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MARITIME ELECTRIC
A FORTIS COMPANY

December 12, 2023

Ms. Cheryl Mosher
Island Regulatory & Appeals Commission
PO Box 577
Charlottetown PE C1A 7L1

Dear Ms. Mosher:

UE22503 - Application for an Order to Approve Stage 1 Rate Design Changes
Response to Interrogatories from PEI Federation of Agriculture

Please find attached the Company's response to the Interrogatories filed by the PEI Federation of Agriculture with respect to the Company's Application for an Order to Approve Stage 1 Rate Design Changes.

In responding to these interrogatories, a typo was noted in the table provided in the Company's response to Commission Staff interrogatory IR-16(a). An updated response to this interrogatory is provided as an attachment hereto.

An electronic copy will follow.

Yours truly,

MARITIME ELECTRIC

Gloria Crockett

Gloria Crockett, CPA, CA
Manager, Regulatory & Financial Planning

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IR-16 Synapse determined that MECL's monthly Residential service charge is "*among the highest residential customer charges of investor-owned utilities in North America*".[1]

a. Please calculate the Residential service charge using the basic customer method as defined by Synapse. Please calculate the resulting change in the Residential basic rate, as well as the RTC for each Residential cohort identified in Table 2 of the Synapse Report. Assume that the Residential declining block rate is eliminated.

b. If MECL does not agree with using the basic customer method to calculate the Residential service charge, please propose an alternate manner of determining the service charge. Please include justification and the calculations request in (a) above.

Response:

a. Maritime Electric's calculation of the Residential service charge, using the basic customer method, agrees to the calculation provided in Table 10 of the Synapse Report and is provided in IR -16 (a) - Attachment 1.

The following table provides the revenue-to-cost ("RTC") ratios for the various cohorts within the Year Round Residential rate class, comparing the current RTC ratios to those reflecting the use of the basic customer method for determining the service charge, assuming the Residential declining block is eliminated.

Impact of Revised Service Charge on RTC Ratio for Year Round Residential[2]		
Cohorts	**2017 RTC Ratios**[3]	**Revised RTC Ratios**
1. Usage 0 to 575 kWh	102.0	99.0
2. Usage 576 to 1,200 kWh	95.2	93.5
3. Usage 1,201 to 2,300 kWh	95.1	94.6
4. Usage 2,301 to 5,000 kWh	81.9	82.9
5. Domestic > 5,000 kWh	70.7	76.7
6. Farms > 5,000 kWh	85.0	101.3
7. Other > 5,000 kWh	65.1	~~96.~~7 76.7
Total	**91.7**	**91.7**

The scenario presented above shifts the recovery of a portion of fixed costs from customers via the service charge to the energy charge. The RTC ratio decreases for those cohorts with lower energy consumption and increases for those cohorts with higher energy consumption, which is also being influenced by the elimination of the declining second block rate.

1 See Exhibit C-4, at page 21.
2 Detailed calculations for this table is provided in IR – 16 (a) Attachment 1.
3 These RTC ratios are as reported in Table 3 in Appendix C, Preliminary Residential Class Load Study Results, of the Stage 1 of Rate Design Application submitted on May 14, 2021.

Maritime Electric would like to point out that this scenario makes the cross subsidization of net metering customers worse. As indicated in the Application, net metering customers avoid paying for the portion of the Company's fixed costs that are allocated to the energy charge.[4] By shifting even more of the Company's fixed costs from the service charge to the energy charge, the impact of the cross-subsidization is worsened.

b. As explained under the heading "Recommendations Regarding the Residential Service Charge" in Maritime Electric's response to the Synapse Report, filed with the Commission on August 5, 2022, Maritime Electric does not believe the basic customer method is an appropriate methodology given the Company's facts and circumstances.[5] However, in that same response, Maritime Electric did agree with Synapse's recommendation to analyze its costs and resulting allocations, and indicated its intent to engage an expert as part of the second stage of rate design.

Therefore, Maritime Electric respectfully requests an opportunity to include a review of the customer and demand classification percentages for the distribution system as part of the Company's next cost allocation study, which would then be incorporated into the development of the second stage of the Rate Design Application.

4 Per Appendix D, Residential Net Metering Impact on Rates, of the Stage 1 of Rate Design Application submitted on May 14, 2021.

5 See Exhibit M-8, Maritime Electric response to Synapse Report, pages 3 to 5.

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VIA EMAIL

December 12, 2023

Ryan P. MacDonald
Key Murray Law
80 Grafton Street, Suite 200
Charlottetown PE C1A 1K7

Dear Mr. MacDonald:

UE22503 – Application for an Order to Approve Stage 1 Rate Design Changes
Responses to Interrogatories from the PEI Federation of Agriculture

Please find attached the Company's responses to the Interrogatories filed by you on behalf of the PEI Federation of Agriculture ("PEIFA" or the "Federation") with respect to the Company's Application to the Island Regulatory and Appeals Commission for an Order approving Stage 1 Rate Design Changes.

Where applicable, the attached responses are based on the updated 2020 Cost Allocation Study ("CAS") revised on January 27,2022 and filed with the Commission on February 25, 2022 with one exception. In preparation of these responses, it was discovered that an incorrect energy input allocator for farms was used in the 2020 CAS. The impact of this error on the reported revenue-to-cost ("RTC") ratios is not material for any classes other than Farms. Table 1 shows the 2020 CAS results filed with the Commission on January 21, 2022 and the updated results reflecting the correct energy input allocator for farms.

TABLE 1
Update to 2020 CAS Results Reflecting Correct Energy Input Allocator for Farms

	2020 CAS Results (February 25, 2022)					Adjusted 2020 CAS Results Reflecting correct energy input allocator for Farms				
	Energy Input allocators (MWh)	Allocation of energy costs ($000s)	Allocated cost ($000s)	Base Revenue ($000s)	RTC ratio (%)	Energy input allocators (MWh)	Allocation of energy costs ($000s)	Adjusted Allocated cost ($000s)	Base Revenue ($000s)	Adjusted RTC Ratio (%)
Residential	654,792	49,841	111,222	103,055	92.7	654,792	49,654	111,034	103,055	92.8
Residential (Seasonal)	21,931	1,669	4,980	4,689	94.2	21,931	1,663	4,974	4,689	94.3
Residential (Farms)	45,716	3,480	6,248	5,753	92.1	50,937	3,863	6,631	5,753	86.8
General Service	388,735	29,590	49,923	58,954	118.1	388,735	29,478	49,812	58,954	118.4
General Service (Seasonal)	7,486	570	1,408	1,443	102.5	7,486	568	1,406	1,443	102.6
Small Industrial	98,430	7,492	11,716	12,783	109.1	98,430	7,464	11,688	12,783	109.4
Large Industrial	157,569	11,994	14,549	13,938	95.8	157,569	11,949	14,504	13,938	96.1
Street Lighting	4,832	368	2,848	2,257	79.2	4,832	366	2,847	2,257	79.3
Unmetered	2,689	205	418	441	105.5	2,689	204	417	441	105.7
TOTALS	**1,382,180**	**105,208**	**203,313**	**203,313**		**1,387,401**	**105,208**	**203,313**	**203,313**	

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The interrogatories provided by the PEIFA were many and were highly technical in nature and considerable time was needed to provide fulsome responses. We appreciate the Federation's patience awaiting these responses as well as their continued interest in this Application.

Yours truly,

MARITIME ELECTRIC

Gloria Crockett

Gloria Crockett, CPA, CA
Manager, Regulatory & Financing Planning

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In relation to the above-noted matter, please find herein the list of interrogatories pertaining to the above noted matter, as submitted on behalf of the Prince Edward Island Federation of Agriculture.

IR-1 IRAC IR-18 asks:

Please provide the names, addresses, and monthly consumption level (in kWh) for each of MECL's customers in the Residential rate class who consumed more than 5,000 kWh per month in 2021. This includes both farm and non-farm customers within the Residential rate class. The Commission asks that the information be broken down by month, and that farms (as classified in the 2017 Cost Allocation Study) and net metering customers be clearly identified by MECL.

MECL provided its response, other than a summary table, confidentially.

a. Please provide the individual customer consumption levels for each of MECL's customers in the residential rate class who consumed more than 2,000 kWh per month in 2021 (i.e. all customers who consume second block energy) similar to as requested by IRAC in the above IR but in a non-confidential manner (i.e. without names, addresses and any identifiers, but with customer numbers if possible to permit correlation of the monthly values).

    i. Please specify the residential service rate schedule (rural, urban, seasonal) for each individual customer.
    ii. Please also label if each customer provided is a farm, net metering, or 'other' customer that corresponds to the table provided in the non-confidential response to IRAC IR-18. For the 12 customers listed as both 'farm' and 'net-meter' please identify both.
        i. Similar to Tables 13 & 14 of the Farm Study, please sub- categorize each farm account by potato, dairy, poultry & hog farms.
    iii. Please identify which of the customer accounts were used as the 87-88 farm accounts used in the 2 Farm Studies (Draft & Final) in the data set.
        1. Please specifically comment on whether different farms were used between the two studies and if so, why this occurred.

b. Please explain MECL's process for assigning the farm 'SIC' code to each account and when this was last completed/updated.

    i. Please comment on whether or not MECL has immediate plans to review and update the SIC data prior to any rate design changes/decisions taking effect.
        1. If yes, please explain how MECL proposes to update/review its SIC code data. If not, please explain why not.
    ii. If any of the above responses are deemed to include confidential information, please provide a process for PEIFA experts to retain this information on a confidential basis, or indicate the specific information that would need to be further withheld to permit the underlying load data to be made available (e.g., other utilities provide confidential information through Non-Disclosure Agreements and commitments to destruction of

documents at the end of the regulatory process).

c. Please explain MECL's proposal as it applies to net metering customers, especially the 12 customers who are both net metered customers and farms.

Response:

a. An electronic data file of individual consumption levels of each of Maritime Electric's customers in the Residential Rate Class who consumed more than 2,000 kWh per month in 2021 by premise number is provided in IR-1 Attachment 1 to this response.

i. The data provided in IR-1 Attachment 1 to this response includes the Residential Rate Class Code for each customer where:

- Rate Code 110 – Residential Urban
- Rate Code 130 – Residential Rural
- Rate Code 131 – Residential Seasonal
- Rate Code 133 – Residential Seasonal Option

ii. Customers are identified as a farm or net metering or both corresponding to the table provided in the non-confidential response to Commission Staff IR-18, Exhibit 10(d) ("IRAC IR-18"). Customers not identified as farm or net meter are considered "other" corresponding to the table provided in the non-confidential response to IRAC IR-18.

In the tab labelled "Table", there is an updated summary of Residential Customers >2,000 in a Month in 2021 similar to the table provided in the non-confidential response to IRAC IR-18. It should be noted that in the non-confidential response to IRAC IR-18, the table was summarized by customer name. In this response, the customer names (as well as location) were removed to protect the privacy of the customer information. The data table in this response is therefore grouped by premise identification number instead. This results in a slightly different customer count with consumption >5,000 kWh in a month.

Secondly, in order to add the accounts with consumption >2,000 kWh, this response is based on a completely new data set and reflects customer information changes since the original data was set was taken for the response to IRAC IR-18. For example, some accounts have added net meter installs since the data set for the response to IRAC IR-18 was obtained.

A reconciliation is provided in this response to a revised IRAC IR-18 non-confidential response Table grouped by premise identification number instead of customer name.

i. In IRAC IR-18, the Commission requested that farms classified in the 2017 Cost Allocation Study ("CAS") be clearly identified. It is not possible to subcategorize each farm by potato, dairy, poultry and hog as the Standard Industrial Classification ("SIC") code in the Company's billing system that

was used to identify farms in the response to IRAC IR-18 does not provide this level of detail. The SIC codes and their descriptions are:

011 - Livestock Farms (Except Animal Specialties)
012 - Other Animal Specialty Farms
013 - Field Crop Farms
014 - Field Crop Combination Farms
015 - Fruit and Vegetable Industries
016 - Horticultural Specialties
017 - Livestock, Field Crop and Horticultural Combination Farms
103 - Fruit and Vegetable Industries

iii. A list of the premises used in the Farm Study is provided in the tab "Farm Study" in IR-1 Attachment 1.

1. As discussed in the Company's response to IR-6(d) from Synapse Energy Economics, Inc. ("Synapse"), Exhibit M-6, the farms identified in the 2017 CAS and the 523 farms in the Farm Study and the 2020 CAS were identified in Maritime Electric's billing system using different approaches.

When the 2017 CAS was prepared, the SIC code assigned to each account was used to identify farms as a subset of the Residential class. Subsequent examination of these accounts in the initial stages of the Farm Study showed that many of the Residential accounts with a farm SIC code were either small farming operations or were no longer farming.

Given that the primary focus of the Farm Study was to assess the impact on farms of eliminating the declining second block energy charge[1] in the Residential Rate, a separate, largely manual, analysis was done to identify the larger farms who would be thus impacted. This analysis identified the 523 farms that made up the farm subset of the Residential class in the 2020 CAS and in the Farm Study.

The analysis was based on publicly available lists of farming operations and included a detailed analysis of Residential accounts using more than 5,000 kWh per month. Hence, some of these 523 farms have a non-farm SIC codes.

b. Maritime Electric began assigning SIC codes to customer accounts in 1985. The impetus was a request from the Provincial Government for electricity usage for fiscal 1984 for all customer groups not considered residential, commercial or industrial (e.g., government buildings, schools, senior citizens homes, recreation facilities, and religious institutions). The data was provided in summary form (i.e., as totals for each customer group).

As part of the work of responding to the Province's request, as accounts were identified a SIC code was assigned to them in Maritime Electric's billing system, so as to be able to

[1] The current approved rate structure includes a lower per kWh charge for residential consumption over 2,000 kWh per month.

more easily respond to potential future requests.

In responding to the Government's request, it was decided that it would be prudent to prepare for potential similar information requests by assigning SIC codes to all accounts. This was accomplished over a two-month meter reading cycle by having meter readers manually identify on the sheets in the meter books for all accounts except private residences what type of customer the account is. In the case of farms, the type of farm was identified based on the available SIC codes.

Since 1985 all new customers have been assigned a SIC code based on information provided by the customer at the time of requesting service. There has been no need to complete a comprehensive review of the assigned codes since.

Depending on the outcome of this proceeding, Maritime Electric may update the SIC codes for farm accounts as needed.

i. The Company will develop a communications plan to ensure all farm customers are informed of the option to be served under the Residential or Small Industrial classes, which will include working with organizations such as the PEI Federation of Agriculture.

ii. No response required.

c. Maritime Electric's Rate Design Application, Exhibit M-1, is not intended to affect net metering installations. However, changes that would normally apply if a customer changes rate class will still apply. For example, if a customer moves from the Residential to the Small Industrial class, then credits for energy delivered to the utility will be based on the energy charges under the Small Industrial rate rather than the energy charges under the Residential rate.

As discussed in the response to Commission Staff IR-8(b), Exhibit M-10, the Company has not proposed any changes to the billing for net metering customers as the billing for net metering customers is legislated by the Province of PEI under the *Renewable Energy Act*.

> Article 12.(2) of the *Renewable Energy Act* states: *"Under a net-metering system agreement … a public utility shall not charge the small capacity renewable energy generator any fee or charge that is not charged or imposed on, or that differs in amount from any such fee or charge that is imposed on, any other customer of the public utility who is in the same power rate class …"*

It is Maritime Electric's interpretation of this legislation that customers within a rate class who elect to invest in net metering infrastructure cannot be charged more than other customers in that class. Therefore, in order to continue to comply with the legislation, the Company is not proposing to recover any additional costs from net metering customers.

IR-2 IRAC-6 gives the resulting RTC ratios after implementation of MECL's proposals based on the 2017 Cost Allocation study

a. Please provide an updated response to IRAC-6 reflecting the 2020 Cost Allocation study.

Response:

The following table shows the revenue-to-cost ("RTC") ratios after implementation of the Company's proposals based on the 2020 CAS results as taken from the response to IR-14(f) of these interrogatories.

TABLE IR-2
Resulting RTC Ratios After Implementation of Stage 1 Changes
Based on 2020 CAS

Rate Class	RTC Ratio
Residential	94.5
Residential (Farms)	99.4
Residential (Seasonal)	94.3
General Service	112.3
General Service (Seasonal)	102.6
Small Industrial	103.2
Large Industrial	100.3
Street Lighting	85.2
Unmetered	105.8

IR-3 IRAC-15 gives the rates for a Farm Class from what appears to be the 2017 Cost Allocation study

a. Please provide an updated response to IRAC-15 reflecting the 2020 Cost Allocation study

b. Please indicate the equivalent contemporary rates (same test year) that would apply to the other classes consistent with the Farm Class Rate shown in Table 1 (i.e., under the same revenue requirement at a 1.0 RTC for each class) and the contemporary rates that were actually in effect.

c. Please recalculate the IRAC-15 Tables 1 and 2 assuming only the farms who would otherwise convert to the Small Industrial class are included in the new Farm class, and provide the backup detail.

Response:

a. The potential Farm Rate in IRAC-15, Exhibit M-10, is based on the 2020 CAS.

b. See Table IR-3(b) below. To simplify the calculations, only the energy charges have been adjusted to arrive at rates that would have resulted in a RTC ratio of 1.0 for each rate class in 2020. In addition, no results are shown for the Street Lighting and Unmetered rate classes due to the complexity associated with the number of different fixture types (Street Lighting) and different hours of use (Unmetered).

TABLE IR-3(b)
Estimated Rates for 2020 that would have resulted in RTC Ratios Equal to 100%

	Rate Charges in Effect for 2020					Rate Charges for RTC = 100%			
	Monthly Service $/month	Demand $/kW	First Block Energy $/kWh A	Second Block Energy $/kWh B	Adjustments to Energy Charge to get RTC Ratios = 100% $/kWh C	Monthly Service $/month	Demand $/kW	First Block Energy $/kWh D=A+C	Second Block Energy $/kWh E=B+C
Residential	24.57/26.92		0.1437	0.1142	0.0128	24.57/26.92		0.1565	0.1270
Residential (S)	26.92/37.50		0.1437	0.1142	0.0139	26.92/37.50		0.1576	0.1281
Residential (Farms)	24.57/26.92		0.1437	0.1142	Designed rate		8.80	0.1243	0.0821
General Service 1	24.57	13.43	0.1767	0.1154	(0.0252)	24.57	13.43	0.1515	0.0902
General Service 1 (S)	24.57	13.43	0.1767	0.1154	(0.0053)	24.57	13.43	0.1714	0.1101
Small Industrial		7.46	0.1731	0.0872	(0.0119)		7.46	0.1612	0.0753
Large Industrial		14.50	0.0714		0.0037		14.50	0.0751	
Street Lighting	Charges vary by type of fixture				0.1312				
Unmetered	Charges vary by daily hours of use				(0.0095)				

c. See Table IR-3(c) below.

TABLE IR-3(c)
Design of a Farm Rate for only those Farms >5,000 kWh that would move to Small Industrial

		Demand			Energy			
	Customer	**1CP**	**NCP**	**Total**	**First Block** (200 kWh/kW)	**Second Block**	**Total**	**Total**
	($/year)	**($/kW-yr)**	**($/kW-yr)**	**($/kW-yr)**			**($/MWh)**	
2020 CAS average costs	311.00	222.05	72.40				82.14	
Mar 2019 to Feb 2020 allocators	**Average # bills**	**(kW)**	**(kW)**				**(MWh)**	
- Farms to Farm Rate	188	3,700	5,100				22,154	
2020 fully allocated costs:	**($000s)**	**($000s)**	**($000s)**	**($000s)**			**($000s)**	**($000s)**
- Farms to Farm Rate	58	822	369	1,191			1,820	3,069
Mar 2019 to Feb 2020 billing determinants	**# of Bills**			**(kW-mo)**	**(MWh)**	**(MWh)**	**(MWh)**	
- Farms to Farm Rate	2,256			75,870	14,511	7,643	22,154	
Suggested Farm Date Design:				**($/kW-mo)**	**($/MWh)**	**($/MWh)**		
- Demand charge (customer costs + ½ demand costs)				8.62				
- First block energy (average energy cost + ½ demand cost)					123.17			
- Second block energy (average energy cost)						82.14		
Check revenue from suggested charges:				**($000s)**	**($000s)**	**($000s)**		**($000s)**
- Farms to Farm Rate				654	1,787	628		3,069

IR-4 a. Please indicate if MECL has continued to collect the data from the metered accounts addressed in the Farm Study, and if so has any updated study been completed (e.g., for 3 or 4 years of data)? If yes, please provide.

i. If the data has continued to be collected by not included in a more comprehensive study, can MECL indicate if the same general load relationships as noted in the Farm Study (e.g., loads, size, coincidence factors, non coincident peak ratios), are present in the newer data or if the newer data indicates a materially different trend.

b. Please provide an updated Tables 1, 10, 11, 12, 13, 14, for the 2020 Cost Allocation Study.

c. Please provide the underlying calculations (in excel format) that support Chart 1 on Study page 2, separating the impacts by the following:

i. The percentage of bill increase as a result of eliminating second block rate (and replacing second block charge to the proposed flat rate equal to the current first block rate);
ii. The percentage of bill increase as a result of increase to reach 95% RTC.

d. Please explain the difference between Chart 1 (page 2) and Chart 2 (page 4), if any. If different please provide the underlying calculations (in excel format) that support Chart 2 with the same separation as requested in part a) above.

e. Please provide a version of Chart 1, estimated for farm customers who use between 2,000 and 5,000 kWh/month (i.e. 24,000 kWh to 60,000 kWh per year).

i. Provide a Chart that splits the impact for 1) bill increase percentage as a result of eliminating the second block rate, and 2) the percentage of bill increase as a result of increase to reach 95% RTC.

f. Please provide a version of Chart 1, estimated for farm customers who use between 60,000 kWh and 100,000 kWh annually.

i. Provide a Chart that splits the impact for 1) bill increase percentage as a result of eliminating the second block rate, and 2) the percentage of bill increase as a result of increase to reach 95% RTC.

g. Please also provide the underlying calculations, in excel format, to support Charts 7 and 8 (on pages 22-23 of the Farm Study) and further, provide the same analysis for the remaining 7 farm accounts not provided (hog and poultry farms).

h. MECL's response to IRAC IR-9b & c discusses the treatment of "Other" customers (as shown in response to IRAC IR-18 non-confidential), which MECL classifies as Farms. Please provide a version of Charts 7 and 8 from the Farm Study for these customers.

i. Given that some of these 'Other' customers use substantially more average monthly consumption than all other residential customers, please specifically discuss how the consumption of these customers could impact both Residential RTC and Small Industrial RTC.
ii. Please explain all adjustments MECL made to its estimated load data and Cost Allocation results for the 'Other' customer class, including if it has meter data for any of these customers that it included in a portion or all of the Farm Study.
    i. If metered load data is available and MECL did not use it for the Farm Study or in estimating potential RTC and customer bill impacts please explain why it wasn't used.
iii. Please discuss how MECL estimated the bill impacts for these customers.
iv. Please provide excel analysis splitting the impact for these 14 customers by 1) bill increase percentage as a result of eliminating the second block rate, and 2) the percentage of bill increase as a result of increase to reach 95% RTC.

i. Please provide the same information (including Excel) as provided in Synapse IR-20 (Exhibit M-3(i)) that is available for any Farm customers over 5000 kWh.

