NON-CONFIDENTIAL

Request IR-83:

Reference: 2013 GRA, NSPI Response to Avon IR-5, Attachment 1, page 1.
Please explain the reason for the large increase in the per mWh cost of renewable generation in 2013.

Response IR-83:

The following table details the renewable energy sources and cost per MWh as represented in Avon IR-5. The Port Hawkesbury Biomass project coming into service in 2013 is the main reason for the increase noted for 2013.

$/MWh (weighted average)	2012	2013	Change
Point Tupper Wind	2.25	2.41	0.16
Digby Wind	8.10	8.13	0.04
Nuttby Wind	10.94	11.29	0.35
Port Hawkesbury Biomass	(13.05)	26.05	39.10
Wind Farm #2	-	(7.07)	(7.07)
COMFIT*	-	3.16	3.16
Contracted IPPs**	59.01	49.16	(9.85)
Total	**$67.24**	**$93.13**	**$25.89**

*Community Feed-In Tariff
**Independent Power Producers

NON-CONFIDENTIAL

Request IR-84:

Reference: 2013 GRA, NSPI Response to Avon IR-6, page 1, "For depreciation purposes, NS Power has identified the date that each unit entered into service as follows:" Please indicate the years in which the listed coal units will be fully depreciated.

Response IR-84:

Please refer to AEC IR-40.

Request IR-85:

Reference: Ex. N-6 NSPI Response to Avon IR-6 Attachment 1 – "Power Production Transformation Strategy".

(a) Please describe the purpose of and audience for the "Power Production Transformation Strategy" presentation attached to IR-6.

(b) Is this Attachment the plan requested by the UARB "to minimize the impact of the closure on [NSPI's] customers at page 3?"

(c) Does NSPI intend to prepare a separate document for the closure of Bowater?

(d) If yes, please provide a copy if it is already available or provide the date of its expected completion.

(e) Please explain what is meant by "Meter Large Industrials & Breaker Control" on page 7 of 28.

(f) Please explain what is meant by "Buy Non-Firm Energy or Breaker Industrials" on page 7 of 28.

(g) Does "Interrupt Interruptable (sic) Customers More Often" refer to economic interruptions? If not, please explain what is meant by this phrase on page 7 of 28.

Response IR-85:

(a) The presentation was prepared to provide the summary results of the analysis to evaluate any changes to the generation investment strategy flowing from the 2007 and 2009 Integrated Resource Plans[1] in the event of the loss of major customers. The audience was the NS Power Executive Team.

[1] NSPI Integrated Resource Plan (IRP) Report, NSUARB-NSPI-P-884, July 26, 2007.
NSPI 2009 Integrated Resource Plan Update Final Report, NSUARB-NSPI-P-884, November 30, 2009.

(b) The decision analysis provides some of the fundamental work for the development of the requested plan.

(c-d) The loss of the Bowater Mersey pulp mill was included as part of the completed decision analysis. No separate document will be prepared.

(e) The large industrial interruptible customers provide a portion of the operating reserve necessary for the effective operation of the NS Power bulk power system. If one or both of the largest customers are lost, there may be an opportunity to acquire this from other major customers.

(f) With the loss of the largest customers, operating reserve may be provided by control of the breakers supplying other major customers. Having control of these customers loads, may allow the load to be counted towards operating reserve.

(g) As per response (e) above, this matrix of Strategic Options for Reserve Management lays out possible options for operating reserve. Interrupting other customers would not be for economic reasons, but for bulk power system security and effective operation of the system.

Request IR-86:

Reference: 2013 GRA, NSPI Response to Avon IR-6, Attachment 1, page 8

(a) Please confirm that for each Scenario/Case a "yes" means that the load in the case can be satisfied by the scenario outlined. If this cannot be confirmed, please explain the yes/no/maybe response for each Scenario/Case option in the matrix.

(b) Please describe what is meant by the Case "Loss of BW or NP PM1".

(c) Please provide NSPI's current view as to the future of the Bowater load.

(d) Is NSPI planning for any Bowater load and maintaining options to serve this load? If so, why and what is the basis for maintaining these options?

(e) Does NSPI confirm that it is not planning for any NP load (per the terms of the proposed PWCC Load Retention Tariff). If this cannot be confirmed please explain.

(f) Does NSPI confirm that if it is not planning for any NP or BW load, the only case that is relevant for the evaluation in Attachment 1 is "Loss of NP and BW". If this cannot be confirmed, please explain.

(g) What cells in the Scenario/Case matrix on page 8 are no longer relevant?

Response IR-86:

(a) The purpose of the matrix was to understand which "Strategic Theme" would be analyzed for each scenario of loss of load. This "triage" approach was necessary to manage the number of model runs that would provide the required fuel/purchased power expense. The matrix is not an output table, but rather a planning tool for the analysis.

(b) Loss of BW or NP PM1 refers to the case in which there is no load from Bowater Mersey or Paper Machine No 1 at the New Page Port Hawkesbury Mill. For the purpose of this analysis, both have approximately the same annual energy requirement.

(c) NS Power's current view is that there will be no load from Bowater Mersey in the future.

(d) NS Power will not be planning for any Bowater Mersey load.

(e-f) NS Power is not planning for any load from Paper Machine No.1 at the former New Page Port Hawkesbury Mill. The future of Paper Machine No.2 remains in flux and NS Power continues to understand its options to serve the possible energy requirements. The application assumes no NP load.

(g) The first and third columns remain as considerations. It may be useful to interpolate between results to consider implications with no NP PMI and BW lost.

Request IR-87:

Reference: 2013 GRA, NSPI Response to Avon IR-6 Attachment 1, page 14.

(a) Please indicate the PRB coal delivered cost assumptions in $/mmBtu and/$mt used for this analysis.

(b) Were the higher CO2 emissions from de-rated unit operations using PRB coal taken into account in this analysis?

Response IR-87:

(a) Please refer to SBA IR-47 for fuel pricing assumptions used in the analysis.

(b) Yes, the unit heat rate curves are part of the model used to determine fuel and purchased power expense and emissions.

NON-CONFIDENTIAL

Request IR-88:

Reference: Ex. N-6 NSPI Response to Avon IR-6 Attachment 1, Pages 11-14 (Pdf pages 34-37).

(a) Please provide the P50 annualized capital for Scenarios 1 through 6.

(b) Please confirm that page 14 of 28 reflects the results for Scenarios 2 through 11, relative to the Base Case. If this cannot be confirmed, please explain.

(c) Please provide a copy of Page 14 with the Scenarios identified with the same numbers as shown on Page 11.

(d) Please confirm that NSPI has chosen to follow the path of operating two units on a seasonal basis, with no PRB at the present time assuming no NPPH or BW load (essentially, Scenario 6 on page 11 of 28). If this cannot be confirmed, please explain.

(e) For each case on page 14 of 28, please discuss the relative merits of the option described relative to the path chosen by NSPI. Please also describe why the option was rejected.

(f) Please identify the P50 annual savings for each of Scenarios 6, 7 and 8 and provide the discount rate used to NPV the savings.

(g) Please identify the reduction in revenue requirement attributable to Scenarios 6, 7 and 8 versus Scenario 1 at the P50 level separated into the cost categories shown on page 13 of 28 (OM&G, annualized capital, reserve cost and replacement energy).

(h) Please confirm that the chosen course of action (Scenario 6) has the lowest cost savings of any option for the years 2013 plus 2014. If this cannot be confirmed, please explain.

Response IR-88:

(a) Please refer to Attachment 1.

(b-c) Confirmed and to aid translation of scenarios to table, the scenarios are presented from left to right as: 2, 5, 9, 11, 3, 6, 4, 7, 8, 10.

(d) Please refer to page 16 of 28 of Avon IR-6 Attachment 1 for recommendations from the analysis. These are the near term recommendations pending a broader discussion on the decision to retire a generating unit (Please refer to CA IR-49 and NSURB IR-43).

Included in the recommendations is the investigation of greater use of Powder River Basis (PRB) coal. The current inventory of other coals and the consumption rate provides the remainder of 2012 and 2013 and a portion of 2014 to test, evaluate, engineer and potentially invest in the coal units to maximize the benefit of PRB.

(e) NS Power is not proceeding with Scenario 6. The Company recommends two near term initiatives. One is the engagement of stakeholders on the decision to retire a coal fired generating unit. Please refer to response (d). NS Power also has immediately moved to reduce costs, in a way not to preclude the selection of one of several scenarios, by rapidly moving to seasonal operation of two coal units, reducing staff, and deferring a planned maintenance outage.

(f) The Weighted Average Cost of Capital for NS Power was used as the discount rate at it was assumed to be 7.87 percent.

Please refer to Attachment 2 for the P50 annual savings.

(g) Please refer to Attachment 2.

(h) Please refer to response (e).

