

EB-2014-0101

Ontario Energy Board

IN THE MATTER OF the *Ontario Energy Board Act, 1998*, S.O. 1998, c. 15, (Schedule B);

AND IN THE MATTER OF an application by Oshawa PUC Networks Inc. for an order approving or just and reasonable rates and other charges for electricity distribution to be effective January 1, 2015 to December 31, 2019.

**VULNERABLE ENERGY CONSUMERS COALITION
("VECC")
CROSS-EXAMINATION COMPENDIUM**

July 3, 2015

TAB 1

OSHAWA PUC NETWORKS INC.

**Response to School Energy Coalition (SEC)
Interrogatory 4.0-SEC-32**

[Ex.4, p.43]

With respect to Appendix 2-K (Table 4-20):

- a) Please add rows showing the total compensation capitalized, and total charged to OM&A.
 - b) Please provide a version of the Appendix 2-K for showing a split between union and non-union employees.
-

Response:

- a) See attached.

	2011 Actuals	Last Rebasing Year - 2012 Board Approved	Last Rebasing Year - 2012 Actual	2013 Actuals	2014 Bridge Year (Actual)	2015 Test Year	2016 Test Year	2017 Test Year	2018 Test Year	2019 Test Year
Number of Employees (FTEs including Part-Time)										
Management	17	18	18	18	18	19	20	20	20	20
Non-Management	52	57	56	56	56	61	65	64	63	61
Total	69	75	74	74	74	80	85	84	83	81
Total Salary and Wages including overtime and incentive pay (\$000's)										
Management	\$1,543	\$1,899	\$1,759	\$1,935	\$1,930	\$2,110	\$2,217	\$2,262	\$2,307	\$2,353
Non-Management	\$4,324	\$4,676	\$4,711	\$5,017	\$4,897	\$5,402	\$5,731	\$5,882	\$5,977	\$5,936
Total	\$5,867	\$6,574	\$6,471	\$6,952	\$6,827	\$7,512	\$7,948	\$8,144	\$8,284	\$8,290
Total Benefits (Current + Accrued) (\$000's)										
Management	\$601	\$718	\$710	\$641	\$631	\$652	\$685	\$698	\$713	\$727
Non-Management	\$1,709	\$1,885	\$1,899	\$1,663	\$1,667	\$1,622	\$1,662	\$1,684	\$1,711	\$1,722
Total	\$2,311	\$2,602	\$2,609	\$2,304	\$2,298	\$2,275	\$2,347	\$2,383	\$2,424	\$2,450
Total Compensation (Salary, Wages, & Benefits) (\$000's)										
Management	\$2,144	\$2,616	\$2,469	\$2,576	\$2,561	\$2,763	\$2,902	\$2,960	\$3,020	\$3,081
Non-Management	\$6,033	\$6,560	\$6,610	\$6,680	\$6,564	\$7,024	\$7,394	\$7,566	\$7,688	\$7,659
Total	\$8,177	\$9,177	\$9,079	\$9,255	\$9,126	\$9,787	\$10,296	\$10,526	\$10,708	\$10,740
Total Compensation Allocation (\$000's)										
OM&A	\$5,824	\$6,542	\$6,445	\$6,323	\$6,310	\$6,676	\$7,114	\$7,273	\$7,382	\$7,339
Capital	\$2,263	\$2,346	\$2,346	\$2,637	\$2,490	\$2,805	\$2,869	\$2,933	\$2,999	\$3,067
Other	\$90	\$288	\$288	\$295	\$325	\$306	\$313	\$320	\$327	\$334
Total	\$8,177	\$9,177	\$9,079	\$9,255	\$9,126	\$9,787	\$10,296	\$10,526	\$10,708	\$10,740

- b) Appendix 2-K 'management' includes only non-union employees, and 'non-management' includes only union employees.

