RÉPONSE DE SOCIÉTÉ EN COMMANDITE GAZ MÉTRO (GAZ MÉTRO) À LA DEMANDE DE RENSEIGNEMENTS NO 13 DE LA RÉGIE DE L'ÉNERGIE (LA RÉGIE) RELATIVE À LA DEMANDE D'APPROBATION DU PLAN D'APPROVISIONNEMENT ET DE MODIFICATION DES CONDITIONS DE SERVICE ET TARIF DE GAZ MÉTRO

DÉRIVÉS FINANCIERS

1. **Références :** (i) Pièce B-0091, p. 30;
(ii) Pièce B-0091, p. 125;
(iii) Pièce B-0091, p. 54;
(iv) Pièce B-0091, p. 62-63;
(v) Pièce B-0091, p. 64-65;
(vi) Pièce B-0092, p. 15 à 27 ainsi que les annexes A et B;
(vii) Pièce B-0322, p.5;
(viii) Pièce B-0091, p. 33;
(ix) Pièce B-0322, p.15 et 16.

Préambule :

(i) « *The Program objectives and the quantification of those objectives into measureable tolerances and risk metrics that ultimately drive the Program should be at the core of the Program. The level of price protection should reflect the risk tolerance of customers. The utility and regulator should have an informed view of customer risk tolerance levels (both upside and downside risk) through surveys and educational workshops, but the workshop would not be a pre-condition to re-establishing the Program.* »

(ii) « *Interveners generally acknowledged that the Program should provide some minimum, inexpensive catastrophic protection for its captive consumers. However, there was a fair amount of consensus around the prospect that the current level of protection may be excessive in the current market context. All agreed that the forward expectation for natural gas markets is for low volatility and low prices; and under these conditions, only the minimum amount of hedging should be conducted so that the consumer could more fully realize the benefit of market declines.* »

(iii) « *The balanced approach also relies on another element of the ability to measure risk. Notwithstanding known deficiencies, best practices are still described by characterizing risk as a function of Value at Risk (VaR). VaR was originally developed to characterize only one potential movement (either up or down) because it was originally developed for trading environments that only have exposure when buying or selling a position. The application of the technique to an end- user (like Gaz Métro) simply extends the measurement to both possibilities (up or down).* »

(iv) « ***Q72. HOW WOULD THIS PROPOSED STRATEGY COMPARE TO HISTORICAL OPPORTUNITY COST?***

A72. The simplest way to understand the comparative performance is by plotting the actual opportunity cost (Figure 1) versus the results of applying the strategy to the same price series (Figure 13). On the aggregate, the figure shows a smaller opportunity cost.

The statistical work done to arrive at these results involved testing numerous scenarios to uncover an adequate combination. This meant simulating the opportunity cost by changing parameters such as hedge horizon, total amount to hedge, tolerance levels, instruments, percentage to hedge, percentage under programmatic, percentage under defensive, and price levels for collars, among others. All in all we simulated more than 150 unique combinations based on the historical price series.

A second approach to enhance the statistical significance of the back cast was to simulate more than 30 different ways in which the historical figures could have evolved in the past. While it is true that the actual history is useful and undeniable, testing how history could have evolved under separate assumptions increases the statistical significance that provides a certain degree of comfort as to how the strategy could have performed under different scenarios.

This second approach increases the robustness of the analysis by making up alternative historical prices to provide a better understanding of potential opportunity costs. Instead of just one series for historical prices there is now a set of potential historical prices that each yields a different opportunity cost.

A third and final statistical approach was performed that instead of recreating the historical prices based on alternative scenarios, created different potential scenarios of the future starting with January 1, 2014.

The selected parameters (as highlighted above) were the ones that best met the following criteria according to the five statistical metrics highlighted above:

Low total opportunity cost (sum) over the period Low single-year opportunity cost over the period
Low aggregate variation in the opportunity cost (standard deviation) Low hedged cost (average) over the period
Low aggregate variation of hedged cost (standard deviation)

The detail of the analysis is available upon request. » [nous soulignons]

(v) « ***Q73. WHAT KIND OF PERFORMANCE CAN WE EXPECT FROM THIS STRATEGY IN THE FUTURE***

A73. The historical results should provide an idea as to how it is likely to perform, but it is possible to try to create a —reasonable picture of how prices may evolve in the future according to the statistical technique called Monte Carlo where potential prices (or paths) are created based on reasonable assumptions of volatility and how prices —migrate in time. It is also reasonable to expect that this —path is one of many possible paths that prices may follow and to achieve this we created a series of 20 potential different paths according to the Monte Carlo technique outlined above.

Just as we tested how the strategy would have performed using actual prices, we proceeded to recreate a performance metric for each of the 20 price paths and averaged the performance in terms of a distribution of prices as projected on a daily basis for 2014, 14 2015, 2016, 2017 and 2018. We then proceeded to associate the average opportunity cost with the average natural gas price scenario to arrive at Figure 14. »

(vii) *« Two alternative scenarios were selected to show a marginal increase (Figure 1) and a significant increase (Figure 2) to tolerance level (interpreted as an increase to the tolerance of having a larger opportunity cost). »* [nous soulignons]

(viii) *« **Q44**. IN PRACTICE, HOW DOES A UTILITY ESTABLISH THE RISK TOLERANCES? A44. Risk tolerances are a direct translation of how prices of natural gas will impact customers, or change their consumption in an unintended way. »*

(ix) figures 11 et 12.

Demandes :

1.1 À la suite des réponses à la demande de renseignements n° 11 et à l'interprétation de la question citée en référence (vii), la Régie désire clarifier sa demande. Ainsi, la Régie demande deux programmes alternatifs ayant comme objectif de diminuer le niveau de protection ou de couverture par rapport au programme proposé. Ces deux programmes alternatifs ont les hypothèses suivantes :

- Les clients ont une tolérance plus élevée à la variabilité du prix du gaz naturel telle qu'expliquée en référence (viii) que le programme proposé.
- Les clients désirent un niveau de protection ou de couverture moins élevé que le programme proposé.

Veuillez présenter deux programmes alternatifs dont le premier diminue de façon modérée le niveau de protection ou de couverture et le deuxième diminue de façon marquée le niveau de protection ou de couverture. Veuillez présenter les résultats de chacun de ces programmes selon le format de la référence (vi) ce aux fins d'identification, de quantification et d'évaluation des risques et que la stratégie de couverture, un résumé du programme ainsi que les calculs des balises pour chaque programme alternatif.