Annualized Capital (Thousands of dollars)

Scenario	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1	43,094	42,690	37,301	38,752	32,885	33,543	34,214	34,898	35,596	36,308	37,034	37,775	38,530	39,301	40,087	40,888	41,706	42,540	43,391
2	42,391	40,815	35,350	37,139	31,790	32,426	33,074	33,736	34,411	35,099	35,801	36,517	37,247	37,992	38,752	39,527	40,317	41,124	41,946
3	42,391	40,815	35,350	37,139	31,790	32,426	33,074	33,736	34,411	35,099	35,801	36,517	37,247	37,992	38,752	39,527	40,317	41,124	41,946
4	39,505	40,539	32,600	31,451	25,560	26,071	26,593	27,124	27,667	28,220	28,785	29,360	29,948	30,547	31,157	31,781	32,416	33,065	33,726
5	40,402	39,576	33,775	33,276	27,391	27,939	28,498	29,068	29,649	30,242	30,847	31,464	32,093	32,735	33,390	34,058	34,739	35,434	36,142
6	40,402	39,576	33,775	33,276	27,391	27,939	28,498	29,068	29,649	30,242	30,847	31,464	32,093	32,735	33,390	34,058	34,739	35,434	36,142

	Base Case, P50 (Thousands of dollars)							
Scenario 6								
	Test Years	2013	2014	2015	2016	2017	2020	Average of Test Years
	Fuel Cost	$ (150,582)	$ (151,000)	$ (172,921)	$ (181,284)	$ (180,951)	$ (187,445)	$ (170,697)
	OM&G	$ (4,225)	$ (4,310)	$ (4,396)	$ (4,484)	$ (4,574)	$ (4,854)	$ (4,474)
	Annualized Capital	$ (3,113)	$ (3,526)	$ (5,476)	$ (5,494)	$ (5,604)	$ (5,947)	$ (4,860)
	Reserve	$ 488	$ 520	$ 536	$ 553	$ 592	$ 534	$ 537
	Replacement Energy	$ 195	$ 208	$ 215	$ 221	$ 237	$ 214	$ 215
	Total	$ (157,237)	$ (158,107)	$ (182,042)	$ (190,488)	$ (190,300)	$ (197,497)	$ (179,279)
	NPV	$ (135,130)	$ (125,965)	$ (134,453)	$ (130,426)	$ (120,791)	Total NPV	$ (646,765)

	Base Case, P50 (Thousands of dollars)							
Scenario 7								
	Test Years	2013	2014	2015	2016	2017	2020	Average of Test Years
	Fuel Cost	$ (178,367)	$ (187,276)	$ (212,542)	$ (218,553)	$ (224,326)	$ (232,907)	$ (208,995)
	OM&G	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Annualized Capital	$ 7,000	$ -	$ 3,800	$ (3,800)	$ (3,876)	$ (4,113)	$ (165)
	Reserve	$ 193	$ 203	$ 209	$ 216	$ 230	$ 205	$ 209
	Replacement Energy	$ 386	$ 406	$ 417	$ 433	$ 461	$ 410	$ 419
	Total	$ (157,237)	$ (158,107)	$ (182,042)	$ (190,488)	$ (190,300)	$ (197,497)	$ (179,279)
	NPV	$ (135,130)	$ (125,965)	$ (134,453)	$ (130,426)	$ (120,791)	Total NPV	$ (646,765)

	Base Case, P50 (Thousands of dollars)							
Scenario 8								
	Test Years	2013	2014	2015	2016	2017	2020	Average of Test Years
	Fuel Cost	$ (174,810)	$ (177,642)	$ (199,923)	$ (189,075)	$ (195,140)	$ (201,270)	$ (189,643)
	OM&G	$ (4,225)	$ (4,310)	$ (9,133)	$ (9,316)	$ (9,502)	$ (10,084)	$ (7,762)
	Annualized Capital	$ (1,288)	$ (4,500)	$ (10,300)	$ (6,675)	$ (6,809)	$ (7,225)	$ (6,133)
	Reserve	$ 373	$ 397	$ 1,072	$ 1,146	$ 1,215	$ 1,094	$ 883
	Replacement Energy	$ 373	$ 397	$ 536	$ 573	$ 607	$ 547	$ 506
	Total	$ (157,237)	$ (158,107)	$ (182,042)	$ (190,488)	$ (190,300)	$ (197,497)	$ (179,279)
	NPV	$ (135,130)	$ (125,965)	$ (134,453)	$ (130,426)	$ (120,791)	Total NPV	$ (646,765)

Request IR-89:

Reference: Ex. N-6 NSPI (Avon) Request IR-6 Attachment 1 - Page 16 (Pdf page 39)

(a) Please describe the efforts planned by NSPI related to "investigating opportunities to maximize PRB usage" and the time frame associated with the activities.

(b) Please explain how the savings related to PRB coal arise – is it primarily due to lower fuel cost, transportation cost or other factors?

(c) The cost reductions for Scenarios based on PRB coal appear sizable. Have there been recent changes in coal pricing that makes these cost reductions possible? Please discuss.

Response IR-89:

(a) NS Power has launched a Powder River Basin (PRB) Coal Opportunity Review to develop the preliminary engineering for PRB fuel supply options. This review will include: PRB fuel handling requirements, milling and fuel feed systems modifications, boiler plan, process review, plant performance, environmental, insurance, and the development of a business case. The preliminary engineering phase is to be completed in 2012. If the business plan supported the increased use of PRB, process changes would begin in 2013 and 2014.

(b) Savings related to PRB are primarily due to lower fuel cost.

(c) PRB coal is relatively inexpensive coal to mine on a dollars per tonne basis. However, the coal has a relatively low calorific value and other properties which limit the amount that can be burned without plant design modifications. It has become an option warranting consideration due to the fact that NS Power's operating profile has lowered the requirement to operate units at full load capacity. The distance between the PRB and

Nova Scotia (over 4,000 kilometres) makes the transportation costs significant. With respect to pricing, PRB has been relatively stable. PRB became more of an option when the price of competing coals increased. Most recently, there has been a softening in the price of competing coals, and therefore the competitiveness of PRB coal has declined.

NON-CONFIDENTIAL

Request IR-90:

Reference: Ex. N-6 NSPI Response to Avon IR-6 Attachment 1, Pages 20-22 (Pdf pages 43-51).

(a) Please confirm that Max PRB (Scenario 7) demonstrates the largest NPV savings of all Scenarios (per Page 21) as well as the largest 2016, 2017 and 2020 savings.

(b) How are PRB saving achievable in 2013 or 2014 given the actions necessary, as described on page 27?

Response IR-90:

(a) Yes, though the scenario carries the largest number of uncertainties and the highest risk due to Powder River Basin's (PRB) tendency to spontaneously combust.

(b) In addition to the quantitative analysis, the decision analysis included a qualitative analysis, a portion of which is represented in the strategic theme reviews on pages 23 to 28 of Avon IR-6 Attachment 1. There will be no savings in 2013 due to the need to carry out modifications to plant systems and address inventory levels of other coals. As noted in the response to Avon IR-89(a), NS Power is continuing with the preliminary engineering work to ensure that the risks associated with the use of this product can be managed through system modifications and engineering controls.

NON-CONFIDENTIAL

Request IR-91:

Reference: 2013 GRA, NSPI Response to Avon IR-8 (b): "NS Power has carried out long-term lay-up of oil and coal generating units in the past…"

(a) How were manning issues handled in these instances?

(b) Were any of these layed-up plants ever brought out of lay-up for any reason?

(c) If so, for what reasons?

(d) If so, what problems, if any, were encountered in bringing these units back into service?

Response IR-91:

(a) In the early/mid 1980's, NS Power laid up both the Point Tupper Generating units upon closure of the Atomic Energy Canada Limited (AECL) Heavy Water Plant. Unit 1 was preserved for sale or redevelopment while Unit 2 was preserved in advance of the conversion to coal firing. Temporary staff were severed while permanent staff were retrained and redeployed. In addition, the Glace Bay generating station was closed in the early nineties and not returned to service.

(b-c) Point Tupper Unit 1 was eventually retired. Unit 2 was brought back into service in 1987 as a coal fired unit.

(d) NS Power followed the lay-up plan including regular inspections. There were no unusual problems upon start-up.

NON-CONFIDENTIAL

Request IR-92:

Reference: 2013 GRA, NSPI Response to Avon IR-10, page 2: "NS Power currently purchases firm renewable energy from the Brooklyn cogen plant under a confidential contract."

Please confirm that this contract will be available in NSPI's Confidential Data Room.

Response IR-92:

Confirmed. Please refer to Confidential Attachments 1-3, available for viewing at NS Power's offices.

NON-CONFIDENTIAL

Request IR-93:

Reference: 2013 GRA, NSPI Response to Avon IR-11, page 1 (b): "The capital spend related to renewable generation for the years 2012-2014 included in the Application are as follows:"

Please further break-down and list all projects with capital costs greater than $1 million.

Response IR-93:

Please refer to Attachment 1.

2012

Project Description	**$M**
Dickie Brook - Donahoe Lake Dam Refurbishment	$1.6
Sheet Harbour - Ten Mile Lake Dam Decommissioning	1.0
Annapolis - Sluiceway and Powerhouse Stop Log Refurbishment	1.1
Marshall Falls Hydro Station	2.8
St. Margaret's Bay - Sandy Lake Dam Refurbishment	5.6
St Margaret's Bay - Coon Pond Dam Refurbishment	2.6
St. Margaret's Bay - Tidewater Pipeline Replacement	7.7
St Margarets Bay - Tidewater Surge Tank Refurbishment	1.2
Port Hawkesbury 60 MW Biomass Project	56.0
Amherst 138kV Substation	2.8
Other Investment (Under $1M)	1.8
	$84.3

2013

Project Description	**$M**
Marshall Falls Hydro Station	$0.8
Hydro Tusket Investment	6.5
Hydro Sissiboo Investment	15.8
Other Hydro Investment	3.7
Port Hawkesbury 60 MW Biomass Project	11.6
Other Investment (Under $1M)	0.1
	$38.4

2014

Project Description	**$M**
Wind Investment	$28.2
Marshall Falls Hydro Station	1.2
Other Hydro Investment	14.6
Black River Investment	5.4
Wreck Cove Investment	6.7
	$56.1

REDACTED

Request IR-94:

Reference: 2013 GRA, NSPI Response to Avon IR-13, page 2: "The procurement plan for biomass fuel is under development. The cost estimates for biomass in the 2014 forecast were based on the Port Hawkesbury biomass capital application."

(a) Please provide the documentation and costing data from the Port Hawkesbury biomass capital application on which the 2014 forecast is based, identifying variances.

(b) How will the fuel procurement plan need to be adjusted to take into account the closure of the New Page and Bowater mills?

(c) Please indicate the documentation of biomass fuel procurement which will be available in the NSPI Confidential Data Room.

Response IR-94:

(a) The cost of [redacted] for the "Random Hardwood and off species – Private" was reported in Multeese IR-11 and was used in the calculation of $/MWh reported in CA IR-51 of the Port Hawkesbury Biomass Application.[1]

(b) The procurement plan is currently under development. Adjustments to take into account the closure of the NewPage and Bowater mills will be incorporated in the plan.

(c) Information associated with the procurement plan including bid evaluations, contract details, and Fuel Strategy Table (FST) Record of Approvals, will be made available in the FAM Confidential Data Room upon completion.

[1] NSPI CI 39029 Port Hawkesbury Biomass Project, NSPI(CA) IR-51, NSUARB-NSPI-P-128.10, May 26, 2010.

NON-CONFIDENTIAL

Request IR-95:

Reference: 2013 GRA, NSPI Response to Avon IR-24, page 1.