Response:

a. Maritime Electric has continued to collect interval data from the metered accounts for the Farm Study, but no analysis has been done on data past December 2020. An updated study has not been completed.

b. See Tables IR-4(b)-1 through IR-4(b)-6 below.

TABLE IR-4(b)-1 Update of Farm Study Table 1 to 2020 CAS		
		($000s, except %)
2020 costs allocated to Residential	A	122,715
Revenue required to achieve RTC ratio of 95%	B = A x .95	116,579
2020 base revenue	C	113,497
Revenue difference	D = B – C	3,082
Resulting rate increase to achieve RTC ratio of 95%	E = D / C	2.7%

Table IR-4(b)-2 Update of Farm Study Table 10 to 2020 CAS		
Customer related	311.00	$/year
1CP Demand related	225.05	$/kW
NCP Demand related	72.40	$/kW
Energy related	82.14	$/MWh

TABLE IR-4(b)-3
Update of Farm Study Table 11 to 2020 CAS
Estimated 2020 Revenue for July 2018 to June 2019 Farm Load

Mar 1, 2018 to Dec 31, 2020 Residential Rate Charges:			2020 total number of Rate 110 and 130 bills			
- Urban monthly service charge	24.57	$/month	Urban (Rate 110)	321,229	0.44	
- Rural monthly service charge	26.92	$/month	Rural (Rate 130)	420,196	0.56	
- First 2,000 kWh months	0.1437	$/month				
- Second block energy	0.1142	$/month				

	2020 CAS		**Jul 2018 to Jun 2019 Residential Billing Data**				
	Residential Year Round	**Farms**	**Potato Farms**	**Dairy Farms**	**Hog Farms**	**Poultry Farms**	**Total**
Sales data:							
- annual sales (MWh)	604,483	47,023	26,804	13,114	2,288	1,195	43,401
First block MWh	548,123	10,516	6,405	3,400	217	356	10,378
Second block MWh	56,360	36,507	20,399	9,714	2,071	839	33,023
- average bills per month	61,785	523	353	143	9	15	520
Application of Rate ($000s)							
- service charges	19,035	169	114	46	3	5	168
- first block energy	78,765	1,511	920	489	31	51	1,491
- second block energy	6,436	4,169	2,330	1,109	237	96	3,771
- estimated revenue as billed	104,236	5,849	3,364	1,644	271	152	5,431
Revenue as reported	102,857	5,742	3,319	1,622	267	150	5,358
Plus weather normalization	198	11	9	4	1	0	14
Base (allocated) revenue for 2020	**103,055**	**5,753**	**3,328**	**1,626**	**268**	**150**	**5,372**

TABLE IR-4(b)-4
Update of Farm Study Table 12 to 2020 CAS
Estimated 2020 Revenue for July 2019 to June 2020 Farm Load

Mar 1, 2018 to Dec 31, 2020 Residential Rate Charges:			2020 total number of Rate 110 and 130 bills			
- Urban monthly service charge	24.57	$/month	Urban (Rate 110)	321,229	0.44	
- Rural monthly service charge	26.92	$/month	Rural (Rate 130)	420,196	0.56	
- First 2,000 kWh months	0.1437	$/month				
- Second block energy	0.1142	$/month				

	2020 CAS		**Jul 2019 to Jun 2020 Residential Billing Data**				
	Residential Year Round	**Farms**	**Potato Farms**	**Dairy Farms**	**Hog Farms**	**Poultry Farms**	**Total**
Sales data:							
- annual sales (MWh)	604,483	47,023	31,598	12,887	2,634	1,199	43,318
First block MWh	548,123	10,516	6,624	3,392	235	352	10,603
Second block MWh	56,360	36,507	24,974	9,495	2,399	847	37,715
- average bills per month	61,785	523	361	142	10	15	528
Application of Rate ($000s)							
- service charges	19,035	169	117	46	3	5	171
- first block energy	78,765	1,511	952	487	34	51	1,524
- second block energy	6,436	4,169	2,852	1,084	274	97	4,307
- estimated revenue as billed	104,236	5,849	3,921	1,617	311	153	6,002
Revenue as reported	102,857	5,742	3,869	1,596	307	150	5,922
Plus weather normalization	198	11	10	4	1	0	15
Base (allocated) revenue for 2020	**103,055**	**5,753**	**3,879**	**1,600**	**308**	**151**	**5,937**

TABLE IR-4(b)-5 Update of Farm Study Table 13 to 2020 CAS Allocation of 2020 Costs to July 2018 to June 2019 Farm Load								
			2020 CAS		Jul 2018 to Jun 2019 Residential Farm Load *			
	Unit Costs (from 2020 CAS)		Residential Year Round	Farms	Potato Farms	Dairy Farms	Poultry & Hog Farms	Total
- Number Customers			61,785	523	353	143	24	520
- Coincident Peak Demand		(MW)	143.2	8.2	4.4	2.9	0.5	7.8
- Group NCP Demand		(MW)	143.2	10.9	8.5	2.6	0.6	11.7
- Energy		(MWh)	604,483	47,023	26,804	13,114	3,483	43,401
Additional costs for 2020 ($000s):								
- Customer Related	311.00	$/yr	19,212	163	110	44	7	161
- CP Demand Related	222.05	$/kW-yr	31,800	1,813	977	644	111	1,732
- NCP Demand Related	72.40	$/kW-yr	10,368	791	615	188	43	846
- Energy Related	82.14	$/MWh	49,654	3,863	2,202	1,077	286	3,565
TOTALS			**111,034**	**6,630**	**3,904**	**1,953**	**447**	**6,304**
Allocated revenues for 2020 ($000s)			**103,055**	**5,753**	**3,328**	**1,627**	**418**	**5,373**
Estimated revenue to cost ratios (%)			**92.8**	**86.8**				**85.2**

* For Jul 2018 to Jun 2019 Residential farm load:
- Coincident Peak Demand is for February 26, 2019 hour ending 19:00
- Non-Coincident Peak Demand is for December 5, 2018 hour ending 09:00

TABLE IR-4(b)-6 Update of Farm Study Table 14 to 2020 CAS Allocation of 2020 Costs to July 2019 to June 2020 Farm Load								
			2020 CAS		Jul 2019 to Jun 2020 Residential Farm Load			
	Unit Costs (from 2020 CAS)		Residential Year Round	Farms	Potato Farms	Dairy Farms	Poultry & Hog Farms	Total
- Number Customers			61,785	523	361	142	25	528
- Coincident Peak Demand		(MW)	143.2	8.2	5.3	2.5	0.4	8.2
- Group NCP Demand		(MW)	143.2	10.9	8.4	2.3	0.6	11.3
- Energy		(MWh)	604,483	47,023	31,598	12,887	3,833	43,318
Additional costs for 2020 ($ x 1,000):								
- Customer Related	311	$/yr	19,212	163	112	44	8	164
- CP Demand Related	222.05	$/kW-yr	31,800	1,813	1,177	555	89	1,821
- NCP Demand Related	72.40	$/kW-yr	10,368	791	608	167	43	818
- Energy Related	82.14	$/MWh	49,654	3,863	2,596	1,059	315	3,970
TOTALS			**111,034**	**6,629**	**4,493**	**1,825**	**455**	**6,773**
Allocated revenues for 2020 ($ x 1,000)			**103,055**	**5,753**	**3,879**	**1,600**	**458**	**5,937**
Estimated revenue to cost ratios (%)			**92.8**	**86.8**				**87.7**

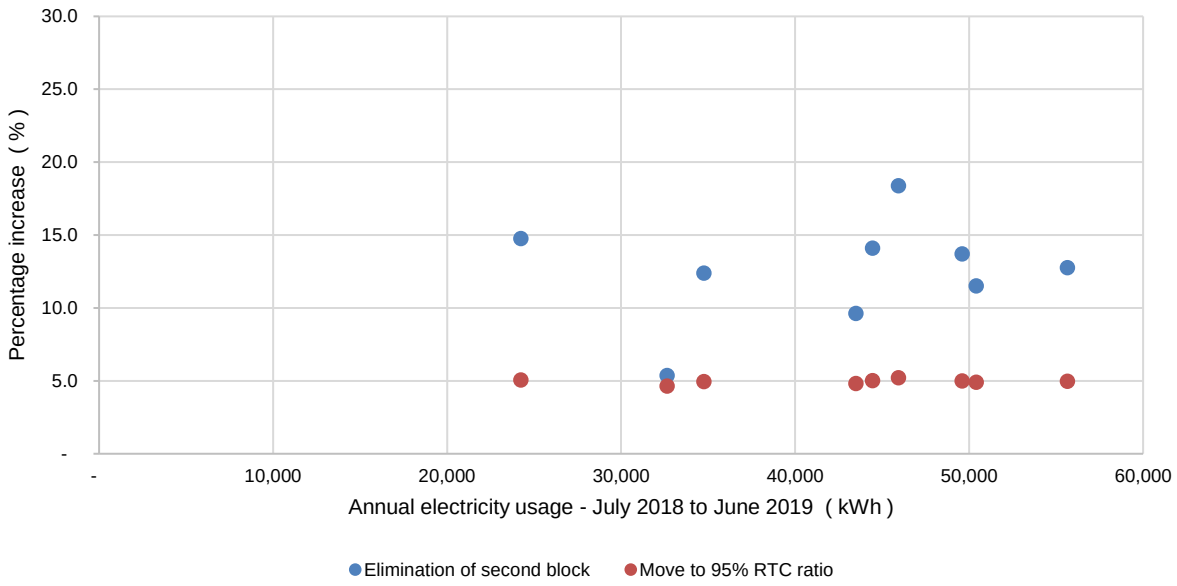
* For Jul 2019 to Jun 2020 Residential farm load:
- Coincident Peak Demand is for January 17, 2020 hour ending 18:00
- Non-Coincident Peak Demand is for December 9, 2019 hour ending 09:00

c. See tab IR-4(c) in the Excel workbook "Federation of Agriculture IR Responses in Excel".

d. There is no difference between Chart 1 (page 2 of the Farm Study) and Chart 2 (page 4 of the Farm Study).

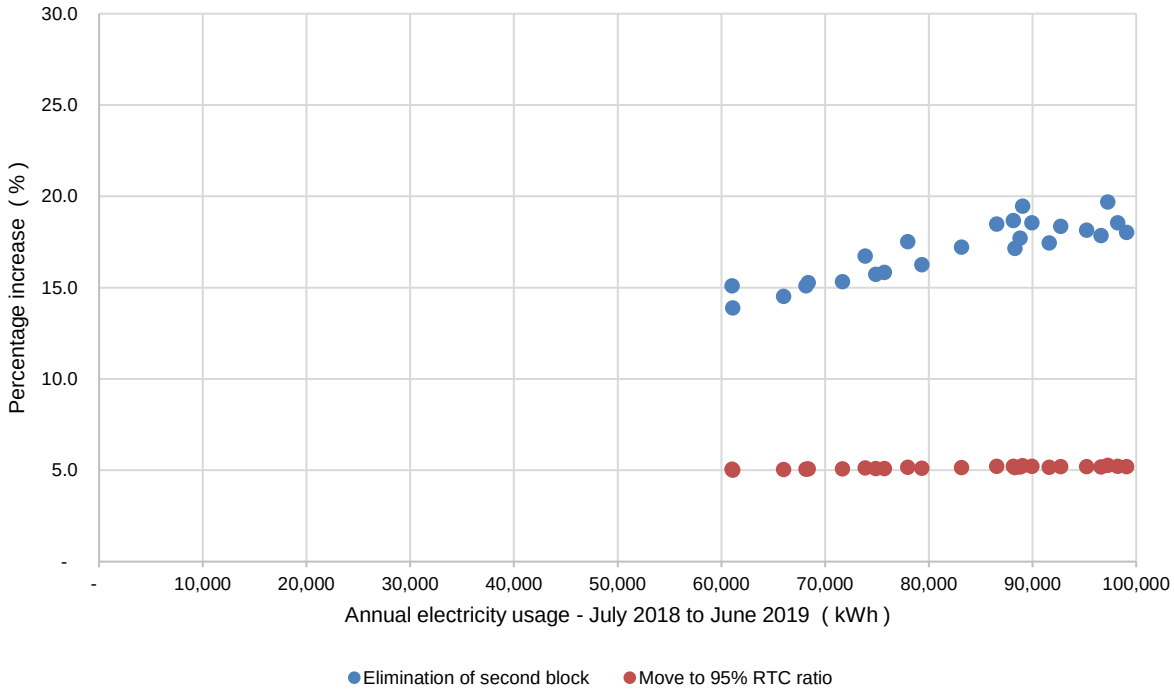
e. See Chart IR-4(e) below.

CHART IR-4(e)
Increase in Bills for Metered Farms using 24,0000 kWh to 60,000 kWh due to proposed changes in Residential Rate



f. See Chart IR-4(f) below.

CHART IR-4(f)
Increase in Bills for Metered Farms using 60,0000 kWh to 100,000 kWh due to proposed changes in Residential Rate



g. See tab IR-4(g) in the Excel workbook "Federation of Agriculture IR Responses in Excel".

h. Billing demand data is not available for eight of these fourteen customers, so estimates of their bills as Small Industrial customers has not been provided.

i. In the 2020 CAS these Other customers are included with year-round Residential. As shown in Table 3, page 24 of the Rate Design Application, Exhibit M-1, the RTC ratio for the Other cohort is 65 per cent which is below the RTC ratios for both year-round Residential (93%) and Small Industrial (109%) in the 2020 CAS. This means that the RTC ratio for year-round Residential would be higher if these Other customers were removed and the RTC ratio for Small Industrial would be lower if these Other customers were added.

ii. Maritime Electric did not make any adjustments for these 14 customers in the CAS. They remained with the year-round residential after Residential Seasonal and Residential (potato, dairy, poultry and hog) Farm were separated out as subgroups.

No data for these Other customers was used in the Farm study because none of these 14 customers are potato, dairy, poultry or hog farms. The primary focus of the Farm Study was to assess the impact on farms of eliminating the declining second

block energy charge in the Residential Rate. Since most of the larger farms are potato, dairy, poultry or hog operations, and most of the electricity usage by farms in PEI is by these four farming types, only potato, dairy, hog and poultry farms were included in the Farm Study.

iii. The largest customer in the Other cohort has an interval meter for billing, which provides hourly load data. Loads for the remaining 13 customers in the Other cohort during a month were estimated by scaling up the metered loads of the largest customer by the ratio of the energy sales for the Other cohort for that month to the energy sales of the largest customer for that month.

iv. See the tab IR-4(h) (iv) in the Excel workbook “Federation of Agriculture IR Responses in Excel”.

i. See the tab IR-4(i) in the Excel workbook “Federation of Agriculture IR Responses in Excel”.

IR-5 Page 5 of the Farm Study states that coincident and non-coincident peak loads for farm load was estimated based on the hourly data collected from the meters installed at "some of the larger farms".

Page 13, states that:

Estimates of hourly class loads for farms were derived from the sample meters hourly data by using a load research method known as ratio estimation. Ratio estimation multiplies the ratio of the sample's weighted average load for a given hour to the sample's weighted average billed energy for the month containing that hour, by the class billed energy for that same month.

a. Please confirm that the meters installed at "some of the larger farms" correspond to the 87 farm accounts used as samples in the Farm Study.

   i. If not confirmed, please explain how many meters were installed for some of the larger farms and why some were or were not used as support in the Farm Study.

b. Please provide MECL's criteria for determining which Farm accounts to install meters for data collection purposes.

   i. Are the 87-88 farm accounts included in the Farm Study the same as the 88 largest farm customers as shown in the non-confidential response to IRAC IR-18 (i.e. the 72 farm customers who use between 20,000 - 49,999 kWh/year and the 16 farm customers who use over 49,999 kWh/year)?

c. Please explain how coincident and non-coincident peak loads were estimated for all farm loads based on the sampled metered data. Please specify in this response any changes made to the actual metered data to broaden the result to apply for all farm customers of various usage amounts (especially in light of large farms being used exclusively in the Farm Study where as actual farms exist of all different usage levels).

   i. In the above response, please explain if the 'ratio estimation' approach as used by MECL results in an exact mirrored peak load profile for all farms as the profiles collected from the participants in the Farm Study (as shown in Charts 3 - 6).
   ii. From pages 29-30 please confirm or explain otherwise that by MECL stating it used the "combined ratio" approach it consolidated the coincident peak and non-coincident peak data for all farms and applied unilaterally, and not applied by type of farm (i.e. dairy farm data collected was solely applied to dairy farms, etc.). If not confirmed, please explain how this was done.
   iii. Please provide the estimated calculations in excel format.
   iv. Please provide the actual coincident peak and non-coincident peak data collected for the farm customers with installed meters for each year 2018-19 and 2019-20. Please include monthly load factor data for each customer included in the study, and specify the type of farm (potato, dairy, hog, poultry).

d. Page 14 of the Farm Study references two potato warehouses being included in Table 8 that were originally outside of the 87 Farm Study accounts. Please explain if these potato warehouses are currently in the residential rate class or general service rate class.

   i. If in the residential rate class, please explain if they are included in the 'Farm' column, the 'net meter' column or the 'other column' in MECL's non-confidential response to IRAC IR-18.
   ii. Please explain what the proposed rate treatment is for the potato warehouses.

e. Please provide the calculated monthly and annual load factors and coincidence factors for each type of farm (potato, dairy, etc.) and indicate if these factors vary by size of farm, for each year of the data collected,

f. Please confirm that the use of the Small Industrial rate, with a demand charge and a higher prices first block energy charge (tied to demand peaks) before a customer can get access to second block energy s generally very favourable to high load factor customers and not favourable to low load factor customers.

g. Please indicate MECL's understanding about the measures that can be practically be used by each type of farming operation to increase their load factor, either by peak shaving or shifting to lower load periods, and whether MECL expects such measures to be practical, cost effective and lead to material savings.

h. Please indicate if MECL has considered implementing the Small Industrial Rate by measuring the billed demand solely on the peak demand set during on-peak hours, and ignoring any higher peaks set in off-peak hours. If yes, please indicate whether this options provides a potential improved price signal to customers linked to system costs.

i. Please update Tables 11, 12, 13 and 14 to the 2020 Cost Allocation study.

j. Please Update Table 4-2 from the Draft Farm Study (Boutilier Study page 80) to include all data from the final Farm Study and using the 2020 Cost Allocation results.

Response:

a. The meters installed at “some of the larger farms” means the 87 farm accounts that were equipped with hourly interval meters at the start of the Farm Study plus a few more that were so equipped during the course of the Farm Study. Taken together, this was the sample group.

b. The 87 – 88 farm accounts that were sampled in the Farm Study are not the same as the 88 largest farm customers shown in the response to IRAC IR-18, Exhibit M-10(d).

