Q. **Volume 1 (1st Revision), Chapter 3: Operations**

For each initiative intended to reduce the cost of providing service to rural customers, please provide an estimate of the energy and cost savings achieved for the approved 2015 test year, 2015 and 2016 actuals, 2017 forecast and 2018 and 2019 test years. The cost savings should be net of any costs required to implement the initiative and any reduced revenue as a result of the initiative. (Volume I (1st Revision), Chapter 3: Operations, Page 3.32, Line 6, et. seq.)

A. The following initiatives are intended to reduce the cost of providing service to rural customers:

Customer CDM Programs – Rural Isolated Systems

Table 1 presents the net cost savings for Hydro's energy conservation programs in rural isolated systems. [1]

Table 1 Customer CDM Programs – Rural Isolated Systems

	Annual Energy Savings (MWh)	NPV of Energy Savings ($)	Annual Program Costs ($)	Annual Revenue Loss ($)	NPV Benefits ($)
2015F	882	1,226,499	763,800	662,802	(200,102)
2015	1,494	2,392,733	634,720	1,184,466	573,547
2016	779	812,560	547,902	462,186	(197,529)
2017F	533	1,120,996	948,001	496,252	(323,257)
2018F	540	1,077,515	1,161,000	480,172	(563,658)
2019F	174	278,812	174,000	96,740	8,072

[1] This presentation of NPV in this manner is similar to the RIM (Rate Impact Measure) economic test. Per P.U. 18(2016) to Newfoundland Power, the Board does not require Hydro and Newfoundland Power to perform this test on its CDM programs.

Connecting Isolated Systems to the Interconnected Grid

Rencontre East is the most recent (2006) isolated system to be connected to the interconnected grid, in addition to over 60 other systems over the past 50 years. As with any capital initiative that is intended to reduce costs, a favourable cost-benefit analysis was required, and completed prior to any interconnection projects being approved. However, the actual cost savings produced post interconnection are not tracked. It is reasonable to expect that projects previously undertaken to interconnect isolated systems, which had a favourable cost-benefit analysis, continue to be more cost-effective than supplying those systems via more costly diesel generation.

Alternative Sources of Supply

Hydro continues to evaluate any initiatives that have potential to reduce the costs associated with its isolated diesel systems. An example of a recent initiative is the power purchase agreement Hydro entered into with the Mary's Harbour small hydroelectric generation site. Any energy Hydro purchases from the private hydro site will help to displace a portion of fuel usage and emissions associated with diesel generation at Mary's Harbour. Annual cost savings will be dependent on the actual annual production of the site, which will vary due to annual hydrological variations. The Mary's Harbour hydro facility is expected to begin operating in 2018.

Internal Energy Efficiency Initiatives – Rural Isolated Systems

Hydro's Internal Energy Efficiency Program continually seeks opportunities to reduce operating costs in isolated systems. Energy efficiency initiatives to date have primarily involved diesel plant lighting retrofits and variable frequency drives for diesel engine radiator fans. Hydro has also converted one isolated community to LED street lights, and plans to continue seeking opportunities to convert other

communities in the future. Table 2 illustrates the net benefits of Hydro's internal energy efficiency initiatives.

Table 2 Hydro's Internal Energy Efficiency Initiatives – Rural Isolated Systems

	Annual Energy Savings (MWh)	NPV of Energy Savings ($)	Annual Initiative Costs ($)	NPV Benefits ($)
2015	75	223,758	32,391	191,367
2016	163	504,370	78,869	425,501
2017F	98	318,045	157,906	160,139
2018F	113	372,798	223,565	149,233
2019F	92	291,289	174,684	116,605

Nain LED Street Light Retrofit

In 2015, Hydro pursued a pilot LED street light replacement project for the Town of Nain. A total of 125 high pressure sodium (HPS) street light fixtures were replaced with LED street light fixtures. Given the location and climate, Nain was chosen as a location to test the performance of LED street lights. The initiative was also bundled with existing distribution work scheduled for the community, as such the estimated incremental cost for the LED street light project was $26,000. The LED street lights installed in Nain use 45,000 kWh less electricity annually compared to the previous HPS fixtures, which is equivalent to $13,500 of diesel fuel savings annually. LED streetlights are also expected to require less maintenance compared to HPS street lights due to reduced relamping requirements. Hydro plans to continue to convert street lights to LED in isolated communities.