

1 **Q. Page 8 of 97 in the Application “A present worth feasibility analysis of projected**  
2 **capital and operating expenditures for the Tors Cove Plant has determined the**  
3 **levelized cost of energy from the plant over the next 50 years to be 2.77 cents/ Kwh.”**  
4 **What is the cost per kwh over 4 years, after MF Infeed and please provide a copy of**  
5 **this feasibility analysis.**

6  
7 A. The levelized cost of energy on a ¢/kWh for recovering the \$1,777,000 capital cost of the  
8 Tors Cove Plant Refurbishment project is 2.65 ¢/kWh. A copy of the NPV feasibility  
9 analysis is included as Attachment A to this response.<sup>1</sup>

10  
11 Evaluating this project over a 4 year timeframe is not appropriate. This asset is expected  
12 to remain in service for more than 50 years and benefits will accrue to the electricity  
13 system and Newfoundland Power’s customers throughout this period. Accordingly, use  
14 of very short cost recovery periods for economic evaluation does not appropriately match  
15 costs and benefits.

16  
17 See the response to Request for Information PUB-NP-004 for more information on the  
18 appropriate time period for calculating the levelized cost of energy to be used in  
19 evaluating hydroelectric plant refurbishments.

20  
21 See the response to Request for Information NLH-NP-007 for more information on least  
22 cost energy supply for the Island Interconnected System following the commissioning of  
23 the Muskrat Falls Project.  
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<sup>1</sup> For the purposes of preparing this NPV analysis future capital cost beyond 2015 has been removed from the analysis.

