## Undertaking 44 Rev 1 – Test Year Load Normalization Scenario

i) For purposes of illustrating the impact of normalizing the 2015 Test Year allocations to account for future Island Industrial Customer (IIC) load growth, the 2015 Test Year demand and energy allocators were recalculated using the 2017 load forecast (i.e. 2017 forecast). The detailed calculations are provided in Attachments 1 and 2 to this undertaking.

Table 1 provides a comparison of revenue allocation and unit costs for each customer group on the Island Interconnected System for demand for the 2015 Test Year. Table 2 provides the same information for energy.

**Table 1: Calculation of 2015 Test Year Demand Revenue Requirement Unit Cost ($000s)**

| | 2015 Test Year Proposed | | | 2015 Test Year Normalized[1] | | | Difference[2] | | |
|---|---|---|---|---|---|---|---|---|---|
| | Revenue Requirement | Billing Units (kW) | Unit Cost ($/kW) | Revenue Requirement | Billing Units (kW) | Unit Cost ($/kW) | Revenue Requirement | Unit Cost ($/kW) | Unit Cost (%) |
| IIC | 8,920 | 1,064,800 | 8.38 | 11,660 | 1,064,800 | 10.95 | 2,740 | 2.57 | 30.7% |
| NP | 153,911 | 15,122,049 | 10.18 | 152,204 | 15,122,049 | 10.07 | (1,706) | (0.11) | -1.1% |
| Rural | 11,006 | 415,225 | 26.51 | 9,972 | 415,225 | 24.02 | (1,033) | (2.49) | -9.4% |
| Total | 173,837 | 16,602,074 | | 173,837 | 16,602,074 | | 0 | | |

[1] Normalized using 2017 forecast demand.

[2] 2015 Test Year billing units same in each scenario.

From a demand cost perspective, IIC have a higher load factor than Newfoundland Power (NP) and a lower coincidence during peak periods. As a result, their unit demand cost is generally lower than that of NP. Table 1 shows that under the normalized approach the unit demand cost is materially higher for IIC than NP.

**Table 2: Calculation of 2015 Test Year Energy Revenue Requirement Unit Cost ($000s)**

| | 2015 Test Year Proposed | | | 2015 Test Year Normalized[1] | | | Difference[2] | | |
|---|---|---|---|---|---|---|---|---|---|
| | Revenue Requirement | Billing Units (MWh) | Unit Cost (cents/kWh) | Revenue Requirement | Billing Units (MWh) | Unit Cost (cents/kWh) | Revenue Requirement | Unit Cost (cents/kWh) | Unit Cost (%) |
| IIC | 32,010 | 621,400 | 5.151 | 42,877 | 621,400 | 6.900 | 10,867 | 1.75 | 33.9% |
| NP | 305,415 | 5,924,100 | 5.155 | 297,299 | 5,924,100 | 5.018 | (8,116) | (0.14) | -2.7% |
| Rural | 24,325 | 425,409 | 5.718 | 21,574 | 425,409 | 5.071 | (2,751) | (0.65) | -11.3% |
| Total | 361,750 | 6,970,909 | | 361,750 | 6,970,909 | | 0 | | |

[1] Normalized using 2017 forecast energy.

[2] 2015 Test Year billing units same in each scenario.

From an energy cost perspective, the average energy unit cost is generally approximately the same for NP and IIC. Table 2 shows that under the normalized test year, the proposed energy charge would be approximately 30% higher for IIC.

The analysis indicates that normalization to reflect higher future loads in the allocation of the 2015 Test Year revenue requirement will result in reflecting the future cost of serving IIC load in current rates. Allocation of a higher proportion of costs to IIC based on the 2017 forecast will have the effect of materially increasing the rates to be charged IIC and result in over-recovering the cost of serving IIC in both the test year and in future years.

ii). Table 3 provides the forecast demand revenue for the IIC for 2015, 2016 and 2017 using the unit demand cost. Table 4 provides the forecast energy revenue for the IIC for 2015, 2016 and 2017 using the unit energy cost and including the impact of the RSP load variation. The forecasted revenues for NP and Rural can not be provided without the completion of detailed rate design as their rates are not calculated based on unit costs.

