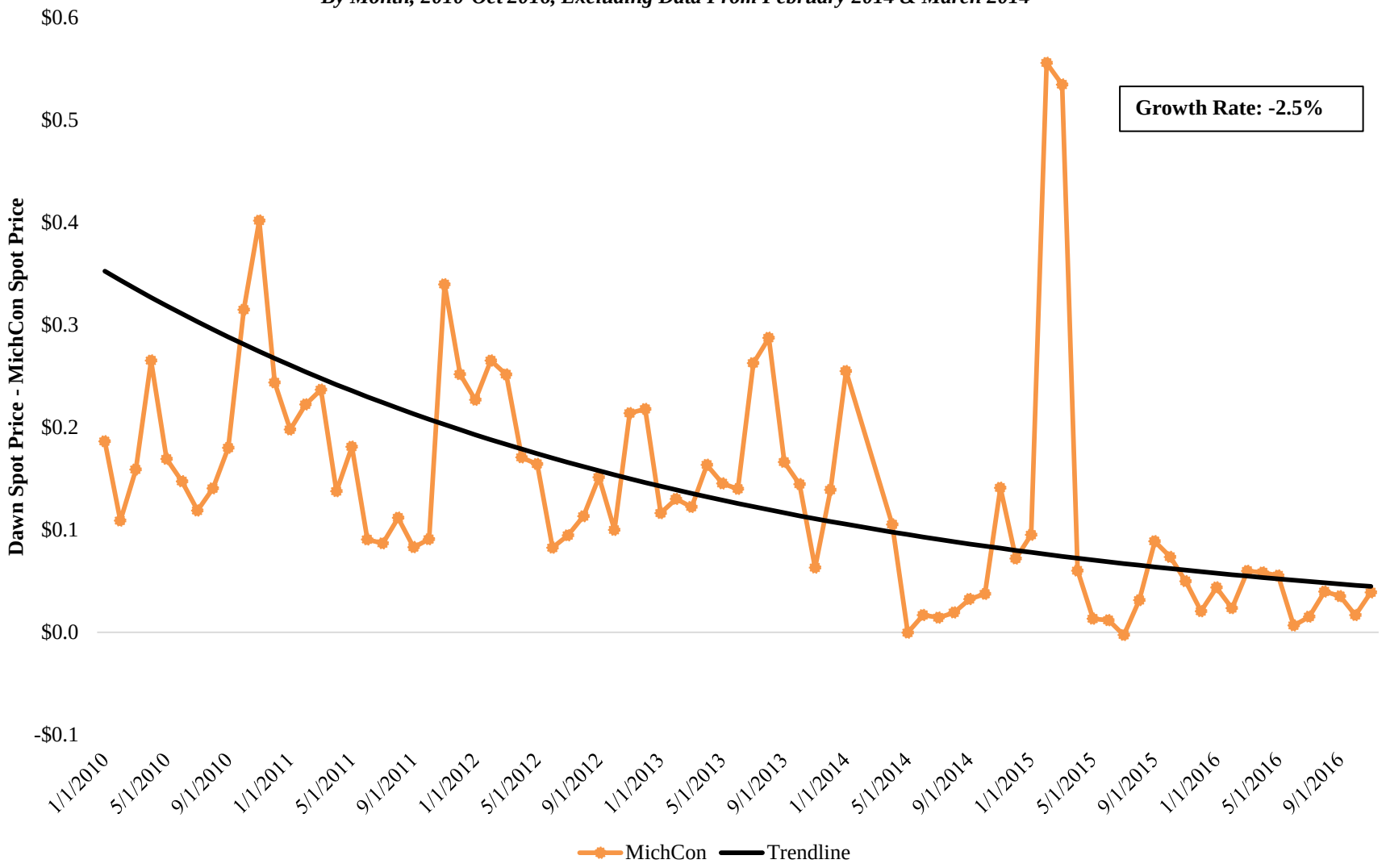
Notes: [1] Monthly average price differences are calculated using data on daily prices.

Source: [a] SNL Energy Natural Gas Day Ahead Indexes, SNL Financial, accessed on 11/23/2016.

Exhibit 11B

Difference Between Dawn & MichCon Spot Price

By Month, 2010-Oct 2016, Excluding Data From February 2014 & March 2014



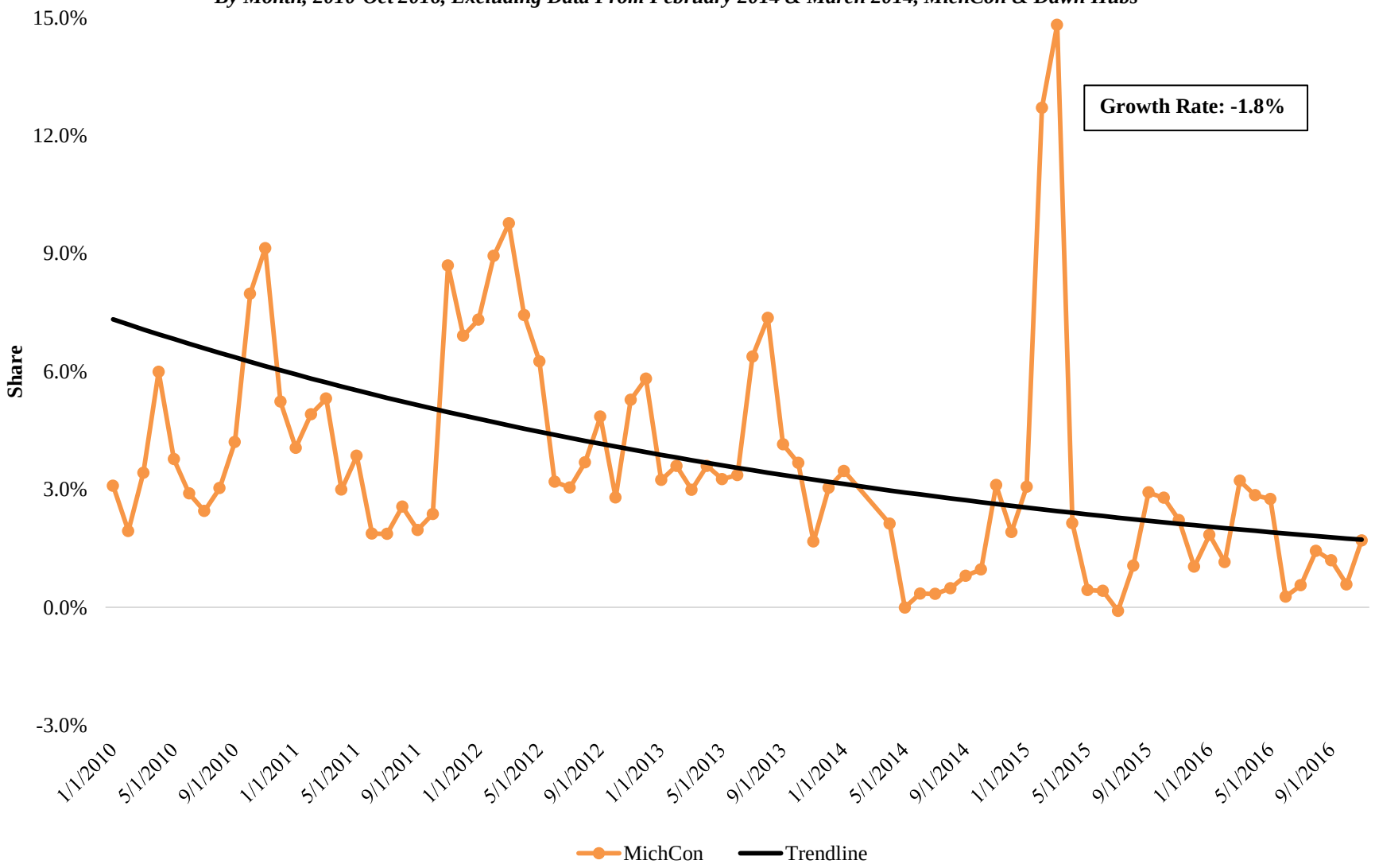
Notes: [1] Monthly average price differences are calculated using data on daily prices. [2] Growth rate estimated by regressing log(basis) against month. Months where the basis was negative were excluded from this regression.