So far as NSPI is aware, is there any other significant loss of load event in prospect?

Response IR-95:

This information will be available in the load and fuel forecast update at the end of August with data updated as of June 30, 2012.

NON-CONFIDENTIAL

Request IR-96:

Reference: 2013 GRA, NSPI Response to Avon IR-27, page 1 (b).

(a) For the sake of clarity please confirm that the answer refers to the Confidential Data Room.

(b) If so, please indicate the binder number.

Response IR-96:

(a) The answer refers to the Confidential Data Room.

(b) Binders in the Confidential Data Room are labeled and will be numbered when all material is added.

NON-CONFIDENTIAL

Request IR-97:

Reference: 2013 GRA, NSPI Response to Avon IR-28, Attachment 1, page 1.

(a) Has this attachment already been revised for the closure of Bowater?

(b) If so, please provide a copy of such revision.

Response IR-97:

(a) Yes.

(b) Please refer to NSUARB IR-51 Attachment 1.

REDACTED

Request IR-98:

Reference: 2013 GRA, NSPI Response to Avon IR-31, page 1 (a-b).

What types of changes or discussions are included in the generic description "under revision" in the "PPA status" column of the table?

Response IR-98:

The response to this Information Request is confidential.

NON-CONFIDENTIAL

Request IR-99:

Reference: 2013 GRA, NSPI Response to Avon IR-31, Attachment 1, pages 30-75.
Please explain how the Standard Small Generator Interconnection and Operating Agreement (SSGIA) relates to the Standard Generator Interconnection and Operating Agreement, a copy of which is contained in NSPI Responses to Multeese IR-11, Attachment 1, page 1-115.

Response IR-99:

The Standard Small Generator Interconnection and Operating Agreement (SSGIA) is only used for distribution connected generation that is greater than 100 kW and that has generation amounts that do not have a material impact on the operation of the transmission system (that is, generation amounts that are typically less than the minimum substation load - like Commercial Feed-in Tariff (COMFIT) projects).

The Standard Generator Interconnection and Operating Agreement (GIA) is for transmission connected projects and distribution projects that do have a material impact on the operation of the transmission system (that is, the 22MW Bear Head facility falls into this category as it is connected to the distribution system).

Both of these documents are standard form agreements. The customers negotiate changes to the appendices to the agreements, but not the main body of the agreements.

NON-CONFIDENTIAL

Request IR-100:

Reference: NSPI Response to Avon IR-33: "Estimating the total cost for 2013 and 2014 that is directly attributable to backing up the variable nature of the renewable portfolio on the NS power system requires further analysis. An estimate of these costs is not available at this time."

(a) When is the estimate expected to be complete?

(b) Is it compiled in any form? If so, please provide.

(c) Does NSPI intend to include in the analysis the impact on CO2 and SO2 emissions of such back-up operations by the thermal units? Please describe the approach taken by NSPI to estimate or analyze the costs.

Response IR-100:

(a-b) Please refer to PC IR-28 and NSDOE IR-6.

(c) NS Power will include the impact on CO_2 and SO_2 emissions in work undertaken to analyze the impacts of additional renewable generation. For example, the Renewable Energy Integration Study currently in progress will include the impact on CO_2 and SO_2 emissions as more renewable generation is added to the power system.

REDACTED

Request IR-101:

Reference: 2013 GRA, NSPI Response to Avon IR-34, page 1: "Between 2007 and 2014 solid fuel fired generation is expected to decrease by [redacted] percent and over this 8-year period plant OM&G is forecast to increase by [redacted] percent. The combined impact of those changes is an [redacted] percent increase in OM&G expense on a $/MWh basis."

(a) Based on the experience to date with the deterioration of heat rates on some of the solid fuel units, please estimate the increased fuel use as a percent per mWh over the period 2007-2014.

(b) Has NSPI considered the experience of other utilities with the effect of wind integration on their fossil fuel plants which has been available in the published literature for at least 6-7 years?

(c) Much of the unit increase in total OM&G costs (Avon IR-34, Attachment 1, page 1) at Lingan occurs between 2012 and 2013; could you please provide some further explanation of this?

Response IR-101:

(a) The estimated increase over the period 2007-2014 is [redacted]. The deterioration in heat rates is resulting from lower average loads and the loss of interruptible, non-firm load. Please refer to Confidential Attachment 1.

(b) NS Power is working with General Electric (GE) on a Renewable Energy Integration Study. GE brings extensive experience from similar work that they have completed for other utilities in integrating intermittent sources of renewable energy to their power systems.

(c) The change in total Operating, Maintenance and General (OM&G) costs per MWh between 2012 and 2013 relates to the transitioning of the Lingan plant from a base loaded

plant to operating two of its four units on a seasonal basis. The reduction in generation as a percent of total generation is greater than the percent reduction in total costs. This is because the fixed cost portion of Lingan's operating costs will not change with this reduction in generation.

REDACTED

Request IR-102:

Reference: 2013 GRA, NSPI Response to Avon IR-35, page 1 (a).

In considering the lowest cost plan in the 2007 IRP and the 2009 update process, did NSPI take the costs from heat rate deterioration and the higher OM&G costs as disclosed in NSPI Response to Avon IR-34 Attachment 1, page 1 into account in examining the cost of renewables?

Response IR-102:

The 2007 Integrated Resource Plan (IRP) Assumptions[1] and 2009 IRP Update Basic Assumptions,[2] which were developed jointly by NS Power and the Board staff and consultants and vetted by stakeholders, did not include increased heat rate and Operating, Maintenance and General (OM&G) costs associated with integrating renewables.

However, NS Power does include an adder for renewable cost integration. The Avon Group, in its Closing Argument for the Biomass Hearing, commented:

> In response to undertaking U-4, NSPI provided its calculation of a notional comparative [redacted] wind price. NSPI assumed an energy price of [redacted] (2008 $), escalated at an inflation rate of 1.92 until installed in 2013 and then, a backup adder of [redacted] inflated for currency exchange was added. The wind adder was calculated with reference to the capital cost for a new gas-fired combustion turbine, stated to be necessary to back up the variable wind.
>
> 30. While NSPI did not accept the New Brunswick adder of $0.50 (Undertaking U-6), nonetheless, clearly, the appropriateness and necessity of that $11 wind adder is suspect. Firstly, in the opinion of Mr. Chernick, the existing system should be able to handle additional wind energy sufficient to meet the 2013

[1] NSPI Integrated Resource Plan (IRP) Report, NSUARB-NSPI-P-884, July 26, 2007.
[2] NSPI 2009 Integrated Resource Plan Update Final Report, NSUARB-NSPI-P-884, November 30, 2009.

> requirements. Secondly, even if backup is required, NSPI's assumption that it required [redacted] of peaking capacity to back up 1 MW of wind is flawed. He explained that the Hatch study indicated that NSPI required in the range of [redacted] of peaking capacity (or some kind of load following capacity) to back up 1 MW of wind. This significantly changes the economics of wind as the comparator would be closer to the base cost of [redacted].[3]

The Renewable Integration Study will be an important step towards defining the costs of renewable energy.

[3] Port Hawkesbury Biomass Application, Avon Closing Submission, NSUARB-NSPI-P-128.10, September 20, 2010, page 5.

NON-CONFIDENTIAL

Request IR-103:

Reference: 2013 GRA, NSPI Response to Avon IR-36, page 1: "Fuel handling contracted out".

Please provide further details, including copies of the relevant contracts.

Response IR-103:

NS Power anticipates that fuel handling costs will be contracted out. However, at the present time there are no contracts for the fuel handling costs for the Port Hawkesbury biomass facility.

NON-CONFIDENTIAL

Request IR-104:

Reference: 2013 GRA, NSPI Response to Avon IR-39, page 1: "This use of hydro to follow generation may occur at non-peak periods and as a result, this limited resource will be less available during peak periods and its value will fall closer to the average marginal cost. This will increase fuel expense."
Could you please approximate the magnitude of this as a percent of total fuel expenses and provide a sample calculation?

Response IR-104:

Studies to quantify the impact of variable energy on the optimal utilization of hydro resources were not performed as part of this Application.

REDACTED

Request IR-105:

Reference: 2013 GRA, NSPI Response to Avon IR-46, page 1: "The fuel price from the capital filing of [redacted] MT for harvested biomass is multiplied by the estimated tonnes of biomass required for nine months of generation in 2013 of [redacted] MT, giving fuel costs of [redacted] million."

Please indicate the assumption about the MMBtu per tonne of biomass which underlies this calculation.

Response IR-105:

The heating value in used in the calculation is [redacted].

Request IR-106:

Reference: Ex. N-6 NSPI Response to Avon IR-62(b) (Pdf page 1587).

(a) Is the NSPI distribution system largely composed of radial distribution feeders? Please describe the nature of the NSPI distribution system.

(b) Has NSPI contemplated utilizing the connectivity in the GIS distribution model to allocate costs of distribution assets to customers utilizing the specific assets, for example, allocating costs of a feeder to all customers on that feeder? If so, please discuss any examination of this approach undertaken to date. If not, why not?

Response IR-106:

(a) Yes. The NS Power distribution system is a mostly overhead, radial system operated at three primary phase-to-phase voltages (25 kV, 12 kV and 4 kV) and covers approximately 26,000 km of line.

(b) NS Power has not contemplated utilizing the connectivity in the Geographic Information System (GIS) distribution model to allocate costs of distribution assets to customers. In our view, in absence of a distinct feeder-based rate classification system, the suggested change in allocation of distribution asset costs would lead to negligible differences in rate class costs. The complexity of cost allocation calculations would increase significantly if the current method of allocating aggregated distribution cost categories among rate classes, based on their non-coincident peak demands, were to be replicated for a few hundred feeder systems.[1] The complexity of the exercise would be compounded by the lack of load data for many feeder circuits, which are not individually metered, and also

[1]Please refer to Avon IR-109 for how class system peak demands are determined. The same process, based on stratified random class samples, would have to be developed and applied for individual feeder circuits or their aggregate constructs.

by the fact that circuits are not operated in a static configuration, as many feeders are subject to frequent operation switching adjustments.