**Table 3: Forecast IIC Demand Revenue using 2015 Test Year Unit Cost versus Normalized Unit Cost ($000s)**

| Line No | | 2015 Test Year | 2016 Forecast | 2017 Forecast |
|---|---|---|---|---|
| | | A | B | C |
| 1 | Using 2015 Test Year Proposed Unit Cost | 8,920 | 10,112 | 11,649 |
| 2 | Using 2015 Test Year Normalized Unit Cost | 11,660 | 13,218 | 15,227 |
| 3 | Difference | 2,740 | 3,106 | 3,578 |
| 4 | Difference (%) | 30.7% | 30.7% | 30.7% |
| 5 | Billing Determinants (kW) | 1,064,800 | 1,207,100 | 1,390,600 |

Table 4: Forecast IIC Energy Revenue using 2015 Test Year Unit Cost versus Normalized Unit Cost ($000s)

| Line No | | 2015 Test Year | 2016 Forecast | 2017 Forecast |
|---|---|---|---|---|
| | | A | B | C |
| | **IIC Energy Revenue before RSP Impact** | | | |
| 1 | Using 2015 Proposed Unit Cost (@5.151 cents/kWh) | 32,010 | 40,072 | 44,997 |
| 2 | Using 2015 Normalized Unit Cost (@6.900 cents/kWh) | 42,877 | 53,676 | 60,273 |
| 3 | Difference | 10,867 | 13,604 | 15,276 |
| 4 | Billing Units (MWh) | 621,400 | 777,900 | 873,500 |
| | **IIC Energy Revenue including RSP Impact[1]** | | | |
| 5 | Using 2015 Proposed Unit Cost (@5.151 cents/kWh) | | 42,129 | 48,071 |
| 6 | Using 2015 Normalized Unit Cost (@6.900 cents/kWh) | | 55,459 | 62,906 |
| 7 | Difference | | 13,330 | 14,835 |
| | **Unit Cost Including RSP Impact (cents/kWh)** | | | |
| 8 | Using 2015 Proposed Unit Cost (@5.151 cents/kWh) | 5.151 | 5.416 | 5.503 |
| 9 | Using 2015 Normalized Unit Cost (@6.900 cents/kWh) | 6.900 | 7.129 | 7.202 |
| 10 | Difference | 1.749 | 1.714 | 1.698 |

[1] **RSP Impact:**

| | | | |
|---|---|---|---|
| | **RSP (2015 Test Year billing rate)** | | |
| | IC Load Variation vs Test Year (MWh) | 156,500 | 252,100 |
| | IC Load Variation vs Test Year ($000s) | 15,999 | 25,772 |
| | NP Load Variation vs Test Year (MWh) | 121,800 | 132,500 |
| | NP Load Variation vs Test Year ($000s) | 4,570 | 4,971 |
| | Total Load Variation ($000s) | 20,569 | 30,743 |
| | IC Allocation (10%) | 2,057 | 3,074 |
| | NP Allocation (90%) | 18,512 | 27,669 |
| | **RSP (2015 Test Year normalized billing rate)** | | |
| | IC Load Variation vs Test Year (MWh) | 156,500 | 252,100 |
| | IC Load Variation vs Test Year ($000s) | 13,262 | 21,363 |
| | NP Load Variation vs Test Year (MWh) | 121,800 | 132,500 |
| | NP Load Variation vs Test Year ($000s) | 4,570 | 4,971 |
| | Total Load Variation ($000s) | 17,832 | 26,334 |
| | IC Allocation (10%) | 1,783 | 2,633 |
| | NP Allocation (90%) | 16,048 | 23,701 |

iii) The 2013 Test Year did not reflect Vale and Praxair being high load factor customers. The adjustment made in the original response to IC-NLH-140 adjusted the IIC peak demand downward without changing the energy requirements to reflect a high load factor for IIC in the 2013 Test Year. The 2013 Test Year adjustment did not use customer demand requirements from future years in determining the normalized test year as have been requested in this undertaking.

iv) Table 5 provides a comparison of the revenue allocation, the unit demand charge, the unit energy charge and the total revenue for each of the Island Interconnected customer classes for the 2013 Test Year amounts to those determined in IC-NLH-140 (original response).

