

Industrial Pricing – ICI Study

DM/CoS Briefing
March 10, 2016

CONFIDENTIAL

Purpose

- Provide an overview of Navigant's report on the Industrial Conservation Initiative (ICI) program.
- Outline Ministry analysis/considerations related to Navigant's conclusions.
- Outline considerations related to a proposal to restrict eligibility requirements for all ICI participants to specific North American Industry Classification System (NAICS) codes.
- Next Steps

Context / Current Status

- The Ministry is reviewing two industrial electricity pricing programs. Navigant Consulting was retained to conduct analysis and identify options for expanding both the Industrial Energy Incentive (IEI) and Industrial Conservation Initiative (ICI) programs.
 - Navigant's IEI report, was submitted in January 2016 and discussed options and considerations for additional streams of the IEI program.
- The draft ICI report was submitted to the Ministry in February 2016 and presents analysis and considerations around three options for ICI expansion.
- The 2016 Budget committed to recycling cap and trade proceeds into the electricity sector. Recycling proceeds will ensure that the net impact of cap and trade would not result in an overall increase in electricity costs for the average industrial/commercial consumer, and that there would be a modest benefit of up to \$2 per month, on average, to residential consumers.
 - The current proposal is to recycle proceeds into the Global Adjustment (GA).
 - ENERGY continues to work with MOECC and IESO to refine this proposal.

Overview – Industrial Conservation Program

- In 2011, Ontario launched the ICI program in order to provide “electricity system benefits” and “improve competitiveness” for large electricity consumers (i.e., industrial consumers).
 - Under current electricity market conditions ICI reduces electricity costs for eligible electricity consumers by approximately 25%.
- ICI established two classes of electricity consumers who are differentiated based on how they pay Global Adjustment (GA):
 - *Class A Consumers:* Who have an average monthly peak demand above 5 MW pay GA according to their share of province-wide peak demand; and
 - *Class B Consumers:* All remaining consumers continue to pay GA on the basis of their total consumption.
- In July 2015, the definition of Class A consumers was updated to also include electricity consumers with an average monthly peak demand greater than 3 MW and less than 5 MW who belong to select industries.
 - Currently, ICI eligibility in the 3-5 MW category is restricted to those consumers who are classified under specific NAICS codes* (primarily industrial).
 - There are no NAICS codes restrictions on consumers above 5 MW (i.e., any consumer above 5 MW is eligible for ICI). **Note:** Commercial and Broader Public Sector (BPS) consumers are not currently eligible unless they are above 5 MW.
- Nearly 300 Class A consumers participate in ICI, in industries such as pulp & paper, mining, cement, steel and chemicals. Some large commercial and BPS facilities also participate in ICI.
 - The remaining 4.9 million Class B Consumers that do not participate in ICI include all residential, most commercial/institutional and small and mid-size industrial consumers.
- Currently, the “cost shift” from Class A to Class B consumers is about \$580 million annually (i.e., a bill impact of approximately \$3.30/month for a typical residential consumer).

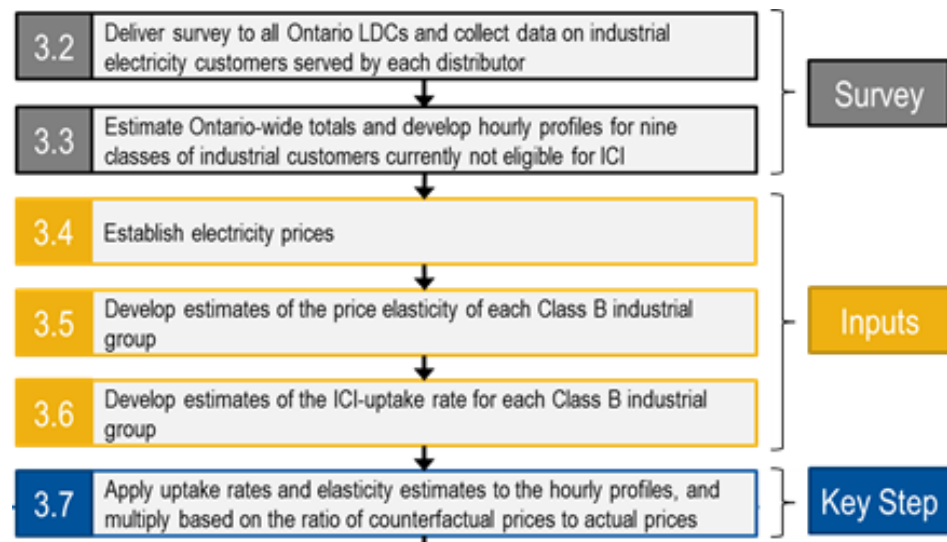
***Note:** NAICS is the standard used by statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data.

