

1 **Q. (Reference Application, 1.2 Feeder Additions for Load Growth)**

- 2 a) For these projects, were dynamic rates such as time-of-day rates
- 3 considered as an alternative?
- 4 b) Footnote 7 indicates that the cost for a battery storage solution is \$2.1
- 5 million based on a June 2021 report prepared for the National Renewable
- 6 Energy Laboratory by Cole et al. Please provide the calculation and all
- 7 assumptions.
- 8 c) Are utility-scale battery systems in use elsewhere?
- 9 d) What are the expected operating and maintenance costs for utility-scale
- 10 battery systems?
- 11 e) Do the significant cost reductions in utility-scale battery systems going
- 12 forward suggest that portions of the feeder additions for load growth
- 13 project may become stranded?

14

15 A. a) No, dynamic rates, such as time-of-day rates, were not considered as an alternative.

16 Dynamic rates do not currently exist in Newfoundland Power's *Schedule of Rates,*

17 *Rules and Regulations,* approved in July 2022. Additionally, Newfoundland Power

18 currently does not have metering infrastructure or systems in place to facilitate

19 dynamic rates. The Company will continue to assess the potential for dynamic rates,

20 including time-of-day rates, going forward.

- 21
- 22 b) The June 2021 report prepared for the National Energy Laboratory by Cole et al.
- 23 provides low, medium and high pricing projections for utility-scale battery banks in
- 24 2020 USD currency. All calculations used in the report *1.2 Feeder Additions for Load*
- 25 *Growth* utilize the medium pricing projections converted to 2024 CAD currency,
- 26 based on the latest GDP inflation figures from the February 2023 update to the
- 27 Conference Board of Canada's medium-term forecast. USD to CAD conversions were
- 28 based on the conversion rate as of March 22, 2023.

29

30 Cole et. al lists the medium projected price for utility scale battery banks in 2024 to

31 be \$263/kWh in 2020 USD currency. Using the above assumptions, this was

32 converted and inflated to \$427/kWh in 2024 CAD currency.

33

34 As stated in the report *1.2 Feeder Additions for Load Growth,* the overloaded single-

35 phase section of distribution feeder BVS-04 was equipped with an ammeter to

36 observe real-time load data during peak days. The ammeter showed that loading on

37 the single-phase section of distribution feeder exceeded the 85 amps ("A") planning

38 limit for 17 hours per day during the study period with a peak load of approximately

39 125 A. Based on this, the battery bank was sized to accommodate $125\text{ A} - 85\text{ A} =$

40 40 A of load at the feeder voltage of 7.2 kV, i.e., $7.2\text{ kV} \times 40\text{ A} \times 17\text{ hours} =$

41 4.9 MWh. Based on a projected price of \$427/kWh, this results a total estimated

42 price of approximately \$2.1 million for a 4.9 MWh utility-scale battery bank.

43

44 It should also be noted that as per Cole et al., literature pertaining to battery system

45 cost projections typically only consider a four-hour discharge time for utility-scale

46 battery systems. Due to the duration and magnitude of the overload condition,

47 there also exists a technical concern regarding the ability of a battery system to

- 1 reliably offload the single-phase section of distribution feeder BVS-04 referenced in
2 report *1.2 Feeder Additions for Load Growth*.
3
- 4 c) Newfoundland Power does not currently use utility-scale battery systems, nor does it
5 specifically track their usage in other jurisdictions.
6
- 7 d) Expected operating and maintenance costs specific to the potential usage of utility-
8 scale battery systems in Newfoundland are currently unavailable. Due to the
9 relatively high capital costs associated with their procurement and installation,
10 estimates of operating and maintenance costs have not been pursued.
11
- 12 e) No, Newfoundland Power does not believe that the proposed three-phase upgrades
13 to the distribution feeders referenced in report *1.2 Feeder Additions for Load Growth*
14 will become stranded. The areas supplied by distribution feeders BVS-04, OXP-01
15 and PUL-02 continue to experience increased property development with larger
16 service sizes. Furthermore, due to the magnitude of the observed overloads, as well
17 as expected load increases associated with electrification in general, the Company
18 affirms that the three-phase upgrades proposed will ensure the continued provision
19 of least-cost, reliable electricity to these areas.