With distribution asset-related costs accounting for from 10 to 15 percent of the total cost of service, the feeder-based rate class system is likely to produce nominal bundled rate differentials. The benefits of increased cost accuracy, and therefore fairness, of such a rate system would have to be weighed against the complexity of setting and administering feeder-based bundled rates.

There would also be implications for the "postage stamp" based rate concept upon which the current ratemaking methodology is based. The proposed approach would lead to rate variation with the density of customer attachments on individual feeders and thus it would create rate differentials among various subgroups of services, such as urban versus rural or underground versus overhead lines.

REDACTED

Request IR-107:

Reference: 2013 GRA, NSPI Response to Avon IR-80, page 1, (a) (ii): "SSY was approached to supply indicative 2013 and 2014 CSL rates for estimation purposes only." Please provide the indicative rates furnished by SSY and the parameters of NSPI's request to SSY.

Response IR-107:

NS Power's request to Spence and Young (SSY) was for self unloader rates into International Pier (INP) Sydney for the transport of annual volumes of [redacted], assuming harbour draft of 49 feet. Based on the forecast analysis for 2013, NS Power used the SSY estimate corresponding to volumes below 900,000 MT, which was [redacted]. For Point Tupper Marine Terminal (PTMT), NS Power used the bulker rates supplied by SSY [redacted]. For 2014, NS Power's request to SSY was for self unloader rates into INP for the transport of [redacted] assuming harbour draft of 49 feet and bulker rates to PTMT. The rates supplied by SSY that were used in the 2014 forecast were as follows:

2014 INP:

- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]

REDACTED

2014 PTMT:

- [redacted]
- [redacted]
- [redacted]

NON-CONFIDENTIAL

Request IR-108:

Reference: Ex. N-15 NSPI Response to Multeese IR-39 lines 15-16 (Pdf page 183).
Please explain why NSPI's approach to classifying generation investments made for environmental purposes as energy-related only is relevant for the Biomass plant. In the response please address how the Point Tupper Biomass plant is similar to and how it differs from other NSPI generation facilities.

Response IR-108:

The Port Hawkesbury Biomass project is being constructed to comply with Renewable Energy Standard requirements.

The Board's 1995 Decision states:

> The Board is of the opinion that classification of the cost of service should reflect to some extent the intent of the asset and therefore fixed costs will have both energy and demand related portions. The Board directs: (i) all generation costs associated with environmental compliance and fuel conversion are to be classified as energy related;[1]

As the Board directed NS Power to classify environmental projects as energy and the Biomass Facility was approved to fulfil the Company's renewable energy requirements, this rate base item was deemed to fall under the energy-related category.

The Biomass Facility is similar to other generation projects that are justified in the ACE Plan for an environmental purpose and hence classified as energy-related.

[1] NSPI 1995 In the Matter of a Generic Hearing respecting Cost of Service and Rate Design, UARB Decision, NSUARB-NSPI-P-864, September 22, 1995, Page 23 of 24.

Request IR-109:

Reference: Ex. N-15 NSPI Response to Multeese IR-42 lines 15-19 (Pdf page 186).

(a) Please explain how NSPI captures the data and calculates class demand at the hour of system peak. What confidence interval would NSPI assign to the class demand at the hour of system peak?

(b) Does NSPI really believe that the Small General Service rate class peak shifted to the extent depicted in the figure on pdf page 187? What other factors could account for the change?

(c) Please provide figures similar to that on pdf page 187 for each rate class.

Response IR-109:

(a) NS Power's techniques, employed in determination of individual class demands at the time of system peaks, fall into two distinct categories.

For large customer classes, that is, classes comprised of a relatively few customers whose non-coincident peak demands exceed a 2,000 kVA threshold, NS Power keeps track of 15 minute consumption records by customer. The hourly system peak demands of these classes are determined by simply aggregating individual customer metering records.

The process of coincident system peak determination for small customer classes, which have far more numerous customer populations, the majority of which are on simple energy or energy and demand meters, is more complex. NS Power is employing a statistical approach in this case. NS Power maintains stratified random class samples of customers who are placed under high data frequency meters. The meters collect average energy consumption over 15 minute intervals. This interval data is averaged by stratum, and then a weighted sum of the strata data is used to create the class load profile. For the purpose of these peak calculations, the data is further aggregated to the hourly level.

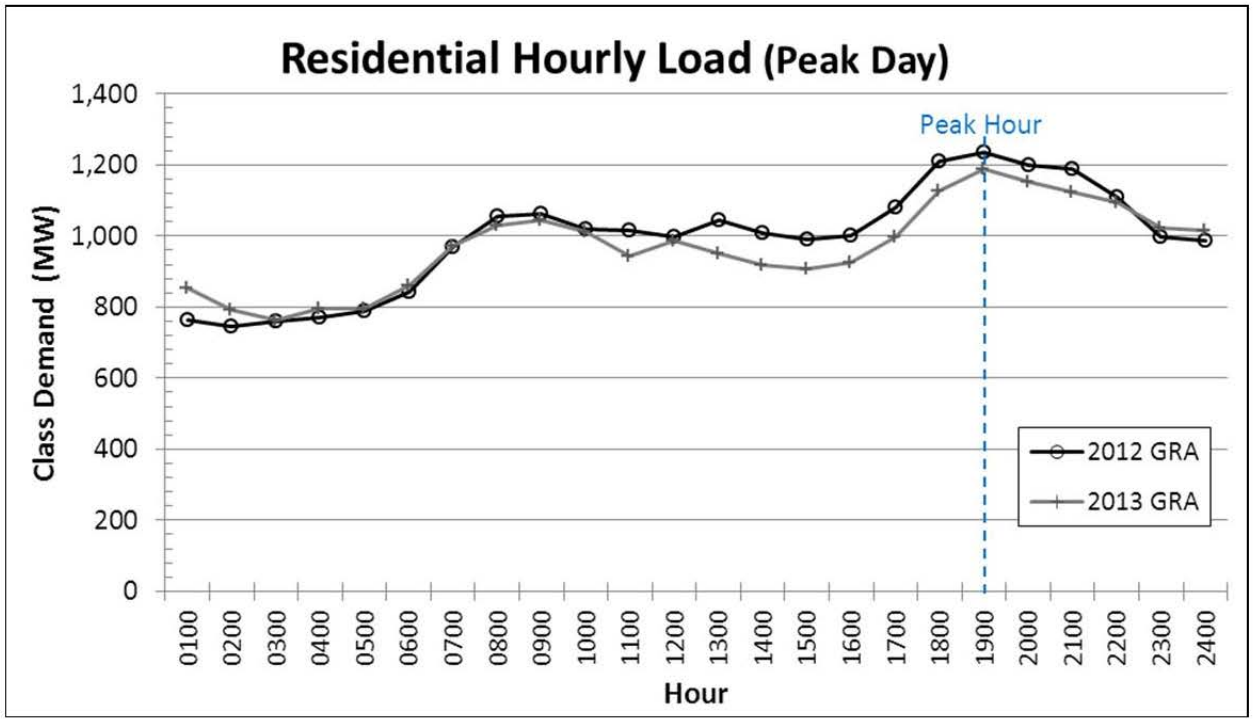
These curves, representing an average customer in each class, are then scaled to the annual class energy consumption. The hourly class curves are then aligned with the hourly system load curve from the Supervisory Control and Data Acquisition (SCADA) system so that their contribution to the system load can be calculated for each hour of the year. Once the load and class curves are reconciled for the historic base year, they are then scaled to forecast levels.

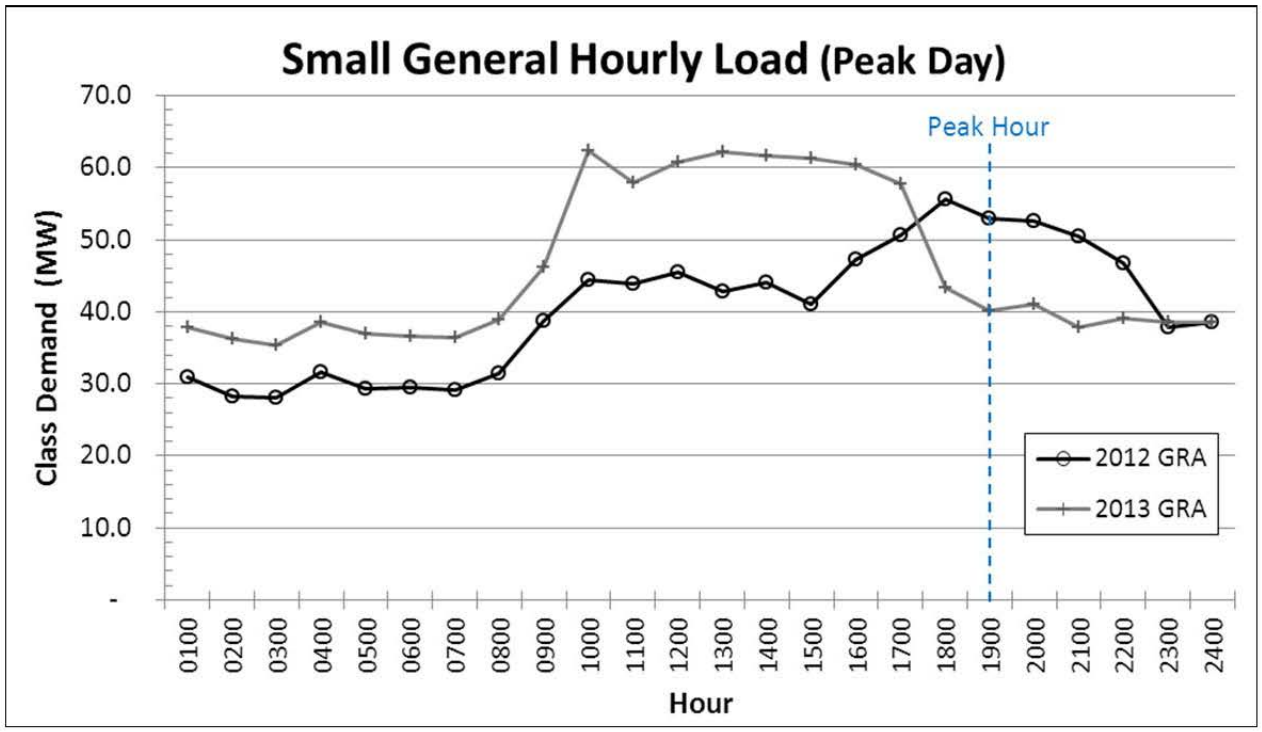
The load research sample was designed to provide a 90/10 confidence or precision level. This means that 90 percent of the time, the precision of the results is within ±10 percent of actual.