ICI Program Review – Overview of Navigant Report

Navigant Report – Approach

- The Ministry retained Navigant to conduct a review of the ICI program, and develop and analyse three scenarios for an expanded ICI.
- Navigant distributed a survey to LDCs in order to gather information on customers with a peak demand in the 1-2 MW and 2-3 MW range (i.e., those customers who may be eligible for ICI if the program was expanded).
- Using this data, Navigant developed the necessary inputs/assumptions and estimated the likely demand reduction, bill impacts and cost shift between classes of consumers for each of the three scenarios assessed.
- Additional detail on Navigant's approach is provided in the Appendix.

Overview of Navigant's Methodology



Source: Navigant

Navigant Report – ICI Expansion Scenarios

- Navigant explored three scenarios that would expand ICI eligibility:
 - **Scenario 1:** Lower the eligibility threshold to 2 MW for currently-eligible North American Industry Classification System (NAICS) codes only;
 - **Scenario 2:** Lower the eligibility threshold to 1 MW for currently-eligible NAICS codes only; and
 - **Scenario 3:** Lower the eligibility threshold to 1 MW for all NAICS codes.
- Navigant considered both “short-term” and “long-term” impacts of the three scenarios and produced two sets of results for each scenario, based on time period.
 - The use of short-term and long-term elasticities accounts for that fact that consumers are expected to respond more to a given increase in price in the long-term compared to the short-term.

Navigant's Report – Summary of Analysis / Conclusions

- Navigant used three main criteria to assess its proposed scenarios and arrived at the following results :
 1. **System Benefit** (i.e., peak demand reduction): Ranges from 10 MW for scenario 1 (short term) to 165 MW for scenario 3 (long term). **Note:** IESO estimated that in 2014, the peak demand reduction associated with ICI was 1,050 MW.
 2. **Financial Impact** (i.e., GA shifted from newly eligible Class A to remaining Class B): Up to \$82M. **Note:** The cost shift from Class A to Class B as it exists today is about \$580M annually, a bill impact of approximately \$3.30/month for a typical RPP TOU consumer.
 3. **Class A Benefit** (i.e., bill impacts): Long term savings of 20-34% for newly eligible Class A consumers.
- Navigant estimates that up to 11.7 TWh of additional annual consumption would be eligible for ICI, compared to total provincial yearly consumption of about 140 TWh. Under Navigant's "medium uptake rate" of 25%, this would represent about 3 TWh of additional participation in ICI.
- The potential new ICI participants are expected to be primarily mid-sized industrials. In Navigant's scenarios that restrict eligibility based on NAICS codes that are currently eligible for ICI, nearly all the potential new ICI participants would be manufacturers (i.e., scenarios 1 and 2). However, a significant portion of Ontario's large greenhouses could also become eligible depending on the threshold chosen.
 - In scenario 3, as a result of removing the NAICS code restriction, many of the new ICI participants would likely be commercial and institutional consumers.
- Due to the nature of their operations, new ICI participants would generally be less responsive to price than existing Class A consumers.
- Due to their load shapes, it is expected that not all eligible consumers will "opt in" to an updated ICI program (e.g., some institutions and auto plants have opted out due to their high summer load, etc). Navigant assumed, based in part on the experience of lowering the eligibility threshold from 5 to 3 MW in 2015, a medium participation (or uptake) rate of 25%.

Note: See the Appendix for more details on the report's analysis and conclusions.

Navigant's Report – Summary of Analysis / Conclusions by Scenario

Scenario	Elasticity	Uptake %	Class A benefit <i>Bill savings</i>	System Benefit <i>Peak Demand Reduction (MW)</i>	Financial Impact <i>GA shifted (\$M)</i>	Residential Bill Impact
1 – Lower eligibility threshold to 2 MW for currently-eligible NAICS codes	Short Term	25	Up to 34%	10	6	0.03%
2 – Lower eligibility threshold to 1 MW for currently-eligible NAICS codes	Short Term	25	Up to 34%	20	15	0.09%
3 – Lower eligibility threshold to 1 MW for <u>all</u> NAICS codes	Short Term	25	Up to 34%	80	47	0.28%
1 – Lower eligibility threshold to 2 MW for currently-eligible NAICS codes	Long Term	25	Up to 34%	15	9	0.05%
2 – Lower eligibility threshold to 1 MW for currently-eligible NAICS codes	Long Term	25	Up to 34%	45	25	0.15%
3 – Lower eligibility threshold to 1 MW for <u>all</u> NAICS codes	Long Term	25	Up to 34%	165	82	0.49%