## **NPV Feasibility Analysis**

**Present Worth Analysis**

Weighted Average Incremental Cost of Capital  
Escalation Rate  
PW Year

6.85%  
See following worksheet  
2014

| YEAR | Generation<br>Hydro<br>64.4yrs<br>8% CCA | Generation<br>Hydro<br>64.4yrs<br>50% CCA | Capital<br>Revenue<br>Requirement | Operating<br>Costs | Operating<br>Benefits | Net benefit | Present<br>Worth<br>Benefit +ve | Cumulative<br>Present Value<br>Benefit +ve | Present<br>Worth of<br>Sunk Costs | Total Present<br>Worth<br>Benefit +ve | Rev Rqmt<br>(€/kWhr) | Levelized<br>Rev Rqmt<br>(€/kWhr)<br>50 years |
|------|------------------------------------------|-------------------------------------------|-----------------------------------|--------------------|-----------------------|-------------|---------------------------------|--------------------------------------------|-----------------------------------|---------------------------------------|----------------------|-----------------------------------------------|
| 2015 | 1,777,000                                | 0                                         | 166,987                           | 120,665            | 0                     | -287,652    | -269,211                        | -269,211                                   | -1,750,666                        | -2,019,876                            | 1.132                | 2.6456                                        |
| 2016 | 0                                        | 0                                         | 180,736                           | 123,078            | 0                     | -303,814    | -266,109                        | -535,319                                   | -1,592,360                        | -2,127,680                            | 1.196                | 2.6456                                        |
| 2017 | 0                                        | 0                                         | 175,364                           | 125,540            | 0                     | -300,904    | -246,663                        | -781,983                                   | -1,448,607                        | -2,230,589                            | 1.185                | 2.6456                                        |
| 2018 | 0                                        | 0                                         | 170,250                           | 128,050            | 0                     | -298,301    | -228,853                        | -1,010,835                                 | -1,317,993                        | -2,328,828                            | 1.174                | 2.6456                                        |
| 2019 | 0                                        | 0                                         | 165,373                           | 0                  | 0                     | -165,373    | -118,738                        | -1,129,574                                 | -1,199,255                        | -2,328,828                            | 0.651                | 2.6456                                        |
| 2020 | 0                                        | 0                                         | 160,713                           | 0                  | 0                     | -160,713    | -107,995                        | -1,237,569                                 | -1,091,259                        | -2,328,828                            | 0.633                | 2.6456                                        |
| 2021 | 0                                        | 0                                         | 156,254                           | 0                  | 0                     | -156,254    | -98,267                         | -1,335,836                                 | -992,992                          | -2,328,828                            | 0.615                | 2.6456                                        |
| 2022 | 0                                        | 0                                         | 151,979                           | 0                  | 0                     | -151,979    | -89,452                         | -1,425,288                                 | -903,540                          | -2,328,828                            | 0.598                | 2.6456                                        |
| 2023 | 0                                        | 0                                         | 147,874                           | 0                  | 0                     | -147,874    | -81,456                         | -1,506,743                                 | -822,085                          | -2,328,828                            | 0.582                | 2.6456                                        |
| 2024 | 0                                        | 0                                         | 143,925                           | 0                  | 0                     | -143,925    | -74,198                         | -1,580,941                                 | -747,887                          | -2,328,828                            | 0.567                | 2.6456                                        |
| 2025 | 0                                        | 0                                         | 140,120                           | 0                  | 0                     | -140,120    | -67,605                         | -1,648,546                                 | -680,282                          | -2,328,828                            | 0.552                | 2.6456                                        |
| 2026 | 0                                        | 0                                         | 136,446                           | 0                  | 0                     | -136,446    | -61,612                         | -1,710,159                                 | -618,669                          | -2,328,828                            | 0.537                | 2.6456                                        |
| 2027 | 0                                        | 0                                         | 132,895                           | 0                  | 0                     | -132,895    | -56,161                         | -1,766,320                                 | -562,508                          | -2,328,828                            | 0.523                | 2.6456                                        |
| 2028 | 0                                        | 0                                         | 129,455                           | 0                  | 0                     | -129,455    | -51,201                         | -1,817,521                                 | -511,307                          | -2,328,828                            | 0.510                | 2.6456                                        |
| 2029 | 0                                        | 0                                         | 126,118                           | 0                  | 0                     | -126,118    | -46,683                         | -1,864,204                                 | -464,625                          | -2,328,828                            | 0.497                | 2.6456                                        |
| 2030 | 0                                        | 0                                         | 122,875                           | 0                  | 0                     | -122,875    | -42,567                         | -1,906,770                                 | -422,058                          | -2,328,828                            | 0.484                | 2.6456                                        |
| 2031 | 0                                        | 0                                         | 119,720                           | 0                  | 0                     | -119,720    | -38,815                         | -1,945,585                                 | -383,243                          | -2,328,828                            | 0.471                | 2.6456                                        |
| 2032 | 0                                        | 0                                         | 116,644                           | 0                  | 0                     | -116,644    | -35,393                         | -1,980,979                                 | -347,849                          | -2,328,828                            | 0.459                | 2.6456                                        |
| 2033 | 0                                        | 0                                         | 113,643                           | 0                  | 0                     | -113,643    | -32,272                         | -2,013,251                                 | -315,577                          | -2,328,828                            | 0.447                | 2.6456                                        |
| 2034 | 0                                        | 0                                         | 110,709                           | 0                  | 0                     | -110,709    | -29,423                         | -2,042,674                                 | -286,154                          | -2,328,828                            | 0.436                | 2.6456                                        |
| 2035 | 0                                        | 0                                         | 107,838                           | 0                  | 0                     | -107,838    | -26,823                         | -2,069,497                                 | -259,331                          | -2,328,828                            | 0.425                | 2.6456                                        |
| 2036 | 0                                        | 0                                         | 105,024                           | 0                  | 0                     | -105,024    | -24,448                         | -2,093,945                                 | -234,883                          | -2,328,828                            | 0.413                | 2.6456                                        |
| 2037 | 0                                        | 0                                         | 102,262                           | 0                  | 0                     | -102,262    | -22,279                         | -2,116,224                                 | -212,604                          | -2,328,828                            | 0.403                | 2.6456                                        |
| 2038 | 0                                        | 0                                         | 99,550                            | 0                  | 0                     | -99,550     | -20,298                         | -2,136,522                                 | -192,306                          | -2,328,828                            | 0.392                | 2.6456                                        |