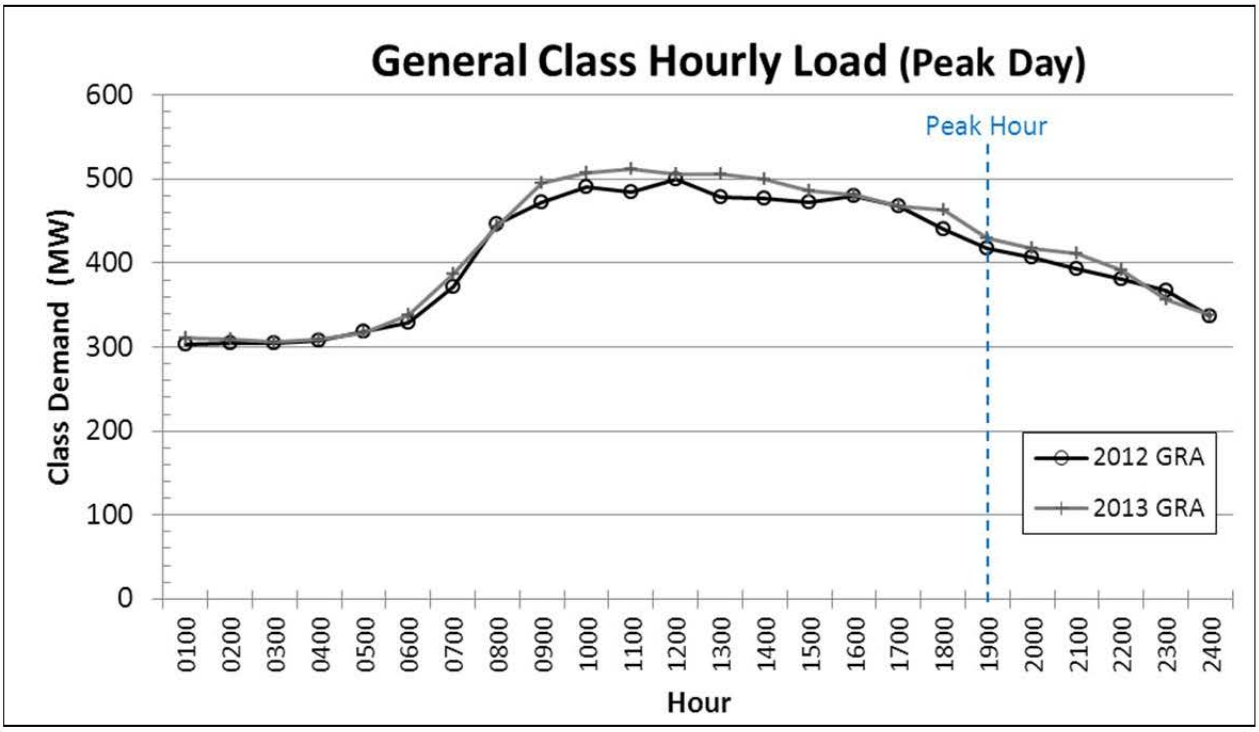
(b) Customer behaviour and energy consumption is influenced by a broad array of factors. The sample class curve methodology is currently the best available approach to estimating class contribution to the hourly system peak. Because of the potential to have unusual customer behaviour on the one annual peak day, NS Power uses the 3CP method of averaging of the three winter peak days for the month of January, February and December. This averaging of the three coincident peaks tends to smooth out unusual patterns.

The class contribution to system peak can change from year to year for a wide variety of reasons. The effects of peak day weather influence classes differently and to different extents. The system peak may also occur on a different month of the year, day of the week and hour of the day from one year to the next. Economic conditions and conservation plans also change customer behaviour.

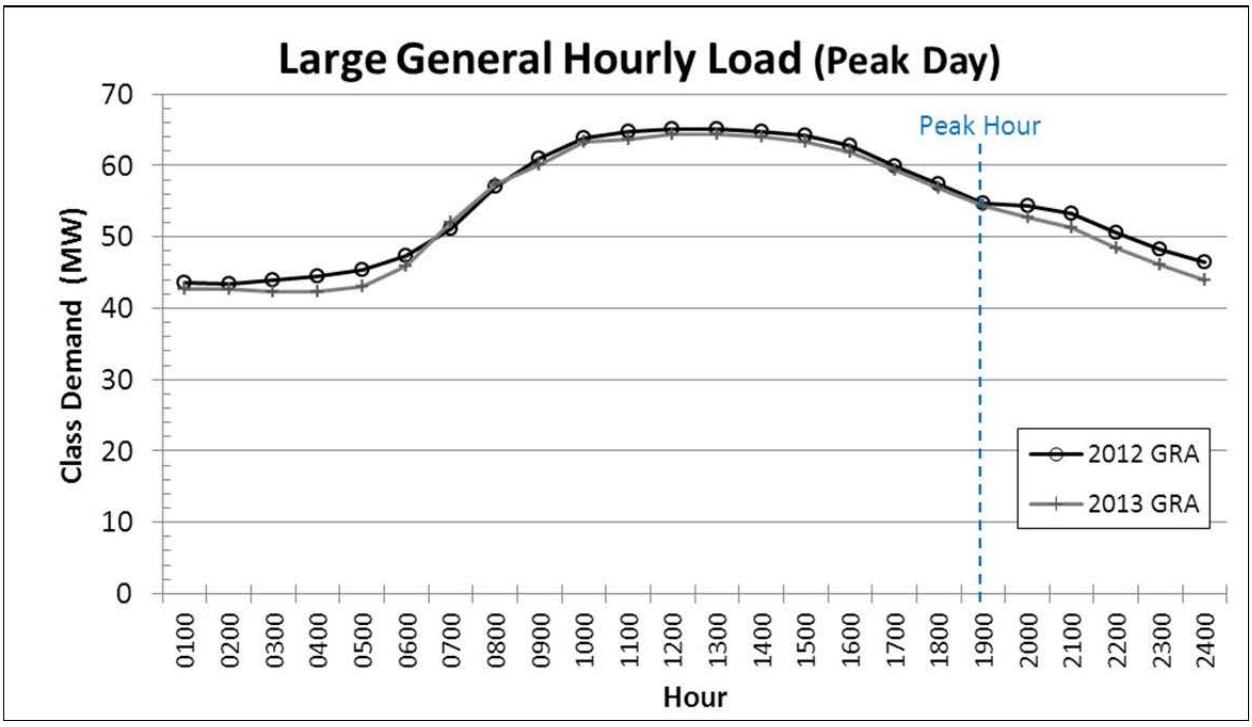
(c) The following figures depict the rate class hourly loads on the forecast peak day from the current and previous filings.


Residential Hourly Load (Peak Day)
Class Demand (MW)
1,400
1,200
1,000
800
600
400
200
0
Peak Hour
2012 GRA
2013 GRA
0100
0200
0300
0400
0500
0600
0700
0800
0900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400
Hour

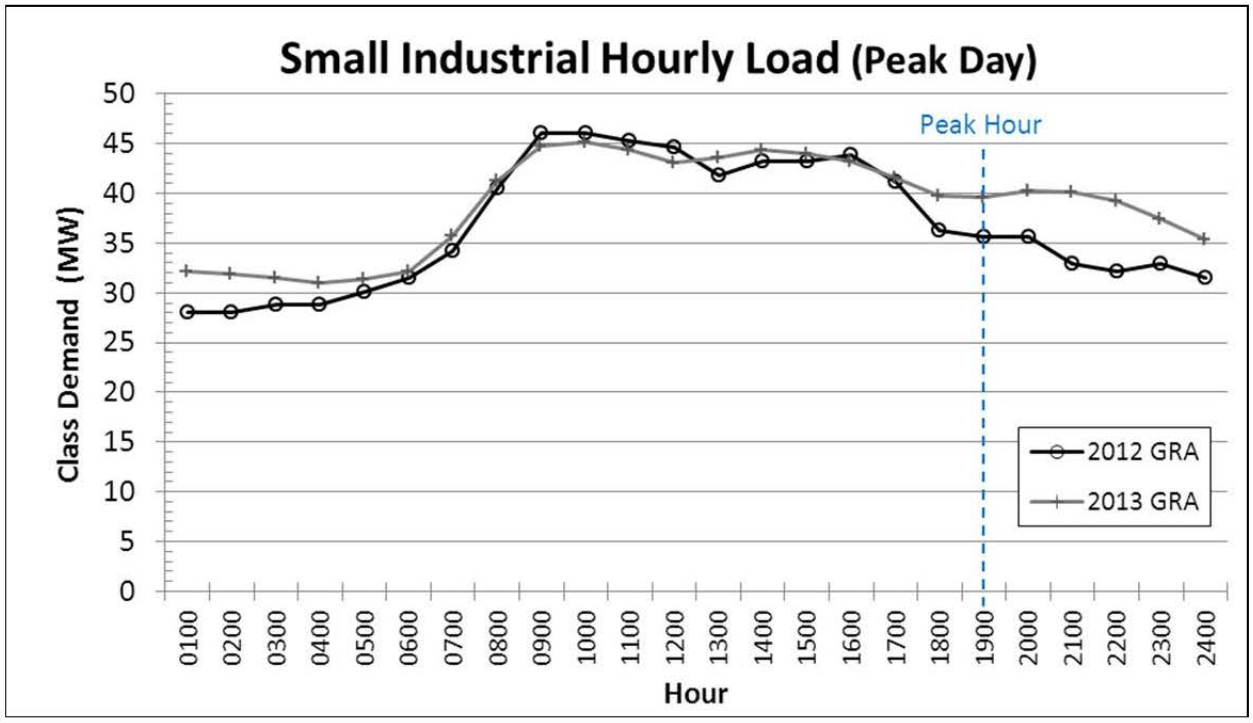

Small General Hourly Load (Peak Day)
Class Demand (MW)
70.0
60.0
50.0
40.0
30.0
20.0
10.0
-
Peak Hour
2012 GRA
2013 GRA
0100
0200
0300
0400
0500
0600
0700
0800
0900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400
Hour