Source: [a] SNL Energy Natural Gas Day Ahead Indexes, SNL Financial, accessed on 11/23/2016.

Exhibit 11C

Spot Price Difference As Share of Dawn Spot Price

By Month, 2010-Oct 2016, Excluding Data From February 2014 & March 2014, MichCon & Dawn Hubs



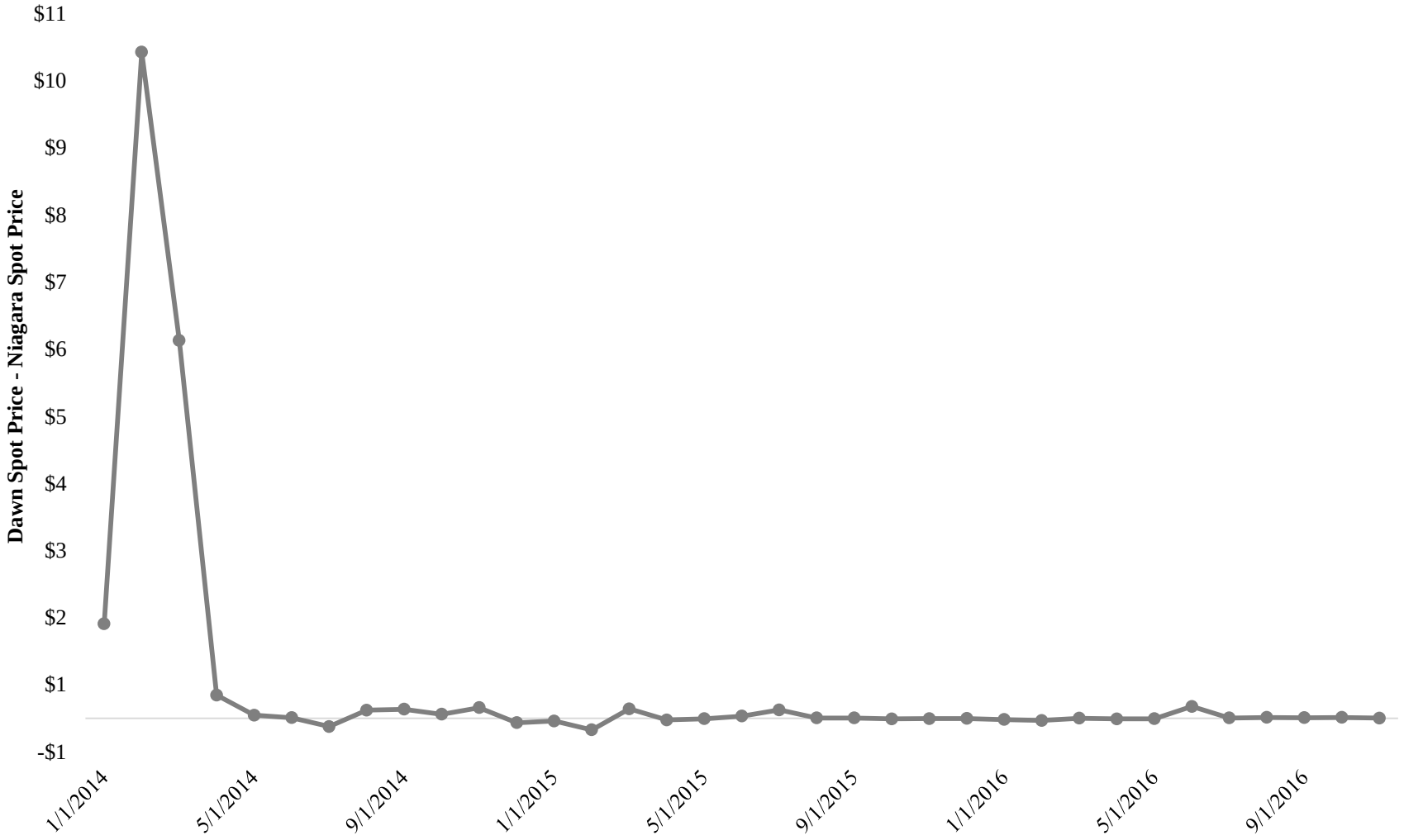
Notes: [1] Monthly average price differences are calculated using data on daily prices. [2] Growth rate estimated by regressing log(share) against month. Months where the share was negative were excluded from this regression.

Source: [a] SNL Energy Natural Gas Day Ahead Indexes, SNL Financial, accessed on 11/23/2016.

