1 2 3 4	NP-CA-009	Reference: Comments on Newfoundland Power's 2022 Capital Budget Application, Elenchus Research Associates Inc., August 13, 2021, page 23, footnote 30.
5 6 7		<i>"The capital cost for the Distributed Energy Resource Project #2 assumes 1% annual cost reductions from technological improvements."</i>
8 9 10 11	QUESTION:	Please provide industry sources that substantiate the 1% annual cost reductions from technological improvements in both the short term and the longer term.
12 13 14 15 16	RESPONSE:	The 1% annual cost reductions from technological improvements in both the short term and the longer term is used for illustrative purposes. The values can be easily revised for any other assumed rate of cost decline. The actual future cost declines are unknowable, but the 1% rate is conservative given the expectations of experts, as cited below.
17 18 19 20 21 22 23 24 25 26 27 28 29 30		• The National Renewable Energy Laboratory ("NREL"), a division of the United States Department of Energy, develops an Annual Technology Baseline database and report which provides historic and forecast technology cost and performance data for renewable technologies. <sup>9</sup> NREL forecasts the levelized cost of utility-scale solar plus battery storage to decline by an average of 2.58% <sup>10</sup> per year from 2019 to 2050. The levelized cost of residential rooftop solar is forecast to decline by 3.23% per year over the same time period. Another NREL study, Cost Projections for Utility-Scale Battery Storage, <sup>11</sup> estimates that the cost of utility-scale battery storage will decline by 59% from 2020 to 2050, an average decline of 2.93% per year.
31 32 33 34 35 36		• In its Alternative Renewables Cost Assumptions in Annual Energy Outlook 2020, the US Energy Information Administration ("EIA"), also part of the US Department of Energy, forecasts the capital cost of utility-scale solar to decline by 53% from 2019 to 2050, an annualized decline of 2.40% per year. Residential rooftop solar is forecast to decline by 1.2% per year over the same period. <sup>12</sup>

<sup>&</sup>lt;sup>9</sup> <u>NREL 2020 Standard Scenarios Report: A U.S. Electricity Sector Outlook</u>. Forecast NREL data is provided in Conservative, Moderate, and Advanced scenarios. The data provided above reflects the Moderate scenario figures provided in the ATB Spreadsheet.

<sup>&</sup>lt;sup>10</sup> Calculated as the geometric mean of annual price declines.

<sup>&</sup>lt;sup>11</sup> Cost Projections for Utility-Scale Battery Storage, Wesley Cole and A. Will Frazier, National Renewable Energy Laboratory, page 5.

<sup>&</sup>lt;sup>12</sup> Alternative Renewables Cost Assumptions in AEO2020, January 2020, US Energy Information Administration, page 2.

1	• Bloomberg New Energy Finance ("BNEF") projects the price of
2	electric vehicles to decline with reductions in the cost of batteries,
3	reaching parity with the cost of internal combustion engine vehicles
4	by 2026. BNEF projects the cost of EVs to continue to decline to
5	18% lower than conventional gas vehicles by 2030. <sup>13</sup>
6	
7	• BNEF's analysis concerns the price of new vehicles. Other studies,
8	such as the Levelized Cost of Charging Electric Vehicles in the
9	United States in Joule by NREL researchers, find that the lifetime
10	cost of EVs is already lower than conventional gas vehicles in the
11	United States as of 2020. <sup>14</sup>
12	
13	Elenchus notes that NP appears to recognize the declining cost of new
14	technologies as compared to mature technologies as evidenced by its
15	observation that EV costs are expected to be on par with gas vehicles by
16	2025.

 <sup>&</sup>lt;sup>13</sup> Electric cars 'will be cheaper to produce than fossil fuel vehicles by 2027', Joanna Partridge, The Guardian, May 9, 2021 (original BNEF source is not publicly available).
<sup>14</sup> Levelized Cost of Charging Electric Vehicles in the United States, Bourlaug, B. et al., Joule, Volume 4, Issue

<sup>7.</sup>