Réponse :

Two alternative scenarios were selected to show a marginal decrease in the level of protection (Figure 1) and a significant decrease in the level of protection (Figure 2) compared to the proposed Program. These scenarios were implemented as follows:

- **Marginal decrease in the level of protection**. For this alternative, I changed the balancing factor from the proposed level of 60% to 40%. As a reference, a value of 50% for the balancing factor implies that tolerance for upside exposure is equal to that of downside exposure. A value of 100% implies full tolerance for downside exposure and a value of 0% implies no tolerance to downside exposure. The base assumption had a recommended 60% tolerance indicative of a tolerance to downside exposure that is marginally larger than tolerance to upside exposure.

- **Significant decrease in the level of Protection**. For this alternative, I reduced the balancing factor from 60% to 40% (just as with the previous alternative) and then reduced the systematic protocol from 20% to 10% to better reflect a scenario of lower level of protection.

•	Systematic Protocol	Defensive Protocol
Objective	20%	As required per protocol without exceeding 70% of total hedged percentage
Frequency	Monthly	Evaluated 8 times per year
Period	13-24 months following the current calendar month	1-12 months following the current calendar month
Quantity	1/12th of the target for each month of the period	As required based on risk assessments
Authorized Tools	Fixed-price instruments and costless collars	Fixed price instruments and costless collars
Tolerance Levels for NYMEX		Upside US$4.08/MMBtu Opportunity Cost: US$(0.24)/MMBtu
Tolerance Level for AECO and Dawn		Upside: CAD$3.63/GJ Downside: CAD$(0.29)/GJ
Balancing Factor		**Decreased the proposed 60% parameter to 40%.** Decreasing the concern for upside exposure implicitly increases the concern for downside exposure and therefore decreases the tolerance for opportunity cost risk.

Figure 1: Marginal Decrease in Level of Protection
Source : CEA

	Systematic Protocol	Defensive Protocol
Objective	**Decreased from 20% to 10%**	As required per protocol without exceeding 60% of total hedged percentage
Frequency	Monthly	Evaluated 8 times per year
Period	13-24 months following the current calendar month	1-12 months following the current calendar month
Quantity	1/12th of the target for each month of the period	As required based on risk assessments
Authorized Tools	Fixed-price instruments and costless collars	Fixed price instruments and costless collars
Tolerance Levels for NYMEX		Upside US$4.08/MMBtu Opportunity Cost: US$(0.24)/MMBtu
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Balancing Factor		**Decreased the proposed 60% parameter to 40%.** Decreasing the concern for upside exposure implicitly increases the concern for downside exposure and therefore decreases the tolerance for opportunity cost risk.

Figure 2: Significant Decrease in Level of Protection
Source : CEA

1.2 Pour chacun des deux programmes alternatifs, veuillez présenter

1.2.1. une analyse détaillée ainsi qu'un graphique semblable à la figure 13 citée en référence (iv) de la première approche basée sur les prix historiques;

1.2.2. une analyse détaillée de la seconde approche citée en référence (iv) basée sur une simulation de différents prix historiques.

Veuillez présenter et expliquer les hypothèses. Veuillez également fournir les sources des données utilisées.

Réponse 1.2.1 :

Figure 3 and Figure 4 show the comparative opportunity cost of the actual Program, the estimated opportunity cost of the proposed Program and the opportunity cost under the two scenarios of increased tolerance to upside risk exposure and lower level of protection. All of these estimates are using actual historical prices for their estimates. It also includes the comparative results for other risk tolerance scenarios, the actual historical results and the estimated results under the proposed Program.

A few observations on the results:

- As the tolerance to upside risk increases (and the tolerance for downside risk decreases) the amount to hedge decreases
- The reduced tolerance to downside risk or the lower protection level effectively diminishes the opportunity cost, but it also increases the exposure to upside price volatility. With the softening of prices over the past four years, opportunity cost has been the most relevant risk, but we shouldn't forget that risk is a measure of both upside and downside exposure.
- As we evaluate the elements of the proposed Program, we should be flexible to choose those parameters not based only on the last four-year performance, but also taking into account the two-sided risk exposure on a longer history.
- Lowering the protection by limiting the volume under the proposed Program implicitly accepts the economic consequences of the risk of power prices increasing. While this has not been the case over the past four years, we have seen evidence of increased price level and volatility in Western Canada, and extremely high volatility in Atlantic Canada. We have also seen some of the volatility start migrating West during the winter 2013-2014.

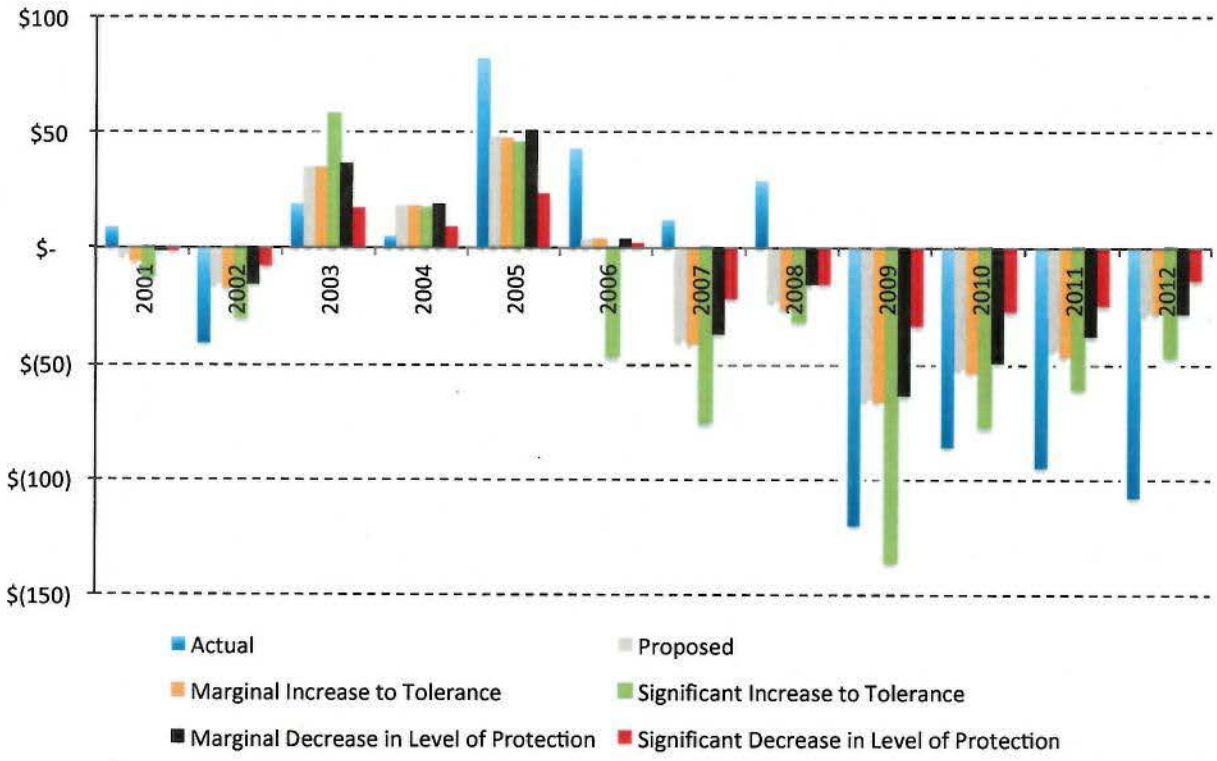


Figure 3: Comparative Opportunity Cost Using Historical Prices and Differing Tolerances to Risk $CAD millions) (2001-2012)

Source: Estimates calculated by CEA using data provided by Gaz Métro and market prices from Bloomberg, ICE and CME.

