COMPARISON OF NUCLEAR FUEL COSTS

1.0 PURPOSE

This evidence presents period-over-period comparisons for nuclear fuel bundle costs for 2016-2026 in support of the approvals sought for nuclear fuel costs. Nuclear fuel costs consist of Total Fuel Bundle Cost, Used Fuel Storage and Disposal, and Fuel Oil. This exhibit only discusses period-over-period changes for Total Fuel Bundle Cost. Used Fuel Storage and Disposal is discussed in Ex. C2-1-1. Comparisons for Fuel Oil are not discussed because the period-over-period changes are immaterial.

2.0 OVERVIEW

Period-over-period variances are presented in Ex. F2-5-2, Table 1 and are explained below. See Ex. F2-5-1 for a discussion of key drivers associated with nuclear fuel bundle costs.[1]

3.0 PERIOD-OVER-PERIOD CHANGES – IR TERM

2022 Plan versus 2021 Budget

The decrease of $18.8M in nuclear fuel bundle cost is due to lower energy production of -$19.2M and higher fuel utilization efficiency of -$0.4M, partially offset by a higher unit price for new fuel loaded at +$0.8M.

2023 Plan versus 2022 Plan

The decrease of $5.3M in nuclear fuel bundle cost is due to lower energy production of -$10.1M, partially offset by a higher unit price for new fuel loaded at +$3.4M and lower fuel utilization efficiency of +$1.3M

[1] As discussed in Ex. F2-5-1, year over year nuclear fuel costs are impacted by the requirement for a one time full load of new fuel into the reactor core of refurbished Darlington units prior to start-up. One half of the nuclear fuel bundle cost of the new fuel load for each unit will start to be expensed when each unit is declared in-service during the period 2020 to 2026, i.e., Unit 2 in 2020, Unit 3 in 2024, Unit 1 in 2025 and Unit 4 in 2026.

2024 Plan versus 2023 Plan

The increase of $23.8M in nuclear fuel bundle cost is due to higher energy production of +$10.8M, a higher unit price for new fuel loaded at +$4.4M and lower fuel utilization efficiency of +$8.6M. There is an impact on fuel utilization efficiency in 2024 related to the one time requirement for a new fuel load for Darlington Unit 3 ($14.9M).

2025 Plan versus 2024 Plan

The decrease of $6.6M in nuclear fuel bundle cost is due to lower energy production of -$9.1M and higher fuel utilization efficiency of -$2.7M, partially offset by a higher unit price for new fuel loaded at +$5.3M. There is a one time impact on fuel utilization efficiency in 2024 and 2025 related to Darlington Unit 3 returning to service in 2024 ($14.9M) and Darlington Unit 1 returning to service in 2025 ($15.3M).

2026 Plan versus 2025 Plan

The decrease of $35.5M in nuclear fuel bundle cost is due to lower energy production of -$32.4M and higher fuel utilization efficiency of -$5.1M, partially offset by a higher unit price for new fuel loaded at +$1.9M. There is an impact on fuel utilization efficiency in 2025 and 2026 related to the one time requirement for a new fuel load for Darlington Unit 1 returning to service in 2025 ($15.3M) and Unit 4 returning to service in 2026 ($16.5M).[2] The decrease in energy production reflects the planned shutdown of Pickering at the end of 2025.

4.0 PERIOD-OVER-PERIOD CHANGES – BRIDGE YEARS

2021 Budget versus 2021 OEB Approved

The decrease of $2.3M in nuclear fuel bundle cost is due to a lower unit price for new fuel loaded at -$14.5M, partially offset by higher energy production of +$11.6M and lower fuel utilization efficiency of +$0.5M. The actual fuel bundle unit cost of $3.81/MWh was lower than the fuel bundle unit cost of $4.19/MWh reflected in the EB-2016-0152 approved settlement proposal (Ex. O1-1-1, p. 9).

[2] As the new fuel load is expensed over time, only $13.3M is expensed in 2026.