   As explained on page 27 of the Farm Study report, the sample group of farms included in

the study (i.e., equipped with hourly interval meters) were identified on the basis of:

1. Being among the larger farms in terms of electricity usage. It is the larger farms that will be most affected by elimination of the Residential second energy block, and thus it is the larger farms that are most relevant to the study.
2. Already having a meter (i.e., installed prior to the Study) that can provide monthly demand as well as monthly energy readings. The reasoning at the time was that this could provide monthly demand readings for 2017, the latest year for which a CAS would be available, which might enable greater use of the 2017 CAS results.

c. (i)(ii) Table IR-5c below is a repeat of Table 8 in the Farm Study, with the correction that the billed usage amounts have been shown as kWh instead of MWh. Table IR-5c shows the estimation of the Residential Rate Coincident Peak farm load for the hour ending ("H. E.") 18:00 on January 17, 2020.

The results shown in Charts 3 – 6 of the Farm Study are from the metered data of the 87 sample farms, and so can be considered as exact. The ratio estimation approach gives estimates for the Residential Rate farm load that mirror the metered data from the sample meters but cannot be considered as exact because they are estimates, with an associated +/- confidence band.

TABLE IR-5(c)
Calculation of Farms Load for H. E. 18:00 on January 17, 2020 using Ratio Estimation

kWh Strata Boundaries		Sample meters results for Jan 17, 2020 HE 18:00					Estimated Load for Residential Rate Farms			
Lower	Upper	Number of Sample meters	Average H.E. Load (kW)	Average Billed (kWh)	Ratio H.E. Load to Billed	Std Dev H.E. Load (kW)	Jan 2020 Number of Bills	Jan 2020 Billed (kWh)	Total Load for H.E. (kW)	Ave. Load for H.E. (kW)
Potato										
0	6,000	9	3.9	3,542		2.0	105	367,365		
6,001	12,000	14	11.7	9,672		5.0	117	1,009,114		
12,001	20,500	17	20.1	15,879		8.9	89	1,407,899		
20,501	and up	12	37.2	31,038		13.0	50	1,546,454		
		52	15.0	12,378	0.00121		361	4,330,832	5,254	14.6
Dairy										
0	6,500	5	10.9	4,784		6.3	62	297,843		
6,501	11,000	7	20.0	9,283		3.7	49	420,494		
11,001	and up	18	32.7	17,052		9.3	31	501,306		
		30	18.8	9,015	0.00208		142	1,219,643	2,543	17.9
Poultry										
0	7,500	3	6.6	6,095		2.7	10	50,572		
7,501	and up	3	18.7	12,067		5.4	5	62,100		
		6	10.6	8,086	0.00132		15	112,672	148	3.9
Hog										
0	and up	3	63.3	52,080	0.00121	5.0	10	213,506	259	25.9
Farm Totals		**91**					**528**	**5,876,653**	**8,204**	**15.5**

The average hour ending load and the average billed kWh for the sample meters are weighted averages, with the number of bills for the Residential Rate farms used as the weightings. For example, for poultry sample meters average hour ending load the weighted average is ((6.6 kW x 10) + (18.7 kW x 5)) / 15 = 10.6 kW. Using the number of bills for the 528 Residential (Farm) accounts as the weightings is how the data from the 91 sample meters is applied to the 528 Residential (Farm) accounts.

The combined ratio is by farm type. For example, for potato the combined ratio is equal to 15.0 kW / 12,378 kWh = 0.00121 kW / kWh.

The total load is estimated by multiplying the total billed kWh by the combined ratio. For example, for potato the total load is 4,330,832 kWh x 0.00121 kW / kWh = 5,254 kW.

The 91 sample meters are included with the total 528 farm accounts.

A separate, but similar, calculation is done for the Non-Coincident Peak load, using the interval data for the hour in the month with the highest combined load for the 91 sample maters.

iii. See tab IR-5(c)(iii) in the Excel workbook "Federation of Agriculture IR Responses in Excel" for the Excel version of Table IR-5(c). Table IR-5(c) is in columns AY – BK.

iv. See tabs IR-5(c)(iv) Jul2018 to Jun2019 and IR-5(c)(iv) Jul2019 to Jun2020 in the Excel workbook "Federation of Agriculture IR Responses in Excel".

d. These two farms are served under the Residential rate. They are included in the Farm column in Maritime Electric's response to IRAC IR-18, Exhibit M-10(d). The proposed rate treatment for potato warehouses is the same as for all other farms – choosing the better of staying on the Residential rate or moving to the Small Industrial Rate.

e. See tab IR-5(e) in the Excel workbook "Federation of Agriculture IR Responses in Excel".

The table below indicates how coincident and load factors vary with size of load.

TABLE IR-5(e)
Coincidence and Load Factors as a Function of Size of Load

Farm type	Coincidence Factor	Load Factor
Potato	Independent of size of load	Independent of size of load
Dairy	Independent of size of load	Increases as size of load increases
Hog	Insufficient data points	Insufficient data points
Poultry	Insufficient data points	Insufficient data points

f. Under cost of service regulation, rates are intended to recover the cost of providing service. Under the Small Industrial rate, with the amount of first block energy being proportional to the monthly peak demand, a portion of fixed costs are recovered through the demand charge and the remaining portion is recovered through the differential between the first and second block energy charges.

For a low load factor customer using only first block energy, the contribution to fixed costs for a given monthly peak demand will be less than for a high load factor customer with the same monthly peak demand (unless the kWh usage for the month by the low load factor customer just happens to equal the maximum first block amount).

For a high load factor customer, the cost of providing energy in excess of the maximum first block amount under the Small Industrial Rate is largely energy-related, and thus a second block energy charge intended to recover only energy-related costs is appropriate.

g. Maritime Electric has not done an investigation in this area. Government has assigned responsibility for energy efficiency to the PEI Energy Corporation and efficiencyPEI.

h. Maritime Electric has not considered this. The installation of smart meters may enable options such as this in the future.

i. See Table IR-4(b)-3 through Table IR-4(b)-6 in the response to IR-4(b) herein.

j. See Tables IR-5(j)-1 and IR-5(j)-2 below.

TABLE IR-5(j)-1
Comparison of Farms Allocated Cost to Small Industrial Rate
Based on 2020 CAS
(Jul 2018 to Jun 2019 Metered Farm Loads)

	Customers	Demand	Energy			Total Allocated Cost
			First Block (first 100 kWh/kW-mo)	Second Block	Total	
2020 Allocated Costs for July 2018 to June 2019 loads ($000s):						
- 50 potato farms	16	333			496	844
- 30 dairy farms	9	230			375	615
- 4 poultry & 3 hog farms	2	87			185	274
Total	27	650			1,056	1,733
Jul 2018 to Jun 2019 billing determinants:		(kW-mo)	(MWh)	(MWh)	(MWh)	
- 50 potato farms		22,738	2,228	3,808	6,036	
- 30 dairy farms		15,385	1,539	3,032	4,571	
- 4 poultry & 3 hog farms		6,458	646	1,610	2,256	
Total		44,581	4,413	8,450	12,863	
		($/kW-mo)	($/kWh)	($/kWh)	($/kWh)	
2020 average costs:		7.90	0.1558	0.0821	0.0821	
Mar 1, 2018 to Dec 31, 2020 Small Industrial Rate:		7.46	0.1731	0.0872		

NOTES:
1. Average 2020 cost for demand includes customer costs and an assumed 50% of demand costs.
2. Average 2020 cost for first block energy includes the second block energy charge plus an assumed 50% of demand costs.
3. July 2018 to June 2019 billing determinants are for assumed service under Small Industrial Rate.

TABLE IR-5(j)-2
Comparison of Farms Allocated Cost to Small Industrial Rate
Based on 2020 CAS
(Jul 2019 to Jun 2020 Metered Farm Loads)

	Customer	Demand	Energy			Total Allocated Cost
			First Block (first 100 kWh/kW-mo)	Second Block	Total	
2020 Allocated Costs for July 2018 to June 2019 loads ($000s):						
- 52 potato farms	16	336			555	908
- 30 dairy farms	9	224			373	606
- 4 poultry & 3 hog farms	3	85			201	288
Total	28	645			1,129	1,802
Jul 2019 to Jun 2020 billing determinants:		(kW-mo)	(MWh)	(MWh)	(MWh)	
- 50 potato farms		23,417	2,295	4,461	6,756	
- 30 dairy farms		15,480	1,549	2,990	4,539	
- 4 poultry farms		6,864	687	1,758	2,445	
Total		45,761	4,531	9,209	13,740	
		($/kW-mo)	($/kWh)	($/kWh)	($/kWh)	
2020 average costs:		7.66	0.1533	0.0821	0.0821	
Mar 1, 2018 to Dec 31, 2020 Small Industrial Rate:		7.46	0.1731	0.0872		

NOTES:
1. Average 2020 cost for demand includes customer costs and an assumed 50% of demand costs.
2. Average 2020 cost for first block energy includes the second block energy charge plus an assumed 50% of demand costs.
3. July 2019 to June 2020 billing determinants are for assumed service under Small Industrial Rate.

IR-6 Tables 2 and 3 on page 6 of the Farm Study provides a summary of detailed analysis done by MECL for residential accounts over 5,000 kWh/month. The tables are reproduced:

TABLE 2
Residential Rate Farm Electricity Usage for July 2018 to June 2019
(for accounts with 5,001+ kWh usage for at least one month)

		Potato	Dairy	Hogs	Poultry	Total
Number of Residential accounts		353	143	9	15	520
Number of farms		174	136	9	13	332
Annual billed usage (MWh)	A	26,804	13,114	2,288	1,195	43,401
Portion of farms with household loads included (%)		50	75	75	75	
Estimated household usage included above in A (MWh) (based on 8,000 kWh per year)	B	696	816	54	78	1,644
Farm usage – total billed less household (MWh)	A – B	26,108	12,298	2,234	1,117	41,757

TABLE 3
Residential Rate Farm Electricity Usage for July 2019 to June 2020
(for accounts with 5,001+ kWh usage for at least one month)

		Potato	Dairy	Hogs	Poultry	Total
Number of Residential accounts		361	142	10	15	528
Number of farms		174	135	9	13	331
Annual billed usage (MWh)	A	31,598	12,887	2,634	1,199	48,318
Portion of farms with household loads included (%)		50	75	75	75	
Estimated household usage included above in A (MWh) (based on 8,000 kWh per year)	B	696	810	54	78	1,638
Farm usage – total billed less household (MWh)	A – B	30,902	12,077	2,580	1,121	46,680

a. Please explain how MECL was able to breakdown each customer by type of farm?

b. Please reconcile the number of farms to the 375 farms listed as total # of farms over 5,000 kWh/month in response to IRAC IR-18 (public version)

c. Please reconcile the number of residential accounts to the number of farms for each column.

d. For the current stepped rate, please explain if the second block applies for each 'account' that surpasses 2,000 kWh/month or if it is applied per farm.

e. Please provide a breakdown of the annual billed usage into first versus second block.

f. For MECL's rate design proposal for farms (where customers can decide to remain in the residential class or move to the small industrial class) will each farm's decision and ultimately the rates applied be applied on a per farm basis or a per account basis - (for example, can a farm consolidate its accounts to retain diversity under the small industrial class)? Please explain MECL's proposal.

g. Please apply the coincident peak and non-coincident peak estimate calculations (as explained on page 5 of the Farm Study) to each column for both Table 2 and Table 3. Please provide in excel format.

h. Please provide a version of 'Chart 1' (increase in bills) for large farms due to changes in proposed residential rate for each column in Table 2 and Table 3 above (i.e. by year).

i. Please also provide the supporting information, broken out by 1) the percentage of bill increase as a result of eliminating second block rate (and replacing second block charge to the proposed flat rate equal to the current first block rate), and 2) The percentage of bill increase as a result of increase to reach 95% RTC.

Response:

a. Publicly available information on industry associations' websites was used to help breakdown each customer by type of farm. Often, the name on the electrical account provides an indication of the type of farm. Also, each customer's electricity usage helped identify the type of farm. Potato farms differ from dairy, poultry and hog farms in that a potato warehouse is usually empty (with little or no electricity usage) for at least several months during the year. Dairy, poultry and hog farms usually have a relatively steady electricity usage year round.

b. The 375 farms listed in the response to IRAC IR-18, Exhibit M-10(d), was based on a query of the billing system that asked for accounts with a farm SIC code that used more than 5,000 kWh. However, not all farms have a farm SIC code in the billing system, which is why the Farm Study includes more than 375 accounts.

Part of the effort in the Farm Study involved identifying farms that do not have a farm SIC code.

c. There are more residential accounts than number of farms because some farms have more than one account. For example, a potato farm can have more than one warehouse, each with its own service entrance and meter.

d. The second block applies to each account that exceeds 2,000 kWh/month.

e. See Table IR-6(e) below.

TABLE IR-6(e) Breakdown of Billed Usage into Residential Rate First and Second Block					
	Potato Farms	Dairy Farms	Hog Farms	Poultry Farms	Total
Jul 2018 to Jun 2019 billed usage:					
- First block MWh	6,405	3,400	217	356	10,378
- Second block MWh	20,399	9,714	2,071	839	33,023
Total	26,804	13,114	2,288	1,195	43,401
Jul 2019 to Jun 2020 billed usage:					
- First block MWh	6,624	3,392	235	352	10,603
- Second block MWh	24,974	9,495	2,399	847	37,715
Total	31,598	12,887	2,634	1,199	48,318

f. Maritime Electric's proposal that a farm customer can choose to remain on the Residential rate or move to the Small Industrial rate is intended to be applied on a per account basis.

g. See tabs IR-6(g) CP Jan2019, IR-6(g) NCP Jan2019, IR-6(g) CP Jan2020 and IR-6(g) NCP Jan2020 in the Excel workbook "Federation of Agriculture IR Responses in Excel".

h. The 87 metered farm accounts shown in Chart 1 of the Farm Study are shown by farm type in the following four charts.

CHART IR-6(h) (potato)
Increase in bills for 50 Metered Potato Farms due to proposed changes in Residential Rate

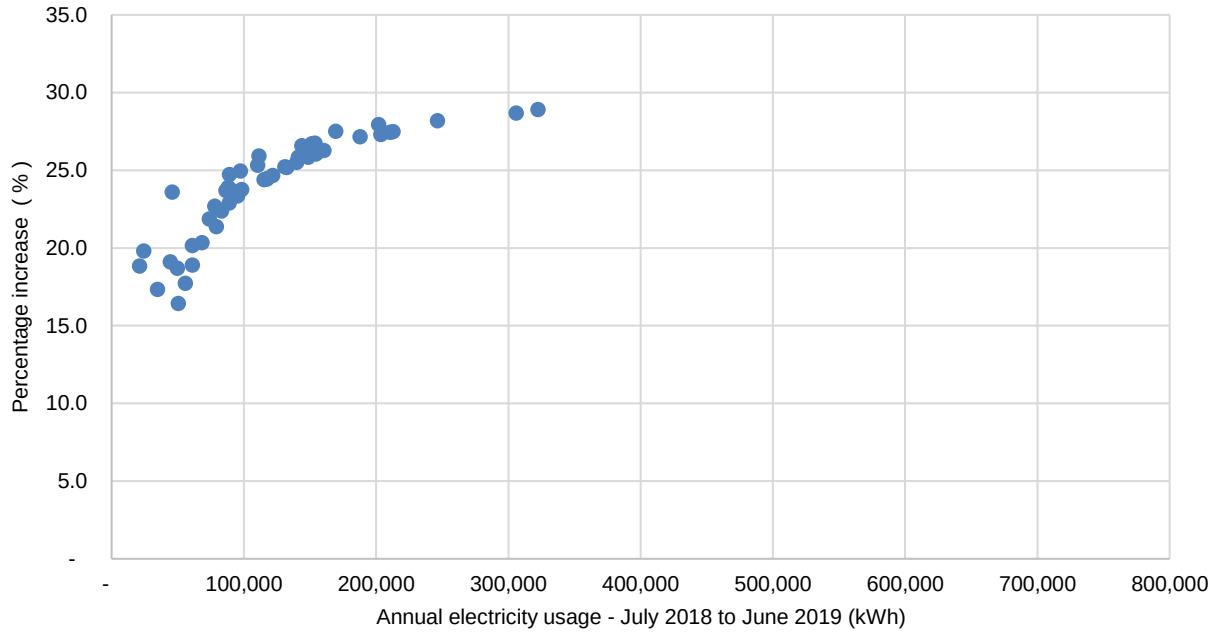


CHART IR-6(h) (dairy)
Increase in bills for 30 Metered Dairy Farms due to proposed changes in Residential Rate

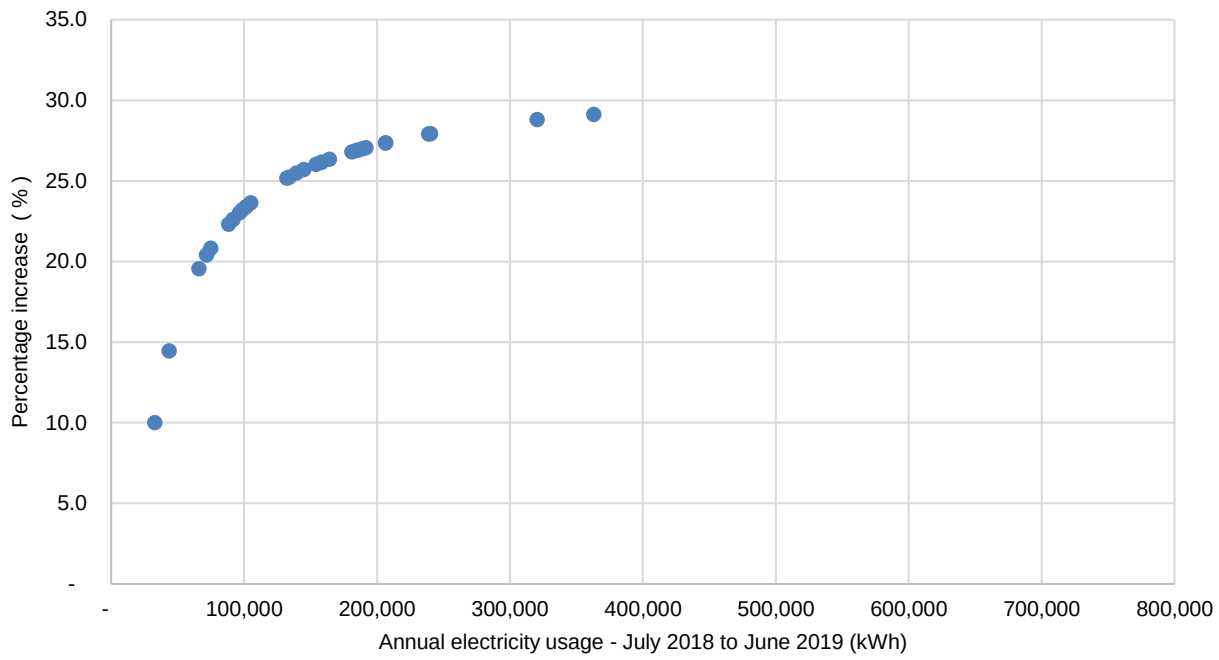


CHART IR-6(h) (poultry)
Increase in bills for 4 Metered Poultry Farms due to proposed changes in Residential Rate