	Using Historical Prices					
	Actual	Proposed	Marginal Increase to Tolerance	Significant Increase to Tolerance	Marginal Decrease in Level of Protection	Significant Decrease in Level of Protection
2001	$ 9	$ (3)	$ (6)	$ (12)	$ (1.75)	$ (1.75)
2002	$ (41)	$ (16)	$ (17)	$ (30)	$ (15.59)	$ (7.78)
2003	$ 19	$ 35	$ 35	$ 58	$ 36.97	$ 16.91
2004	$ 5	$ 18	$ 18	$ 17	$ 18.61	$ 9.08
2005	$ 82	$ 49	$ 48	$ 46	$ 51.13	$ 23.30
2006	$ 43	$ 4	$ 4	$ (47)	$ 3.69	$ 1.85
2007	$ 12	$ (40)	$ (42)	$ (76)	$ (37.15)	$ (21.64)
2008	$ 29	$ (23)	$ (27)	$ (32)	$ (16.00)	$ (15.33)
2009	$ (120)	$ (66)	$ (66)	$ (136)	$ (64.20)	$ (33.55)
2010	$ (86)	$ (52)	$ (54)	$ (78)	$ (49.24)	$ (27.51)
2011	$ (95)	$ (44)	$ (47)	$ (61)	$ (38.17)	$ (24.93)
2012	$ (108)	$ (28)	$ (28)	$ (47)	$ (28.31)	$ (14.17)

Figure 4: (Table) Comparative Opportunity Cost Using Historical Prices and Differing Tolerances to Risk ($CAD millions) (2001-2012)

Source : Estimates calculated by CEA using data provided by Gaz Métro and market prices from Bloomberg, ICE and CME.

Réponse 1.2.2 :

The comparative opportunity cost of using the alternative price scenarios as a source of the historical results can be appreciated in Figure 5 and Figure 6.

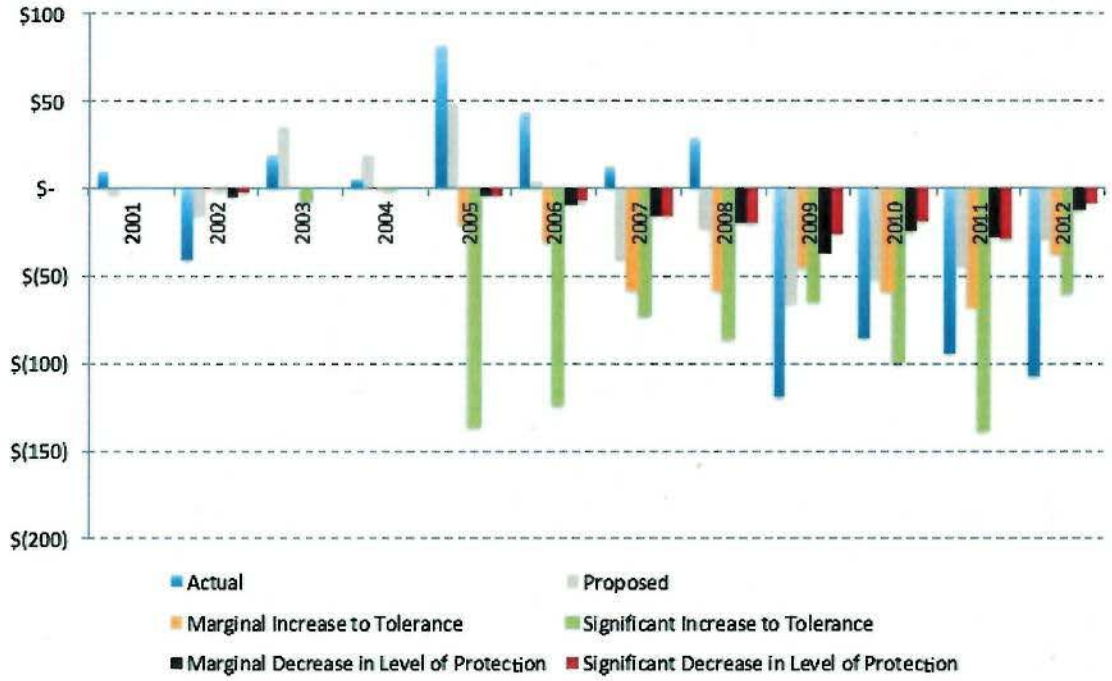


Figure 5: Opportunity Cost of Alternate Historical Prices and Differing Tolerance to Risk ($CAD millions) (2001-2012)

Source: Estimates calculated by CEA using data provided by Gaz Métro and market prices from Bloomberg, ICE and CME.

	Using Historical Prices		Using Alternative Price Scenarios			
	Actual	Proposed	Marginal Increase to Tolerance	Significant Increase to Tolerance	Marginal Decrease in Level of Protection	Significant Decrease in Level of Protection
2001	$ 9	$ (3)	$ (0)	$ (0)	$ -	$ -
2002	$ (41)	$ (16)	$ (0)	$ (0)	$ (5)	$ (3)
2003	$ 19	$ 35	$ (0)	$ (7)	$ -	$ -
2004	$ 5	$ 18	$ (0)	$ (0)	$ -	$ -
2005	$ 82	$ 49	$ (21)	$ (137)	$ (5)	$ (4)
2006	$ 43	$ 4	$ (31)	$ (125)	$ (9)	$ (8)
2007	$ 12	$ (40)	$ (59)	$ (73)	$ (16)	$ (16)
2008	$ 29	$ (23)	$ (59)	$ (86)	$ (20)	$ (20)
2009	$ (120)	$ (66)	$ (46)	$ (64)	$ (36)	$ (26)
2010	$ (86)	$ (52)	$ (59)	$ (99)	$ (25)	$ (19)
2011	$ (95)	$ (44)	$ (69)	$ (139)	$ (28)	$ (30)
2012	$ (108)	$ (28)	$ (38)	$ (60)	$ (13)	$ (8)

Figure 6: (Table) Opportunity Cost of Alternate Historical Prices and Differing Tolerance to Risk, (2001-2012)
Source: Estimates calculated by CEA using data provided by Gaz Métro and market prices from Bloomberg, ICE and CME.