Source: Ministry of Energy; Navigant

Considerations

- A lowering of the ICI threshold would deliver price reductions for the newly eligible Class A consumers that choose to opt-in to Class A. Depending on the industry, savings of 20% to 34% in the long term are expected compared to all-in Class B costs.
- A lowering of the ICI threshold would provide some system benefits due to reductions in peak demand. **Note:** These benefits are expected to materialize over the mid to long-term (i.e., due to limited need for peaking capacity in short-term).
- Due to the large consumption base of Class B, bill increases for RPP consumers would be limited to less than 1%, assuming medium uptake. This is a bill increase of about \$1.50/month for a typical residential ratepayer.
- Stakeholder reaction would vary by consumer class:
 - New ICI participants would be supportive due to savings on their bills.
 - Small Class B consumers, including residentials, would be concerned about increased bills.
 - The non-eligible large Class B consumers would raise concerns around the threshold chosen and sector eligibility.

Considerations (cont'd)

- The recycling of cap and trade auction proceeds to the electricity sector through GA would provide different benefits to Class A and B consumers. Any new consumers opting into Class A would see a lower benefit due to proceeds recycling, but would also have a lower all-in electricity cost relative to Class B.
- Under ICI, some participants pursue behind-the-meter (BMG) generation to reduce their GA costs. The cap and trade program could increase the cost of fossil fuel-fired BMG through application of a carbon price. This could decrease some of the benefit derived under ICI of operating BMG during peak periods.
 - ENERGY continues to work with MOECC, MEDEI and IESO on potential amendments to the draft cap and trade regulation to address CHP BMG.
- Many LDCs currently do not have any Class A consumers. With an expansion of ICI, some of these LDCs would acquire Class A consumers, requiring changes to their billing systems.
- In order for any changes to ICI eligibility to take effect before the next 12-month billing period beginning July 1, 2016, regulatory amendments would have to be made before this date.
- Given various recent developments in the electricity sector that will impact supply and pricing (i.e., cap and trade), ENERGY continues to assess the outlook for industrial pricing and potential for further rate mitigation.

ICI Changes – Impact for New BPS Entities

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- Consideration could be given to extending the eligibility restrictions that are currently in place in the 3 to 5 MW category to consumers in the “greater than 5 MW” category. Implementing such a proposal would require amendments to O. Reg. 429/04.

Considerations:

- Currently, all electricity consumers with average monthly peak demand greater than 5 MW are eligible for ICI, while eligibility in the 3 to 5 MW category is restricted to certain NAICS codes.
 - Eligible industries in the 3 to 5 MW category are limited to: manufacturing, mining, data processing, refrigerated warehousing and greenhouses.
- Placing eligibility restrictions on new consumers with monthly average peak demand greater than 5 MW would mean that the following new BPS consumers would be excluded from Class A:
 - Large hospitals and universities;
 - Subways and LRTs;
 - Water treatment plants and large municipal pumping stations; and,
 - Military facilities.

Considerations (Cont'd)

- In addition, new consumers beyond the BPS could be impacted – depending on how the amended regulation was drafted, including large commercial consumers such as:
 - Large office towers and corporate headquarters;
 - Large shopping malls; and
 - Casinos.
- Existing non-industrial Class A consumers will ask to be grandfathered under such a proposal.
 - There are currently about 50 non-industrial ICI participants.
- Excluding new BPS entities from ICI would raise the operating costs of these facilities, which receive at least part of their operating budgets from tax revenues.

Next Steps

- Minister's briefing on industrial rate mitigation.
- Begin regulatory amendments, if required.
- ENERGY to:
 - Prepare LRC Submission to amend O.Reg. 429/04, if required; and
 - Report back to Treasury Board and/or Cabinet, as required.

Appendix

Navigant's Approach – ICI Survey

- Navigant delivered a survey to all Ontario distributors, collecting data on the number, type, and consumption of industrial electricity consumers served by each distributor.
- Navigant received responses to the ICI survey from LDCs that represent approximately 76% of GS>50 electricity sales.
- The survey responses provided information on the number of customers by size (e.g., 1-2 MW, 2-3 MW, and 3-5 MW), their annual consumption, NAICS classification, and –where available- hourly load profiles.
- Based on the surveys received, Navigant developed Ontario-wide consumption and peak demand estimates.