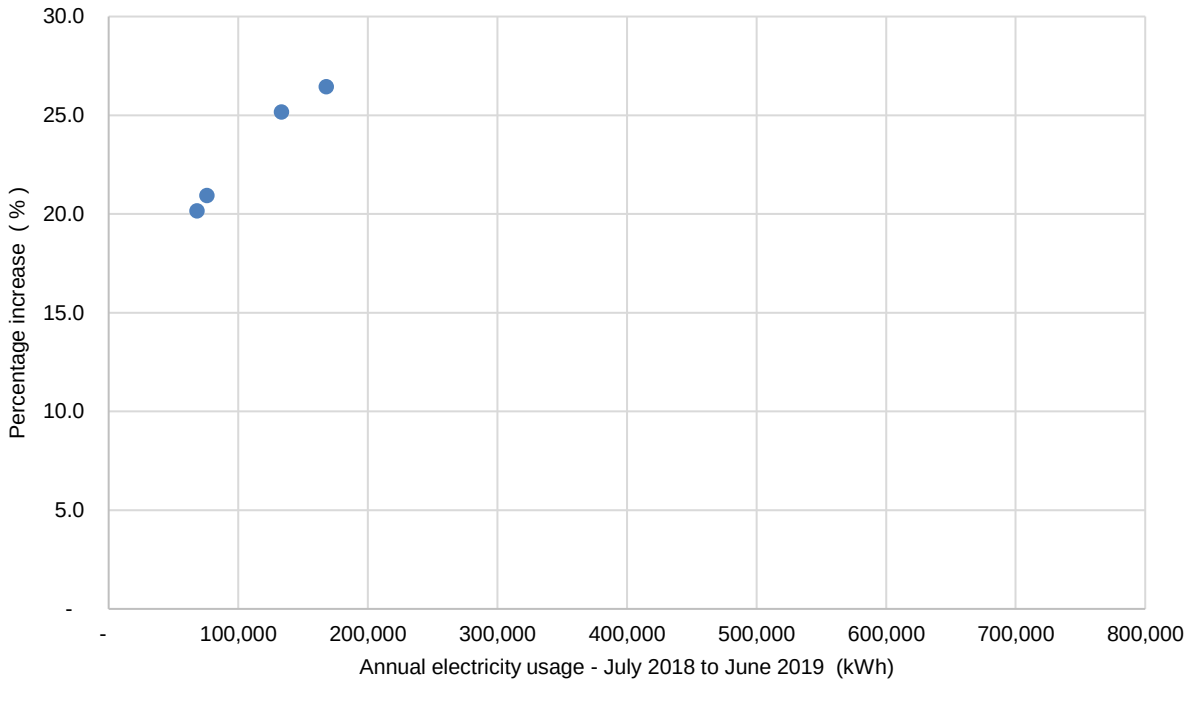
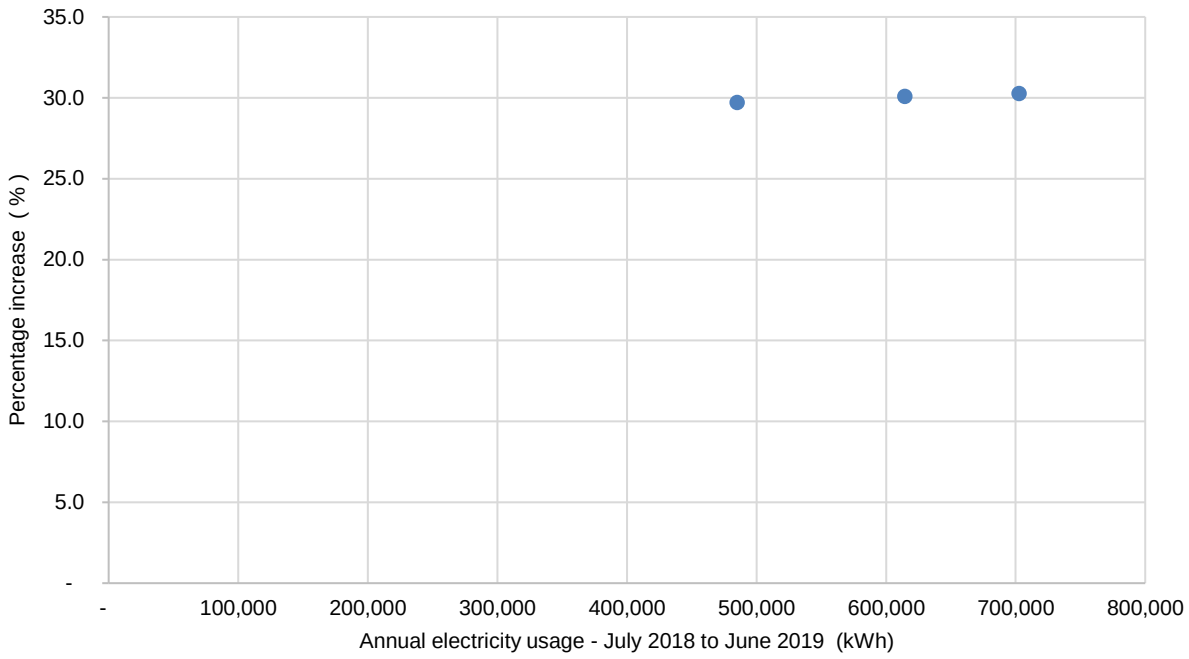


CHART IR-6(h) (hog)
Increase in bills for 3 Metered Hog Farms due to proposed changes in Residential Rate



i. See tab IR-4(c) in the Excel workbook "Federation of Agriculture IR Responses in Excel". This is the same request as in IR-4(c).

IR-7 On page 8 of the Farm Study MECL states that:

"The conclusion is that basing this Study on farms that use at least 5,000 kWh per month as identified in the billing system is a reasonable approach because it includes most of the electricity usage by farms in the Residential class."

a. Please confirm whether or not the above statement when referring to 'this Study' is in relation to the 87 farm accounts used in the 'Farm Study' to meter for monthly consumption data or if it applies to the estimates done for the 520+ residential farm accounts with usage over 5,000kWh/month

b. Please explain how MECL's 'top down estimate' compared to its detailed analysis for accounts greater than 5,000kWh/month leads to the above conclusion.

Response:

a. The statement refers to the 520+ Residential accounts with usage over 5,000 kWh per month, which include most of the electricity usage by farms in the Residential class.

b. Table IR-7(b) below is a repeat of Table 6 in the Farm Study.

TABLE IR-7(b)
Comparison of Billed Electricity Usage with Intensity Factors Estimate
(July 2018 to June 2019)

Type of Crop/Farming	Main Uses of Electricity	Billed Residential Usage Less Household Usage (Table 2) (GWh)	Electricity Usage for 2018 Production (estimated using intensity factors)		
			Total (Table 4) (GWh) A	Less usage under GS or SI Rates (GWh) B	Balance assumed in Residential Accounts (GWh) C = A – B
Potato	Fan power for storage cooling and ventilation	26.1	36.4	9.2	27.2
Dairy (milk)	Milk cooling, hot water heating, milking machinery	12.3	12.1	-	12.1
Hog	Ventilation and radiant heating	2.2	2.2	0.4	1.8
Poultry/Eggs	Ventilation, lighting and feeding	1.1	1.9	0.1	1.8
Cereal crops	Fan power for drying and storage ventilation	Note 1	2.3	0.8	1.5
TOTAL		**41.7**	**54.9**	**10.5**	**44.4**

Note 1: Immaterial consumption. Assumed to be usually included with the other loads on a farm.

The 41.7 GWh total for the first column of numbers is the estimate of farm usage for the period July 2018 through June 2019 based on analysis of the 520+ Residential farm

accounts with usage over 5,000 kWh per month. This is taken from Table 2 in the Farm Study.

The 54.9 GWh total for column A is the estimated electricity usage for 2018 farm production from Table 4 of the Farm Study, based on 2018 PEI agriculture production statistics and industry intensity factors (i.e., amount of electricity used per unit of agriculture production). This is the “top down” estimate of electricity usage for agriculture in PEI.

In order to compare the 54.9 GWh total to the Residential class estimate of 41.7 GWh, the 54.9 GWh total needs to be adjusted for electricity that is supplied to farm loads under the General Service and Small Industrial classes. Subtracting the 10.5 GWh supplied under the General Service and Small Industrial classes from the 54.9 GWh top down estimates gives an estimated 44.4 GWh supplied under the Residential class. This compares favourably with the 41.7 GWh estimate, not only in total but also by farm type for the two largest users – potato and dairy.

Similar comments apply to Table 7 in the Farm Study, which is based on 2019 farm production.

IR-8 Table 4 & 5 (pages 7 & 8) provides an estimate for farm electricity usage, breaking down by type of farm and main electricity end uses for each year 2018-19 and 2019-20.

a. Please explain whether or not MECL considered potential future changes that may impact farm usage levels, including for example the impacts of electrification usage per type of farm in its estimate of electricity usage by type of farm.

Response:

Maritime Electric has not done any investigation into potential changes that may impact future farm electricity usage.

IR-9 Table 14 on page 21 of the farm study is reproduced below. Table 13 in the Study is similar but for the 2018-2019 time period.

TABLE 14
Allocation of 2017 Costs to July 2019 to June 2020 Farm Load
(Based on 2017 CAS)

	Unit Costs (from 2017 CAS)		2017 CAS		Jul 2019 to Jun 2020 Residential Farm Load			
			Residential Year Round	Farms	Potato Farms	Dairy Farms	Poultry & Hog Farms	Total
Number of Customers	#		57,286	2,094	361	142	25	528
CP Demand		(MW)	131.5	13.6	5.3	2.5	0.4	8.2
Group NCP Demand		(MW)	161.9	16.8	8.4	2.3	0.6	11.3
Energy		(MWh)	505,169	52,322	31,598	12,887	3,833	48,318
Allocated costs for 2017 ($000's)								
Customer related	295	$/yr	16,915	618	107	42	7	156
CP Demand related	184	$/kW-yr	24,257	2,509	978	461	74	1,513
NCP Demand related	54	$/kW-yr	8,710	904	452	124	32	608
Energy related	83	$/MWh	41,928	4,343	2,623	1,070	318	4,010
			91,810	8,373	4,159	1,696	432	6,287
Allocated revenues for 2017 ($000's)			83,860	6,868	3,610	1,491	426	5,527
Estimated RTC ratios (%)			91	82				89

For July 2018 to June 2019 Residential farm load:
- CP Demand is for February 25, 2019 hour ending 19:00
- NCP demand is for December 5, 2018 hour ending 09:00

a. Please confirm or explain otherwise that the Residential Farm Load columns is an estimate of accounts based on the detailed 'SIC' review MECL undertook for accounts greater than 5,000 kWh/month usage. If not please explain.

b. Please provide a version of Table 13 and Table 14 that adds columns for the 87 metered Farm customers by type of farm (potato, dairy, poultry & hog, etc.).

i. Please explain if there are any underlying differences in the allocators used between the 87 metered Farm customers (by farm type) and the broader 'Farms' and 'Residential Farm Load' columns to apply the unit cost calculation to develop total allocated costs.

Response:

a. The Residential Farm load columns is largely based on the detailed review Maritime Electric undertook for accounts greater than 5,000 kWh usage. The Residential Farm load columns also include a relatively small number of accounts with less than 5,000 kWh usage.

b. The revised tables are shown below.

TABLE IR-9(i)
Allocation of 2017 Costs to July 2018 to June 2019 Farm Load
(Based on 2017 CAS)

	Unit Costs (from 2017 CAS)		2017 CAS		Jul 2018 to Jun 2019 Residential Farm Load				Jul 2018 to Jun 2019 Metered Farm Load			
			Residential Year Round	Farms	Potato Farms	Dairy Farms	Poultry & Hog Farms	Total	Potato Farms	Dairy Farms	Poultry & Hog Farms	Total
- Number Customers			57,286	2,094	353	143	24	520	50	30	7	87
- Coincident Peak Demand		(MW)	131.5	13.6	4.4	2.9	0.5	7.8	0.97	0.80	0.28	2.05
- Group NCP Demand		(MW)	161.9	16.8	8.5	2.6	0.6	11.7	1.62	0.73	0.34	2.69
- Energy		(MWh)	505,169	52,322	26,804	13,114	3,483	43,401	6,036	4,571	2,256	12,863
Additional costs for 2020 ($000s):												
- Customer Related	295.27	$/yr	16,915	618	104	42	7	153	15	9	2	26
- CP Demand Related	184.46	$/kW-yr	24,257	2,509	812	535	92	1,439	179	148	52	379
- NCP Demand Related	53.80	$/kW-yr	8,710	904	457	140	32	629	87	39	18	144
- Energy Related	83.00	$/MWh	41,928	4,343	2,225	1,088	289	3,602	501	379	187	1,067
TOTALS			**91,810**	**8,373**	**3,598**	**1,805**	**420**	**5,823**	**782**	**575**	**259**	**1,616**
Allocated revenues for 2017 ($000s)			**83,860**	**6,868**	**3,100**	**1,515**	**388**	**5,003**	**678**	**508**	**243**	**1,429**
Estimated revenue to cost ratios (%)			**91**	**82**				**86**				**88**

Note for Jul 2018 to Jun 2019 Residential farm load:
- Coincident Peak Demand is for February 26, 2019 hour ending 19:00
- Non-Coincident Peak Demand is for December 5, 2018 hour ending 09:00

TABLE IR-9(ii)
Allocation of 2017 Costs to July 2019 to June 2020 Farm Load
(Based on 2017 CAS)

	Unit Costs (from 2017 CAS)		2017 CAS		Jul 2019 to Jun 2020 Residential Farm Load				Jul 2019 to Jun 2020 Metered Farm Load			
			Residential Year Round	Farms	Potato Farms	Dairy Farms	Poultry & Hog Farms	Total	Potato Farms	Dairy Farms	Poultry & Hog Farms	Total
- Number Customers			57,286	2,094	361	142	25	528	52	30	9	91
- Coincident Peak Demand		(MW)	131.5	13.6	5.3	2.5	0.4	8.2	0.99	0.78	0.27	2.04
- Group NCP Demand		(MW)	161.9	16.8	8.4	2.3	0.6	11.3	1.61	0.70	0.34	2.65
- Energy		(MWh)	505,169	52,322	31,598	12,887	3,833	48,318	6,756	4,539	2,445	13,740
Additional costs for 2020 ($000s):												
- Customer Related	295.27	$/yr	16,915	618	107	42	7	156	15	9	3	27
- CP Demand Related	184.46	$/kW-yr	24,257	2,509	978	461	74	1,513	183	144	50	377
- NCP Demand Related	53.80	$/kW-yr	8,710	904	452	124	32	608	87	38	18	143
- Energy Related	83.00	$/MWh	41,928	4,343	2,623	1,070	318	4,011	561	377	203	1,141
TOTALS			**91,810**	**8,373**	**4,160**	**1,697**	**431**	**6,288**	**846**	**568**	**274**	**1,688**
Allocated revenues for 2017 ($000s)			**83,860**	**6,868**	**3,610**	**1,491**	**426**	**5,527**	**754**	**505**	**265**	**1,524**
Estimated revenue to cost ratios (%)			**91**	**82**				**88**				**90**

Note for Jul 2019 to Jun 2020 Residential farm load:
- Coincident Peak Demand is for January 17, 2020 hour ending 18:00
- Non-Coincident Peak Demand is for December 9, 2019 hour ending 09:00

The CP and NCP demands for the 87 metered Farm load columns are the sum of the individual account metered values.

The CP and NCP demands for the Residential Farm load columns are estimates based on the 87 metered Farm load columns, and these estimates include the metered Farm load data.

IR-10 Page 2 of the Farm Study states the following:

> To gain a better understanding of electricity usage by farms, in the first half of 2018 Maritime Electric installed meters capable of storing hourly load data at 87 of the larger farms on Prince Edward Island ("PEI"). Based on the first 12 months (July 2018 to June 2019) of hourly data, the estimated RTC ratio for farm load is 0.86. For the second 12 months (July 2019 to June 2020) of hourly data, the estimated RTC ratio is 0.88. These values are higher than the estimate of 0.82 for Farms in the 2017 Cost Allocation Study, but are still below the target range of 0.95 to 1.05.

a. Please explain in detail and provide all calculations in support of the methods used to calculate the estimated RTC ratios provided above.

b. Please provide the underlying calculations for each estimated RTC ratio.

c. Please explain how the Farm Study participants, as "larger" users and therefore generally using more second block power, have a much higher estimated RTC ratio of 0.88 compared to the estimate for the entirety of the Farm customers of 0.82, when the full Farm customer base includes much more proportionate usage of Block 1 energy per customer.

Response:

a. Table IR-10(i) below is a repeat of Table 11 in the Farm Study, and shows the calculation of the allocated revenue amounts as shown in Table 13 in the Farm Study. For convenience, Table 13 in the Farm Study is shown below as Table IR-10(ii).

In Table IR-10(i) the March 1, 2017 Residential Rate charges are used to estimate the revenue as billed for each farm type for the 12 month period July 2018 to June 2019. These charges were in effect for March through December of 2017. Since the charges for January and February of 2017 were different from the charges that were effective starting March 1, the revenue so estimated needs to be adjusted accordingly. This is the purpose of the Residential Year Round column.

In the Residential Year Round column, the revenue for calendar year 2017 is estimated using the March 1, Residential Rate charges, and then compared to the revenue as billed from the 2017 CAS. The estimated “revenue as billed” for each farm type for the 12 month period July 2018 to June 2019 is adjusted by the ratio of revenue as billed to estimated revenue as billed for Residential Year Round. For example, the $3,268 “estimated revenue as billed” for potato farms is multiplied by $86,682 / $87,175 to get the $3,250 “revenue as billed”. Similarly, the ECAM, rate of return adjustment and weather normalization amounts for Residential Year Round are applied pro rata to each farm type to get “base (allocated) revenue for 2017” amounts.

The “estimated RTC ratios” for July 2018 through June 2019 in Table IR-10(ii) are the allocated revenue amounts from Table IR-10(i) divided by the corresponding allocated cost amounts. For example, the RTC for the Residential Farm load is $5,003,000 x 100 / $5,823,000 = 86%.

For July 2019 through June 2020, Table IR-10(iii) below is a repeat of Table 12 in the Farm Study and Table IR-10(iv) below is a repeat of Table 14 in the Farm Study. Similarly the "estimated RTC ratios" for the Residential Farm load is $5,527,000 x 100 / $6,288,000 = 88%.

TABLE IR-10(i)
Estimated 2017 Revenue for July 2018 to June 2019 Farm Load
(based on 2017 CAS)

March 1, 2017 Residential Rate Charges:			2017 total number of bills			
- Urban monthly service charge	24.57	$/month	Urban	303,682		
- Rural monthly service charge	26.92	$/month	Rural	408,486		
- First 2,000 kWh months	0.1396	$/month				
- Second block energy	0.1108	$/month				

	2017 CAS		**Jul 2018 to Jun 2019 Residential Billing Data**				
	Residential Year Round	**Farms**	**Potato Farms**	**Dairy Farms**	**Hog Farms**	**Poultry Farms**	**Total**
Sales data:							
- annual sales (MWh)	505,169	52,322	26,804	13,114	2,288	1,195	43,401
First block MWh	466,014	23,545	6,405	3,400	217	356	10,378
Second block MWh	39,155	28,777	20,399	9,714	2,071	839	33,023
- average bills per month	57,286	2,094	353	143	9	15	520
Application of Rate ($000s)							
- service charges	17,781	676	114	46	3	5	168
- first block energy	65,056	3,287	894	475	30	50	1,449
- second block energy	4,338	3,189	2,260	1,076	229	93	3,658
- subtotal estimated revenue as billed	87,175	7,152	3,268	1,597	262	148	5,275
Revenue as billed	86,682	7,115	3,250	1,588	261	147	5,246
Less ECAM	1,226	127	65	32	6	3	106
Subtotal revenue as reported	85,456	6,988	3,185	1,556	255	144	5,140
Less rate of return adjustment	1,622	122	86	42	7	4	139
Plus weather normalization	26	2	1	1	0	0	2
Total base (allocated) revenue for 2017	**83,860**	**6,868**	**3,100**	**1,515**	**248**	**140**	**5,003**

TABLE IR-10(ii) Allocation of 2017 Costs to July 2018 to June 2019 Farm Load (Based on 2017 CAS)								
	Unit Costs (from 2017 CAS)		2017 CAS		Jul 2018 to Jun 2019 Residential Farm Load			
			Residential Year Round	Farms	Potato Farms	Dairy Farms	Poultry & Hog Farms	Total
- Number of Customers			57,286	2,094	353	143	24	520
- Coincident Peak Demand		(MW)	131.5	13.6	4.4	2.9	0.5	7.8
- Group NCP Demand		(MW)	161.9	16.8	8.5	2.6	0.6	11.7
- Energy		(MWh)	505,169	52,322	26,804	13,114	3,483	43,401
Allocated costs for 2017 ($000s):								
- Customer Related	295.27	$/yr	16,915	618	104	42	7	153
- CP Demand Related	184.46	$/kW-yr	24,257	2,509	812	535	92	1,439
- NCP Demand Related	53.80	$/kW-yr	8,710	904	457	140	32	629
- Energy Related	83.00	$/MWh	41,928	4,343	2,225	1,088	289	3,602
TOTALS			**91,810**	**8,374**	**3,598**	**1,805**	**420**	**5,823**
Allocated revenues for 2017 ($000s)			**83,860**	**6,868**	**3,100**	**1,515**	**388**	**5,003**
Estimated RTC ratios (%)			**91**	**82**				**86**

Note for Jul 2018 to Jun 2019 Residential farm load:

- Coincident Peak Demand is for February 26, 2019 hour ending 19:00
- Non-Coincident Peak Demand is for December 5, 2018 hour ending 09:00

Maritime Electric

TABLE IR-10(iii)
Estimated 2017 Revenue for July 2019 to June 2020 Farm Load
(based on 2017 CAS)

March 1, 2017 Residential Rate Charges:			**2017 total number of bills:**			
- Urban monthly service charge	24.57	$/month	Urban	303,682		
- Rural monthly service charge	26.92	$/month	Rural	408,486		
- First 2,000 kWh months	0.1396	$/month				
- Second block energy	0.1108	$/month				

	2017 CAS		**Jul 2019 to Jun 2020 Residential Billing Data**				
	Residential Year Round	**Farms**	**Potato Farms**	**Dairy Farms**	**Hog Farms**	**Poultry Farms**	**Total**
Sales data:							
- annual sales (MWh)	505,169	52,322	31,598	12,887	2,634	1,199	48,318
First block MWh	466,014	23,545	6,624	3,392	235	352	10,603
Second block MWh	39,155	28,777	24,974	9,495	2,399	847	37,715
- average bills per month	57,286	2,094	361	142	10	15	528
Application of Rate ($000s)							
- service charges	17,781	676	117	46	3	5	171
- first block energy	65,056	3,287	925	474	33	49	1,481
- second block energy	4,338	3,189	2,767	1,052	266	94	4,179
- subtotal estimated revenue as billed	87,175	7,152	3,809	1,572	302	148	5,831
Revenue as billed	86,682	7,115	3,787	1,563	300	147	5,797
Less ECAM	1,226	127	77	31	6	3	117
Subtotal revenue as reported	85,456	6,988	3,710	1,532	294	144	5,680
Less rate of return adjustment	1,622	122	101	41	8	4	155
Plus weather normalization	26	2	2	1	0	0	2
Total base (allocated) revenue for 2017	**83,860**	**6,868**	**3,611**	**1,492**	**286**	**140**	**5,527**

TABLE IR-10(iv) Allocation of 2017 Costs to July 2019 to June 2020 Farm Load (Based on 2017 CAS)								
	Unit Costs (from 2017 CAS)		2017 CAS		Jul 2019 to Jun 2020 Residential Farm Load			
			Residential Year Round	Farms	Potato Farms	Dairy Farms	Poultry & Hog Farms	Total
- Number Customers			57,286	2,094	361	142	25	528
- Coincident Peak Demand		(MW)	131.5	13.6	5.3	2.5	0.4	8.2
- Group NCP Demand		(MW)	161.9	16.8	8.4	2.3	0.6	11.3
- Energy		(MWh)	505,169	52,322	31,598	12,887	3,833	48,318
Allocated costs for 2017 ($000s):								
- Customer Related	295.27	$/yr	16,915	618	107	42	7	156
- CP Demand Related	184.46	$/kW-yr	24,257	2,509	978	461	74	1,513
- NCP Demand Related	53.80	$/kW-yr	8,710	904	452	124	32	608
- Energy Related	83.00	$/MWh	41,928	4,343	2,623	1,070	318	4,011
TOTALS			**91,810**	**8,374**	**4,160**	**1,697**	**431**	**6,288**
Allocated revenues for 2017 ($000s)			**83,860**	**6,868**	**3,610**	**1,491**	**426**	**5,527**
Estimated RTC ratios (%)			**91**	**82**				**88**

Note for Jul 2019 to Jun 2020 Residential farm load:
- Coincident Peak Demand is for January 17, 2020 hour ending 18:00
- Non-Coincident Peak Demand is for December 9, 2019 hour ending 09:00

b. See a) above

c. The data in Table IR-10(v) below has been taken from Tables IR-10(i) through IR-10(iv).