1.3 Pour chacun des deux programmes alternatifs, veuillez présenter une analyse détaillée en utilisant l'approche citée en référence (v) pour la prévision de la performance de chacun des programmes alternatifs ainsi que des tableaux comme ceux des « figures » 11 et 12 cités en référence (ix). Veuillez présenter le 50ième percentile de la distribution de chacun des programmes alternatifs. Veuillez présenter et expliquer les hypothèses.

Réponse :

The aggregate impact to opportunity cost given different possible evolution of prices is summarized in Figure 7 and Figure 8. To aid in the comparison of the historical opportunity cost, the two Figures provide a continuation of the opportunity cost (actual and under the proposed Program) and the range of values that we could expect for each individual year under the two additional scenarios.

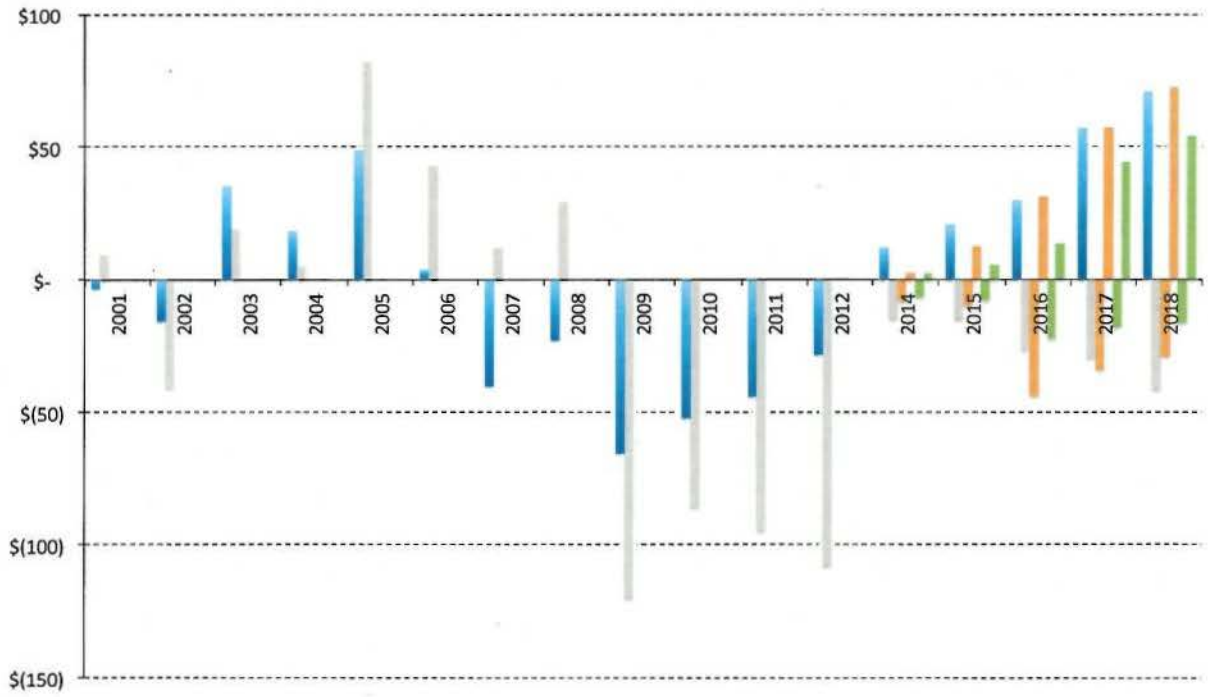


Figure 7: Range of Opportunity Cost for Alternative Price Scenarios and Differing Tolerance Levels ($CAD millions) (2014-2018)
Source: Estimates calculated by CEA using market prices from Bloomberg, ICE and CME.
Coloring: Actual (**Blue**), Proposed (Gray), Marginal Decrease in Level of Protection (Orange) and Significant Decrease in Level of Protection (Green)

	2001-2018		2014-2018				2014-2018			
	Base Case		Marginal Increase to Tolerance		Significant Increase to Tolerance		Marginal Decrease in Level of Protection		Significant Decrease in Level of Protection	
	Unfavorable Opportunity Cost	Favorable Opportunity Cost	Unfavorable Opportunity Cost	Favorable Opportunity Cost	Unfavorable Opportunity Cost	Favorable Opportunity Cost	Unfavorable Opportunity Cost	Favorable Opportunity Cost	Unfavorable Opportunity Cost	Favorable Opportunity Cost
2001	$ 9	$ (3)								
2002	$ (41)	$ (16)								
2003	$ 19	$ 35								
2004	$ 5	$ 18								
2005	$ 82	$ 49								
2006	$ 43	$ 4								
2007	$ 12	$ (40)								
2008	$ 29	$ (23)								
2009	$ (120)	$ (66)								
2010	$ (86)	$ (52)								
2011	$ (95)	$ (44)								
2012	$ (108)	$ (28)								
2014	$ (15)	$ 12	$ (29)	$ 26	$ (56)	$ 55	$ (8)	$ 2	$ (7)	$ 2
2015	$ (15)	$ 21	$ (20)	$ 33	$ (39)	$ 62	$ (10)	$ 12	$ (8)	$ 6
2016	$ (27)	$ 30	$ (27)	$ 28	$ (38)	$ 48	$ (44)	$ 31	$ (22)	$ 14
2017	$ (30)	$ 57	$ (29)	$ 56	$ (43)	$ 87	$ (34)	$ 57	$ (18)	$ 44
2018	$ (42)	$ 71	$ (50)	$ 71	$ (74)	$ 100	$ (29)	$ 73	$ (17)	$ 54

Figure 8: (Table) Range of Opportunity Cost for Alternative Price Scenarios and Differing Tolerance ($CAD millions) (2014-2018)
Source: Estimates calculated by CEA using market prices from Bloomberg, ICE and CME.

The implicit hypothesis behind the creation of the Monte Carlo is that the mean will be close to zero because we don't have a way to assume that the mean today will change over time. The intuition is that today's expectation of the opportunity cost is statistically zero; otherwise the hedging decision becomes simple.