| 2039 | 0                                        | 0                                         | 96,882                            | 0                  | 0                     | -96,882     | -18,488                         | -2,155,010                                 | -173,818                          | -2,328,828                            | 0.381                | 2.6456                                        |
| 2040 | 0                                        | 0                                         | 94,255                            | 0                  | 0                     | -94,255     | -16,833                         | -2,171,843                                 | -156,985                          | -2,328,828                            | 0.371                | 2.6456                                        |
| 2041 | 0                                        | 0                                         | 91,666                            | 0                  | 0                     | -91,666     | -15,321                         | -2,187,164                                 | -141,664                          | -2,328,828                            | 0.361                | 2.6456                                        |
| 2042 | 0                                        | 0                                         | 89,111                            | 0                  | 0                     | -89,111     | -13,939                         | -2,201,104                                 | -127,724                          | -2,328,828                            | 0.351                | 2.6456                                        |
| 2043 | 0                                        | 0                                         | 86,589                            | 0                  | 0                     | -86,589     | -12,677                         | -2,213,780                                 | -115,048                          | -2,328,828                            | 0.341                | 2.6456                                        |
| 2044 | 0                                        | 0                                         | 84,096                            | 0                  | 0                     | -84,096     | -11,522                         | -2,225,303                                 | -103,525                          | -2,328,828                            | 0.331                | 2.6456                                        |
| 2045 | 0                                        | 0                                         | 81,631                            | 0                  | 0                     | -81,631     | -10,467                         | -2,235,770                                 | -93,058                           | -2,328,828                            | 0.321                | 2.6456                                        |
| 2046 | 0                                        | 0                                         | 79,190                            | 0                  | 0                     | -79,190     | -9,504                          | -2,245,274                                 | -83,554                           | -2,328,828                            | 0.312                | 2.6456                                        |
| 2047 | 0                                        | 0                                         | 76,772                            | 0                  | 0                     | -76,772     | -8,623                          | -2,253,896                                 | -74,932                           | -2,328,828                            | 0.302                | 2.6456                                        |
| 2048 | 0                                        | 0                                         | 74,375                            | 0                  | 0                     | -74,375     | -7,818                          | -2,261,714                                 | -67,114                           | -2,328,828                            | 0.293                | 2.6456                                        |
| 2049 | 0                                        | 0                                         | 71,998                            | 0                  | 0                     | -71,998     | -7,083                          | -2,268,797                                 | -60,031                           | -2,328,828                            | 0.283                | 2.6456                                        |
| 2050 | 0                                        | 0                                         | 69,638                            | 0                  | 0                     | -69,638     | -6,412                          | -2,275,209                                 | -53,619                           | -2,328,828                            | 0.274                | 2.6456                                        |
| 2051 | 0                                        | 0                                         | 67,295                            | 0                  | 0                     | -67,295     | -5,799                          | -2,281,008                                 | -47,821                           | -2,328,828                            | 0.265                | 2.6456                                        |
| 2052 | 0                                        | 0                                         | 64,967                            | 0                  | 0                     | -64,967     | -5,239                          | -2,286,247                                 | -42,581                           | -2,328,828                            | 0.256                | 2.6456                                        |
| 2053 | 0                                        | 0                                         | 62,653                            | 0                  | 0                     | -62,653     | -4,729                          | -2,290,975                                 | -37,853                           | -2,328,828                            | 0.247                | 2.6456                                        |
| 2054 | 0                                        | 0                                         | 60,352                            | 0                  | 0                     | -60,352     | -4,263                          | -2,295,238                                 | -33,590                           | -2,328,828                            | 0.238                | 2.6456                                        |
| 2055 | 0                                        | 0                                         | 58,063                            | 0                  | 0                     | -58,063     | -3,838                          | -2,299,077                                 | -29,751                           | -2,328,828                            | 0.229                | 2.6456                                        |
| 2056 | 0                                        | 0                                         | 55,784                            | 0                  | 0                     | -55,784     | -3,451                          | -2,302,528                                 | -26,300                           | -2,328,828                            | 0.220                | 2.6456                                        |
| 2057 | 0                                        | 0                                         | 53,515                            | 0                  | 0                     | -53,515     | -3,099                          | -2,305,627                                 | -23,201                           | -2,328,828                            | 0.211                | 2.6456                                        |
| 2058 | 0                                        | 0                                         | 51,256                            | 0                  | 0                     | -51,256     | -2,778                          | -2,308,404                                 | -20,424                           | -2,328,828                            | 0.202                | 2.6456                                        |
| 2059 | 0                                        | 0                                         | 49,005                            | 0                  | 0                     | -49,005     | -2,485                          | -2,310,890                                 | -17,939                           | -2,328,828                            | 0.193                | 2.6456                                        |
| 2060 | 0                                        | 0                                         | 46,761                            | 0                  | 0                     | -46,761     | -2,220                          | -2,313,109                                 | -15,719                           | -2,328,828                            | 0.184                | 2.6456                                        |
| 2061 | 0                                        | 0                                         | 44,525                            | 0                  | 0                     | -44,525     | -1,978                          | -2,315,087                                 | -13,741                           | -2,328,828                            | 0.175                | 2.6456                                        |
| 2062 | 0                                        | 0                                         | 42,296                            | 0                  | 0                     | -42,296     | -1,758                          | -2,316,845                                 | -11,983                           | -2,328,828                            | 0.167                | 2.6456                                        |
| 2063 | 0                                        | 0                                         | 40,072                            | 0                  | 0                     | -40,072     | -1,559                          | -2,318,405                                 | -10,424                           | -2,328,828                            | 0.158                | 2.6456                                        |
| 2064 | 0                                        | 0                                         | 37,854                            | 0                  | 0                     | -37,854     | -1,378                          | -2,319,783                                 | -9,045                            | -2,328,828                            | 0.149                | 2.6456                                        |
| 2065 | 0                                        | 0                                         | 35,641                            | 0                  | 0                     | -35,641     | -1,215                          | -2,320,998                                 | -7,831                            | -2,328,828                            | 0.140                | 2.6456                                        |