Figure A-1: Estimated annual electricity consumption, by customer size and NAICS classification, non ICI-eligible consumers, 1-5 MW

Source: Navigant

Industry Group	Mining		Manufacturing		Data processing, refrigerated warehousing and greenhouses		Other NAICS (1-2 MW)	Other NAICS (2-3 MW)	Other NAICS (3-5 MW)	Total
	21 (1-2 MW)	21 (2-3 MW)	31-33 (1-2 MW)	31-33 (2-3 MW)	51, 11, 49 (1-2 MW)	51, 11, 49 (2-3 MW)				
TWh	0.06	0.00	1.46	0.86	0.03	0.02	4.22	2.44	2.62	11.71
%	0%	0%	12%	7%	0%	0%	36%	21%	22%	100%

Navigant's Approach – Prices

- In order to estimate the demand reduction associated with an expansion of ICI, it is necessary to make assumptions about the price paid by a newly eligible Class A consumer compared to what they would pay as a Class B consumer.
- Although Class A GA costs are established in the five highest demand hours, for the purposes of the analysis, Navigant spread these costs over several hundred hours of the year, to more accurately reflect an industrial customer's response to ICI peaks.
- In other words, Class A consumers do not know ahead of time which hours are the peak hours. Instead, they response to a certain number of “event days” and particular hours on those days which they anticipate could be the peak hours.
- Intuitively, if Navigant did not spread the Class A GA costs over several hundred hours, the Class A price would be too high, and would yield a peak demand reduction estimate that is too large.

Navigant's Approach – Price Elasticity

- Estimates of price elasticity are necessary in order to estimate the reduction in peak demand as a result of expanding ICI – newly eligible Class A consumers face higher prices in the highest demand hours and respond by reducing demand.
- Navigant's research suggests that industrial electricity consumers have relatively inelastic demand. That is, increases in price are met with fairly small decreases in demand, in percentage terms.
 - In the short term, Navigant estimates that for a 10% increase in price, demand would decrease by zero to 0.5% (zero to 0.8% for manufacturing).
 - In the longer term, the same 10% increase in price would be met by a decrease in demand of zero to 1% (zero to 1.6% for manufacturing).

Figure A-2: Price elasticity estimates, short and long term

Source: Navigant

Elasticity	21 (1-2 MW)	21 (2-3 MW)	31-33 (1-2 MW)	31-33 (2-3 MW)	51, 11, 49 (1-2 MW)	51, 11, 49 (2-3 MW)	Other NAICS (1-2 MW)	Other NAICS (2-3 MW)	Other NAICS (3-5 MW)
Short Term	0 to -0.05 (-0.025)		0 to -0.08 (-0.04)				0 to -0.05 (-0.025)		
Long Term	0 to -0.10 (-0.05)		0 to -0.16 (-0.08)				0 to -0.10 (-0.05)		



Mining



Manufacturing



Data processing,
refrigerated
warehousing and
greenhouses

Navigant's Analysis / Results – Demand Reduction

- Navigant's analysis considered a range of participation rates. All results in the body of this presentation reflect the median participation rate of 25%.
- Assuming that 25% of newly eligible consumers were to opt-in to Class A, Figure 3 below shows the estimated peak demand reductions.
- In the short term, Scenario 3 would lead to a peak demand reduction of 80 MW, or eight times that of Scenario 1.
- In the longer term, as consumers become better equipped to react to higher prices at peak, Scenario 3 is expected to yield a 165 MW reduction in peak demand.

Figure A-3: Peak demand reduction estimates

Elasticity	Scenario	Description	Peak Demand Reduction (MW)	Peak Demand Reduction (%)
Short Term	Scenario 1	Extend to 2-3 MW, Current NAICS	10	26%
	Scenario 2	Extend to 1-2 MW, Current NAICS	20	26%
	Scenario 3	Extend to 1-2 MW, All NAICS	80	19%
Long Term	Scenario 1	Extend to 2-3 MW, Current NAICS	15	53%
	Scenario 2	Extend to 1-2 MW, Current NAICS	45	52%
	Scenario 3	Extend to 1-2 MW, All NAICS	165	37%

Source: Navigant

Navigant's Analysis / Results – “Cost Shift” from Class A to Class B

- The table below shows Navigant's cost shift estimates. The total dollar amount shifted from Class A to Class B has two distinct parts:
 - Recovery mechanism cost shift** – The shift that occurs as a result of the different GA cost-recovery mechanisms employed for Class A and Class B customers.
 - Price responsiveness cost shift** – New Class A customers face a higher price during the highest demand hours, and reduce demand according to estimates of price elasticity.
- The cost shift as a share of total GA is estimated to range from just 0.06% in the short term for scenario 1 to 0.86% in the long term for scenario 3.