	Opportunity Cost Using Proposed Program	Marginal Increase to Tolerance	Significant Increase to Tolerance	Marginal Decrease in Level of Protection	Significant Decrease in Level of Protection
2014	$ (0.14)	$ (0.51)	$ (2.61)	$ -	$ -
2015	$ (1.18)	$ (1.73)	$ (3.21)	$ (0.42)	$ 0.01
2016	$ 1.48	$ 1.46	$ 0.32	$ 0.05	$ 0.36
2017	$ 1.42	$ 1.16	$ 2.16	$ 2.23	$ 2.08
2018	$ (0.79)	$ (0.78)	$ 2.06	$ 0.63	$ 0.54

Figure 9: 50th Percentile of Future Opportunity Cost of Differing Tolerance Levels (CAD millions) (2014-2018)
Source: Estimates calculated by CEA using market prices from Bloomberg, ICE and CME.

1.4 Pour le programme proposé ainsi que pour chacun des deux programmes alternatifs, veuillez présenter, selon des scénarios de prix basés sur la technique Monte Carlo citée en référence (v), une évaluation du risque VaR citée en référence (iii) en $/GJ et en M$ pour une période d'une année avec un intervalle de confiance de 95 % et 99 %. Veuillez présenter la simulation des différents scénarios de prix. Veuillez présenter et expliquer les hypothèses. Veuillez également fournir les sources des données utilisées.

Réponse :

There are several assumptions to the calculation of the VaR (Figure 10):

- The simulation of the prices starts in 2013 and assumes that there are no pre-existing hedges in place;
- VaR is estimated as the difference between the unfavourable opportunity cost under the two confidence levels and the average expectation. .
- By definition, the expected value of the opportunity cost is zero because the expected value of hedging is zero. (i.e. it is a "fair bet").
- The changes in tolerance are consistent with those used for the historical analysis and are implemented by changes in the balancing factor between upside and downside exposure.

	95% VaR US$ Millions			95% VaR US$/GJ		
	Recommended Tolerance	Marginal Decrease in Level of Protection	Significant Decrease in Level of Protection	Recommended Tolerance	Marginal Decrease in Level of Protection	Significant Decrease in Level of Protection
2014	$ (15.09)	$ (8.39)	$ (6.86)	$ (0.25)	$ (0.14)	$ (0.11)
2015	$ (8.39)	$ (9.92)	$ (7.90)	$ (0.14)	$ (0.17)	$ (0.13)
2016	$ (9.92)	$ (43.82)	$ (22.43)	$ (0.17)	$ (0.73)	$ (0.37)
2017	$ (43.82)	$ (34.17)	$ (18.05)	$ (0.73)	$ (0.57)	$ (0.30)
2018	$ (34.17)	$ (29.02)	$ (16.66)	$ (0.57)	$ (0.48)	$ (0.28)

	99% VaR US$ Millions			99% VaR US$/GJ		
	Recommended Tolerance	Marginal Decrease in Level of	Significant Decrease in Level of	Recommended Tolerance	Marginal Decrease in Level of Protection	Significant Decrease in Level of
2014	$ (16.10)	$ (10.36)	$ (7.99)	$ (0.27)	$ (0.17)	$ (0.13)
2015	$ (16.36)	$ (10.26)	$ (9.00)	$ (0.27)	$ (0.17)	$ (0.15)
2016	$ (29.29)	$ (51.60)	$ (26.20)	$ (0.49)	$ (0.86)	$ (0.44)
2017	$ (39.35)	$ (41.62)	$ (21.78)	$ (0.65)	$ (0.69)	$ (0.36)
2018	$ (44.04)	$ (32.50)	$ (17.25)	$ (0.73)	$ (0.54)	$ (0.29)

Figure 10: Estimated VaR Increased Tolerance to Price Increase and Lower Level of Protection, 2014-2018
Source: Estimates calculated by CEA using market prices from Bloomberg, ICE and CME. 1GJ=0.9470 MMBtu.

2. Références : (i) Pièce B-0092, p. 18;
(ii) Pièce B-0322, p.15 et 16.

Préambule :

(i) *« Selon la recommandation de l'Expert, la balise de hausse de prix (BHP) serait calculée comme la moyenne des 12 balises de hausse de prix mensuelles (BHPt) de l'année gazière visée, soit de novembre 2013 à octobre 2014 pour la Cause tarifaire 2014. Similairement, la balise de perte d'opportunité (BPO) serait calculée comme la moyenne des 12 balises de perte d'opportunité mensuelles (BPOt) des 12 mois de l'année gazière visée. »*

(ii) *« La proposition de Gaz Métro d'utiliser une moyenne sur 12 mois est basée sur la recommandation de l'expert, l'objectif principal étant de simplifier le processus d'approbation des paramètres du programme.*

Plusieurs autres façons d'établir les balises auraient pu être retenues et Gaz Métro a opté pour l'utilisation de la moyenne 12 mois, tel que recommandé par l'expert. D'ailleurs, toutes les simulations faites par l'expert, autant passées que futures, incorporent des balises établies selon cette formule proposée. »

Demande :

2.1 Est-ce que l'expert peut expliquer son choix de l'utilisation d'une moyenne 12 mois par rapport à une moyenne qui serait calculée ainsi : la moyenne pour la saison d'hiver pondérée

par les volumes de cette saison et la moyenne pour la saison d'été pondérée par les volumes pour cette saison. Veuillez expliquer les avantages et inconvénients de cette approche par rapport à celle de la moyenne 12 mois.

Réponse :

The original recommendation to use a simple 12 months average was based on three reasons. First, it is simplier to refer to the customer's tolerance as one number than to have a tolerance that varies across the year. Second, over the past few years the difference between consumption in the winter and summer months spot prices has been relatively small and therefore a single tolerance for the entire year was a good representation for the customer's tolerance and the nature of the price risk throughout the year. Finally, the customer pays a 12-month average and any seasonal difference throughout the year is largely lost once reflected in the rate.

Conceptually though, the customer's tolerance should represent not only its preference but also the nature of the price risk through the year and it is clear that price risk is seasonal (winter-summer). Consumption of system gas is highly dependent on weather and volume within the season may change significantly. Therefore the seasonal-weighted average would be an acceptable alternative to the arithmetic average, especially to reflect the heightened risk of the months with the largest volumetric exposure.

I therefore think that it is reasonable to use a weighted-average for the winter and the summer instead of what I had originally proposed to be a 12-month non-weighted parameter. By selecting a weighted-average seasonal approach we acknowledge the possibility of significant difference between winter and non-winter seasons. The seasonal approach will also avoid having to indirectly influence the summer tolerance based on the winter tolerance. In a way, a year-round tolerance would underrepresent the winter tolerance and overstate the summer tolerance.

3. **Références :** (i) Pièce B-0059, p. 5 à 7;
(ii) Pièce B-0091, p. 5;
(iii) Pièce B-0091, p. 16.