TABLE IR-10(v)					
			2017 CAS Farms	July 2018 to June 2019 Residential Farm Load	July 2019 to June 2020 Residential Farm Load
CP demand	kW	A	13.6	7.8	8.2
Annual sales	MWh	B	52,322	43,401	48,318
Annual load factor	%	C = B / (A*87.6)	44	64	67
First block energy			23,545	10,378	10,603
Second block energy			28,777	33,023	37,715
Total allocated revenue	$000s	D	6,868	5,003	5,527
Revenue per kW of CP	$000/kW	E = D/A	505	641	674

Table IR-10(v) shows that the Farm Study participants have a significantly higher load factor than the Farm subclass in the 2017 CAS. Because demand-related costs are recovered through the first and second block energy charges under the Residential Rate (there is no demand charge), the higher load factor for the Farm Study participants means that for each kW of coincident peak demand (and associated allocated cost) there is a higher recovery of fixed (demand-related) costs. The significantly higher load factor for the Farm Study participants more than offsets the effect of their lower proportion of first block energy.

IR-11 a. Please indicate if the 2020 Cost Allocation study is the most recent prepared, and if not please provide the paper and electronic versions of the latest Cost Allocation study.

b. Please provide a copy of the 2020 Cost Allocation study assuming all farm customers stay as residential, and the full Stage 1 Rate Plan had been implemented (i.e., no second block rate for residential remains, etc.). Please indicate all requires assumptions applied to complete the analysis.

c. Please provide a copy of the 2020 Cost Allocation study assuming all farm customers move as intended (i.e., those anticipated to move to the Small Industrial class move to that class, and those that are anticipated to remain as residential stay as residential), and the full Stage 1 Rate Plan had been implemented (i.e., no second block rate for residential remains, etc.). Please indicate all requires assumptions applied to complete the analysis.

Response:

a. The 2020 CAS is the most recent.

b. See the table below for an estimate of the 2020 RTC ratios that would have resulted, based on the assumptions as detailed in the notes.

TABLE IR-11(b) All Farm and Other > 5,000 Customers Stay on Residential Rate under Stage 1 of Rate Plan								
	2020 CAS results				With Stage 1 Rate Plan implemented			
	Allocated Cost ($000s)	Base Revenue ($000s)	RTC Ratio (%)		Adjustments to Revenue ($000s)	Adjusted Revenue ($000s)	RTC Ratio (%)	Notes
Residential	111,034	103,055	92.8		1,663	104,718	94.3	1
Residential (Seasonal)	4,974	4,689	94.3		62	4,751	95.5	1
Residential (Farms)	6,631	5,753	86.8		1,077	6,830	103.0	1
General Service 1	49,812	58,954	118.4		(3,582)	55,372	111.2	4
General Service 1 (Seasonal)	1,406	1,443	102.6			1,443	102.6	
Small Industrial	11,688	12,783	109.4			12,783	109.4	
Large Industrial	14,504	13,938	96.1		613	14,551	100.3	2
Street Lighting	2,847	2,257	79.3		167	2,424	85.1	3
Unmetered	417	441	105.8			441	105.8	
	203,313	203,313			-	203,313		

Notes:

1. Stage 1 Rate Plan called for increasing Residential second block energy charge to be equal to the first block energy charge.

	2020 Second Block MWh	Difference between 1st and 2nd Block ($/kWh)	Increase in Revenue ($000s)
Residential	56,360	0.0295	1,663
Residential (S)	2,116	0.0295	62
Residential (Farms)	36,507	0.0295	1,077

2. Stage 1 Rate Plan called for increasing the Large Industrial Rate by 4.4%. Implementing an increase of 4.4% would have resulted in an increase in 2020 revenue of 13,938 x 0.044 = 613.

3. Stage 1 Rate Plan called for increasing the Street Lighting rate by 7.4%. Implementing an increase of 7.4% would have resulted in an increase in 2020 revenue of 2,257 x 0.074 = 167.

4. Increase in revenue from Residential, Large Industrial and Street Lighting to be offset by a corresponding decrease in revenue from General Service.

c. See the updated Table 8 in the response to IR-14(f) herein.

IR-12 In MECL's response to IRAC IR-16a provides RTC ratios based on the 2017 Cost Allocation results revised for the "basic customer method". MECL's response to IRAC IR-16b states that:

Therefore, Maritime Electric respectfully requests an opportunity to include a review of the customer and demand classification percentages for the distribution system as part of the Company's next cost allocation study, which would then be incorporated into the development of the second stage of the Rate Design Application.

a. Please provide the supporting calculations that lead to MECL's revised RTC ratios by cohort, including what the resulting residential service charge (basic rate) would be for each cohort using this method and the revenue split between different charges (customer, energy, etc.).

b. Please provide a version of the Table from IR-16a that splits the Revised RTC ratio changes by two steps: 1) first removing the 2,000 kWh declining block rate, and 2) impacts from changing the customer classification and charge.

c. Please provide a version of the response to IR-16a using the 2020 Cost Allocation study, as well as supporting calculations.

d. Please specify how MECL intends to test the customer and demand classification percentages - including if methodological review is anticipated based on actual customer class splits.

Response:

a. The supporting calculations are shown in a series of six tables, as follows.

Table IR-12(a)-1 shows the RTC ratios as calculated in Table 3 – Preliminary Residential class load study results, on page 7 in the Rate Design Application, Exhibit M-1. The table is based on load data for the 12 month period March 2019 through February 2020.

Maritime Electric

TABLE IR-12(a)-1 (for Residential Year Round – March 2019 to February 2020)													
						2017 Allocated Costs ($000s)							
	Number of Customers	CP Load (MW)	NCP Load (MW)	Energy Sales (GWh)		Customer Related	1CP Demand Related	NCP Demand Related	Energy Related	Total		2017 Base Revenue ($000s)	RTC Ratio (%)
January Billing Cohorts:													
- Usage 0 to 575 kWh	22,807	17.0	27.0	93.9		6,734	3,136	1,453	7,790	19,113		19,501	102.0
- Usage 576 to 1,200 kWh	18,980	40.8	42.3	163.3		5,604	7,526	2,276	13,557	28,963		27,568	95.2
- Usage 1,201 to 2,300 kWh	11,687	37.1	38.5	152.9		3,451	6,844	2,071	12,694	25,060		23,833	95.1
- Usage 2,301 to 5,000 kWh	7,017	48.4	48.4	150.6		2,072	8,928	2,604	12,498	26,102		21,367	81.9
- Domestic > 5,000 kWh	293	4.3	4.3	11.6		87	792	231	960	2,070		1,462	70.6
- Farms > 5,000 kWh	418	7.8	10.7	42.5		123	1,439	576	3,525	5,663		4,816	85.0
- Other > 5,000 kWh	45	3.3	4.7	10.5		13	615	251	872	1,751		1,140	65.1
Combined	61,247			625.3		18,084	29,280	9,462	51,896	108,722		99,687	91.7

Table IR-12(a)-2 shows the reductions in customer-related allocated costs that result from using the $10.00/month from the basic customer method (for all cohorts) as proposed by Synapse as compared to the $295.27/year unit cost from the 2017 CAS. The total reduction in customer-related costs is $10,735,000.

TABLE IR-12(a)-2 (For Residential Year Round – March 2019 to February 2020)				
		2017 Costs Allocated by # Customers ($000s)		
	Number of Customers A	Status Quo B	Using Basic Customer Method $10.00 C=Ax12x10.00/1000	Reduction D = B - C
January Billing Cohorts:				
- Usage 0 to 575 kWh	22,807	6,734	2,737	3,997
- Usage 576 to 1,200 kWh	18,980	5,604	2,278	3,326
- Usage 1,201 to 2,300 kWh	11,687	3,451	1,402	2,049
- Usage 2,301 to 5,000 kWh	7,017	2,072	842	1,230
- Domestic >5,000 kWh	293	87	35	52
- Farms >5,000 kWh	418	123	50	73
- Other >5,000 kWh	45	13	5	8
Combined	61,247	18,084	7,349	10,735

Table IR-12(a)-3 shows the increases in NCP demand-related costs that are needed to offset the total reduction in customer-related costs of $10,735,000.

TABLE IR-12(a)-3 (For Residential Year Round – March 2019 to February 2020)				
		2017 Costs Allocated by NCP Demand ($000s)		
	NCP Load A	Status Quo B	Additional if using Basic Customer Method C = 10735 allocated pro rata by A	Revised Amount D = B + C
January Billing Cohorts:				
- Usage 0 to 575 kWh	27.0	1,453	1,648	3,101
- Usage 576 to 1,200 kWh	42.3	2,276	2,582	4,858
- Usage 1,201 to 2,300 kWh	38.5	2,071	2,350	4,421
- Usage 2,301 to 5,000 kWh	48.4	2,604	2,954	5,558
- Domestic >5,000 kWh	4.3	231	262	493
- Farms >5,000 kWh	10.7	576	653	1,229
- Other >5,000 kWh	4.7	251	286	537
Combined	175.9	9,462	10,735	20,197

Table IR-12(a)-4 shows the weighted average Residential service charge in effect for March 2019 through February 2020.

TABLE IR-12(a)-4 Year Round Residential		
	Mar 2019 to Feb 2020	
	Number of Bills	Monthly Service Charge $
Urban	313,720	24.57
Rural	421,247	26.92
Weighted average		25.92

Table IR-12(a)-5 shows the revenue that would have resulted from using a service charge of $10.00/month (from the basic customer method – for all cohorts) as compared to the weighted average service charge of $25.92 per Table IR-12(a)-4. A revised single block energy charge is then calculated that would offset the reduction in revenue from the reduced service charge.

TABLE IR-12(a)-5 (for Residential Year Round – March 2019 to February 2020)				
		Revenue from service charges ($000s)		
	Number of Customers A	Status Quo (weighted ave.) $25.92 B = Ax12x25.92/1000	Using Basic Customer Method $10.00 C = Ax12x10.00/1000	Difference D = C - B
January Billing Cohorts:				
- Usage 0 to 575 kWh	22,807	7,094	2,737	(4,357)
- Usage 576 to 1,200 kWh	18,980	5,904	2,278	(3,626)
- Usage 1,201 to 2,300 kWh	11,687	3,635	1,402	(2,233)
- Usage 2,301 to 5,000 kWh	7,017	2,183	842	(1,341)
- Domestic > 5,000 kWh	293	91	35	(56)
- Farms > 5,000 kWh	418	130	50	(80)
- Other > 5,000 kWh	45	14	5	(9)
Combined	61,247	19,051	7,349	(11,702)

The estimated single block energy charge associated with the basic customer method for service charge is:

Status quo total basic revenue ($000s)	99,688
Less service charges revenue based on basic customer method ($000s)	7,350
Revenue to be collected through single block energy charge ($000s)	92,338
Energy sales (GWh)	625.3
Resulting energy charge ($/kWh)	0.1477

Table IR-12(a)-6 is a revised version of Table IR-12(a)-1 which incorporates the results from Tables IR-12(a)-2, IR-12(a)-3 and IR-12(a)-5. The resulting RTC ratios are the same as those shown in the response to IRAC IR-16(a), Exhibit M-10, for the basic customer method.[2]

TABLE IR-12(a)-6 (Using the Basic Customer Method for Classifying Customer-Related Costs) (For Residential Year Round – March 2019 to February 2020)												
			2017 Allocated Costs ($000s)						2017 Base Revenue ($000s)			
	Number of Customers	Energy Sales (GWh)	Customer Related	1 CP Demand Related	NCP Demand Related	Energy Related	Total		Service Charge	Energy Charge	Total	RTC Ratio (%)
January Billing Cohorts:												
- Usage 0 to 575 kWh	22,807	93.9	2,737	3,136	3,101	7,790	16,764		2,737	13,866	16,603	99.0
- Usage 576 to 1,200 kWh	18,980	163.3	2,278	7,526	4,858	13,557	28,219		2,278	24,115	26,393	93.5
- Usage 1,201 to 2,300 kWh	11,687	152.9	1,402	6,844	4,421	12,694	25,361		1,402	22,579	23,981	94.6
- Usage 2,301 to 5,000 kWh	7,017	150.6	842	8,928	5,558	12,498	27,826		842	22,239	23,081	82.9
- Domestic > 5,000 kWh	293	11.6	35	792	493	960	2,280		35	1,713	1,748	76.7
- Farms > 5,000 kWh	418	42.5	50	1,439	1,229	3,525	6,243		50	6,276	6,326	101.3
- Other > 5,000 kWh	45	10.5	5	615	536	872	2,028		5	1,551	1,556	76.7
Combined	61,247	625.3	7,349	29,280	20,196	51,896	108,721		7,349	92,339	99,688	91.7

[2] In preparation of this response, a typo was found in the Table provided in the Company's response to Commission IR-16(a). The RTC for the billing cohort described as "Other > 5,000 kWh" was reported as 96.7 instead of 76.7. An updated response to Commission Staff IR-16(a) has been filed with the Commission in conjunction with these responses.

b. The table below includes a third column showing the RTC ratios that result from eliminating the second energy block while leaving the allocation of customer-related costs unchanged.

TABLE IR-12(b)-3 RTC Ratios			
	Status Quo	**Elimination of Second Energy Block**	**Elimination of Second Block Plus Basic Customer Method**
January billing cohorts:			
- Usage 0 to 575 kWh	102.0	100.5	99.0
- Usage 576 to 1,200 kWh	95.2	93.1	93.5
- Usage 1,201 to 2,300 kWh	95.1	93.2	94.6
- Usage 2,301 to 5,000 kWh	81.9	82.8	82.9
- Domestic > 5,000 kWh	70.6	76.7	76.7
- Farms > 5,000 kWh	85.0	99.1	101.3
- Other > 5,000 kWh	65.1	78.1	76.7
Combined	91.7	91.7	91.7

c. The following table is a version of the response to IR-16(a) using the 2020 CAS.

TABLE IR-12(c)-1 Impact of Revised Service Charge on RTC Ratio for Year Round Residential		
Cohorts	**2020 RTC Ratios**	**Revised 2020 RTC Ratios**
1. Usage 0 to 575 kWh	98.8	96.9
2. Usage 576 to 1,200 kWh	92.2	90.8
3. Usage 1,201 to 2,300 kWh	92.5	91.8
4. Usage 2,301 to 5,000 kWh	78.7	79.5
5. Domestic > 5,000 kWh	67.7	72.8
6. Farms > 5,000 kWh	84.5	99.0
7. Other > 5,000 kWh	62.9	73.0
Total	**88.8**	**88.8**

Similar to the response to IR-12(a) herein, the supporting calculations are shown in a series of six tables.

TABLE IR-12(c)-2
(For Residential Year Round – March 2019 to February 2020)

	Number of Customers	CP Load (MW)	NCP Load (MW)	Energy Sales (GWh)	2020 Allocated Costs($000s)					2020 Base Revenue ($000s)	RTC Ratio (%)
					Customer Related	1 CP Demand Related	NCP Demand Related	Energy Related	Total		
- Usage 0 to 575 kWh	22,807	17.0	27.0	93.9	7,092	3,775	1,955	7,713	20,534	20,285	98.8
- Usage 576 to 1,200 kWh	18,980	40.8	42.3	163.3	5,902	9,060	3,062	13,414	31,438	28,980	92.2
- Usage 1,201 to 2,300 kWh	11,687	37.1	38.5	152.9	3,634	8,238	2,787	12,560	27,219	25,166	92.5
- Usage 2,301 to 5,000 kWh	7,017	48.4	48.4	150.6	2,182	10,747	3,504	12,371	28,804	22,678	78.7
- Domestic > 5,000 kWh	293	4.3	4.3	11.6	91	953	311	953	2,308	1,562	67.7
- Farms > 5,000 kWh	418	7.8	10.7	42.5	130	1,732	775	3,491	6,128	5,177	84.5
- Other > 5,000 kWh	45	3.3	4.7	10.5	14	741	338	862	1,955	1,229	62.9
Combined	61,247			625.3	19,044	35,246	12,732	51,363	118,386	105,077	88.8

Where the 2020 CAS unit costs are:

Customer	=	$310.94/year
1CP Demand	=	$222.05/kW - yr
NCP Demand	=	$72.40/kW - yr
Energy	=	$82.14/MWh

TABLE IR-12(c)-3
(for Residential Year Round – March 2019 to February 2020)

	Number of Customers A	2020 Costs Allocated by # Customers ($000s)		
		Status Quo B (from Table IR-12c-2)	Using Basic Customer Method C=Ax12x10.00/1000	Reduction D = B - C
January billing cohorts:				
- Usage 0 to 575 kWh	22,807	7,092	2,737	4,355
- Usage 576 to 1,200 kWh	18,980	5,902	2,278	3,624
- Usage 1,201 to 2,300 kWh	11,687	3,634	1,402	2,232
- Usage 2,301 to 5,000 kWh	7,017	2,182	842	1,340
- Domestic > 5,000 kWh	293	91	35	56
- Farms > 5,000 kWh	418	130	50	80
- Other > 5,000 kWh	45	14	5	9
Combined	61,247	19,044	7,349	11,696

TABLE IR-12(c)-4 (For Residential Year Round - March 2019 to February 2020)				
		2020 costs allocated by NCP Demand ($000s)		
	NCP Load (MW) A	Status Quo B	Additional Using Basic Customer Method C = 11,696 allocated pro rata by A	Revised Amount D = B + C
January billing cohorts:				
- Usage 0 to 575 kWh	27.0	1,955	1,796	3,751
- Usage 576 to 1,200 kWh	42.3	3,062	2,813	5,875
- Usage 1,201 to 2,300 kWh	38.5	2,787	2,560	5,347
- Usage 2,301 to 5,000 kWh	48.4	3,504	3,219	6,723
- Domestic > 5,000 kWh	4.3	311	286	597
- Farms > 5,000 kWh	10.7	775	712	1,487
- Other > 5,000 kWh	4.7	338	310	648
Combined	175.9	12,732	11,696	24,428

Table IR-12(c)-5 Year Round Residential Mar 2019 to Feb 202		
	Number of Bills	Monthly Service Charge $
Urban	313,720	24.57
Rural	421,247	26.92
Weighted average		25.92

Table IR-12(c)-6 (For Residential Year Round - March 2019 to February 2020)				
	Number of Customers A	Revenue from Service Charges ($000s)		
		Status Quo (weighted average) $25.92 B = Ax12x25.92/1000	Using Basic Customer Method $10.00 C = Ax12x10.00/1000	Difference D = C - B
January billing cohorts:				
- Usage 0 to 575 kWh	22,807	7,094	2,737	(4,357)
- Usage 576 to 1,200 kWh	18,980	5,904	2,278	(3,626)
- Usage 1,201 to 2,300 kWh	11,687	3,635	1,402	(2,233)
- Usage 2,301 to 5,000 kWh	7,017	2,183	842	(1,341)
- Domestic > 5,000 kWh	293	91	35	(56)
- Farms > 5,000 kWh	418	130	50	(80)
- Other > 5,000 kWh	45	14	5	(9)
Combined	61,247	19,051	7,349	(11,702)

The estimated single block energy charge associated with basic customer method for calculating the service charge is:

Status quo total basic revenue ($000s)	105,077
Less service charges revenue based on basic customer method ($000s)	7,350
Revenue to be collected through single block energy charge ($000s)	97,727
Energy sales (GWh)	625.3
Resulting energy charge ($/kWh)	0.1563

TABLE IR-12(c)-7 (For the Basic Customer Method for Classifying Customer-Related Costs) (for Residential Year Round – March 2019 to February 20200											
	Number of Customers	Energy Sales (GWh)	2020 Allocated Costs ($000s)					2020 Base Revenue ($000s)			RTC Ratio (%)
			Customer Related	1CP Demand Related	NCP Demand Related	Energy Related	Total	Service Charge	Energy Charge	Total	
- Usage 0 to 575 kWh	22,807	93.9	2,737	3,775	3,750	7,713	17,975	2,737	14,675	17,412	96.9
- Usage 576 to 1,200 kWh	18,980	163.3	2,278	9,060	5,875	13,414	30,627	2,278	25,522	27,799	90.8
- Usage 1,201 to 2,300 kWh	11,687	152.9	1,402	8,238	5,348	12,560	27,548	1,402	23,896	25,299	91.8
- Usage 2,301 to 5,000 kWh	7,017	150.6	842	10,747	6,723	12,371	30,683	842	23,537	24,379	79.5
- Domestic > 5,000 kWh	293	11.6	35	953	596	953	2,537	35	1,813	1,848	72.8
- Farms > 5,000 kWh	418	42.5	50	1,732	1,486	3,491	6,759	50	6,642	6,692	99.0
- Other > 5,000 kWh	45	10.5	5	741	648	862	2,256	5	1,641	1,646	73.0
Combined	61,247	625.3	7,349	35,246	24,426	51,364	118,385	7,349	97,726	105,075	88.8

d. Maritime Electric has asked Chymko Consulting to review and update the customer/demand classification percentages as part of the 2023 CAS.