Aid to Cross Examination ("GOCC")

Utility	Case Number	Application	Date	Comment	Decision	Date	Comment
Niagara Peninsula Energy Inc.	EB-2014-0096	3.05%	23-Sep-14	Forecast Nov. 2014 Loan	3.920%	Settled	Settlement Filed March 25, 201
Festival Hydro	EB-2014-0073	4.48%	29-May-14	Forecast for Dec. 2014 Loan	4.232%	05-May-15	Settlement Agreement dated October 23, 2014
		3.35%	31-May-13	Loan for 25 years			
Horizon Utilities Corp.	EB-2014-0002	3.47%	17-Apr-14	Excess Deemed Long Term Debt at weighted avg. Funded Debt Rate	3.470%	08-Jan-15	Settlement Agreement September 23, 2014
		3.64%					
North Bay Hydro Distribution Ltd.	EB-2014-0099	4.38%			4.240%	No Board Decision yet	Settlement Filed June 22, 2015
Oshawa PUC Networks*	EB-2014-010	4.55% 4.24%		Per Board Decision Close of Discovery			RRWF File June 23, 2015

OPUCN has used the inflation rate for labour costs as per its current collective bargaining agreement, details of which are described in the Employee Compensation section below, and for other OM&A costs has used rates from the Conference Board of Canada CPI for Ontario (2% 2015 & 2016, 2.1% 2017 forward).

Summary of Operating Costs

Table 4-5 provides a summary of operating costs for the previous Board-Approved Year and the relevant historical years, the 2014 Bridge Year and the 2015-2019 Test Years.

TABLE 4-5 – SUMMARY OF OPERATING COSTS 2011-2019

	2011 Actual (CGAAP)	2012 Board Approved (MIFRS)	2012 Actual (MIFRS)	2013 Actual (MIFRS)	2014 Bridge Year (MIFRS)
OM&A (excluding Property Taxes)	10,178	11,331	11,091	11,058	11,136
Property Taxes	144	149	149	152	155
Depreciation and Amortization	5,076	2,858	3,032	3,652	3,845
PILS (income taxes)	1,637	325	47	162	123
Total Operating Costs	17,036	14,663	14,320	15,024	15,260
	2015 Test Year (MIFRS)	2016 Test Year (MIFRS)	2017 Test Year (MIFRS)	2018 Test Year (MIFRS)	2019 Test Year (MIFRS)
OM&A (excluding Property Taxes)	11,987	12,453	12,722	12,941	13,011
Property Taxes	158	162	165	168	172
Depreciation and Amortization	3,896	4,847	5,001	5,203	5,371
PILS (income taxes)	148	304	365	469	485
Total Operating Costs	16,190	17,765	18,253	18,782	19,039

Associated Cost Drivers and Significant Changes

The major drivers that produce significant changes in OM&A levels in the Test Years relative to the historical years and the 2014 Bridge Year are as follows:

- Inflation
- Succession planning to manage high level of retirements in the period
- Additional 5.8 FTE's to 2012 Board-Approved to handle customer connection growth assumed in period

OSHAWA PUC NETWORKS INC.

Response to School Energy Coalition (SEC)
Interrogatory 4.0-SEC-31

[Ex.4, p.43]

For each new position the Applicant is forecasting adding during the test period, please provide a description and rationale.

Response:

The principal driver behind all the new positions proposed is the projected customer growth of approximately 15% from 2014 to the end of the rate period (2019). The comparable proposed growth in FTE's over the period is 8%.

Customer Service – 1 FTE

Additional CSR required to accommodate customer growth forecast at 3% per annum.

IT – 1 FTE

Additional resource required to accommodate increased requirements in IT to manage increasing use of advanced technologies and to support increased use of technology in the maintenance and support of the distribution system.

Grid Construction & Maintenance – 1 FTE

New Lineman to accommodate projected growth.

Technical Design – 2 FTE

One Design Technician required to accommodate projected growth. One Design Supervisor (added 2014) to manage increasing workload.

Metering – 1 FTE

New Meter Technician required to accommodate projected growth.

TAB 2

OSHAWA PUC NETWORKS INC.

Response to Board Staff Interrogatory 4.0-Staff-30

Ref: Exhibit 4, page 21

Community Relations Costs are set to rise by 5.9% in 2015 and then an additional 12.7% in 2016 with inflationary level increases each year to 2019. While OPUCN has provided some reasons for the general increase, please provide additional rationale for the 2015 and 2016 increases.