Figure A-7: Cost shift estimates

Elasticity	Scenario	Recovery Mechanism Shift (\$M)	Price Responsiveness Shift (\$M)	Total GA Shifted (\$M)	Fraction of Total GA (%)	Class B GA Increase (%)
Short Term	Scenario 1	2	3	6	0.06%	0.07%
	Scenario 2	5	10	15	0.16%	0.18%
	Scenario 3	12	35	47	0.49%	0.56%
Long Term	Scenario 1	2	7	9	0.10%	0.11%
	Scenario 2	5	19	25	0.26%	0.29%
	Scenario 3	12	71	82	0.86%	0.98%

Source: Navigant

Navigant's Analysis / Results – “Cost Shift” to Class B

- The transfer from new Class A consumers to Class B consumers ranges from \$6M for Scenario 1 in the short term to \$82M for Scenario 3 in the long term.
- The cost shift as a share of total GA is estimated to range from 0.06% in the short term for Scenario 1 to 0.86% in the long term for Scenario 3.
- The table below shows Navigant's cost shift estimates.

Figure A-4: Cost shift estimates

Elasticity	Scenario	Total GA Shifted (\$M)	Fraction of Total GA (%)	Class B GA Increase (%)
Short Term	Scenario 1	6	0.06%	0.07%
	Scenario 2	15	0.16%	0.18%
	Scenario 3	47	0.49%	0.56%
Long Term	Scenario 1	9	0.10%	0.11%
	Scenario 2	25	0.26%	0.29%
	Scenario 3	82	0.86%	0.98%

Source: Navigant

Navigant's Analysis / Results – “Bill Impact” for Class A

- New Class A consumers would realize cost savings that vary by industry classification.
- As a percentage of costs incurred by Class B customers, savings are expected to range from 10% to 21% in the short term and from 20% to 34% in the longer term.
- Other NAICS (1-2 MW) would experience the smallest savings among the different industry groups, while Manufacturing (2-3 MW) would achieve the largest savings.
- The savings vary due to differences in load shape as well as differences in price elasticity. New Class A manufacturing, with a flat load shape and high elasticity, would realize the largest savings.

Figure A-5: Estimated Class A savings

Data processing, refrigerated warehousing and greenhouses

Source: Navigant

	<i>Mining</i>		<i>Manufacturing</i>		<i>Data processing, refrigerated warehousing and greenhouses</i>				
	21 (1-2 MW)	21 (2-3 MW)	31-33 (1-2 MW)	31-33 (2-3 MW)	51, 11, 49 (1-2 MW)	51, 11, 49 (2-3 MW)	Other NAICS (1-2 MW)	Other NAICS (2-3 MW)	Other NAICS (3-5 MW)
Class B	0%		0%	0%	0%	0%	0%	0%	0%
Class A - Zero Elasticity	-8%		-6%	-9%	-8%	-8%	-1%	-3%	-3%
Class A - Short Term Elasticity	-16%		-19%	-21%	-16%	-16%	-10%	-12%	-12%
Class A - Long Term Elasticity	-24%		-33%	-34%	-24%	-24%	-20%	-21%	-21%

Navigant's Analysis / Results – “Bill Impact” for Class B

- The savings for new Class A consumers would lead to bill increases for remaining Class B consumers.
- The bill increase associated with scenario 3 (0.77%) represents an increase of about \$14/year for a typical residential consumer.

Figure A-6: Bill impact estimates

Elasticity	Scenario	Non-RPP Bill Increase (%)	RPP Bill Increase (%)
Short Term	Scenario 1	0.04%	0.03%
	Scenario 2	0.10%	0.09%
	Scenario 3	0.31%	0.28%
Long Term	Scenario 1	0.06%	0.05%
	Scenario 2	0.16%	0.15%
	Scenario 3	0.54%	0.49%

Source: Navigant

Navigant's Analysis / Results – “Sensitivity Analysis”