IR-13 MECL filed the 2017 Cost Allocation Study and an updated 2020 Cost Allocation Study in support of its Rate Design Application.

a. Please indicate whether or not the 2017 Cost Allocation Study as provided in Exhibit M- 1(b) is the final version reflecting all review and approvals from any regulatory proceeding. If not, please indicate he changes required as a result of regulatory review.

b. Please explain in detail any methodological changes that MECL has included in its 2017 Cost Allocation Study compared to the 2014 study, including but not limited to functionalization, classification or allocated related method or input changes.

   a. If any changes have occurred, please explain the rationale for the change and compare the details of the change and the resulting RTC impact on customer classes, including by Residential cohorts.
   b. For the proposed classification change for Point Lepreau from 95% demand & 5% energy to 25% demand and 75% energy please explain whether or not this change has been approved by the Commission to date, and if so please provide the Order reference approving it.
      i. Please provide a comparison for both the 2017 Cost Allocation Study and 2020 Cost Allocation Study showing the classification change allocated for each customer class and resulting RTC impacts.
   c. For the classification for all combustion turbine fuel costs as energy related rather than demand-related, please explain whether or not this change has been approved by the Commission to date, and if so please provide the Order reference approving it.
      i. Please provide a comparison for both the 2017 Cost Allocation Study and 2020 Cost Allocation Study showing the classification change allocated for each customer class and resulting RTC impacts.
   d. For the classification for a portion of wind purchase power as demand related, rather than 100% energy related, with demand-related at 23% (same proportion as ratio of wind power name capacity) please explain whether or not this change has been approved by the Commission to date, and if so please provide the Order reference approving it.
      i. Please provide a comparison for both the 2017 Cost Allocation Study and 2020 Cost Allocation Study showing the classification change allocated for each customer class and resulting RTC impacts.

Response:

a. The 2017 CAS as provided in Exhibit M-1(b) is the final version. No changes were required as a result of regulatory review.

b. The 2017 CAS incorporated three changes to classification percentages as recommended by Maritime Electric in the Point Lepreau Cost Allocation Classification Study, Docket UE20944, Exhibit M-2. All three recommended changes were approved by the Commission in Order UE19-08.

The first recommendation in the Point Lepreau Classification Study was that 25 per cent of Point Lepreau Nuclear Generating Station ("Point Lepreau") non-fuel costs should be classified as demand-related and 75 per cent should be classified as energy-related. This would reflect the fact that most of the fixed costs for a nuclear generating plant are incurred to provide base load energy. Fuel costs would continue to be classified as 100 per cent energy-related. Previously all Point Lepreau non-fuel costs were classified as 100 per cent demand-related.

A comparison of the change in classifying Point Lepreau non-fuel costs is shown in Tables IR-13(b)-1 and IR-13(b)-2.

TABLE IR-13(b)-1
2017 CAS

	Allocators in 2017 CAS (Page 27, Appendix A)		Allocation of Point Lepreau Non-Fuel Costs			
			As Classified in 2017 CAS ($000s)		Classification prior to 2017 CAS ($000s)	
	1 CP Demand Allocators (kW)	Input Energy Allocators (MWh)	25% Demand Related	75% Energy Related	100% Demand Related	0% Energy Related
Residential	142,677	545,726	3,194	7,055	12,776	-
Residential (S)	1,581	21,273	35	275	142	-
Farm	14,756	56,523	330	731	1,321	-
General Service	58,081	404,585	1,300	5,230	5,201	-
General Service (S)	1	9,549	-	123	-	-
Small Industrial	14,593	95,207	327	1,231	1,307	-
Large Industrial	16,303	156,089	365	2,018	1,460	-
Street Lighting	1,424	5,989	32	77	128	-
Unmetered	364	2,621	8	34	33	-
TOTAL	**249,780**	**1,297,562**	**5,591**	**16,774**	**22,368**	**-**

	2017 CAS Results			2017 Results if using prior Classification	
	Base Revenue ($000s)	Total Allocated Costs ($000s)	RTC Ratio (%)	Total Allocated Costs ($000s)	RTC Ratio (%)
Residential	83,860	91,806	91.3	94,333	88.9
Residential (S)	4,309	4,512	95.5	4,343	99.2
Farm	6,868	8,372	82.0	8,632	79.6
General Service	58,151	47,880	121.5	46,550	124.9
General Service (S)	1,766	1,565	112.8	1,442	122.5
Small Industrial	11,675	11,402	102.4	11,151	104.7
Large Industrial	13,205	14,115	93.6	13,192	100.1
Street Lighting	2,330	2,559	91.1	2,577	90.4
Unmetered	407	391	104.1	382	106.5
TOTAL	**182,571**	**182,602**		**182,602**	

TABLE IR-13(b) 2020 CAS						
	Allocators in 2020 CAS (Page 26, Appendix A)		Allocation of Point Lepreau Non-Fuel Costs			
			As Classified in 2020 CAS ($000s)		Classification prior to 2017 CAS ($000s)	
	1 CP Demand Allocators (kW)	Input Energy Allocators (MWh)	25% Demand Related	75% Energy Related	100% Demand Related	0% Energy Related
Residential	153,982	654,792	3,452	8,137	13,806	-
Residential (S)	1,835	21,931	41	273	165	-
Farm	8,780	45,716	197	568	787	-
General Service	61,822	388,735	1,386	4,831	5,543	-
General Service (S)	2	7,486	-	93	-	-
Small Industrial	13,236	98,430	297	1,223	1,187	-
Large Industrial	14,205	157,569	318	1,958	1,274	-
Street Lighting	1,179	4,832	26	60	106	-
Unmetered	371	2,689	8	33	33	-
TOTAL	**255,412**	**1,382,180**	**5,725**	**17,176**	**22,901**	**-**

	2020 CAS Results			2020 Results if using prior Classification	
	Base Revenue ($000s)	Total Allocated Costs ($000s)	RTC Ratio (%)	Total Allocated Costs ($000s)	RTC Ratio (%)
Residential	103,055	111,034	92.8	113,252	91.0
Residential (S)	4,689	4,974	94.3	4,825	97.2
Farm	5,753	6,631	86.8	6,653	86.5
General Service	58,954	49,812	118.4	49,138	120.0
General Service (S)	1,443	1,406	102.6	1,313	109.9
Small Industrial	12,783	11,688	109.4	11,356	112.6
Large Industrial	13,938	14,504	96.1	13,501	103.2
Street Lighting	2,257	2,847	79.3	2,866	78.8
Unmetered	441	417	105.8	409	107.9
TOTAL	**203,313**	**203,313**		**203,313**	

c. The second recommendation in the Point Lepreau Classification Study was that all combustion turbine fuel costs should be classified as 100 per cent energy-related. This would reflect the fact that most fuel usage by Maritime Electric's combustion turbines occurs to supply energy for the system. Previously combustion turbine fuel costs were classified as 100 per cent demand-related, the same as fuel costs for the Charlottetown Steam Plant, where most fuel is used for standby purposes - testing and plant heating.

A comparison of the change in classifying combustion turbine fuel costs is shown in Tables IR-13(c)-1 and IR-13(c)-2.

TABLE IR-13(c)-1 2017 CAS						
	Allocators in 2017 CAS (Page 27, Appendix A)		Allocation of Point Lepreau Non-Fuel Costs			
			As Classified in 2017 CAS ($000s)		Classification prior to 2017 CAS ($000s)	
	1 CP Demand Allocators (kW)	Input Energy Allocators (MWh)	25% Demand Related	100% Energy Related	100% Demand Related	0% Energy Related
Residential	142,677	545,726	-	410	556	-
Residential (S)	1,581	21,273	-	16	6	-
Farm	14,756	56,523	-	42	58	-
General Service	58,081	404,585	-	304	226	-
General Service (S)	1	9,549	-	7	0	-
Small Industrial	14,593	95,207	-	71	57	-
Large Industrial	16,303	156,089	-	117	64	-
Street Lighting	1,424	5,989	-	4	6	-
Unmetered	364	2,621	-	2	1	-
TOTAL	**249,780**	**1,297,562**	**-**	**974**	**974**	**-**

	2017 CAS			2017 Results if using prior Classification	
	Base Revenue ($000s)	Total Allocated Costs ($000s)	RTC Ratio (%)	Total Allocated Costs ($000s)	RTC Ratio (%)
Residential	83,860	91,806	91.3	91,953	91.2
Residential (S)	4,309	4,512	95.5	4,502	95.7
Farm	6,868	8,372	82.0	8,387	81.9
General Service	58,151	47,880	121.5	47,803	121.6
General Service (S)	1,766	1,565	112.8	1,558	113.4
Small Industrial	11,675	11,402	102.4	11,387	102.5
Large Industrial	13,205	14,115	93.6	14,061	93.9
Street Lighting	2,330	2,559	91.1	2,560	91.0
Unmetered	407	391	104.1	391	104.1
TOTAL	**182,571**	**182,602**		**182,602**	

TABLE IR-13(c)-2 2020 CAS						
	Allocators in 2020 CAS (Page 26, Appendix A)		Allocation of Combustion Turbine Fuel Costs			
			As Classified in 2020 CAS ($000s)		Classification prior to 2017 CAS ($000s)	
	1 CP Demand Allocators (kW)	Input Energy Allocators (MWh)	0% Demand Related	100% Energy Related	100% Demand Related	0% Energy Related
Residential	153,982	654,792	-	95	121	-
Residential (S)	1,835	21,931	-	3	1	-
Farm	8,780	45,716	-	7	7	-
General Service	61,822	388,735	-	56	48	-
General Service (S)	2	7,486	-	1	-	-
Small Industrial	13,236	98,430	-	14	10	-
Large Industrial	14,205	157,569	-	23	11	-
Street Lighting	1,179	4,832	-	1	1	-
Unmetered	371	2,689	-	-	-	-
TOTAL	**255,412**	**1,382,180**	**-**	**200**	**200**	**-**

	2020 CAS Results			2020 Results if using prior Classification	
	Base Revenue ($000s)	Total Allocated Costs ($000s)	RTC Ratio (%)	Total Allocated Costs ($000s)	RTC Ratio (%)
Residential	103,055	111,034	92.8	111,060	92.8
Residential (S)	4,689	4,974	94.3	4,972	94.3
Farm	5,753	6,631	86.8	6,631	86.8
General Service	58,954	49,812	118.4	49,804	118.4
General Service (S)	1,443	1,406	102.6	1,405	102.7
Small Industrial	12,783	11,688	109.4	11,685	109.4
Large Industrial	13,938	14,504	96.1	14,492	96.2
Street Lighting	2,257	2,847	79.3	2,847	79.3
Unmetered	441	417	105.8	417	105.8
TOTAL	**203,313**	**203,313**		**203,313**	

d. The third recommendation in the Point Lepreau Classification Study was that wind power purchase costs should be classified as demand-related in the same proportion that wind power nameplate capacity is counted as capacity for generating capacity planning purposes. This proportion is 23 per cent (i.e., 23 per cent of the 92 MW of wind power that Maritime Electric purchases, equal to 21 MW, is counted as capacity toward meeting the Company's planning reserve requirement). Previously, wind power purchase costs were classified as 100 per cent energy-related, because initially no capacity value was assigned to wind generation.

A comparison of the change in classifying wind energy costs is shown in Tables IR-13(d)-1 and IR-13(d)-2.

Maritime Electric

TABLE IR-13(d)-2 2017 CAS						
	Allocators in 2017 CAS (Page 27, Appendix A)		Allocation of Wind Energy Costs			
			As Classified in 2017 CAS ($000s)		Classification prior to 2017 CAS ($000s)	
	1 CP Demand Allocators (kW)	Input Energy Allocators (MWh)	23% Demand Related	77% Energy Related	0% Demand Related	100% Energy Related
Residential	142,677	545,726	3,052	7,524	-	9,771
Residential (S)	1,581	21,273	34	293	-	381
Farm	14,756	56,523	316	779	-	1,012
General Service	58,081	404,585	1,243	5,578	-	7,244
General Service (S)	1	9,549	-	132	-	171
Small Industrial	14,593	95,207	312	1,313	-	1,705
Large Industrial	16,303	156,089	349	2,152	-	2,795
Street Lighting	1,424	5,989	30	83	-	107
Unmetered	364	2,621	8	36	-	47
TOTAL	**249,780**	**1,297,562**	**5,344**	**17,890**	**-**	**23,233**

	2017 CAS Results			2017 Results if using prior Classification	
	Base Revenue ($000s)	Total Allocated Costs ($000s)	RTC Ratio (%)	Total Allocated Costs ($000)	RTC Ratio (%)
Residential	83,860	91,806	91.3	91,001	92.2
Residential (S)	4,309	4,512	95.5	4,566	94.4
Farm	6,868	8,372	82.0	8,289	82.9
General Service	58,151	47,880	121.5	48,304	120.4
General Service (S)	1,766	1,565	112.8	1,604	110.1
Small Industrial	11,675	11,402	102.4	11,482	101.7
Large Industrial	13,205	14,115	93.6	14,409	91.6
Street Lighting	2,330	2,559	91.1	2,553	91.3
Unmetered	407	391	104.1	394	103.3
TOTAL	**182,571**	**182,602**		**182,602**	

Maritime Electric

TABLE IR-13(d)-2 for 2020 CAS						
	Allocators in 2020 CAS (Page 26, Appendix A)		Allocation of Wind Energy Costs			
			As Classified in 2020 CAS ($000s)		Classification prior to 2017 CAS ($000s)	
	1 CP Demand Allocators (kW)	Input Energy Allocators (MWh)	0% Demand Related	100% Energy Related	100% Demand Related	0% Energy Related
Residential	153,982	654,792	3,404	8,955	-	11,629
Residential (S)	1,835	21,931	41	300	-	390
Farm	8,780	45,716	194	625	-	812
General Service	61,822	388,735	1,367	5,316	-	6,904
General Service (S)	2	7,486	-	102	-	133
Small Industrial	13,236	98,430	293	1,346	-	1,748
Large Industrial	14,205	157,569	314	2,155	-	2,798
Street Lighting	1,179	4,832	26	66	-	86
Unmetered	371	2,689	8	37	-	48
TOTAL	**255,412**	**1,382,180**	**5,647**	**18,902**	**-**	**24,548**

	2020 CAS Results			2020 Results if using prior Classification	
	Base Revenue ($000s)	Total Allocated Costs ($000s)	RTC Ratio (%)	Total Allocated Costs ($000s)	RTC Ratio (%)
Residential	103,055	111,034	92.8	110,305	93.4
Residential (S)	4,689	4,974	94.3	5,023	93.4
Farm	5,753	6,631	86.8	6,624	86.9
General Service	58,954	49,812	118.4	50,033	117.8
General Service (S)	1,443	1,406	102.6	1,436	100.5
Small Industrial	12,783	11,688	109.4	11,798	108.3
Large Industrial	13,938	14,504	96.1	14,834	94.0
Street Lighting	2,257	2,847	79.3	2,840	79.5
Unmetered	441	417	105.8	420	105.0
TOTAL	**203,313**	**203,313**		**203,313**	

IR-14 MECL's Exhibit M-1c provides its 2020 Cost Allocation Study, on page /2 it states that there has been a shift from energy-related costs to demand-related costs since the 2017 study.

a. Please explain whether or not the 2020 Cost Allocation Study has been reviewed or approved in a regulatory proceeding.

    a. If not, is approval of the 2020 Cost Allocation Study part of MECL's requested approvals in this proceeding? Please explain.

b. Please explain in detail any methodological changes that MECL has included in its 2020 Cost Allocation Study compared to the 2017 study, including but not limited to any functionalization, classification or allocation related method or input changes.

    a. If any changes have occurred, please explain the rationale for the change and compare the details of the change and the resulting RTC impact on customer classes, including by Residential cohorts.

c. Please explain what has occurred with regards to MECL's resource base and system load profile that has caused this shift and if MECL anticipates it to continue moving forward.

d. Please discuss MECL's power supply (both generation and purchased power) and transmission resource costs including whether or not there is any monthly volume and price volatility on the supply side being driven by changes in monthly customer demand.

e. Please provide a copy of the 2020 Cost Allocation study separating the Farm versus other Residential loads using the breakdown provided in MECL's response to Synapse IR-9 from October 1, 2021 (i.e., only include large farms in the "farms" category).

f. Please Update Tables 2, 3, 4, and 5, and 8 of the May 14, 2021 Application to reflect the 2020 Cost Allocation study.

g. Please provide a version of Chart 1 and 2 from the May 14, 2021 Application calculated assuming the Small Industrial rate was adjusted to only recover 100% RTC (per the 2020 Cost Allocation Study) through a reduction in the demand charge and the first block energy charge (first 100 kWh per kW) (or adjustment of the second block energy charge, if needed to bring the unit rates for the second block rate into alignment with the unit costs of energy).

Response:

a. The 2020 CAS, Docket 20945, Exhibit M-1(b), was filed with the Commission on July 22, 2021. The Study was not reviewed as a stand-alone document, but rather was used as input to the Open Access Transmission Tariff Application, which was approved in Order

UE22-04. While not expressly approved in that Order, the Order indirectly accepts the 2020 CAS as valid evidence.

b. The main change in the 2020 CAS as compared to the 2017 CAS is in the inputs for the Residential Farm subclass.

The Residential Farms subclass in the 2017 CAS included all Residential Rate customers who had been assigned one of the eight farming related SIC codes in the Company's billing system, as summarized in the table below.

TABLE IR-14(b)
Residential Rate Farm for 2017 CAS

SIC Code	SIC Code Description	Usage (MWh)	Numbers of Customers
011	Livestock Farms (Except Animal Specialties)	16,368	836
012	Other Animal Specialty Farms	2,989	172
013	Field Crop Farms	16,792	532
014	Field Crop Combination Farms	2,887	108
015	Fruit and Other Vegetables	487	27
016	Horticultural Specialties (includes green houses)	3,090	9
017	Livestock, Field Crop and Horticultural Comb. Farms	8,954	527
103	Fruit and Vegetable Industries	762	12
		52,329	**2,223**

Note: The 2,094 average number of monthly bills shown in the 2017 CAS for Farms is less than the 2,223 number of customers shown above because some of the accounts, such as for an irrigation pump site, are active for only part of the year.

For the 2017 CAS, the SIC codes were the best information available for identifying farms as a subset of the Residential Rate class.

Subsequently, the Farm Study provided better information, which was then used in the 2020 CAS. An examination in the initial stages of the Farm Study of some of the 2,094 Residential accounts with farm SIC codes showed that many of them were small farming operations or were no longer farming. However, the primary focus of the Farm Study was to assess the impact on farms of eliminating the declining second block energy charge in the Residential Rate. Since most of the larger farms are potato, dairy, hog or poultry operations, and most of the electricity usage by farms in PEI is by these four farming types, only potato, dairy, hog and poultry farms were included. The farms included in the Farm Study made up the 523 average monthly bills for potato, dairy, hog and poultry farms that formed the Farm subset of the Residential Rate class in the 2020 CAS.

A result of the change in inputs was a 87 per cent RTC ratio for Residential Farm in the 2020 CAS as compared to a 82 per cent RTC ratio in the 2017 CAS.

c. On page 2 of the 2020 CAS, "There has been a shift from energy-related costs to demand-related costs since 2017. The ratio of energy-related revenue requirement has decreased

primarily due to lower on-Island generation. The ratio for demand-related revenue requirement has increased due to increased transmission-related amortization associated with investment in transmission infrastructure since 2017."