Préambule :

(i) *« 2.1. Devises des achats de gaz naturel*
Les achats de gaz naturel de Gaz Métro sont exprimés en GJ peu importe l'indice utilisé. De plus, elle effectue normalement ses achats de gaz naturel en $CAN. Le marché gazier transige les indices NYMEX et NGX Dawn en $US/MMBtu alors que l'indice AECO est transigé en $CAN/GJ.

Deux options s'offrent à Gaz Métro pour effectuer des achats en fonction d'indices normalement transigés en $US :

1. Transiger en $CAN/GJ

Sous cette option, une transaction effectuée sur la base NYMEX serait établie de la façon suivante :

Prix d'achats : Indice NYMEX Henry Hub Close (Last Day Settle) + Prime en $US/MMBtu

Taux de change : Taux de change quotidien à midi de la Banque du Canada à la date d'établissement de l'indice « Henry Hub Close », soit la dernière journée ouvrable de transaction sur le NYMEX pour des achats du mois suivant.

Conversion en $/GJ : Facteur de conversion MMBtu = 1,055056 GJ

De façon générale, la plupart des fournisseurs accepteraient de se conformer à cette approche, quoique non courante dans le marché gazier. Comme ils assumeront le risque de change, il pourrait y avoir une surprime intégrée dans le prix d'achat. Le montant de cette surprime ne peut toutefois être déterminé. Il est à noter que Gaz Métro a effectué, en avril 2013, des achats auprès de trois fournisseurs en fonction de l'indice NGX Dawn, converti en $CAN selon la formule énoncée ci-dessus, et aucune prime n'a été ajoutée à l'indice par les fournisseurs, laissant penser que la surprime pour compenser le risque de change supporté par les fournisseurs, s'il y en avait une, serait minime.

2. Transiger en $US/MMBtu

La facturation des achats de gaz naturel en $US entrainerait un risque de change pour la clientèle de Gaz Métro. En effet, il s'écoule en moyenne une période de 20 à 25 jours entre le moment où le compte à payer est comptabilisé par Gaz Métro et le moment où le paiement au fournisseur est effectué. L'écart de change pour chaque achat effectué en $US correspondrait à la différence entre :

le montant du compte fournisseur converti en $CAN au taux de change en vigueur au moment où il est comptabilisé dans les livres de Gaz Métro ; et le montant du compte fournisseur converti en $CAN au taux de change en vigueur au moment où le paiement au fournisseur est effectué.

Cet écart de change peut entraîner soit un gain ou une perte pour la clientèle de Gaz Métro, selon l'évolution des taux de change au cours de cette période. Si l'option de transiger en $US/MMBtu était retenue, Gaz Métro demande à la Régie de l'autoriser à appliquer un traitement comptable réglementaire aux gains et pertes de change générés par les achats effectués en $US, consistant à inclure ces gains et pertes de change dans les coûts de fourniture. Pour ce faire, ces gains et pertes de change seraient imputés au compte d'écart de prix de la fourniture et ainsi intégrés mensuellement dans le calcul du prix du service de fourniture de gaz naturel. » [nous soulignons]

(ii) *« Q8. WHAT IS HEDGING?*
A8. Hedging is a series of management decisions aimed at reducing the probability of unfavorable outcomes, typically in the form of undesirable prices and/or volatility. In the case of natural gas prices, hedging is the set of management decisions taken to mitigate the impact on customers of price increases/decreases that may create a wide disparity in the cost of gas from month-to-month, or year-to-year. » [nous soulignons]

(iii) *« Q21. DO YOU AGREE THAT DEFERRAL ACCOUNTS AND PURCHASED GAS ADJUSTMENTS COULD REDUCE VOLATILITY SUCH THAT NO HEDGING 11 WOULD BE REQUIRED?*

A21. No. Though I agree that in periods of low volatility and declining prices this may be all that is required to minimize the effect of price increases, there is nothing to protect the customer from extreme and sustained price increases. The customer will eventually pay for the price increase. The deferral accounts or purchased gas adjustments largely create a cosmetic effect on prices by simply averaging the price spikes over a longer period of time. By the same virtue, the averaging of the spike also creates a form of stickiness in prices because the effect of the price spike tends to be longer-lived. Hedging strategies are more successful if they are structured to avoid the spikes instead of just smoothing the effect. » [nous soulignons]

Demandes :

3.1 Est-ce que l'expert peut confirmer que le programme proposé ne prévoit pas de couverture de change sur l'indice NYMEX que ce soit selon une formule de conversion ou transigés en $US/MMBtu tel qu'expliqué à la référence (i) ?

Réponse :

The proposed Program does not provide foreign exchange coverage for any of the two supply alternatives as presented in the supply evidence.

3.2 Est-ce que l'expert peut confirmer qu'une couverture portant uniquement sur le prix du gaz naturel sur l'indice NYMEX selon une formule de conversion ou transigés en $US/MMBtu peut créer une perte ou un gain de change ?

Réponse :

True, a hedging transaction on the price component of a $US index will generate a foreign exchange exposure (gain or loss) but only if it engages in products that are settled in foreign currency and its price is different from the value at the time the hedge was executed. Settlement in this context means how the difference between the hedged price and the settlement price is financially resolved. If the hedge involves a payment in US$ at settlement, then the level in the foreign exchange (effectively the price of the currency) may change from when it was hedged and when it eventually settles.

3.3 Est-ce que l'expert peut confirmer que l'horizon temporel du risque de change sur une couverture sur le NYMEX peut aller jusqu'à deux ans selon le programme proposé?

Réponse :

True. Since the horizon of the proposed Program is 2 years, then the horizon of the foreign exchange risk is also 2 years.

3.4 Est-ce que l'expert peut indiquer si le risque de change est plus élevé ou moins élevé pour une période de 20 à 25 jours tel que cité en référence (i) que sur une période de deux ans?. Veuillez expliquer avec preuve à l'appui et présenter les sources de données.

Réponse :

Yes the risk on 2 years is bigger than the risk over 20-25 days, but this is largely due to the uncertainty of time, and not necessarily due to increased volatility. In general risk increases as the time horizon increases but not in a linear way but rather in a factor represented by the squared-root of time. For instance, if daily volatility is 2%, then the potential price movement for tomorrow will be 2% TIMES SQRT(1). The same volatility a year into the future will be 2% TIMES SQRT(260) because there are 260 trading days in a year. The risk of foreign exchange increasing as a function of time is also intuitively correct because there are fewer things that can happen tomorrow than what can further happen in the future. Furthermore, the potential volatility for one year already includes the potential volatility for the short-term.