General Class Hourly Load (Peak Day)
Peak Hour
Class Demand (MW)
600
500
400
300
200
100
0
0100
0200
0300
0400
0500
0600
0700
0800
0900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400
Hour
2012 GRA
2013 GRA

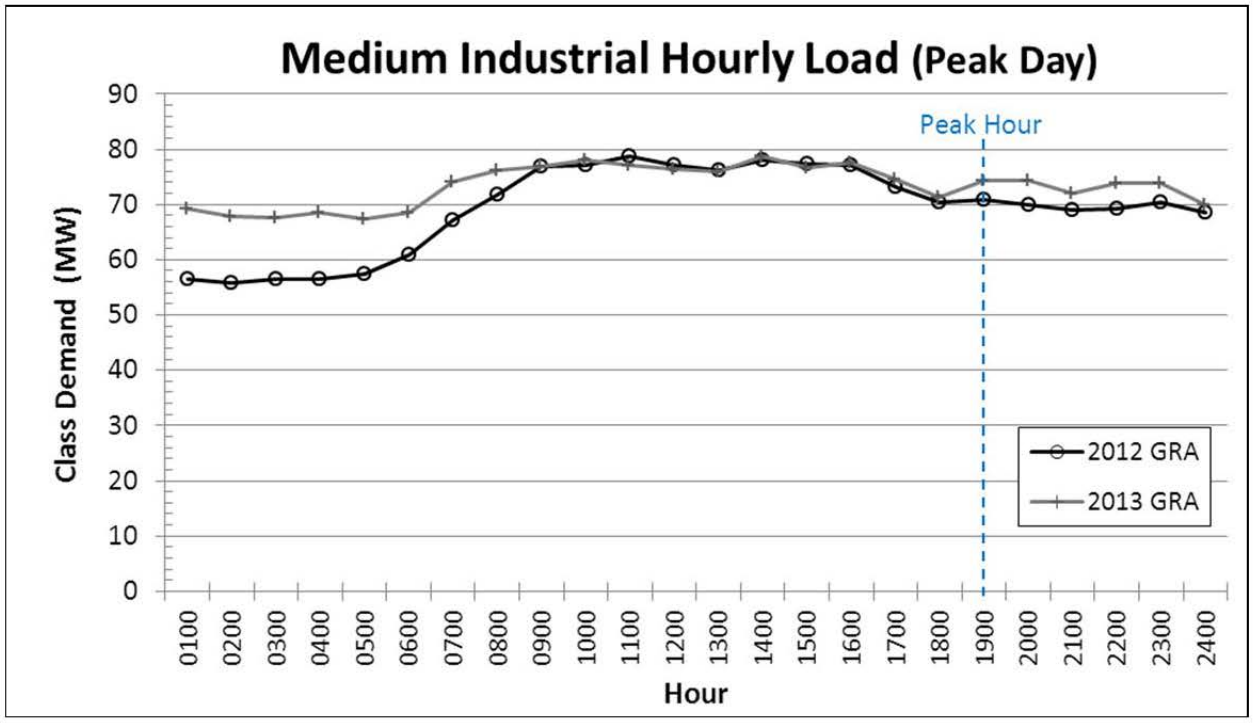
1


Large General Hourly Load (Peak Day)
Peak Hour
Class Demand (MW)
70
60
50
40
30
20
10
0
0100
0200
0300
0400
0500
0600
0700
0800
0900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400
Hour
2012 GRA
2013 GRA

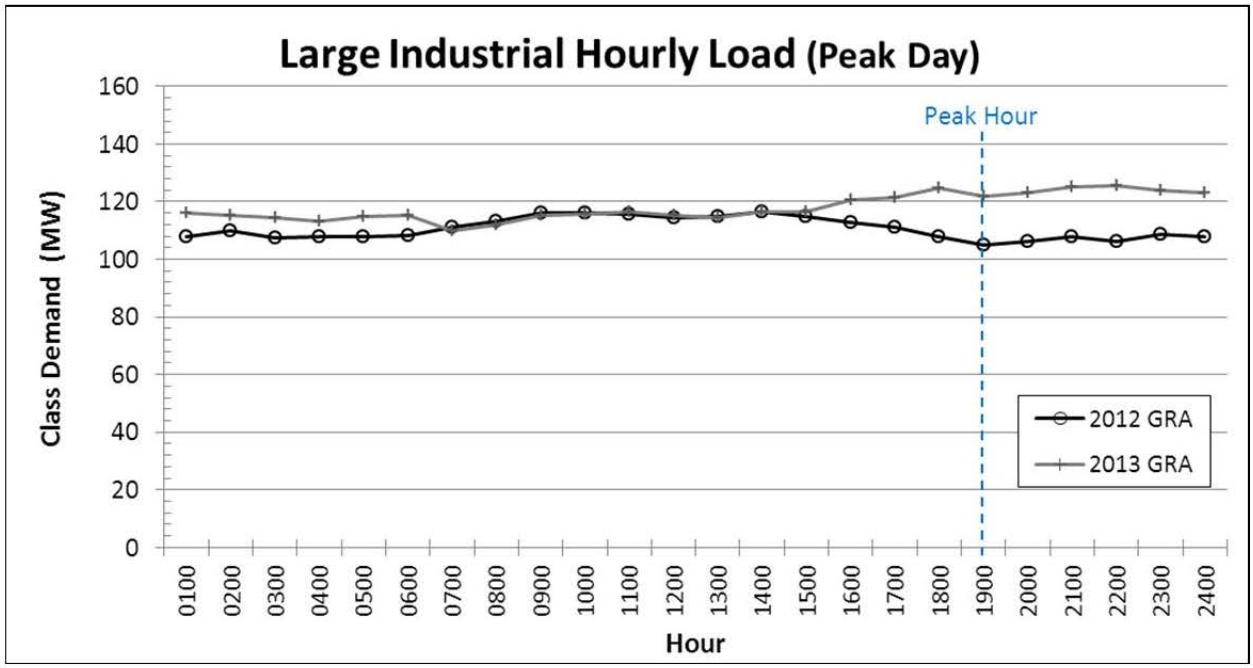
2


Small Industrial Hourly Load (Peak Day)
Class Demand (MW)
Hour
Peak Hour
2012 GRA
2013 GRA
0 5 10 15 20 25 30 35 40 45 50
0100 0200 0300 0400 0500 0600 0700 0800 0900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400

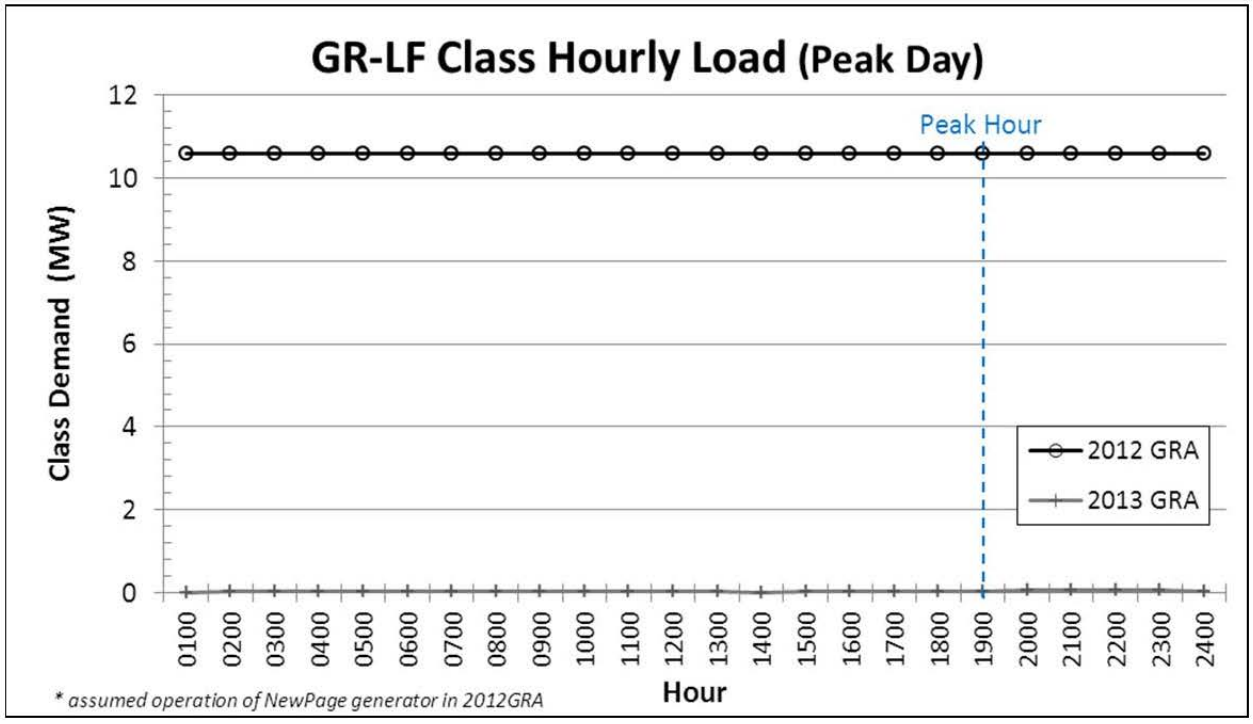
1


Medium Industrial Hourly Load (Peak Day)
Class Demand (MW)
Hour
Peak Hour
2012 GRA
2013 GRA
0 10 20 30 40 50 60 70 80 90
0100 0200 0300 0400 0500 0600 0700 0800 0900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400