Exhibit 12A

Difference Between Dawn & Niagara Spot Price

By Month, 2014-Oct 2016



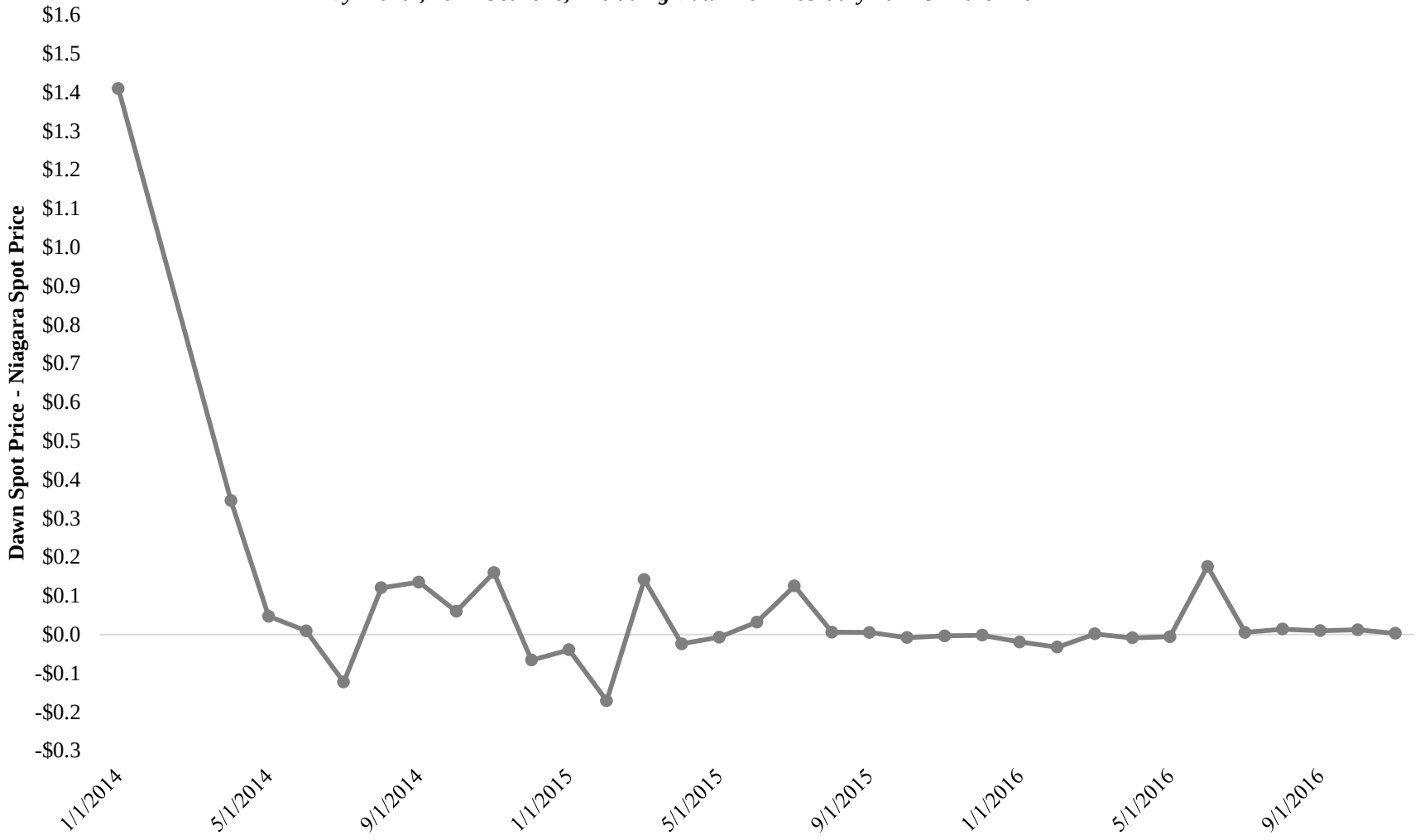
Notes: [1] Monthly average price differences are calculated using data on daily prices.

Source: [a] SNL Energy Natural Gas Day Ahead Indexes, SNL Financial, accessed on 11/23/2016.

Exhibit 12B

Difference Between Dawn & Niagara Spot Price

By Month, 2014-Oct 2016, Excluding Data From February 2014 & March 2014



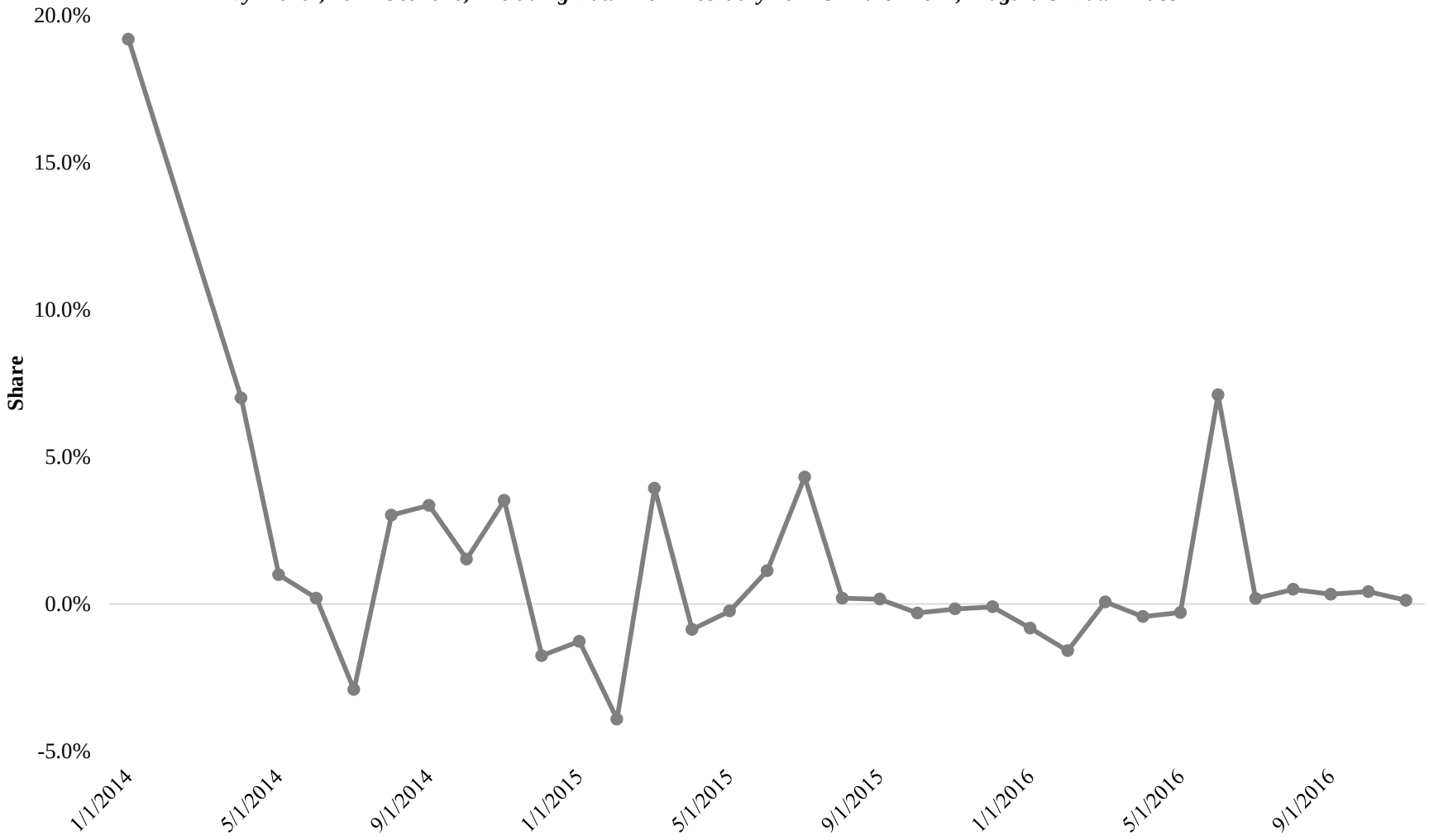
Notes: [1] Monthly average price differences are calculated using data on daily prices.

Source: [a] SNL Energy Natural Gas Day Ahead Indexes, SNL Financial, accessed on 11/23/2016.

Exhibit 12C

Spot Price Difference As Share of Dawn Spot Price

By Month, 2014-Oct 2016, Excluding Data From February 2014 & March 2014, Niagara & Dawn Hubs



Notes: [1] Monthly average price differences are calculated using data on daily prices.

Source: [a] SNL Energy Natural Gas Day Ahead Indexes, SNL Financial, accessed on 11/23/2016.