**Table 5: 2013 Test Year Demand and Energy Revenue Requirement**

| **2013 Test Year - As Filed** | **Demand ($)** | **Energy ($)** | **Demand (kW)** | **Energy (MWh)** | **Demand ($/kW)** | **Energy (cents/kWh)** |
|---|---|---|---|---|---|---|
| Island Interconnected | | | | | | |
| Newfoundland Power | 127,044,995 | 267,676,715 | 13,929,036 | 5,594,300 | 9.12 | 4.785 |
| Industrial - Firm | 7,631,172 | 19,529,103 | 835,400 | 408,400 | 9.13 | 4.782 |
| Rural | 10,254,110 | 21,745,108 | 458,905 | 409,787 | 22.34 | 5.306 |
| Total Island Interconnected | 144,930,277 | 308,950,927 | 15,223,341 | 6,412,487 | | |

| **2013 Test Year - IC 140** | **Demand ($)** | **Energy ($)** | **Demand (kW)** | **Energy (MWh)** | **Demand ($/kW)** | **Energy (cents/kWh)** |
|---|---|---|---|---|---|---|
| Island Interconnected | | | | | | |
| Newfoundland Power | 128,239,125 | 267,675,647 | 13,929,036 | 5,594,300 | 9.21 | 4.785 |
| Industrial - Firm | 6,342,598 | 19,529,759 | 835,400 | 408,400 | 7.59 | 4.782 |
| Rural | 10,350,311 | 21,744,610 | 458,905 | 409,787 | 22.55 | 5.306 |
| Total Island Interconnected | 144,932,033 | 308,950,015 | 15,223,341 | 6,412,487 | | |

| **Difference** | **Demand ($)** | **Energy ($)** | **Demand (kW)** | **Energy (MWh)** | **Demand ($/kW)** | **Energy (cents/kWh)** |
|---|---|---|---|---|---|---|
| Island Interconnected | | | | | | |
| Newfoundland Power | 1,194,129 | (1,068) | 0 | 0 | 0.09 | (0.00) |
| Industrial - Firm | (1,288,574) | 655 | 0 | 0 | (1.54) | 0.00 |
| Rural | 96,201 | (498) | (0) | 0 | 0.21 | (0.00) |
| Total Island Interconnected | 1,757 | (911) | (0) | 0 | | |