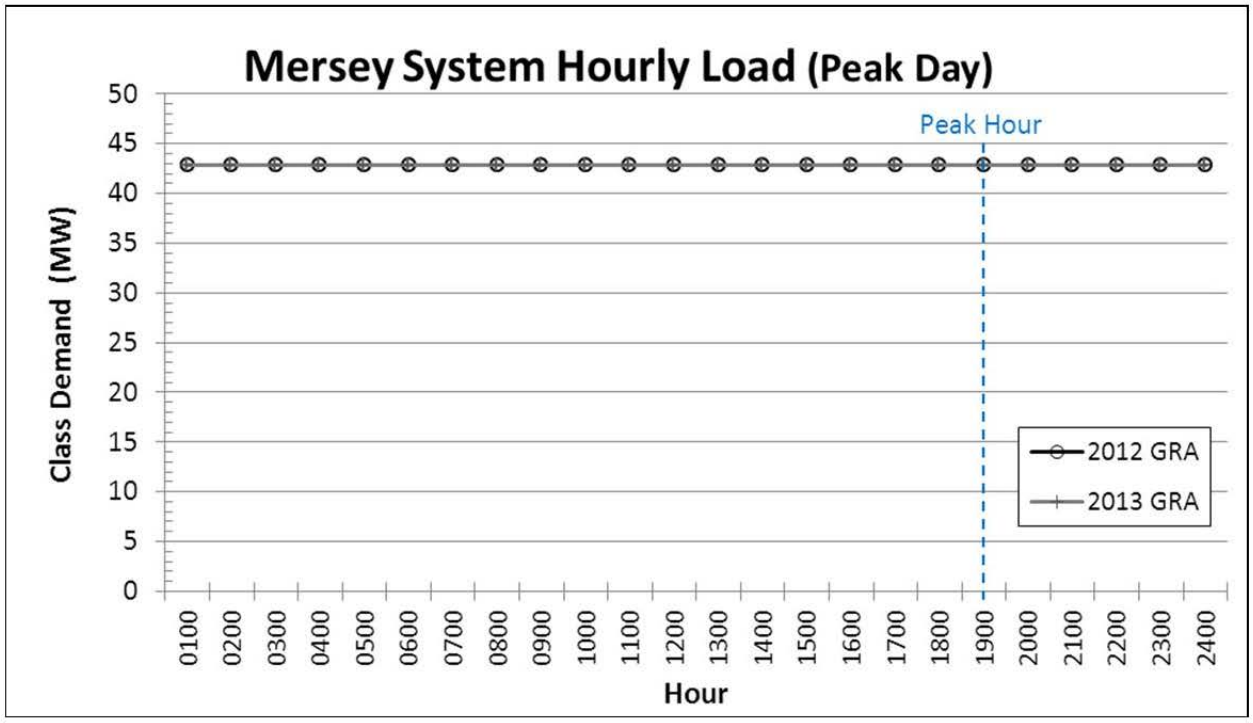
2


Large Industrial Hourly Load (Peak Day)
Class Demand (MW)
160
140
120
100
80
60
40
20
0
Peak Hour
2012 GRA
2013 GRA
0100
0200
0300
0400
0500
0600
0700
0800
0900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400
Hour

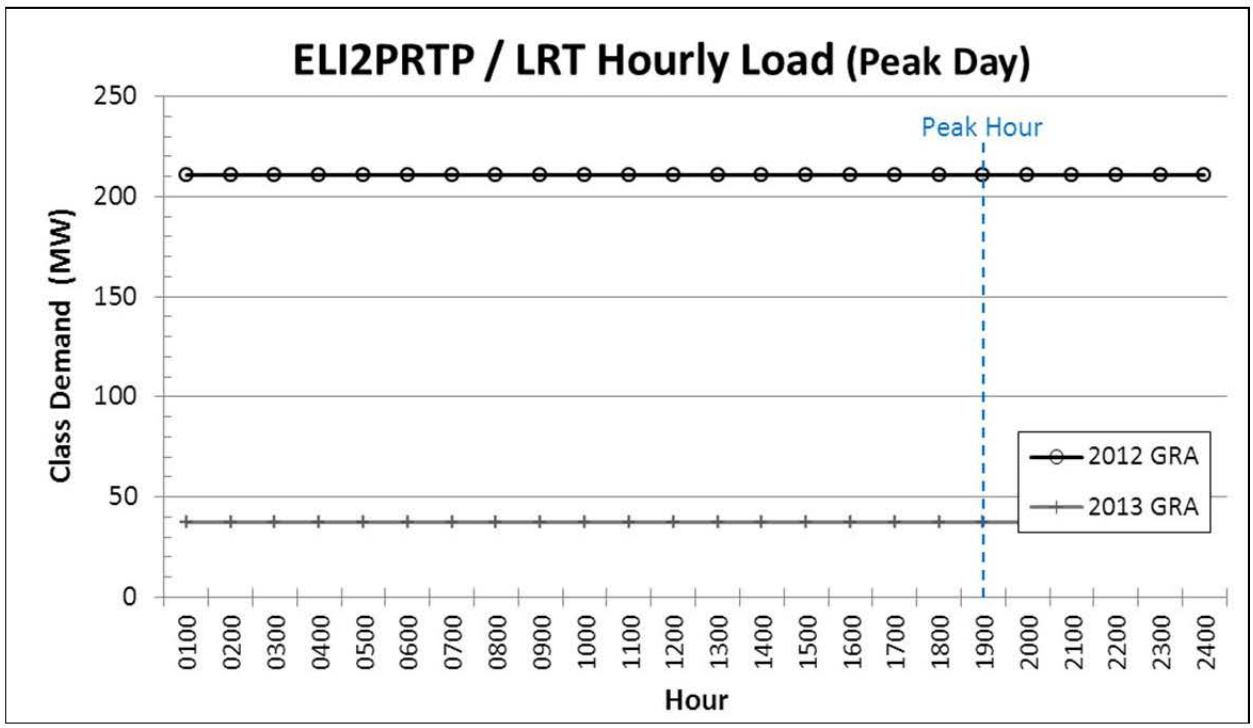
1


GR-LF Class Hourly Load (Peak Day)
Class Demand (MW)
12
10
8
6
4
2
0
Peak Hour
2012 GRA
2013 GRA
0100
0200
0300
0400
0500
0600
0700
0800
0900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400
Hour
* assumed operation of NewPage generator in 2012GRA

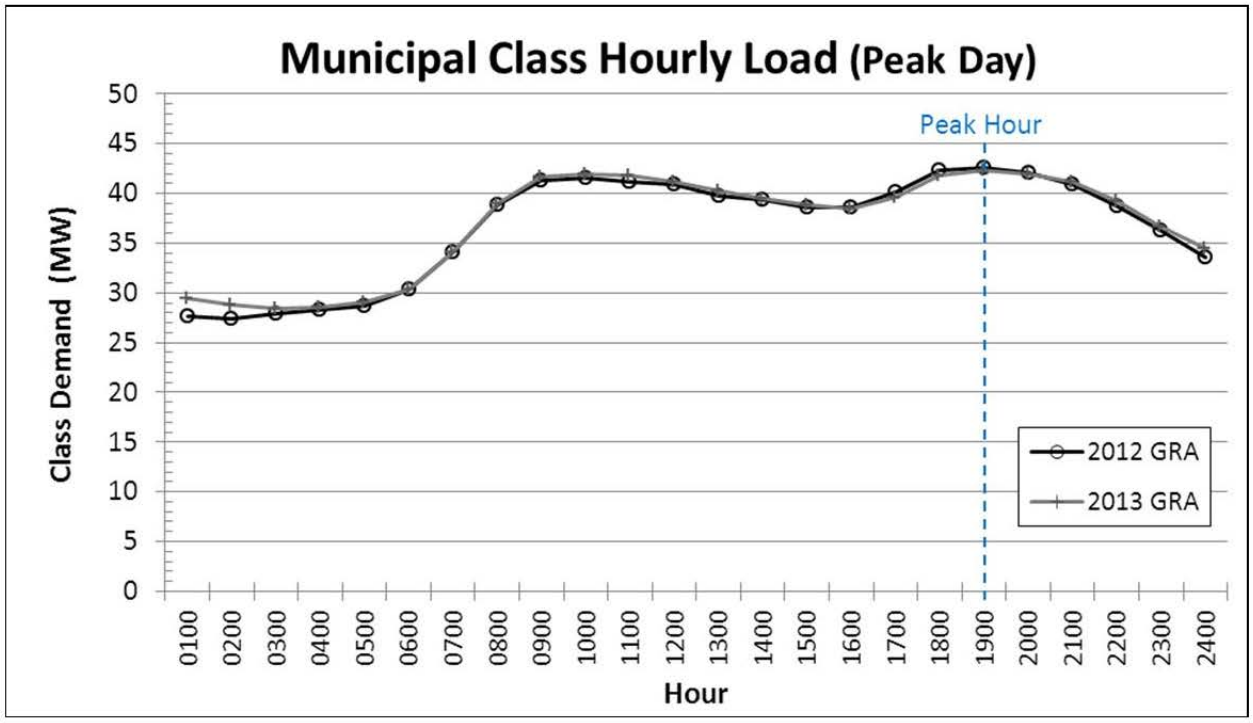
2
3


Mersey System Hourly Load (Peak Day)
Peak Hour
Class Demand (MW)
Hour
2012 GRA
2013 GRA
0
5
10
15
20
25
30
35
40
45
50
0100
0200
0300
0400
0500
0600
0700
0800
0900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400