CRA Charles River Associates

Memorandum

To: Oliver Borgers, Jonathan Bitran (McCarthy Tétrault)
Cal Goldman, Richard Annan (Goodmans)

From: Margaret Sanderson, John Hayes, Hitesh Makhija

Date: February 8, 2017

Subject: **ENBRIDGE/SPECTRA: SECTION 96 TRADE-OFF ANALYSIS**

Further to your request, this memorandum discusses the application of the Canadian *Competition Act* section 96 efficiencies trade-off provision to the proposed merger of Enbridge Inc. ("Enbridge") and Spectra Energy Corp. ("Spectra" or "Union" when referring to its affiliate) (the "Proposed Transaction").

A number of submissions have been provided to the Competition Bureau ("Bureau") discussing competitive alternatives to the merging firms' merchant storage services at Dawn.[1] While merchant storage services are stand-alone services provided by the merging firms, customers are ultimately interested in acquiring natural gas. For many customers, natural gas can be obtained without the need for storage at Dawn. For example, some customers can choose to buy gas as needed, on a seasonal basis, so that no physical storage capacity is required. This purchasing option explains why the market price of storage tracks the seasonal value of natural gas, as measured by summer-winter spreads. Alternatively, customers can purchase balancing services from pipelines like TransCanada Pipeline or Vector. For customers who want to purchase storage, there are alternatives to the merging firms such as storage outside Ontario in neighbouring U.S. states such as Illinois, Michigan and New York, or storage purchased through marketers. Given the variety of options available for most customers of merchant storage, the Proposed Transaction is unlikely to materially increase prices for merchant storage services at Dawn, so there will be no resulting anticompetitive effects.

If, notwithstanding these submissions, the Bureau is concerned that there are some merchant storage customers at Dawn who do not have adequate access to alternatives and could be subject to a post-merger price increase (such as Ontario power generators), it remains the case that even for these customers there are unlikely to be any material quantifiable anticompetitive effects. First, changes in Ontario's electricity markets are expected to reduce Ontario power generators' need for committed storage at Dawn, such that Ontario power generators will be no

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1 Including "Analysis of Merchant Natural Gas Storage Competition in Ontario," Michael Sloan, ICF, January 30, 2017 [hereafter referred to as the "ICF Report"], and "Statistical Analysis of Dawn Hub Gas Prices", memorandum from Margaret Sanderson, John Hayes and Hitesh Makhija to Oliver Borgers, Jonathan Bitran (McCarthy Tétrault), Joe Matelis (Sullivan Cromwell), Cal Goldman, Richard Annan (Goodmans), January 31, 2017.

different than marketers, traders and LDCs in their lack of need for storage at Dawn. Second, even if Ontario's electricity markets remain as they are today there are unlikely to be any material allocative inefficiencies or deadweight loss associated with any possible price increase to Ontario power generators (assuming this is possible) because the quantity of storage is unlikely to be materially reduced.[2] Under either scenario, modest efficiencies from the Proposed Transaction would very likely offset and outweigh any anticompetitive effects arising from the Proposed Transaction, should the Bureau have concerns about pricing to some customers.

As Mr. Steve Baker discussed at our meeting with the Bureau, if Ontario's electricity markets change in the manner that is expected given the government's desire to: (i) reduce gas-fired generation capacity in order to reduce greenhouse gas emissions; and (ii) increase competition among generators bidding into the power grid, Ontario power generators will have less need for committed storage at Dawn. The changes that are likely to be made to Ontario's electricity market will no longer require power generators to commit to meeting any bid into the power grid if the generator is called upon to supply power to the grid at a given hour. With a more flexible system in place to supply and bid power into the grid, Ontario power generators are expected to be less committed to having merchant storage at Dawn to meet any possible bid requirements. Ontario power generators will then be like marketers, traders, and local distribution companies ("LDCs") in their need for merchant storage, which increases their options beyond Ontario and beyond physical storage.

Under the second scenario that assumes Ontario's electricity markets remain as they are today and assuming that Ontario power generators are committed to using merchant storage at Dawn, the efficient level of storage is likely to be contracted with these customers even if the merged firm could operate as a monopolist supplier of storage at Dawn to these customers (which we do not believe is likely). The reasons for this conclusion are summarized below.

1) There are a limited number of merchant storage customers that may not have adequate access to alternatives to physical storage at Dawn. We understand that the Bureau's concerns are focused on Ontario power generators because they may have sufficiently high deliverability requirements that commit them to using merchant storage at Dawn. There are a total of eight Ontario power generator customers contracting with Enbridge or Union.

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[2] Whenever demand curves slope downward, any increase in price that may result from a merger is associated with a lower quantity demanded, and hence a lower quantity purchased at higher prices. The lower quantity that is purchased at the higher post-merger price generates two allocative inefficiencies, which are referred to as "deadweight loss." First, consumer deadweight loss represents the value of lost consumer surplus due to buyers reducing their purchases in response to the higher price, notwithstanding that buyers were willing to make purchases at pre-merger prices. The consumer deadweight loss is measured as the area under the demand curve that lies between the pre-merger and post-merger price levels and between the pre-merger and post-merger quantities purchased. Second, producer deadweight loss represents the value of lost producer surplus due to buyers reducing their purchases in response to the higher price when producers previously earned a variable margin on the forgone purchases at pre-merger price levels. The producer deadweight loss is measured as the variable margin earned on the pre-merger quantity multiplied by the change in the quantity demanded due to the higher post-merger price.

2) Only two of the eight Ontario power generator customers at Dawn have used both Enbridge and Union [redacted][3] With respect to the other five Ontario power generators, the rates that they currently pay are unlikely to be related to competition between Enbridge and Union because (i) many contracts with Union were entered into before Enbridge was a material provider of merchant storage services; and (ii) [redacted]

3) The combination of (1) and (2) means that any potential reduction in quantity demanded due to a post-merger price increase (and hence any resulting deadweight loss) would be restricted to a very limited number of potentially affected customers.

4) If there were to be no change in Ontario's electricity markets, we expect little to no change in the storage quantity demanded by Ontario power generators[4] even if their bargaining position vis-à-vis the merging firms is altered post-merger. Without any change in the quantity demanded, there is no deadweight loss. Various reasons exist for why storage quantities would be unlikely to change if there were to be no change in Ontario's electricity markets.

   a) Storage costs represent a fraction of any affected power generator's costs of natural gas and a smaller fraction of the customer's total costs of operation, which makes demand for storage less responsive to small changes in storage prices (i.e., demand is relatively inelastic).

   b) Storage prices are set through negotiations between the merging firms and Ontario power generators over contracts that include both fixed and quantity-based payments. We expect such bargaining to result in the efficient quantity of storage services being supplied, regardless of the number of supply options available to the customer.[5] To the extent that the Proposed Transaction removes some customers' ability to threaten to shift suppliers from Union to Enbridge, or vice versa, this would only change the negotiation of the fixed price component without affecting the per-unit pricing or contracted quantity of storage.

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3 Greenfield Energy Centre purchases storage from both Enbridge and Union. Greenfield South Power Corporation purchases storage from Enbridge [redacted]

4 If the Bureau concludes that the customers of concern have few alternatives to merchant storage at Dawn then these customers cannot switch to other storage locations or to using alternatives to storage. For those customers who have access to alternatives to merchant storage at Dawn, their demand for storage at Dawn will be more elastic.