Fuel costs at Maritime Electric's generating plants were $1.8 million in 2017 as compared to $0.5 million in 2020. This was due to reduced operation of the generating units in 2020. Fuel costs for each of 2021 and 2022 were $0.8 million. Maritime Electric does not expect any further decrease in fuel costs in the future because the costs for 2020 to 2022 already reflect little or no generation by the Charlottetown Thermal Generating Station, which has been retired and scheduled for decommissioning.

Transmission-related costs (including costs associated with the interconnection with New Brunswick) were $5.5 million in 2017 as compared to $6.8 million in 2020. The increase was largely due to a partial year of costs in 2017 associated with the new submarine cables, which went into service in 2017. Maritime Electric expects that transmission costs will continue to increase in the coming years due to investments to meet load growth and increased right-of-way clearing.

d. Under the current Energy Purchase Agreement ("EPA") with NB Power, there is no monthly price volatility driven by changes in monthly customer demand because the EPA provides for fixed pricing. There is a large variation in monthly volumes, driven largely by space heating load. The current EPA extends to the end of 2026.

e. The RTC ratio results are shown in Table IR-14(e) below. The only adjustments are due to moving some of the Residential (Farm) load to Residential year-round, so the table deals only with these two groups. There are no changes to the RTC ratios for the other rate classes.

TABLE IR-14e Adjusted 2020 CAS results with only Farms > 5,000 kWh					
		2020 CAS		With Only Farms > 5,000 kWh	
		Residential	Residential (Farm)	Residential	Farms >5,000 kWh
Allocators:					
- 1CP Demand (at system input)	kW	153,982	8,780	155,302	7,460
- NCP Demand (at Distribution primary)	kW	151,306	11,544	152,603	11,296
- Energy sales (at customer meter)	MWh	604,483	47,023	609,030	42,476
- Number of sites (avg bills per month)		61,785	523	61,890	418
Allocated Costs:	$000s				
- Customer-related		19,212	164	19,245	131
- 1CP Demand-related		31,802	1,813	32,075	1,540
- NCP Demand-related		10,369	791	10,458	774
- Energy-related		49,654	3,863	50,028	3,489
Total		**111,037**	**6,631**	**111,806**	**5,934**
Revenue	**$000s**	**103,055**	**5,753**	**103,611**	**5,197**
RTC Ratio	**%**	**92.8**	**86.8**	**92.7**	**87.6**

f. Tables 2, 3, 5, and 8 from the Rate Design Application, Exhibit M-1, have been updated to reflect the 2020 CAS as follows.

TABLE IR-14(f)-1 Update of Rate Design Application Table 2 to 2020 CAS Summary of 2020 CAS Results					
	2020 Energy Sales (GWh)	**2020 Allocated Costs ($000s) A**	**2020 Base Revenue ($000s) B**	**RTC Ratios (%)[3] C = B/A**	**Within Required RTC Range**
Residential	604.5	111,034	103,055	92.8	No
Residential (Farms)	47.0	6,631	5,753	86.8	No
Residential subtotal – year-round customers	**651.5**	**117,665**	**108,808**	**92.5**	No
Residential (Seasonal)	20.4	4,974	4,689	94.3	No
Residential subtotal	**671.9**	**122,639**	**113,497**	**92.5**	No
General Service	363.5	49,812	58,954	118.4	No
General Service (Seasonal)	7.0	1,406	1,443	102.6	Yes
General Service subtotal	**370.5**	**51,218**	**60,397**	**117.9**	No
Small Industrial	91.6	11,688	12,783	109.4	No
Large Industrial	151.8	14,504	13,938	96.1	Yes
Street Lighting	4.5	2,847	2,257	79.3	No
Unmetered	2.5	417	441	105.8	No
TOTALS	**1,292.8**	**203,313**	**203,313**		

[3] Table 2, and the rest of the Rate Design Application, shows the RTC ratios to the nearest 0.1 per cent in order to illustrate the changes in the RTC ratios at each step of the rate plan. This should not be taken as an indication of the level of precision for the RTC ratios. In the 2017 CAS, the RTC ratios are shown rounded to the nearest 1 per cent, which is more appropriate given the assumptions and estimates involved in the analysis.

TABLE IR-14(f)-2 Update of Rate Design Application Table 3 to 2020 CAS Preliminary Residential Load Study - Analysis of Year-round Residential Cohorts[4]					
Cohorts[5]	Number of Customers	Energy Sales (GWh)	2020 Allocated Cost ($000s) A	2020 Base Revenue ($000s) B	RTC Ratio (%) C = B/A
1. Usage up to 2,300 kWh	53,474	410.1	79,191	74,431	94.0
2. Usage 2,301 to 5,000 kWh	7,017	150.6	28,804	22,678	78.7
3. Domestic >5,000 kWh	293	11.6	2,308	1,562	67.7
4. Farms >5,000 kWh	418	42.5	6,128	5,177	84.5
5. Other[6] >5,000 kWh	45	10.5	1,955	1,229	62.8
Combined	**61,247**	**625.3**	**118,386**	**105,077**	**88.8**

Table 4 from the Rate Design Application does not need to be updated because doing so would provide the exact result as provided in Table IR-14(f)-2 above. Table 4 of the Application shows the revised 2017 CAS RTC ratios after reallocating $1.2 million in costs from the Residential Class to the General Service Class based on the preliminary load study results. The 2020 CAS incorporated the results of the load study from the onset so this reallocation is not required.

TABLE IR-14(f)-3 Update of Rate Design Application Table 5 to 2020 CAS - Expanded[7] Analysis of Year-round Cohorts with the Declining Second Block Eliminated						
Cohorts	Updated 2020 Allocated Cost from Table 3 ($000s) A	2020 Base Revenue from Table 3 ($000s) B	2020 Base Revenue – Declining Second Block Eliminated ($000s) C	Incremental Revenue from Elimination of Declining Second Block ($000s) D = C - B	Increase in Revenue (%) E = D/B	Revised 2020 RTC Ratio (%) F = C/A
1. Usage up to 2,300 kWh	79,191	74,431	74,691	260	0.3	94.3
2. Usage 2,301 to 5,000 kWh	28,804	22,678	23,564	886	3.9	81.8
3. Domestic >5,000 kWh	2,308	1,562	1,736	174	11.1	75.2
4. Farms > 5,000 kWh to Small Industrial ("SI")	3,068	2,676	3,213	537	20.1	96.9
5. Farms > 5,000 kWh Remaining in Residential	3,059	2,501	2,965	464	18.6	104.7
6. Subtotal Farms >5,000 kWh (4+5)	6,128	5,177	6,178	1,001	19.3	100.8
7. Other > 5,000 kWh to SI	1,467	902	1,132	230	25.5	77.2
8. Other > 5,000 kWh Remaining in Residential	488	327	379	52	15.9	77.7
9. Subtotal Other >5,000 kWh (7+8)	1,955	1,229	1,511	282	22.9	77.3
TOTAL (1+2+3+6+9)	**118,386**	**105,077**	**107,680**	**2,603**	**2.5**	**91.0**

[4] Analysis was based on the 12-month period of March 2019 to February 2020. Seasonal customers were not included in the analysis as only a small percentage of them initiate second block usage charges and, therefore, they would not materially influence the results.

[5] Stratum boundaries were selected to minimize the confidence interval and maximize the accuracy for the estimates of load that are derived from the load study meter data and therefore do not correlate with the second block threshold of 2,000 kWh.

[6] Customer accounts that are not farms or household uses of electricity. Two thirds of the usage in this cohort is accounted for by the six largest loads, which are two cannabis industry operators, three fish farms and one greenhouse operation. There are also a number of churches and premises providing lodging with nine beds or less as permitted under the Rates and General Rules and Regulations to be included in the Residential Class.

[7] The Farms > 5,000 kWh and Other > 5,000 have been expanded to separate those that would move to Small Industrial and those that would remain in Residential in Table IR-14(f)-3 only for reference in other interrogatory responses.

TABLE IR-14(f)-4 Update of Rate Design Application Table 8 to 2020 CAS Estimate RTC Ratios after Stage 1									
	2020 Allocated Costs				2020 Base Revenue				
	Table 2 – 2020 Allocated Costs ($000s) A	2020 Cost of Customers move from Res to SI ($000s) B	Stage 1 2020 Allocated Costs ($000s) C = A+B		Table 2 – 2020 Base Revenue ($000s) D	Base Revenue Changes of Customers Move from Res to SI ($000s) E[8]	Stage 1 Changes to Revenue ($000s) F	Stage 1 2020 Revenue ($000s) G = D+E+F	Stage 1 RTC Ratios (%) H = G/C
Residential	111,034	(1,467)	109,567		103,055	(1,017)	1,488	103,526	94.5
Residential (Farms)	6,631	(3,068)	3,563		5,753	(2,945)	733	3,541	99.4
Subtotal – Year-round Residential	**117,665**	**(4,535)**	**113,130**		**108,808**	**(3,962)**	**2,221**	**107,067**	**94.6**
Residential (Seasonal)	4,974	-	4,974		4,689			4,689	94.3
Residential Subtotal	**122,639**	**(4,535)**	**118,104**		**113,497**	**(3,962)**	**2,221**	**111,756**	**94.6**
General Service	49,812	-	49,812		58,954	-	(3,002)	55,952	112.3
General Service (Seasonal)	1,406	-	1,406		1,443	-		1,443	102.6
General Service Subtotal	**51,218**	**-**	**51,218**		**60,397**	**-**	**(3,002)**	**57,395**	**112.1**
Small Industrial	11,688	4,535	16,223		12,783	3,962	-	16,744	103.2
Large Industrial	14,504	-	14,504		13,938	-	613	14,552	100.3
Street Lighting	2,847	-	2,847		2,257	-	168	2,425	85.2
Unmetered	417	-	417		441	-	-	441	105.8
TOTALS	**203,313**	**-**	**203,313**		**203,313**	**-**	**-**	**203,313**	

[8] Base Revenue Adjustment in this Table reflects the assumption that Farms >5,000 kWh to SI and Other > 5,000 kWh to SI are expected to do so after step 2 of 4 to eliminate the Residential Declining Second Block.

g. See Charts IR-14(g)-1 and IR-14(g)-2 are updated versions of Charts 1 and 2, respectively, from the Rate Design Application to reflect the 2020 CAS.

CHART IR-14(g)-1
Estimated Increases in Electricity Bills for each of 50 Potato Farms

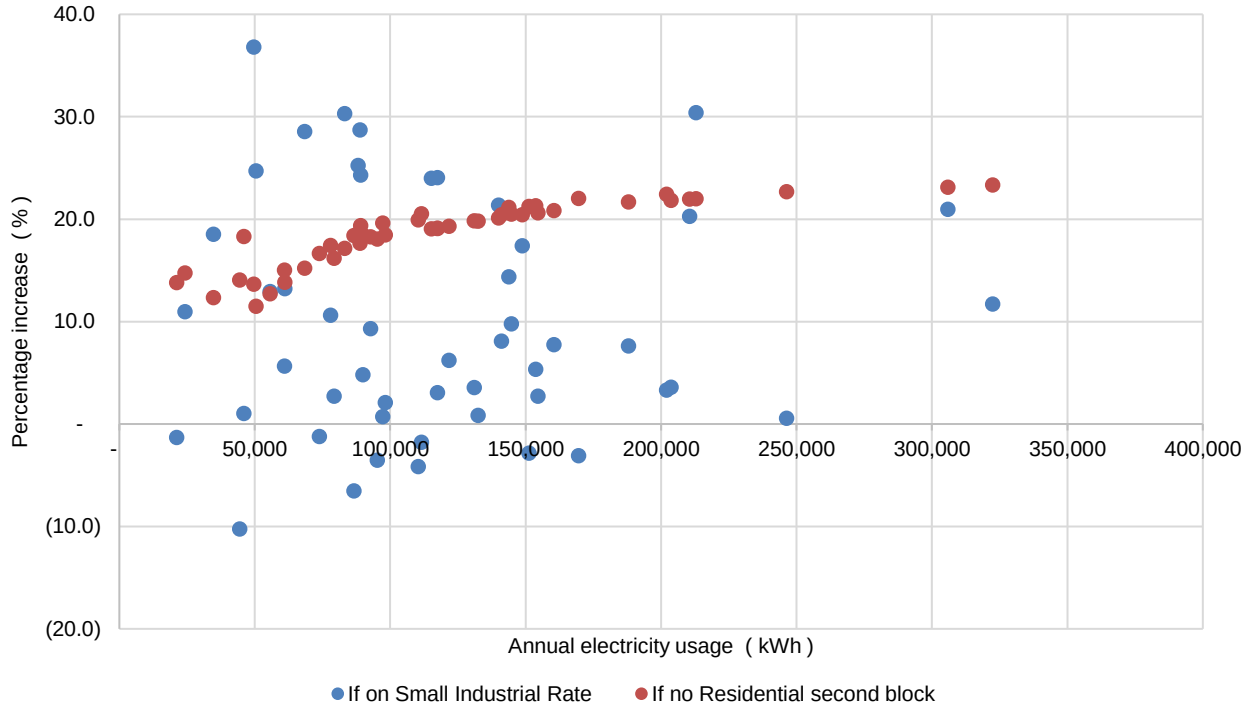
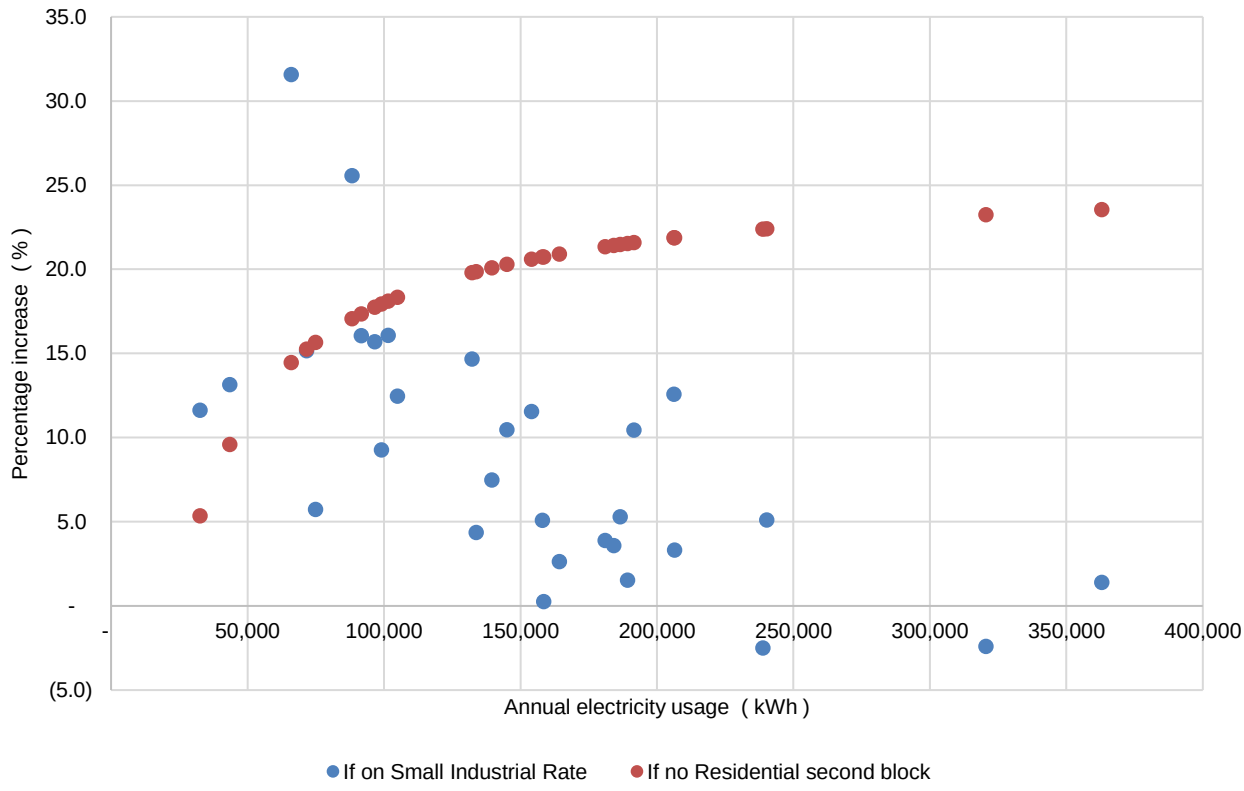
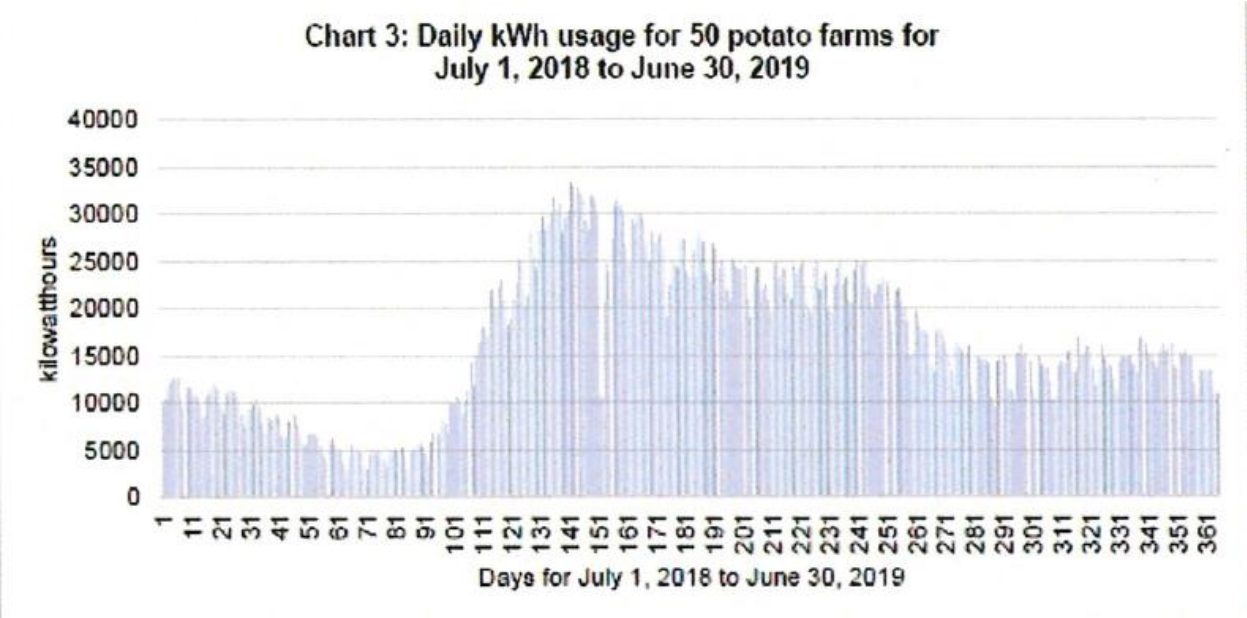
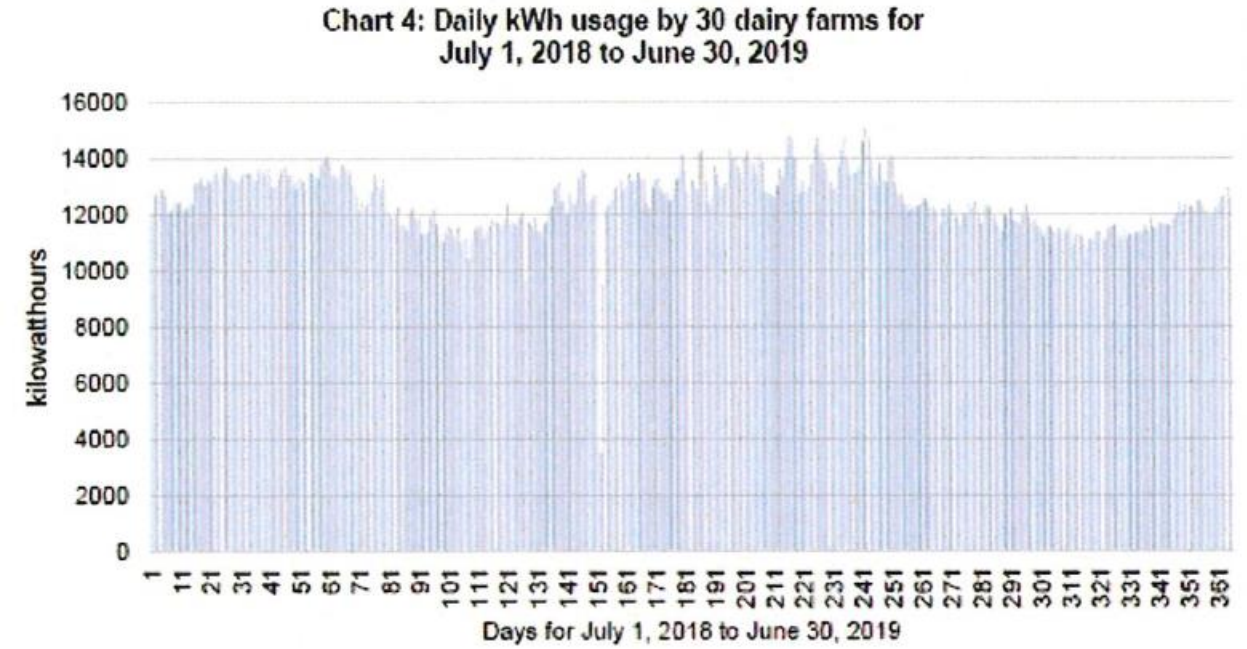