3.5 Est-ce que l'expert peut concilier l'objectif cité en référence (ii) avec un risque de gain ou de perte de change qui peut amplifier la volatilité du coût de fourniture ?

Réponse :

Hedging the foreign exchange exposure is consistent with statements in reference (ii). The proposed Program was developed by evaluating the price risk exposure of natural gas prices while the decisions to hedge the FX exposure was not a focus of the development of the proposed Program primarily because the exposure to foreign exchange variability depends on the instruments chosen for the hedging decisions. If the hedges for US price indices are executed in $CAN/GJ then there would be no foreign exchange exposure and is equivalent to hedging in $US and entering into $CAD swap at the same time.

3.6 Est-ce que l'expert peut concilier sa position citée en référence (iii) sur les comptes de frais reportés comme outil de couverture du coût de fourniture avec la position de ne pas couvrir le risque de change et par conséquent inclure les gains et pertes dans le coût de fourniture ?

Réponse :

The deferral accounts would not be sufficient to take care of the foreign exchange exposure. This can be addressed directly through the use of foreign exchange swaps or if the foreign exchange is already integrated in the transaction to hedge the price of the commodity. The proposed Program was developed by evaluating the price risk exposure of natural gas prices while the decisions to hedge the foreign exchange exposure was not a focus of the development of the proposed Program.

3.7 Quelle est la recommandation de l'expert, pour le programme proposé, sur la couverture du risque de change selon une échelle de 0 % à 100 % que ce soit selon une formule de conversion ou transigés en $US/MMBtu tel qu'expliqué à la référence (i)? Veuillez expliquer les avantages et inconvénients de la recommandation.

Réponse :

It really depends on how the execution of the Program is implemented and this therefore assumes that the hedging Program is implemented with instruments that are denominated in a foreign currency. If the hedging Program is implemented in $CAN/GJ (by using indexes such as AECO) then there would be no foreign exchange directly associated with the hedging program. Let's assume for a moment that the hedging Program involves indices that settle in US$, then we have two options:

- **No Foreign Exchange Hedges Is Needed if the Currency Exposure is Incorporated in the Index**. Gaz Métro would not have to hedge the foreign exchange risk if it is able to execute the hedges in $CAN/GJ and this could be achieved by simply engaging financial counterparts and asking for US price indices (such as Henry Hub) but for the pricing to be in $CAN/GJ. This would therefore effectively manage the price and the currency exposure at the same time. This is equivalent to executing the hedges in $US and entering into $CAD swap at the same time.
- **Hedge the Foreign Exchange Exposure to Match the Commodity Risk**. If the hedging Program involves commodities to be settled at expiration in $US then the foreign exchange should match the exact same percentage as the hedge for the commodity itself and executive contemporaneously with the commodity hedges. In the case of the commodity price hedges through swaps they would be paired with currency swaps. I recommend not to use costless collars if foreign exchange is not bundled in the commodity price risk.

As highlighted in the response to 3.2 above, a foreign exchange exposure is created when hedging US-price indices that are denominated in $US. Take for instance the evolution of prices for the September 2014 Henry Hub and the $CAN/$US exchange rate (Figure 11). Let's further assume that a hedging decision takes place on 9/13/2012 when gas prices were $US3.98/MMBtu and the foreign exchange was $CAN0.97/$US.

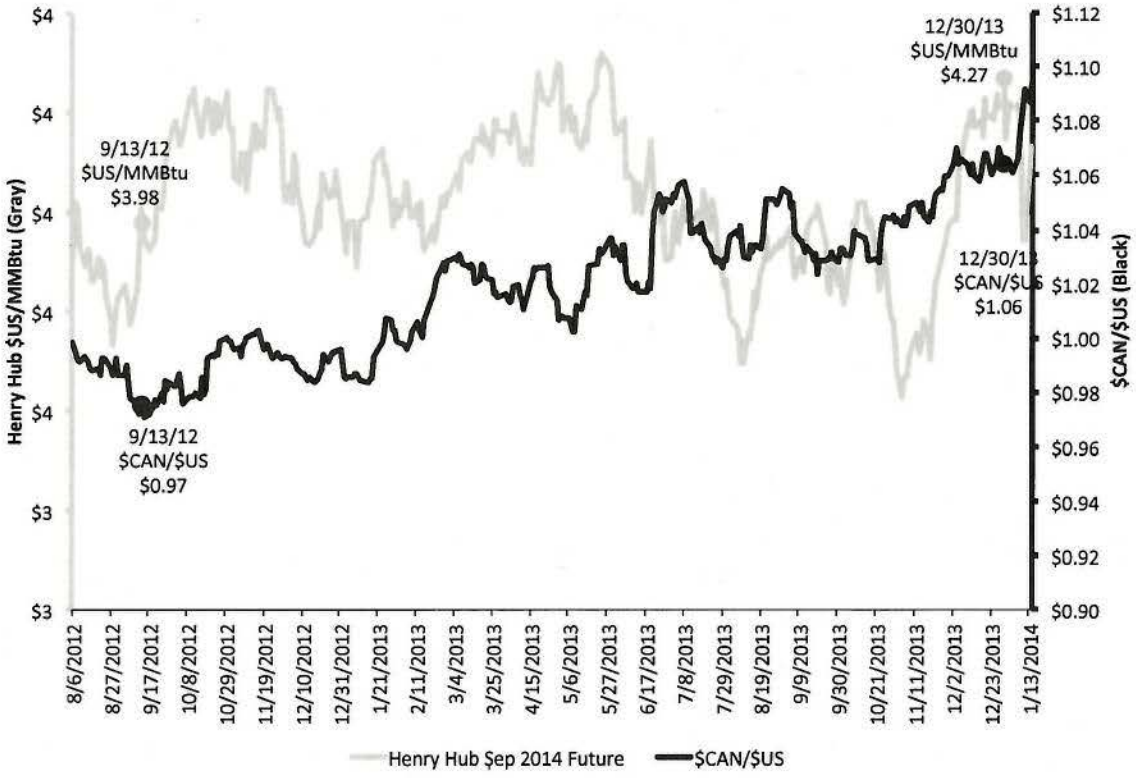


Figure 11: Commodity (Left Axis) and Foreign Exchange (Right Axis) Exposure for September 2014 Contract
Source: U.S. Federal Reserve Board and CME