5 If the merging firm and customers do not negotiate the efficient quantity, then they will not have maximized the joint surplus available to them, when they have every incentive to do so. They can bargain over the division of the maximum joint surplus by varying the fixed payment and leaving the per-unit price at a level that induces consumption of the efficient quantity of merchant storage.

c) Regulatory incentives limit the merging firms' ability and incentive to reduce the capacity available for merchant storage services at Dawn.

5) In addition to there being limited to no deadweight loss associated with any possible price increase, there is also no socially adverse wealth transfer because Ontario power generators are large corporate entities. Any wealth transfer from these customers to shareholders of the merging firms would not be considered "socially adverse" under the Competition Tribunal's standard adopted in the *Superior Propane Redetermination* case.[6]

6) With no quantifiable anticompetitive effects owing to no deadweight loss and no socially adverse wealth transfer, any efficiencies associated with the Proposed Transaction will satisfy the requirements of the section 96 efficiencies defence under the *Competition Act*.

7) There are cognizable, merger-specific efficiencies associated with the Proposed Transaction, including cost savings from merging the companies' merchant storage lines of business. With respect to Ontario merchant storage, Enbridge estimates that the Proposed Transaction will allow it to eliminate the majority of three of its administrative functions – Sales/Marketing, Contracting and Customer Administration – for its merchant storage line of business without reducing the quantity of merchant storage available or the number of merchant storage customers. There are also very substantial synergies associated with the Proposed Transaction overall.

We elaborate on this summary below.

Limited Pre-Merger Competition between Enbridge and Union

Most natural gas storage at Dawn is used by the parties to supply natural gas to their regulated utilities.[7] There is no competition between Enbridge and Union to provide this storage to their regulated utility customers.[8]

With respect to merchant storage, Union has been the predominant supplier at Dawn since the Ontario Energy Board, in its 2006 NGEIR decision, determined that such services could be provided on an unregulated basis.[9] Union has 79.9 Bcf of merchant gas storage capacity at Dawn. Enbridge remains a small player in the supply of merchant gas storage services at

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6 *Commissioner of Competition v. Superior Propane Inc. and ICG Propane Inc.* [2002]. "Reasons and Order Following the Reasons for Judgment of the Federal Court of Appeal Dated April 4, 2001." Competition Tribunal.

7 ICF Report, p. 16. Enbridge informs us that 85 percent of its storage is under regulated rates as part of its use for In-Franchise customers.

8 Merchant storage capacity cannot be physically separated from the storage used for regulated services.

9 Ontario Energy Board Decision with Reasons, EB-2005-0551 Natural Gas Electricity Interface Review (NGEIR Decision), November 7, 2006.

Dawn,with only 16.3 Bcf of merchant gas storage capacity. Thus, Enbridge's merchant storage capacity share at Dawn is 17 percent, while Union has the remaining 83 percent.

Reflecting its smaller share of third-party capacity, Enbridge has not bid on many merchant storage contracts. Enbridge's bid database, which includes all contracts on which a customer has solicited a formal RFP from Enbridge, includes only six bids since 2010.[10] In contrast, Union has bid on 34 contracts since 2010.[11]

Very Small Number of Potentially Affected Customers

Focusing on the merchant storage customers in Ontario, which we are informed is the set of customers of potential concern to the Bureau, the ICF Report finds that 21 of 42 customers[12] also hold storage contracts with other storage providers in Michigan, New York, Illinois, or Iowa.[13] These customers appear to have ready access to alternative storage services, so the Proposed Transaction is unlikely to materially increase prices to these customers.[14]

The remaining 21 customers that may only hold storage contracts at Dawn[15] purchased a total of 31.2 Bcf storage capacity from Union and 8.44 Bcf storage capacity from Enbridge, accounting for 36.2 percent of the storage capacity sold by Enbridge and Union (see Exhibit 1). Of these 21 customers, only two [redacted] are included in the Enbridge bid database, [redacted] Customers that have only used Union [redacted] may not experience a change in their competitive options due to the Proposed Transaction (see Exhibit 2).

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10 These six bids relate to [redacted]

11 The Union bid data file contains all storage requests received by Union from January 1, 2010 to November 1, 2016 via a formal RFP or other communication method, including email.

12 Exhibit 4-2 of the ICF report lists 43 customers that purchase merchant storage from Union or Enbridge. From this list of 43 customers, we have excluded Centra Gas and Energy Source Natural Gas from our analysis. We understand that Centra Gas is a subsidiary of Union Gas. Enbridge is co-developing a storage pool with Centra. We also understand that Energy Source Natural Gas has not contracted for any merchant storage capacity at Enbridge or Union. Energy Source Natural Gas purchases 0.03 Bcf of excess utility space at Union. Finally, the St. Clair Energy Service purchases market deliverability from Union and is included in our analysis but is not listed in Exhibit 4-2 of the ICF report. We understand that St. Clair Energy Service does not purchase any storage from FERC regulated storage providers.

13 Most of the customers with storage capacity contracted outside Ontario are marketers and traders. We understand that the Bureau has indicated that it does not have competition concerns with respect to marketers and traders. We understand that marketers and traders hold capacity at multiple locations and also hold a very significant share of the pipeline capacity into and out of Ontario. This gives the traders and marketers greater flexibility to serve Ontario markets and to compete against Union and Enbridge.

14 ICF Report, at v.

15 Some of these customers may also hold storage contracts outside Dawn, which ICF was unable to verify.

Ontario power generators, which we understand are the only merchant storage customers in Ontario that have a need for higher deliverability, make up a small fraction of Enbridge and Union merchant storage customers. Enbridge has two power generator customers and Union has seven power generator customers[16] (see Exhibits 3A and 3B), for a total of eight unique customers across Enbridge and Union.[17] These customers accounted for only 6.1 percent of Enbridge's merchant storage revenues in 2016 (January – October) and only 15.6 percent of Union's merchant storage revenues in 2016 (January – October),[18] as reported in Exhibit 4. Combined, Ontario power generators represented 14.5 percent of Enbridge and Union merchant storage revenues in 2016 (January – October), amounting to annualized 2016 storage revenues of CAD$16.1 million.[19]

Among the eight unique power generator customers at Dawn, only two have used Enbridge and Union, [redacted][20] These two customers paid a total of CAD$2.3 million for merchant storage to Union and Enbridge in 2016 (January – October), which represents only 2.5 percent of the parties' combined total merchant storage revenues.

In summary, any possible competition concerns with respect to merchant storage prices at Dawn are limited to very few customers and involve very little revenue.

Demand for Storage Is Unlikely to Change with a Change in Price

For any power generator customers requiring storage at Dawn, storage costs represent a fraction of the costs of acquiring natural gas and an even smaller fraction of a customer's overall costs of operation. While we do not have details on customers' operating costs, it is likely that the costs of storage at Dawn are a small fraction of these firms' total costs of operation. It is well understood in economics that the demand for a component that represents a small share of total costs and that is used to produce a highly valuable end product will be relatively inelastic. We expect this to be true for merchant storage. Relatively inelastic demand is generally associated with a smaller deadweight loss, although we note that inelastic demand also allows for larger price increases relative to more elastic demand.