2021 Budget versus 2020 Budget

The decrease of $33.9M in nuclear fuel bundle cost is due to lower energy production of -$19.5M, a lower unit price for new fuel loaded at -$5.9M and higher fuel utilization efficiency of -$8.5M. This is also impacted by a one time requirement of new fuel load for Darlington Unit 2 ($15.6M) prior to start-up in 2020.

2020 Budget versus 2020 OEB Approved

The increase of $16.1M in nuclear fuel bundle cost is due to higher energy production of +$22.1M, partially offset by a lower unit price for new fuel loaded at -$5.0M and higher fuel utilization efficiency of -$1.1M. The actual fuel bundle unit cost of $4.28/MWh was lower than the fuel bundle unit cost of $4.39/MWh reflected in the EB-2016-0152 approved settlement proposal (Ex. O1-1-1, p. 9). The impact related to the requirement for a load of new fuel into the reactor core of Darlington Unit 2 prior to start-up was comparable to the EB-2016-0152 forecast ($15.6M versus $15.3M forecast).[3]

2020 Budget versus 2019 Actual

The increase of $2.2M in nuclear fuel bundle cost is due to lower fuel utilization efficiency of +$12.7M, partially offset by lower energy production of -$4.7M and a lower unit price for new fuel loaded at -$5.8M. As noted above, there is a one time impact on fuel utilization efficiency in 2020 related to the requirement for a load of new fuel into the reactor core of Darlington Unit 2 prior to start-up ($15.6M).

5.0 PERIOD-OVER-PERIOD CHANGES – HISTORICAL YEARS

2019 Actual versus 2019 OEB Approved

The increase of $19.2M in nuclear fuel bundle cost is due to higher energy production of +$17.8M, a higher unit price for new fuel loaded at +$2.1M, offset by higher fuel utilization efficiency of -$0.8M. The actual fuel bundle unit cost of $4.08/MWh was higher than the fuel bundle unit cost of $4.07/MWh reflected in the EB-2016-0152 approved settlement proposal (Ex. O1-1-1, p. 9).

[3] EB-2016-0152, Ex. F2-5-2, p. 2.

2019 Actual versus 2018 Actual

The increase of $1.3M in nuclear fuel bundle cost is due to higher energy production of +$10.6M, partially offset by lower unit price for new fuel loaded at -$5.2M and higher fuel utilization efficiency of -$4.1M.

2018 Actual versus 2018 OEB Approved

The increase of $17.4M in nuclear fuel bundle cost is due to higher energy production of +$10.2M, a higher unit price for new fuel loaded at +$4.3M and lower fuel utilization efficiency of +$2.9M. The actual fuel bundle unit cost of $4.31/MWh was higher than the fuel bundle unit cost of $4.14/MWh reflected in the EB-2016-0152 approved settlement proposal (Ex. O1-1-1, p. 9).

2018 Actual versus 2017 Actual

The decrease of $1.5M in nuclear fuel bundle cost is due to a lower unit price for new fuel loaded at -$4.1M offset by higher energy production of +$0.9M and lower fuel utilization efficiency of +$1.7M.

2017 Actual versus 2017 OEB Approved

The increase of $18.7M in nuclear fuel bundle cost is due to higher energy production of +$10.7M, a higher unit price for new fuel loaded at +$6.4M and lower fuel utilization efficiency of +$1.7M. The actual fuel bundle unit cost of $4.37/MWh was higher than the fuel bundle unit cost of $4.18/MWh reflected in the EB-2016-0152 approved settlement proposal (Ex. O1-1-1, p. 9).

2017 Actual versus 2016 Actual

The decrease of $20.7M in nuclear fuel bundle cost is due to lower energy production of -$21.3M and higher fuel utilization efficiency of -$0.6M, partially offset by a higher unit price for new fuel loaded at +$1.2M.

2016 Actual versus 2016 Budget

The increase of $0.1M in nuclear fuel bundle cost is due a higher unit price for new fuel loaded at +$4.2M and lower fuel utilization efficiency of +$1.4M, partially offset by lower energy production of -$5.5M.