- a) What additional activities will be undertaken?
 - b) How will those activities feed into OPUCN's plans?
 - c) What alternatives were considered and rejected in favour of the proposed spending on these areas?
-

Response:

- a) The principal activities include:
 - customer engagement
 - customer communications
 - compliance with privacy rules
- b) These activities will aid OPUCN in aligning its capital and operational planning and investments with the expectations of customers for reliable service at a reasonable price.
- c) OPUCN continues to evaluate the specifics on how to effectively address the outcomes outlined in the Board's report on RRFE, in particular customer focus and the need to identify customer preferences. OPUCN considered and rejected creating a full time in house position at this time in favour of using 3rd party services with established expertise.

TAB 3

OSHAWA PUC NETWORKS INC.

**Response to The Consumers Council of Canada (CCC)
Interrogatory 4.0-CCC-32**

Please provide copies of any compensation studies that the Applicant has undertaken since 2012.

Response:

None have been undertaken.

OSHAWA PUC NETWORKS INC.

**Response to School Energy Coalition (SEC)
Interrogatory 4.0-SEC-33**

[Ex.4, p.43]

How does the Applicant determine the reasonableness of its management, both executive and non-executive, compensation costs? Please provide copies of any compensation studies that the Applicant has undertaken since 2012.

Response:

For management and non-executive, OPUCN participates in the annual MEARIE Salary Survey which allows it to review compensation levels with industry trends.

OPUCN plans a compensation review with Hay Group for management and non-executive positions this year (2015).

OSHAWA PUC NETWORKS INC.

Response to Energy Probe Research Foundation (Energy Probe)
Interrogatory 4.0-Energy Probe-44

Ref: Exhibit 4, page 41

- a) Please provide the annual wage increase for union employees for 2012 and 2013.
 - b) Please provide the forecasted wage increase for union employees for 2018 and 2019.
 - c) Please provide the actual and forecasted percentage increases for the executive/management/non-management category for each of 2012 through 2019.
-

Response:

- a) 3.0%
- b) 2.25%
- c) Actual 2012 - 3.00%
Actual 2013 - 3.00%
Actual 2014 - 2.00%
Actual 2015 - 1.75%
Forecast 2016 - 2.25%
Forecast 2017 - 2.25%
Forecast 2018 - 2.25%
Forecast 2019 - 2.25%

productivity efficiencies embedded within its forecast although the nature of these efficiencies have not been specifically identified.

OPUCN recognizes the expectation of the Board for productivity and is committed to delivering such to its customers to provide them with electricity distribution at a reasonable cost.

Table 4-4 - OM&A by Customer, which is a metric reported by the OEB in its *Annual Yearbook of Electricity Distributors*, illustrates the embedded efficiencies within OPUCN’s forecast for the period 2015 to 2019. Adjusting OM&A costs for inflation, using IRM actual and assumed rates as the inflation rate, OM&A per customer reduces by approximately \$23 per customer (11.0%) in 2019 compared to the level approved by the OEB in OPUCN’s most recent rebasing application (EB-2011-0073). OPUCN believes this is another reasonable representation of embedded efficiencies totaling \$1.3 million which includes both expected productivity and the incremental (\$0.4 million) gains identified previously.

TABLE 4-4 – OM&A PER CUSTOMER 2011-2019

OM&A per Customer \$000's except per customer	2011 Actual	2012 Approved	2012 Actual	2013 Actual	2014 Bridge	2015 Test	2016 Test	2017 Test	2018 Test	2019 Test
Number of Customers	53,071	54,410	53,395	53,925	54,613	56,251	57,939	59,677	61,467	63,311
OM&A Costs (\$000s)	10,323	11,480	11,240	11,210	11,291	12,146	12,614	12,887	13,110	13,183
OM&A per Customer	195	211	211	208	207	216	218	216	213	208
Inflation Adjusted										
Inflation % (IRM Rate)				1.08%	1.55%	1.55%	1.55%	1.55%	1.55%	1.55%
OM&A Costs				11,090	11,000	11,652	11,917	11,988	12,010	11,893
OM&A per Customer	195	211	211	206	201	207	206	201	195	188