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16 Union's power generator customers include two customers (St. Clair Energy Service and TransCanada Power) that have no contracted storage capacity but have contracted maximum daily injection and withdrawal capacity.

17 Greenfield Energy Centre purchases storage from both Union and Enbridge.

18 We only have Enbridge and Union merchant storage revenue data for the first 10 months of 2016.

19 January – October 2016 revenues for Union contracts with Ontario power generators were CAD$12.65 million, which is an average of CAD$1.265 million per month. Thus, the annualized amount over 12 months is CAD$15.18 million. According to Enbridge, 2016 revenues from Ontario power generators were CAD$0.873 million. Hence, combined Enbridge and Union 2016 revenues from Ontario power generator were $15.18 million + $0.873 million = CAD$16.1 million.

20 Greenfield Energy Centre purchases storage from both Enbridge and Union. Greenfield South Power Corporation purchases storage from Enbridge [redacted]

Negotiated Contract Structure Implies No Quantity Reduction

The structure of the contracts negotiated between the merging parties and their Ontario power generator customers provides another reason why the quantity of merchant storage would not be reduced below the efficient level, even if the merger resulted in a price increase to some customers. The contracts negotiated by providers of storage services and individual customers include both a fixed payment and a variable, or quantity-based, payment. Economists call this type of payment a "non-linear" price or a "two-part tariff." In markets where a small number of buyers and sellers negotiate individualized contracts with two-part tariffs, economists expect the negotiating parties to reach agreements to buy and sell the efficient quantity.[21]

Merchant storage contracts with Ontario power generators provide for maximum storage capacity, as well as maximum daily and hourly injection and withdrawal rates depending on each customer's specific requirements. As such, contracts are highly individualized. Pricing terms have a fixed and variable component. The variable component of Union's contracts with power generator customers has been the same amount since the NGEIR decision and is the same across customers, at CAD 0.7 cents per GJ,[22] while the fixed component of the contract (which Union refers to as the "demand rate") varies across customers and over time.

Only the variable component of the storage costs will influence the quantity of merchant storage demanded by Ontario power generators because the fixed costs are independent of the quantity chosen.[23] Regardless of the number of supply options, a merchant storage seller and its customer will always have the incentive to negotiate payment terms that result in the efficient quantity of storage being consumed because this is the storage quantity that maximizes the joint surplus available for the negotiating parties to share. The division of that surplus can then be adjusted by manipulating the fixed component of the payment. Indeed, as explained above, Union's contracts feature the same, low variable cost of CAD 0.7 cents per GJ, while the fixed components vary across customers and over time. There is no reason to believe the merger would alter that variable cost. Instead, if the Proposed Transaction were to increase the bargaining power of one of the merging parties in negotiations with certain power generators, we would expect the increased bargaining power to result in a higher fixed payment. When this

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21 An "efficient" outcome is one that involves trade, or a purchase, such that the sum of the customer's consumer surplus and the supplier's producer surplus is maximized. That is, trade is efficient if there is no deadweight loss.

22 Union informs us that the CAD 0.7 cents/GJ is reflective of the fuel charged in Union's MPSS rate schedule and the M12/C1 rate schedules. The variable rate is composed of the commodity rate on the MPSS rate schedule of CAD 0.6 cents/GJ plus CAD 0.1 cents/GJ for dehydration (CAD 0.4 cents/GJ x 90 days average usage / 365 days = CAD 0.7 cents/GJ. The fuel and commodity cost is the same for long-term storage and power generator customers. These costs can be considered a proxy for the marginal cost of existing storage.

23 The fixed component of storage costs will affect the overall profitability of the power generators, but a negotiation should not result in fixed costs so high as to drive a power generator out of business because this would not be in the interest of either the generator or the merging parties, who would lose a valuable customer.

happens, the effect of any merger-related price increase is entirely a "transfer" from buyers to sellers with no associated deadweight loss.[24]

Storage prices are negotiated by sophisticated purchasers and suppliers of merchant storage services, so we would expect the parties to be capable of bargaining to reach economically efficient outcomes. Otherwise, they are missing out on potential surplus that they could easily capture by restructuring the contract to have a higher fixed payment and lower variable cost. Storage is a stable technology and Union and Enbridge have been providing service to most of the same customers for some time. Therefore, informational asymmetries that can sometimes prevent the negotiation of efficient quantities are not present in this case. Contracts provide for long-term commitments by both parties to meet the buyer's storage, injection and withdrawal requirements. Contracts are entered into at different times with different customers and have lengthy initial terms.[25] Union's contracts with its power generator customers are 10 or 20 year contracts.[26]

Moreover, even if the merging parties and the power generators were not necessarily negotiating efficient contracts, the Proposed Transaction would be unlikely to impact many Ontario power generator customers because their current contracts were negotiated without competition between Union and Enbridge. Four of Union's seven contracts with Ontario power generators were entered into in 2008 and 2009,[27] before Enbridge was an active supplier of third-party storage at Dawn, and as such the contract terms for these customers are unlikely to have been influenced by Enbridge. Three of Union's Ontario power generator contracts expire in 2022, 2027 and 2028, respectively, and as such these customers would not have the opportunity to use Enbridge as an alternative storage supplier to Union for some time to come.[28] The three Union Ontario power generator contracts with near-term expiry dates generated storage revenues of CAD$5.1 million in 2016 (January – October).[29] This puts an upper bound on the volume of

25 Renewal terms may be much shorter than the initial contract length.

26 Union's contracts with Thorold CoGen, Greenfield Energy Centre, Portlands Energy Centre, and York Energy Centre have 10 year terms. Union's contract with Goreway Station Partnership has a 20 year term.

27 Union's contracts with Thorold CoGen, Greenfield Energy Centre and Goreway Station Partnership were entered into in 2008. Union's contract with Portlands Energy Centre was entered into in 2009. Union's contract with York Energy Centre was entered into in 2012.

28 Union's contract with York Energy Centre expires on October 31, 2022, its contract with St. Clair Energy Service expires on October 31, 2027 and its contract with Goreway Station Partnership expires on October 31, 2028.

29 Union's contract with Greenfield Energy Centre expires on October 31, 2018. Union's contracts with Thorold CoGen and Portlands Energy Centre expire on March 31, 2019.

Union customer revenues that could potentially be impacted by the Proposed Transaction. In the case of Enbridge, its two Ontario power generator contracts expire in the next two years.[30]

Non-linear and non-uniform pricing that is established between a sophisticated buyer and a sophisticated seller through a negotiation that covers a lengthy term will be flexible enough to meet a variety of future market conditions and will result in an efficient outcome. There is no reason to believe the current contracts are inefficient despite the fact that most were negotiated without bids from both Union and Enbridge. We fully expect the efficient outcomes following the Proposed Transaction, for these Ontario power generator customers as well as others. In sum, there would be no (or very little) change in the quantity of merchant storage services acquired at Dawn even if the Proposed Transaction alters the bargaining position that Union and Enbridge have with the limited number of customers of concern to the Bureau.[31]

Regulation Limits Incentive and Ability to Remove Storage Capacity

While the OEB has forborne from regulating the rates for merchant storage at Dawn, there remain some regulatory conditions that limit the parties' incentive and ability to reduce the storage capacity that is available in the merchant market. Of particular relevance, the parties are required by the OEB to post operating capacity and contracted capacity publicly.[32] As a result, customers can monitor the removal of storage capacity and can lodge a complaint with the OEB if they are unable to contract because storage has been withdrawn.