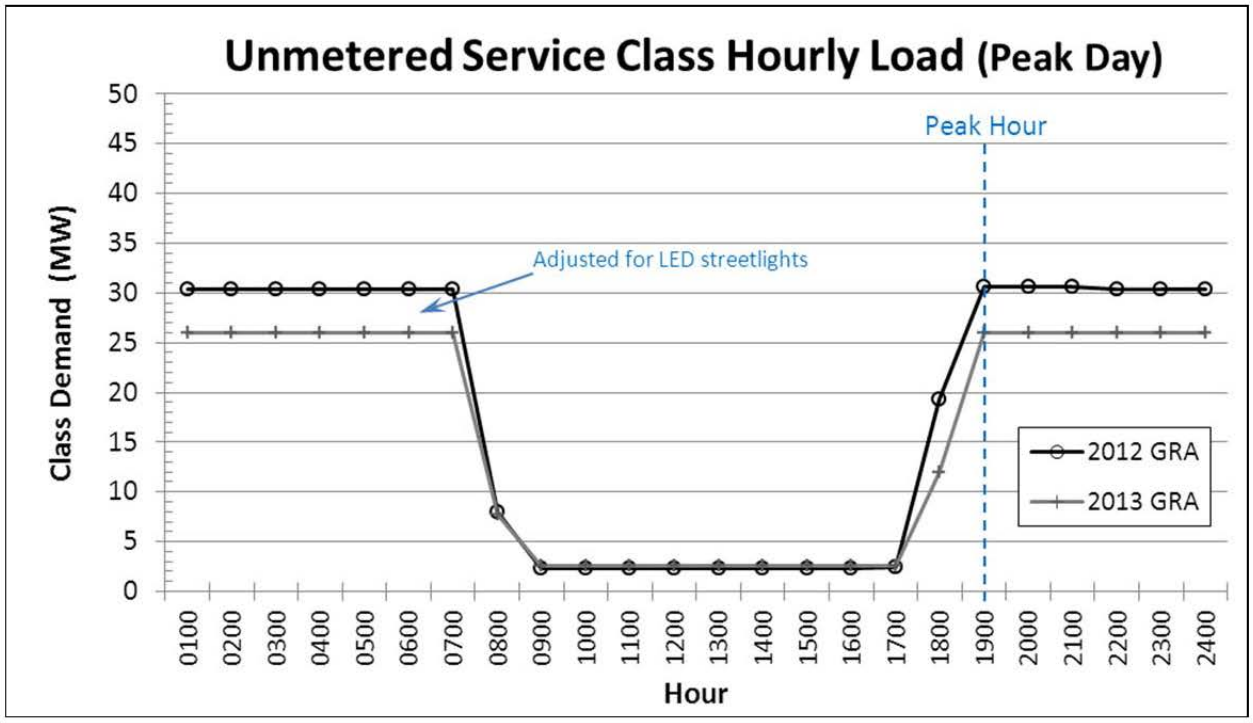
1


ELI2PRTP / LRT Hourly Load (Peak Day)
Peak Hour
Class Demand (MW)
Hour
2012 GRA
2013 GRA
0
50
100
150
200
250
0100
0200
0300
0400
0500
0600
0700
0800
0900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400

2
3


Municipal Class Hourly Load (Peak Day)
Class Demand (MW)
Hour
Peak Hour
2012 GRA
2013 GRA
0
5
10
15
20
25
30
35
40
45
50
0100
0200
0300
0400
0500
0600
0700
0800
0900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400

1


Unmetered Service Class Hourly Load (Peak Day)
Class Demand (MW)
Hour
Peak Hour
Adjusted for LED streetlights
2012 GRA
2013 GRA
0
5
10
15
20
25
30
35
40
45
50
0100
0200
0300
0400
0500
0600
0700
0800
0900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400

2

NON-CONFIDENTIAL

Request IR-110:

Reference: 2013 GRA, NSPI Responses to Multeese IR-52 Attachment 1 page 12 and Attachment 2 page 12 appear to show that OM&G costs forecast for 2013 and 2014 on a $/mWh basis are higher for the three renewable technologies—wind, hydro and biomass—than for the thermal generation

(a) Please indicate if this is, in fact, the case?

(b) If so, please, explain why.

Response IR-110:

(a) Confirmed.

(b) NS Power's thermal units produce significantly larger output than the average renewable unit and as the scale of output is increased there are factors which cause the average cost per unit to decrease.

Another influence on the cost per unit of some renewable technologies is the intermittent nature of generation. For example, whether the wind blows or not, there are operating costs incurred. The lower the availability of wind, the higher the average cost per unit becomes.

REDACTED

Request IR-111:

Reference: 2013 GRA, NSPI Response to Liberty IR-1 page 1: "First, freight rates for transportation within the Great Lakes were reduced through negotiation for the 2012-2014 seasons. Secondly, the completion of Sydney harbour dredging in 2012 is expected to further reduce freight rates."

(a) Please provide all documents relating to the Great Lakes freight renegotiation.

(b) In regard to this renegotiation, please, indicate the amount on a $/MT basis that the freight rates for 2012 to 2014 were reduced.

(c) Please, provide details of the Sydney harbour dredging and how it affects the use of NSPI's unloading facilities (including a map of the harbour).

(d) Please, indicate the magnitude of the expected rate reduction as a consequence of the harbour dredging.

Response IR-111:

(a) Please refer to Confidential Attachment 1 and Confidential Attachment 2.

(b) The initial bids submitted by [redacted]. The subsequent negotiation resulted in [redacted]. The overall cost for transport within the Great Lakes is reduced by [redacted].

(c) The dredging will result in a draft increase [redacted]. Please refer to Liberty IR-79 for further details. A map of the harbour will be available in the FAM Confidential Data Room.

(d) Please refer to Confidential Attachment 3 which shows rate reduction estimates supplied by Spence and Young (SSY) as a result of this increase in draft.

REDACTED

Request IR-112:

Reference: 2013 GRA, NSPI Response to Liberty IR-3, Attachment 1, pages 1 and 2.
Please explain why the solid fuel inventory at [redacted] is so much larger [redacted] than solid fuel inventories at [redacted]

Response IR-112:

In both 2013 and 2014, total consumption and total delivery are similar. This reflects the ongoing efforts to reduce costs by importing and consuming lower cost, higher sulphur coals as well as lower cost natural gas, rather than depleting inventory. On average for 2014, total consumption and total delivery are approximately the same at [redacted], resulting in a net effect on inventory of near zero for the year. 2013 is similar, however, consumption exceeds delivery by [redacted], which has a lowering effect on overall inventory in this area in 2013. Further, the starting inventory between [redacted] at the beginning of 2013 is higher at [redacted] by approximately [redacted]. These two effects result in the difference between inventories [redacted], and this difference is carried through 2014 due to the similarity between delivery and consumption.

NON-CONFIDENTIAL

Request IR-113:

Reference: 2013 GRA, NSPI Response to Liberty IR-12: "On May 31, 2012 NS Power approached the market place requesting proposals for the supply of both low-Btu and high-Btu low sulphur coal."

Please indicate when you expect the documents relating to this tender to be available in NSPI's Confidential Data Room and provide the Binder number.

Response IR-113:

The documents relating to the tender will be available in the Confidential FAM Data Room when the tendering process is complete.

NON-CONFIDENTIAL

Request IR-114:

Reference: 2013 GRA, NSPI Response to Liberty IR-12: "Solid fuel transportation Requests for Proposals are in the planning stage for both the unloading and land transportation services at the International Pier…"
Please provide a narrative outline of the various alternatives for which NSPI expects to issue an unloading and land transportation RFP.

Response IR-114:

A Request for Expressions of Interest (RFEI) was issued by NS Power to:

- Assist communicating the opportunity to participate in the Request for Proposal (RFP) process to all potential industry participants and to

- Confirm which industry participants want to receive an RFP package.

The RFP will ask for proposals to unload, store, and deliver fuel from the International Pier to Lingan and Point Aconi Generating Stations, using rail cars for the delivery to Lingan and using trucks for delivery to Point Aconi. NS Power will follow a structured decision making process which is referred to as Decision Analysis (DA).

NON-CONFIDENTIAL

Request IR-115:

Reference: 2013 GRA, NSPI Responses to Liberty IR-28 a).
Please indicate whether the Shared Service Agreement and Transition Agreement referenced will be available in the Confidential Data Room and provide the Binder number.

Response IR-115:

For the Shared Services Agreement, please refer to Confidential Attachment 1, available for viewing at NS Power's offices. The Transition Agreement is still under negotiation. It will be available in the Confidential Data Room (Confidential Attachment 2) once these negotiations are complete.

NON-CONFIDENTIAL

Request IR-116:

Reference: 2013 GRA, NSPI Response to Liberty IR-36(a): "From the Fuels Department model, the forecast for coal use in 2014, 2015 and 2016 is 53 percent, 44 percent and 42 percent respectively."

(a) Please identify which coal units will be mothballed in each of 2014, 2015 and 2016 as a consequence of the lower coal utilization.

(b) If no units will be mothballed, please, provide a detailed economic justification for continuing to operate all coal units.

Response IR-116:

(a-b) Please refer to Avon IR-6, Attachment 1, Multeese IR-7 and Multeese IR-62. The potential exists to retire a unit in 2015 depending on a number of factors including the contribution of wind energy to firm capacity and the calculation of reserve margins.

NON-CONFIDENTIAL

Request IR-117:

Reference: 2013 GRA, NSPI Response to Liberty IR-79 page 1: "NS Power participated in the Sydney Marine Group. Through the work of the group a number of benefits were identified that would arise from the dredging of Sydney Harbour."

(a) Please indicate using a map or drawing how the dredging will relate to the International Pier.

(b) Please indicate whether CSL has or whether there are in Atlantic service any geared capesize vessels

(c) Are onshore facilities at International Pier capable of handling capesize vessels?

Response IR-117:

(a) This is information will be available in the Confidential FAM Data Room.

(b) There are no geared Capesize vessels in Atlantic service.

(c) The International Pier is not designed to handle Capesize vessels.

REDACTED

Request IR-118:

Reference: 2013 GRA, NSPI Response to Liberty IR-79, Confidential Attachment 1.

(a) Please indicate the source for this table.

(b) Please explain the selection for the two drafts of [redacted] and [redacted] used in this table.

(c) The discussion of the dredging refers to 17 meters (approximately 56 feet); why is that not used in this table? Is there another NPV analysis?

Response IR-118:

(a) The information in the table was assembled by NS Power.

(b) The header labelled [redacted]. The current harbour limit is 38 feet. The harbour is being dredged to 56 feet. As a result, the new limiting factor will be [redacted]. The 49 feet allows for a fully loaded Panamax vessel which is the size vessel we use for cargoes other than those originating in the Great Lakes.

(c) Please refer to response (b) and NSUARB IR-44 Attachment 1.

NON-CONFIDENTIAL

Request IR-119:

Reference: 2013 GRA, NSPI Response to Larkin IR-10, Partially Confidential Attachment 1, page 1.

(a) Please indicate if the dollar values for solid fuel inventory in 2013 and 2014 are the same as the tonnages shown in NSPI Response to Liberty IR-3, Attachment 1, page 1

(b) If not, please explain the difference.

Response IR-119:

(a-b) Liberty IR-3 reflects actual coal monthly ending inventory metric tonnes throughout the test years, and Larkin IR-10 profiles NS Power's change in inventory dollars based on the monthly change in metric tonnes.