## Attachment 1 - Allocation of 2015 Test Year Demand Revenue Requirement

| Line No | Basis of Allocation - Demand | 2015 Test Year Production Demand (1 CP kW) | % of Total | 2015 Test Year Transmission Demand (CP kW) | % of Total | 2015 Normalized for 2017 Forecast Production Demand (1 CP kW) | % of Total | 2015 Normalized for 2017 Forecast Transmission Demand (CP kW) | % of Total |
|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H |
| | **Amounts** | | | | | | | | |
| 1 | Newfoundland Power | 1,296,985 | 88.6% | 1,288,081 | 88.9% | 1,281,284 | 87.5% | 1,272,919 | 87.8% |
| 2 | Industrial - Firm | 75,597 | 5.2% | 73,040 | 5.0% | 98,635 | 6.7% | 95,299 | 6.6% |
| 3 | Rural | 91,636 | 6.3% | 88,537 | 6.1% | 84,290 | 5.8% | 81,439 | 5.6% |
| 4 | **Total** | **1,464,218** | | **1,449,658** | | **1,464,209** | | **1,449,658** | |
| | **Total Allocated Demand Revenue Requirement** | | | | | | | | |
| 5 | Newfoundland Power | 126,280,957 | 88.5% | 27,629,848 | 88.8% | 124,880,880 | 87.5% | 27,331,925 | 87.8% |
| 6 | Industrial - Firm | 7,354,554 | 5.2% | 1,565,473 | 5.0% | 9,613,474 | 6.7% | 2,046,251 | 6.6% |
| 8 | Rural | 9,074,169 | 6.4% | 1,931,507 | 6.2% | 8,215,326 | 5.8% | 1,748,652 | 5.6% |
| 8 | **Total** | **142,709,680** | | **31,126,828** | | **142,709,680** | | **31,126,828** | |
| 9 | **IC Allocated Demand Revenue Requirement ($)** | 8,920,028 | | | | 11,659,726 | | | |
| 10 | **2015 IC Demand Billing Units (kW)** | 1,064,800 | | | | 1,064,800 | | | |
| 11 | **IC Unit Demand Cost ($/kW)** | $8.38 | | | | $10.95 | | | |
| 12 | **NP Allocated Demand Revenue Requirement ($)** | 153,910,805 | | | | 152,212,805 | | | |
| 13 | **2015 NP Demand Billing Units (kW)** | 15,122,049 | | | | 15,122,049 | | | |
| 14 | **NP Unit Demand Cost ($/kW)** | $10.18 | | | | $10.07 | | | |
| 15 | **Rural Allocated Demand Revenue Requirement ($)** | 11,005,676 | | | | 9,963,978 | | | |
| 16 | **2015 Rural Demand Billing Units (kW)** | 415,225 | | | | 415,225 | | | |
| 17 | **Rural Unit Demand Cost ($/kW)** | $26.51 | | | | $24.00 | | | |
| 18 | **Total Allocated Demand Revenue Requirement ($)** | 173,836,508 | | | | 173,836,508 | | | |
| 19 | **Total Demand Billing Units (kW)** | 16,602,074 | | | | 16,602,074 | | | |

## Attachment 2 - Allocation of 2015 Test Year Energy Revenue Requirement

| Line No | Basis of Allocation - Energy | 2015 Test Year (MWh @ Gen) | 2015 Test Year % of Total | 2015 Normalized for 2017 Forecast (MWh @ Gen) | 2015 Normalized for 2017 Forecast % of Total |
|---|---|---|---|---|---|
| | | A | B | C | D |
| | **Amounts** | | | | |
| 1 | Newfoundland Power | 6,118,065 | 84.5% | 5,914,939 | 81.7% |
| 2 | Industrial - Firm | 641,746 | 8.9% | 853,069 | 11.8% |
| 3 | Rural | 479,089 | 6.6% | 470,892 | 6.5% |
| 4 | **Total** | **7,238,900** | | **7,238,900** | |
| | **Total Energy Revenue Requirement** | | | | |
| 5 | Newfoundland Power | 305,414,747 | 84.4% | 295,587,618 | 81.7% |
| 6 | Industrial - Firm | 32,010,206 | 8.8% | 42,630,483 | 11.8% |
| 7 | Rural | 24,325,073 | 6.7% | 23,531,924 | 6.5% |
| 8 | **Total 2015 Test Year** | **361,750,026** | | **361,750,026** | |
| 9 | **2015 IC Energy Billing Units (MWh)** | 621,400 | | 621,400 | |
| 10 | **IC Unit Energy Cost (¢/kWh)** | 5.151 | | 6.860 | |
| 11 | **2015 NP Energy Billing Units (MWh)** | 5,924,100 | | 5,924,100 | |
| 12 | **NP Unit Energy Cost (¢/kWh)** | 5.155 | | 4.990 | |
| 13 | **2015 Rural Energy Billing Units (MWh)** | 425,409 | | 425,409 | |
| 14 | **Rural Unit Energy Cost (¢/kWh)** | 5.718 | | 5.532 | |