No Socially Adverse Anti-Competitive Effects

Ontario power generators, which we understand are the customers of concern to the Bureau, are large corporate entities. As such, any wealth transfer from these customers to the merging firms would not meet the requirements of the Competition Tribunal for a "socially adverse" anticompetitive effect.

Moreover, the magnitude of any wealth transfer from Ontario power generators to the merging firms would be small. As noted above, Enbridge and Union's combined merchant storage revenues from Ontario power generators using Dawn amounted to CAD$16.1 million on an annualized basis for 2016. Not all of these customers – or even any of these customers – are

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30 Enbridge's contract with Greenfield Energy expires on March 31 2018 and its contract with Greenfield South expires on August 31 2019.

31 We have also considered the possibility that demand is not perfectly inelastic such that there would be some small change in the quantity of storage purchased by Ontario power generators in the event of a price increase. If we assume a demand elasticity equal to -0.10 or -0.25, and assume variable margins of 50% or 70%, the annual deadweight losses (in consumer and producer surplus) are below the annual expected cost savings (using the midpoint of 2016 and 2017 cost savings) even if prices were to increase by 20% across all Ontario power generator customer revenues of CAD$16.1 million. As we expect that prices would not increase by this amount and would not increase to all Ontario power generator customers, and that demand is likely to be very inelastic (closer to -0.10 than -0.25), the quantifiable anticompetitive effects will certainly be less than the quantifiable efficiencies even if there is some change in the quantity demanded.

32 OEB's Storage and Transportation Access Rule (December 9, 2009), sections 4.1 and 4.2.

likely to face higher prices for their storage at Dawn following the Proposed Transaction for the reasons described herein. Even if we assume a 5 percent increase in price across all eight Ontario power generator customers this would result in a transfer of CAD$802,884 from Ontario power generators to the merging firms.

If a 5 percent increase impacted only the three Ontario power generator customers with Union contracts that expire in the next two years, it would result in a transfer of about CAD$304,279 to the merging firms on an annualized basis in 2016.[33] The two Ontario power generator customers with Enbridge contracts that either use Union as well [redacted] generated Enbridge storage revenues of CAD$0.873 million in 2016. A 5 percent increase in price for these customers would result in a transfer of about CAD$43,650 to the merging firms.

Whether one considers just the Ontario power generators with near-term expiring contracts or all Ontario power generators, any transfer associated with a 5 percent increase in price (assuming a price increase of 5 percent is even possible) would be small in magnitude relative to the value of the Proposed Transaction. Furthermore, any such transfers would be payments from one set of large corporate entities – the Ontario power generators – to another – the merging firms. As a result, the transfers would not be considered socially adverse for the reasons discussed herein.

We have also considered the hypothetical possibility that socially adverse consequences could arise if changes in the price of storage were to affect power prices in Ontario.[34] We find that this hypothetical is implausible and should be of no concern to the Bureau. Though gas power generators are marginal suppliers of power during some hours and, therefore, set the market price at some hours of the day, it is highly unlikely that a change in storage costs at Dawn would change the gas power generators' bid prices of power.

As noted above, Ontario power generators' storage contracts have a fixed and variable component. Economic theory predicts that only the variable component of the cost of storage (which would be part of the marginal cost of supplying electricity) would be directly passed through in power generators' offers to sell electricity. Fixed storage charges should not affect power generators' marginal costs or bid prices for electricity.

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33 The three Union Ontario power generator contracts with near-term expiry dates generated storage revenues of CAD$5.1 million in 2016 (January – October), which is an average of CAD$0.51 million per month. Thus, the annualized amount over 12 months is CAD$6.1 million. A 5% increase in price would be 0.05*$6.1 million, which is CAD$304,279.

34 Our understanding of this issue has benefitted from information provided by Mr. George Vegh of McCarthy Tétrault and Mr. Robert Cary, Senior Consultant to CRA. Mr. Vegh is the head of McCarthy Tétrault's Toronto energy regulation practice. Prior to joining McCarthy Tétrault, Mr. Vegh was General Counsel of the Ontario Energy Board. Mr. Cary has more than 20 years of experience in the electricity industry and has been instrumental in the development and advancement of a number of Canadian provinces' electricity markets. Prior to founding his own consulting practice, Mr. Cary held positions at Westcoast Power, AGRA Monenco, and Darchem Limited.

The fixed component of contract terms with power generators is by far the largest cost. For Union, storage revenues from Ontario power generators associated with fixed charges amount to 99 percent of total revenues from these customers. Union's total variable revenues in 2016 (January – October) were only CAD$114,862. Similarly for Enbridge, the fixed component of contract terms with power generators is the largest. Storage revenues from Ontario power generators associated with variable charges amount to 7 percent of Enbridge's 2016 (January – October) revenues from these customers. Enbridge's variable revenues from Ontario power generator contracts in 2016 (January – October) were only CAD$48,333.

To the extent that generators were to incorporate increased variable merchant storage charges into their electricity offers, and that these higher offers were to result in higher electricity market prices when such generators were the marginal suppliers of electricity, the end effect on consumers would be strongly muted, and in any event would not result in materially higher costs of electricity for residential and other small customers. Electricity consumers pay two components of energy generation costs: the energy market price (often referred to as the Hourly Ontario Electricity Price or "HOEP"), which is set by the market; and the Global Adjustment ("GA"), which covers all the costs for payments under long-term supply contracts. The long-term energy supply contracts are all structured so that the net payments are reduced as the HOEP increases, all else equal. Therefore, the combined total of HOEP and GA would be substantively unchanged by the addition of variable storage costs into generator offers. The GA's charge mechanism allocates proportionately more of the GA cost to energy used by small consumers than to that used by large consumers. The net effect of an increase in the HOEP would thus be at worst a small redistribution of total cost from small consumers to large consumers. In the competition trade-off analysis, the only electricity consumers that might be affected are large, enterprise customers and any transfer from such consumers would not be considered to be socially adverse.

Anticipated Cost Savings

Enbridge's merchant storage line of business is not large, as already noted. Enbridge runs this business using part of the time of three employees for a total of two full-time equivalents ("FTEs"). Given Union's larger operations, it is Enbridge's expectation that Union can readily absorb managing the terms of the Enbridge contracts without any need for the two FTEs within Enbridge. As a result, all salary, benefit, travel, supply and miscellaneous expenses associated with these individuals would be saved. Below we provide a breakdown of these costs for Enbridge in 2016 and Enbridge's 2017 budget without the transaction.[35] The 2016 costs are based on six months of actual costs and six months of forecast costs, as this is how Enbridge reports the figures.

[35] Some expenses have been reclassified between categories for Enbridge between 2016 and 2017.