Figure A-8: Uptake sensitivity

Uptake	Elasticity	Scenario	Peak Demand Reduction (MW)	Total GA Shifted (\$M)	Class B GA Increase (%)
Low Uptake	Short Term	Scenario 1	3	2	0.03%
		Scenario 2	9	6	0.07%
		Scenario 3	33	19	0.22%
	Long Term	Scenario 1	6	4	0.04%
		Scenario 2	18	10	0.12%
		Scenario 3	65	33	0.39%
Medium Uptake	Short Term	Scenario 1	10	6	0.07%
		Scenario 2	20	15	0.18%
		Scenario 3	80	47	0.56%
	Long Term	Scenario 1	15	9	0.11%
		Scenario 2	45	25	0.29%
		Scenario 3	165	82	0.98%
High Uptake	Short Term	Scenario 1	16	12	0.14%
		Scenario 2	45	30	0.37%
		Scenario 3	163	94	1.15%
	Long Term	Scenario 1	32	19	0.23%
		Scenario 2	90	49	0.60%
		Scenario 3	327	164	2.01%

Source: Navigant

- Navigant has highlighted that the results are sensitive to assumptions about uptake.
- Low (10%) uptake would result in a 65 MW demand reduction under scenario 3, and a ~0.4% Class B GA rate increase.
- High (50%) uptake would produce a 327 MW demand reduction under scenario 3, and a 2% Class B GA rate increase.

Navigant's Analysis / Results – “Sensitivity Analysis” (Cont'd)

Figure A-9a: Demand reduction – sensitivity

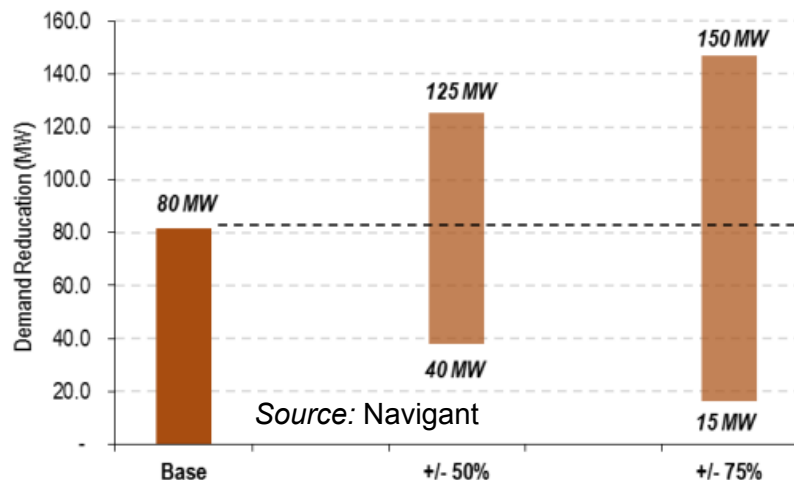
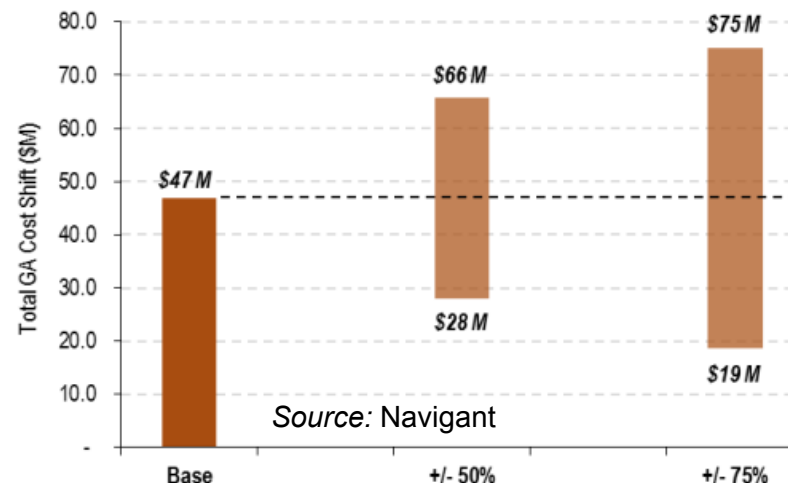


Figure A-9b: Cost shift – sensitivity



- The expected demand reduction and cost shift from an expansion of ICI is highly sensitive to what Navigant terms the “ICI financial incentive”, which is largely a function of the overall size of GA (i.e., about \$10B annually currently).
- A 75% increase in the ICI financial incentive, for example, would increase the demand reduction from 80 MW (base case) to 150 MW. A 75% decrease would drop the demand reduction to just 15 MW.
- Similarly, changes in the ICI financial incentive would have implications for the GA cost shift.