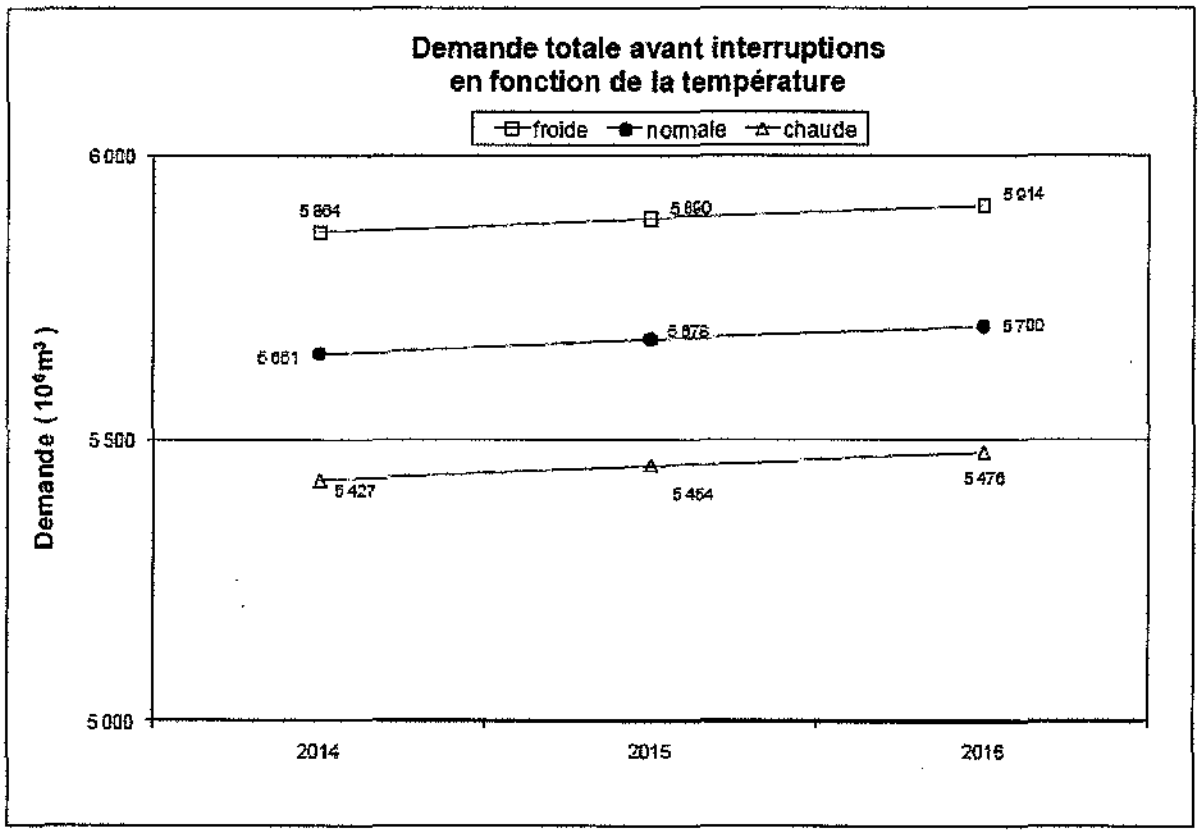
Figure 11 can also be used to address the consequences of hedging 100% of the foreign exchange or hedging none at all. If we hedge 100% of the foreign exchange exposure as of 09/13/12 we would guarantee that the price of the commodity will be $US/MMBtu. If we hedge none of the foreign exchange we will pay an additional 9.28% to make-up for the loss in the currency value.

4. **Références :** (i) Pièce B-0054, p. 98;
(ii) Pièce B-0322, p.15 et 16.

Préambule :

(i)

Graphique 15



(ii) « *Les besoins volumétriques de fourniture de gaz naturel anticipés sont établis à chaque cause tarifaire. Ces volumes correspondent à la somme des éléments suivants :*

- *la demande de fourniture de gaz naturel de la clientèle qui utilise le service du distributeur;*
- *le gaz perdu et le gaz pour l'usage de la compagnie;*
- *la variation nette des retraits et injections d'inventaires;*
- *le gaz de compression requis pour transporter la fourniture jusqu'au territoire de Gaz Métro.*

Il est à noter que les volumes contractés pour les clients engagés auprès de Gaz Métro dans une entente de fourniture à prix fixe approvisionnée par un fournisseur spécifique ne sont pas considérés dans le cadre du programme de dérivés financiers. »

Demandes :

4.1 Est-ce que l'expert a considéré l'utilisation de la demande de fourniture de gaz naturel selon un scénario de température chaude cité en référence (i) ? Dans tous les cas, veuillez expliquer les avantages et inconvénients de cette approche.

Réponse :

I recommend establishing the volume to hedge based on the supply forecast of the most likely (i.e. "expected") volumetric requirements and not base it on an expectation that is significantly different such as the case for a warm winter. If weather affects load then the quantity to hedge should be based on the most likely weather conditions. I do not recommend choosing a scenario of an extreme (hot or cold) winter if this expectation is not widely shared as the most likely to occur. If on the other hand the most likely scenario were for an extreme winter (hot or cold), then obviously I would use this expectation because it then becomes the most likely expectation. There are several reasons for this:

- **Exacerbates the Impact of Spot Purchases if the Volume Hedged is Significantly Different from Actual Consumption**. If the volume to hedge is not based on the most likely expectation, then the economic impact of the difference between the hedged volume and the realized consumption will create volatile costs in the spot markets.

  Take for instance the case where the volume is based on a warm winter and it turns out that the realized winter is cold and we end-up having to purchase more in the spot market that originally planned. In this case we will likely pay more in the spot market because of how prices are affected by consumption that in turn is affected by weather. If on the other hand we hedge to a cold winter and it turns out that it is a warm one, we will likely have to sell the unused hedge in the market and probably at a lower price than originally hedged.

  Hedging to the expected supply forecast minimizes the economic impact of having to buy (or sell) gas in the spot market that we may need to cover the shortfall (or excess).

- **Diminishes the Effectiveness of the Program**. Establishing the volume to hedge based on a warm winter conceptually reduces the usefulness of the hedging Program by design. By assuming a warm winter we are effectively reducing the target volume to hedge and implicitly accepting that if the winter turns out to be either normal or colder than normal, then we will have to purchase more gas in the spot market. By virtue of omitting volume in the hedging Program we are effectively accepting the risk of more volatile spot prices.

  One of the basic tenants of the recommended Program is that risk is a double-edged sword. Hedging reduces the uncertainty of the future and reduces volatility, but at the same time hedging creates the possibility that the hedge may be higher than the ultimate settlement. By the same logic, a Program that structurally diminishes the amount to hedge (by assuming a warmer winter) is implicitly accepting the risk of not hedging. I am currently providing similar services to Nova Scotia Power Incorporated (NSPI) where the primary issue is the exposure to short term (i.e. spot) markets, their volatility and higher price levels.

  Reducing the amount to hedge by assuming a warmer winter may reduce the risk of opportunity cost as defined throughout my evidence. But it under-represents the risk for upside exposure.