Enbridge Cost Saving Categories, 2016 Costs and 2017 Budget

	2016 Costs (CAD)	2017 Budget (CAD) [no transaction]
All salary and benefits costs	[redacted]	[redacted]
Temporary labour	[redacted]	[redacted]
Computer software, supplies, postage, reproduction services	[redacted]	[redacted]
Legal fees	[redacted]	[redacted]
Travel + conferences (airfare, accommodation, sponsorships)	[redacted]	[redacted]
Internal expense allocations and charges associated with the expenses for merchant storage line of business	[redacted]	[redacted]
Total	[redacted]	[redacted]

In addition to the costs described in the table, there are two other categories of expenditures with potential savings. First, Enbridge had professional consulting services costs of [redacted] in 2016 with a planned 2017 budget of [redacted] At this juncture, Enbridge does not know how much of this category would be saved under the Proposed Transaction. Second, a portion of the regulated business' costs for managing injection and withdrawal are allocated to the merchant storage business based on usage. To the extent that the merger allows the combined entity to optimize its management of injection and withdrawal, these charges would be reduced. The costs for managing injection and withdrawal that were allocated to the merchant storage business were [redacted] in 2016 and are budgeted at [redacted] in 2017.

While the efficiencies that can currently be quantified are modest in totality, they represent [redacted] of Enbridge's 2017 budget for its merchant storage business that would be saved through the Proposed Transaction. Moreover, as noted above, there are no (or extremely limited) quantifiable anticompetitive effects from the Proposed Transaction given the lack of deadweight loss and the lack of any socially adverse wealth transfer.

Exhibit 1

Ontario Storage Customers Purchasing Merchant Storage at Michigan, New York, Illinois, or Iowa

As of January 2017

	Customers		Capacity	
	Count	**Share of Total**	**Amount (Bcf)**	**Share of Total**
Ontario Storage Customers That Don't Purchase Storage at Michigan, New York, Illinois, or Iowa	21	50.0%	39.64	36.2%
Ontario Storage Customers That Also Purchase Storage at Michigan, New York, Illinois, or Iowa	21	50.0%	69.84	63.8%
Enbridge Storage Customers That Don't Purchase Storage at Michigan, New York, Illinois, or Iowa	6	46.2%	8.44	51.7%
Enbridge Storage Customers That Also Purchase Storage at Michigan, New York, Illinois, or Iowa	7	53.8%	7.87	48.3%
Union Gas Storage Customers That Don't Purchase Storage at Michigan, New York, Illinois, or Iowa	19	50.0%	31.2	33.5%
Union Gas Storage Customers That Also Purchase Storage at Michigan, New York, Illinois, or Iowa	19	50.0%	61.97	66.5%

Notes:

[1] Centra and Energy Source Natural Gas have been excluded from this analysis.

[2] St. Clair Energy Service purchases market deliverability from Union and is included in this analysis but is not listed in Exhibit 4-2 of the ICF report.

Sources:

[a] ICF, Analysis of Merchant Natural Gas Storage Competition in Ontario, January 30, 2017, Exhibit 4-2 and supporting worksheets.

[b] Union Gas Data.

Exhibit 2

Enbridge and Union Gas Customers With Storage at Dawn Only

As of January 2017

Customer Name	Union Gas 2016 Revenues ($ CAD)	Enbridge 2016 Revenues ($ CAD)	Used Both EGD & Union In 2016	Uses Union, [redacted]	Uses Enbridge, [redacted]
AltaGas	$2,863,404	$0	No		
Exelon Generation	$942,032	$0	No		
Freepoint Commodities	$450,433	$0	No		
Gaz Metro	$8,377,813	$0	No		
[redacted]					
Greenfield Energy Centre LP		$511,699	Yes		
Greenfield South Power Corporation	$0	$146,132	No		
Iberdrola Energy Services	$0	$4,426,729	No		
MIECO INC	$596,545	$0	No		
NextEra Energy Power Marketing	$61,358	$0	No		
NJR Energy Services Company	$1,322,951	$0	No		
Noble Americas Gas & Power Corp.	$771,697	$0	No		
Petrochina International	$1,074,291	$952,040	Yes		
[redacted]					
Powerex Corp.	$5,528,679	$0	No		
[redacted]					
St. Lawrence Gas	$286,649	$262,035	Yes		
[redacted]					
TransCanada Power	$897,600	$0	No		
Utilities Kingston	$209,669	$85,618	Yes		
York Energy Centre LP	$1,977,043	$0	No		

Notes:

[1] Enbridge customer revenue converted from US Dollars to Canadian Dollars using data on average montly exchange rates published by Bank of Canada.

[2] Uniong Gas 2016 revenues and Enbridge 2016 revenues refer to the January - October 2016 time period.

Sources:

[a] ICF, Analysis of Merchant Natural Gas Storage Competition in Ontario, January 30, 2017, Exhibit 4-2.

[b] Union Gas Data.

[c] Enbridge Data.

Exhibit 3A

Enbridge Merchant Storage Contracts With Ontario Power Generators

As of January 2017

Customer Name	Contracted Storage Capacity (Bcf)	Contracted Peak Deliverability (Mcf)	Contract Start Date	Contract End Date
Greenfield Energy Centre	0.12	11,999	1-Jun-08	31-Mar-18
Greenfield South Power Corp.	0.15	15,571	1-Apr-16	31-Aug-19

Source:

[a] ICF, Analysis of Merchant Natural Gas Storage Competition in Ontario, January 30, 2017, Exhibit 1-6.

Exhibit 3B

Union Gas Merchant Storage Contracts With Ontario Power Generators

As of January 2017

Customer Name	Contracted Storage Capacity (Bcf)	Contracted Peak Deliverability (Mcf)	Contract Start Date	Contract End Date
Goreway Station Partnership	0.57	121,321	1-Jul-08	31-Oct-28
Greenfield Energy Centre	0.20	40,000	1-May-08	31-Oct-18
Portlands Energy Centre	0.47	37,913	1-Jan-09	31-Mar-19
St. Clair Energy Service	0.00	26,092	1-Jan-13	31-Oct-27
Thorold CoGen	0.16	41,704	1-Nov-08	31-Mar-19
TransCanada Power	0.00	33,264	1-Oct-14	14-Jan-20
York Energy Centre	0.17	83,080	1-Apr-12	31-Oct-22

Note:

[1] St. Clair Energy Service purchases market deliverability from Union and is included in this analysis but is not listed in Exhibit 1-6 of the ICF report.

Sources:

[a] ICF, Analysis of Merchant Natural Gas Storage Competition in Ontario, January 30, 2017, Exhibit 1-6.

[b] Union Gas Data.

Exhibit 4

Share of Enbridge and Union Gas Storage Revenue Associated with Ontario Power Generators

January 2016 - October 2016

Company	Revenues (Thousands of CAD) Power Generators [a]	All Customers [b]	Share of Revenue Associated With Power Generators [c]=[a]/[b]
Enbridge	$ 658	$ 10,842	6.1%
Union Gas	$ 12,654	$ 81,062	15.6%
Total	***$ 13,312***	***$ 91,904***	***14.5%***

Note:

[1] Enbridge customer revenue converted from US Dollars to Canadian Dollars using data on average montly exchange rates published by Bank of Canada.

Sources:

[a] ICF, Analysis of Merchant Natural Gas Storage Competition in Ontario, January 30, 2017, Exhibit 1-6.
[b] Union Gas Data.
[c] Enbridge Data.