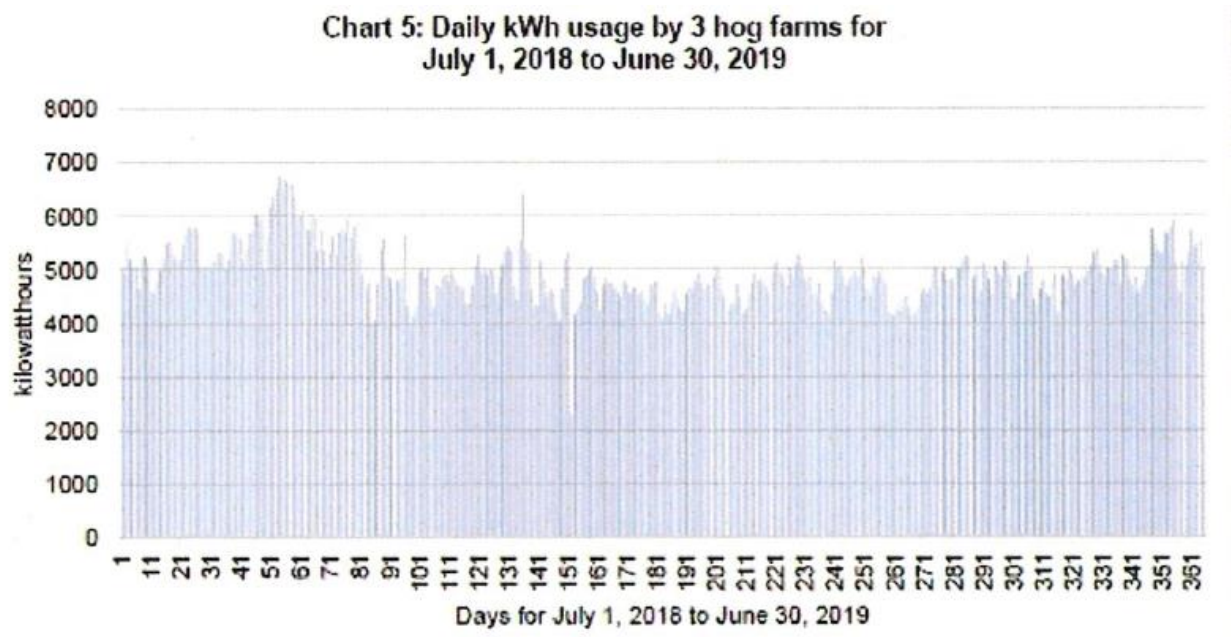
CHART IR-14(g)-2
Estimated Increases in Electricity Bills for each of 30 Dairy Farms

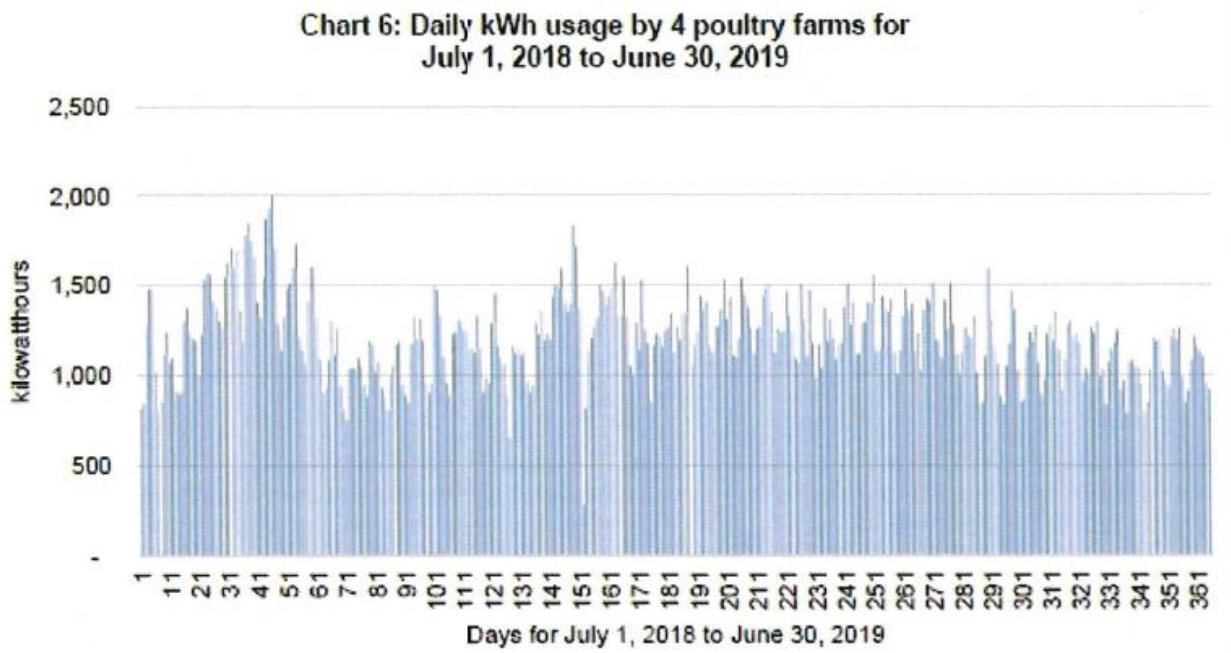


IR-15 Charts 3-6 from the Farm Study, on pages 11-13, are provided below:









MECL's Farm Study collected electricity usage data from the following types and number of farms:

50	at potato farms
30	at dairy farms
3	at hog farms
4	at poultry farms
87	

Page 15 provides the following summary table for Farm CP, NCP and billed energy usage compared to the system peak:

TABLE 9 Estimated Coincident Peak and Non-Coincident Peak Loads for Residential Rate Farms								
	2018 Nov	**2018 Dec**	**2019 Jan**	**2019 Feb**	**2019 Nov**	**2019 Dec**	**2020 Jan**	**2020 Feb**
MECL monthly system peak load								
Date	22	27	3	26	13	16	17	21
Hour ending	18:00	18:00	18:00	19:00	18:00	18:00	16:00	8:00
Net MWh/h	241.5	243.2	243.1	245.8	226.6	249.5	259.4	249.2
Farms CP load (MW)								
Potato farms	5.0	5.1	5.3	4.4	5.8	6.4	5.3	5.2
Dairy farms	2.4	2.6	2.5	2.9	2.2	2.4	2.5	2.7
Poultry and hog farms	0.4	0.4	0.4	0.5	0.6	0.5	0.4	0.5
	7.8	8.1	8.2	7.8	8.6	9.3	8.2	8.4
90 % confidence band (+/- %)	10.4	11.2	7.2	8.5	10.9	6.2	6.9	7.5
Farms NCP load (MW)								
Date	21	5	8	11	14	9	*30*	5
Hour ending	9:00	9:00	9:00	9:00	10:00	9:00	9:00	9:00
Potato farms	6.3	8.5	6.7	6.1	7.9	8.4	7.7	7.5
Dairy farms	2.5	2.6	2.8	2.9	1.9	2.3	2.7	2.4
Poultry and hog farms	0.4	0.6	0.5	0.5	0.6	0.6	0.5	0.5
	9.2	11. 7	10 .0	9.5	10.4	11.3	10.9	10.4
Billed energy usage (MWh)								
Potato farms	3,245	3,982	3,572	3,243	4,161	4,532	4,331	3,959
Dairy farms	1,054	1,132	1,227	1,314	1,076	1,097	1,220	1,262
Hog farms	196	185	183	186	243	208	213	216
Poultry farms	91	99	106	115	103	102	113	106
	4,586	5,398	5,088	4,858	5,583	5,939	5,877	5,547

Table 10 on page 17 of the Farm Study shows the unit cost breakdown for distribution system customer loads based on the 2017 Cost Allocation Study:

TABLE10 **Unit Costs (from 2017 Cost Allocation Study)**		
Customer related	295	$/yr
CP demand related	184.46	$/kWh
NCP demand related	53.80	$/kWh
Energy related	83.00	$/MWh

From MECL's 2017 Cost Allocation Study Schedules 2.4 and 2.5 (pages 28 & 29 of 80), it appears that transmission, substations, and part of MECL generation and MECL purchases are allocated on the basis of a Coincident Peak allocator. MECL includes multiple different 1CP type allocations in its Schedule 2.1 (page 23 of 80).

a. Please confirm that the entire 87-91 accounts from the Farm Study were used in the above referenced charts and tables. If not confirmed, please explain why MECL made changes to the farm customer accounts it was using to populate this research.

b. For both the 2017 and 2020 Cost Allocation Studies, please explain the methodology used for calculating the Coincident peak allocator, including the number or duration of occurrences that go into the CP calculation (i.e. is it a single 15 minute Coincident Peak, or for example a broader average over hours).

c. Please provide actual CP data broken out by rate class (including Farms) for each of the past 10 years, including the most recent set of actuals, including the time and date for each peak.

d. Please provide the underlying calculations that reconcile Table 10 above from the Farm studies with the appropriate schedules from the 2017 Cost Allocation Study.

e. Please provide an updated Table 10 above from the Farm Study for the 2020 Cost Allocation Study.

Response:

a. Yes, Charts 3 to 6 are based on the initial 87 accounts selected for the Farm Study.

The November 2018 through February 2019 portion of Table 9 is also based on the initial 87 accounts selected for the Farm Study. The November 2019 through February 2020 portion of Table 9 includes a few additional accounts that were subsequently added to the Farm Study and were included in the analysis as data became available.

b. The coincident peak is the 1CP (i.e., the highest single hourly load for the year). For each rate class the coincident peak allocator is the contribution of that rate class to the 1CP.

c. Table IR-15(c) provides a breakdown by rate class of Maritime Electric's annual peak load for the years 2014, 2017 and 2020. Large Industrial is the only rate class for which all customers have hourly interval metering. The coincident peak values for all other rate classes are estimates done as part of a CAS. These estimates are normally only done for CAS years, which is why data is shown for only 2014, 2017 and 2020.

TABLE IR-15(c)
Breakdown of MECL Annual Peak Load (at system input)

Year	**2014**	**2017**	**2020**
Date	December 30	December 27	December 16
Hour ending	18:00	18:00	18:00
Coincident Peak load (MW)			
Residential year round	119.2	142.6	154.0
Residential Seasonal	0.7	1.6	1.8
Residential Farm	10.9	14.8	8.8
General Service	63.6	58.1	61.8
General Service Seasonal	-	-	-
Small Industrial	15.8	14.6	13.2
Large Industrial	17.2	16.3	14.2
Street Lighting	1.6	1.4	1.2
Unmetered	0.4	0.4	0.4
	229.4	**249.8**	**255.4**

d. Table IR-15(d) provides the requested calculations.

TABLE IR-15(d) 2017 CAS Unit Costs					
	2017 Costs Allocated to Year Round Residential ($000s)[9]				
	Page 18 Appendix A Customer Related	Page 16 Appendix A 1CP Demand Related	Page 16 Appendix A NCP Demand Related	Page 17 Appendix A Energy Related	Page 15 Appendix A Total
- Generation		6,913		2,410	9,323
- Purchased power		8,687		39,518	48,205
- Transmission		7,020			7,020
- Substations		1,634			1,634
- Primary lines	5,204		3,914		9,118
- Transformers	3,049		3,440		6,489
- Secondary lines	1,802		1,356		3,158
- Service lines	4,400				4,400
- Meter assets	955				955
- Meter reading	655				655
- Billing	721				721
- Remittance & collection	523				523
- Uncollectibles & damage claims	357				357
- Service connections	(266)				(266)
- Late payments	(485)				(485)
- Street Lighting	-				-
	16,915	**24,254**	**8,710**	**41,928**	**91,807**

From Page 27 of Appendix A:				
- Average bills per month	57,286			
- 1CP distribution secondary (kW)		131,479		
- NCP distribution secondary (kW)			161,888	
- Annual energy sales (MWh)				505,169
Unit costs	295.27	184.47	53.80	83.00
	$/year	$/kW	$/kW	$/MWh

[9] Appendix A page references refer to the 2017 CAS, Docket UE21222.

e. Table IR-15(e) provides unit costs from the 2020 CAS.

TABLE IR-15(e) Unit Costs from 2020 CAS		
Customer related	310.95	$/year
1CP Demand related	225.05	$/kW
NCP Demand related	72.40	$/kW
Energy related	82.14	$/MWh

IR-16 At page 31, the Application indicates that:

To implement eligibility for farm customers under the Small Industrial class, the Small Industrial Rate Application Guidelines in Section N-8 of the Rates and General Rules and Regulations will need to be updated. The following wording should be added to the "Division E Manufacturing Industries" after "In Addition: ... "

"Agricultural farming operations are eligible for service under this rate. If there is a residence(s) on the same property as the farming operation, the residence(s) must be metered separately and billed under the Residential Rate."

a. Please provide a summary of the number of customers that are anticipated to move to the Small Industrial class that would need to have their electrical service split in order to meet this requirement.

b. Please indicate all consultation or analytical work prepared by MECL indicating the customer costs to split their customer-side wiring and loads to permit implementation of this constraint, including the extent to which such costs were considered by MECL in making the proposal. Please provide any indication of customer-side costs available to MECL.

c. What proportion of the total existing load of the farm customers expected to switch to the Small Industrial rate is represented by residential consumption? Has MECL completed any analysis or estimates of the impacts on MECL revenue if customers were permitted to switch their entire load to Small Industrial, as compared to splitting the load and charging the residential load at the prevailing residential rate? If so, please provide all quantification and supporting assumptions.

Response:

a. Table IR-16(a) below shows the estimated number of farms that would move to the Small Industrial rate and that would have to split their electrical service in order for the household (i.e., domestic) consumption to be billed under the Residential Rate. The starting point for the table below is Table 3 (page 6) of Appendix A – Farm Study, included in Exhibit M-1.

TABLE IR-16(a)
Number of Farms Required to Split Electrical Service
(for accounts with 5,001+ kWh usage for at least one month in July 2019 to June 2020)

		Potato	Dairy	Hogs	Poultry	Total
Number of Residential Rate accounts		361	142	10	15	528
Number of farms	A	174	135	9	13	331
Portion of farms with household loads included	B	0.50	0.75	0.75	0.75	-
Portion of farms estimated to move to Sm Industrial	C	0.50	0.50	0.50	0.75	-
Number that would need to split electrical service	D = A x B x C	44	51	3	7	105

b. Maritime Electric has not done any analysis in this regard.

c. Table IR-16(c) below shows the estimated proportion of the total existing load of the farm customers expected to switch to the Small Industrial rate that consists of household consumption. Similar to the response to IR-16(a), the starting point for the table below is Table 3 (page 6) of Appendix A – Farm Study.

TABLE IR-16(c)
Proportion of Farm Load that is Residential (i.e., domestic) Consumption
(for accounts with 5,001+ kWh usage for at least one month in July 2019 to June 2020)

		Potato	Dairy	Hogs	Poultry	Total
Number of Residential Rate accounts		361	142	10	15	528
Number of farms	A	174	135	9	13	331
Annual billed usage (Jul 2019 to Jun 2020) (MWh)	B	31,598	12,887	2,634	1,199	48,318
Portion of farms estimated to move to Sm Industrial	C	0.50	0.50	0.50	0.75	-
Load estimated to move to Sm Industrial (MWh)	D = B x C	15,799	6,444	1,317	899	24,459
Portion of farms with household loads included	E	0.50	0.75	0.75	0.75	-
Estimated household usage included in D (MWh) (based on 8,000 kWh per year)	F = A x C x E x 8	348	405	27	59	839
Proportion of D that is Residential consumption (%)	G = F x 100/D					3.4

Maritime Electric has not completed any analysis in regard to the impact on utility revenue. The requirement to split the electrical service is intended to have farm customers treated on the same basis as existing Small Industrial and Residential customers.

- The Small Industrial rate is intended for electricity used in the listed manufacturing and processing industries. Existing Small Industrial customers do not have household usage as part of their loads.
- However, farms that choose to remain on the Residential rate will be continue to be an exception to the requirement under the Residential Rate that when non-household electricity usage exceeds 50 per cent of the total metered usage, the electrical service must be split and the non-household usage be served under the General Service Rate.

IR-17 Pages 21-22 of the Farm Study justifies MECL's proposal for customers to move to the Small Industrial rate class over the General Service because:

- The Small Industrial rate has a better matching of revenues and costs. The 2017 Cost Allocation Study estimated a 1.02 RTC ratio for Small Industrial, as compared to 1.21 for General Service. Thus, a move to Small Industrial would involve smaller bill increases than would a move to General Service.

- The Small Industrial rate has two energy block rates, with the size of the first energy block being proportional to the size of the monthly maximum demand reading. This is better for a wide range of load factors, which is the case for individual farm loads. Under the General Service rate, the size of the first energy block is fixed at 5,000 kWh per month, regardless of the size of the monthly maximum demand reading.

  a) Given the Small Industrial Rate Class is now at 109% per the 2020 Rate Study, has MECL considered the exacerbated adverse impacts on customers from being required to switch from a 93% RTC class to a 109% RTC class in order to help address purported low RTC ratios?
  b) Please indicate the MECL revenue generated from farm customers expected to shift to the Small Industrial rate from paying 109% RTC ratio versus a rate that would be 100% RTC ratio.
  c) Is it not harder on customers, and similarly unnecessary, to drive them to a point of paying 9% above costs at a time when rate impacts of 10% or more are anticipated solely for rate design/rebalancing purposes (outside of overall Revenue Requirement changes)?

Response:

a. A RTC ratio of 109 per cent for the Small Industrial rate class in the 2020 CAS as compared to 102 per cent in the 2017 CAS does not exacerbate the impact on Farm customers moving from Residential to Small Industrial. The average estimated increase in bills is still 12.5 per cent, because the charges under the Small Industrial rate did not change as a result of the 2020 CAS. In the 2020 CAS, the costs allocated to Small Industrial were proportionally lower relative to the 2017 CAS, which resulted in a higher RTC ratio.

   If anything, a RTC ratio of 109 per cent for Small Industrial might, over time, result in moderating the impact on Farm customers that move to Small Industrial. Should future cost allocation studies continue show a RTC ratio above 105 per cent for Small Industrial, then that could lead to charges under the Small Industrial rate being lower than they otherwise would have been so as to bring the RTC ratio to within the 95 per cent to 105 per cent range.

b. From Table IR-14(f)-3 herein, which is an updated Table 5 from the Rate Design Application, the costs allocated to the Farm customers expected to move to Small Industrial is $3,068,000 (column A, row 4).

Revenue from these Farm customers at 109% RTC ratio:	$3,068,000	x 1.09	=	$3,344,000
Revenue from these Farm customers at 100% RTC ratio:	$3,068,000	x 1.00	=	$3,068,000
Difference				$ 276,000

However, as explained in c) below, the 109% RTC ratio is for the existing Small Industrial class of customers. It does not apply to the Farm customers expected to move to Small Industrial.

c. Based on the Table IR-14(f)-3 herein, which is an updated Table 5 from the Application, Farm customers that move to Small Industrial would not be paying 109 per cent above their cost of service.

Estimated revenue from Farm customers that move to Small Industrial:	
Residential Rate revenue from Table IR-14(f)-3 (column B, row 4)	$2,676,000
Plus estimated average 12.5% increase in bills on Small Industrial	$ 335,000
	$3,011,000

Estimated cost of service for Farm customers that move to Small Industrial: $3,068,000

Corresponding RTC ratio is $3,011,000 / $3,068,000 = 98.1, or 98.1%

Boutilier Study

IR-18 a. Please update Boutilier's estimated impacts and conclusion regarding the Large Farm class option (option #2) at page 16, using the 2020 Cost Allocation study as inputs rather than 2017

Response:

The table below shows the inputs from the 2020 CAS along with the corresponding inputs from the 2017 CAS, as discussed on page 16 of the Boutilier Study in regard to the Large Farm rate class option (Option #2).

TABLE IR-18
Comparison of CAS Inputs for Large Farm Rate Class Option

	2017 CAS	2020 CAS
Allocated cost ($ million)	8.37	6.63
Base revenue under Residential Rate ($ million)	6.87	5.75
Revenue to cost ratio	0.82	0.87
Increase in revenue required for a RTC ratio of 0.95 (%)	15.8	9.5

Synapse Study

IR-19 a. Please indicate if MECL agrees with the calculations and results shown in Synapse Table 2 (page 6). If not, please provide MECL's corrected version.

b. Please amend Synapse's Table 2 to include Small Industrial as a row.

Response:

a. Maritime Electric agrees with the results shown in Synapse Table 2 (page 6).

b. The table is based on data for the 12-month period March 2019 through February 2020. The corresponding data for Small Industrial is not available for this period. As explained above in the response to IR-15(c), Large Industrial is the only rate class for which all customers have hourly interval metering. The coincident peak values for all other rate classes are estimates done as part of a CAS. These estimates are normally only done for CAS years, and a CAS was not done for 2019.