PEG – Benchmarking the Forecasted Cost of Oshawa PUC Networks (PEG Report)

PEG is a leading utility cost research consultancy who have filed rigorous benchmarking and productivity studies in regulatory proceedings for two decades. Some of their work in Ontario includes benchmarking evidence for Enbridge Gas Distribution and Hydro One Networks, and twice developed power distributor benchmarking and productivity

OPUCN has used the inflation rate for labour costs as per its current collective bargaining agreement, details of which are described in the Employee Compensation section below, and for other OM&A costs has used rates from the Conference Board of Canada CPI for Ontario (2% 2015 & 2016, 2.1% 2017 forward).

Summary of Operating Costs

Table 4-5 provides a summary of operating costs for the previous Board-Approved Year and the relevant historical years, the 2014 Bridge Year and the 2015-2019 Test Years.

TABLE 4-5 – SUMMARY OF OPERATING COSTS 2011-2019

	2011 Actual (CGAAP)	2012 Board Approved (MIFRS)	2012 Actual (MIFRS)	2013 Actual (MIFRS)	2014 Bridge Year (MIFRS)
OM&A (excluding Property Taxes)	10,178	11,331	11,091	11,058	11,136
Property Taxes	144	149	149	152	155
Depreciation and Amortization	5,076	2,858	3,032	3,652	3,845
PILS (income taxes)	1,637	325	47	162	123
Total Operating Costs	17,036	14,663	14,320	15,024	15,260
	2015 Test Year (MIFRS)	2016 Test Year (MIFRS)	2017 Test Year (MIFRS)	2018 Test Year (MIFRS)	2019 Test Year (MIFRS)
OM&A (excluding Property Taxes)	11,987	12,453	12,722	12,941	13,011
Property Taxes	158	162	165	168	172
Depreciation and Amortization	3,896	4,847	5,001	5,203	5,371
PILS (income taxes)	148	304	365	469	485
Total Operating Costs	16,190	17,765	18,253	18,782	19,039

Associated Cost Drivers and Significant Changes

The major drivers that produce significant changes in OM&A levels in the Test Years relative to the historical years and the 2014 Bridge Year are as follows:

- Inflation
- Succession planning to manage high level of retirements in the period
- Additional 5.8 FTE's to 2012 Board-Approved to handle customer connection growth assumed in period

TAB 4

OSHAWA PUC NETWORKS INC.

**Response to Energy Probe Research Foundation (Energy Probe)
Interrogatory 2.0-Energy Probe-6**

Ref: Exhibit 2, Tab 1

On page 16 it is stated that the total expenditures for system renewal over the 2015-2019 period is approximately \$23.9 million which includes unplanned emergency type replacements of \$4.2 million.

- a) Please confirm that the \$4.2 million is for the 5 year period, or about \$0.84 million per year on average.
 - b) What were the average capital expenditures over the 2011 through 2014 period for unplanned emergency type replacements?
-

Response:

- a) Yes, the \$4.2 million is the total for the 5 year period.
- b) The average annual expenditures over the 2011 through 2014 period for unplanned emergency type replacements was \$800,000.

OSHAWA PUC NETWORKS INC.

**Response to School Energy Coalition (SEC)
Interrogatory 2.0-SEC-18**

[Ex.2-B, p.12]

Please explain why 'Reactive/emergency Plant Replacement' does not decrease through the test period in light of the considerable capital program the Applicant proposes to undertake.

Response:

Relatively speaking, the amount of reactive component in the total capital budget is low and is reflective of the typical experience at OPUCN. From a qualitative perspective, since OPUCN is using the same planning methodology for capital projects, we expect similar trends in reactive capital as the number and type of failures are expected to remain consistent with past experience. We do, however, expect increased risks resulting from changing weather patterns, and increased loading stress as we continue to take on peak loading risks. The net effect of these items is reflected in our submission for reactive capital.

TAB 5

OSHAWA PUC NETWORKS INC.

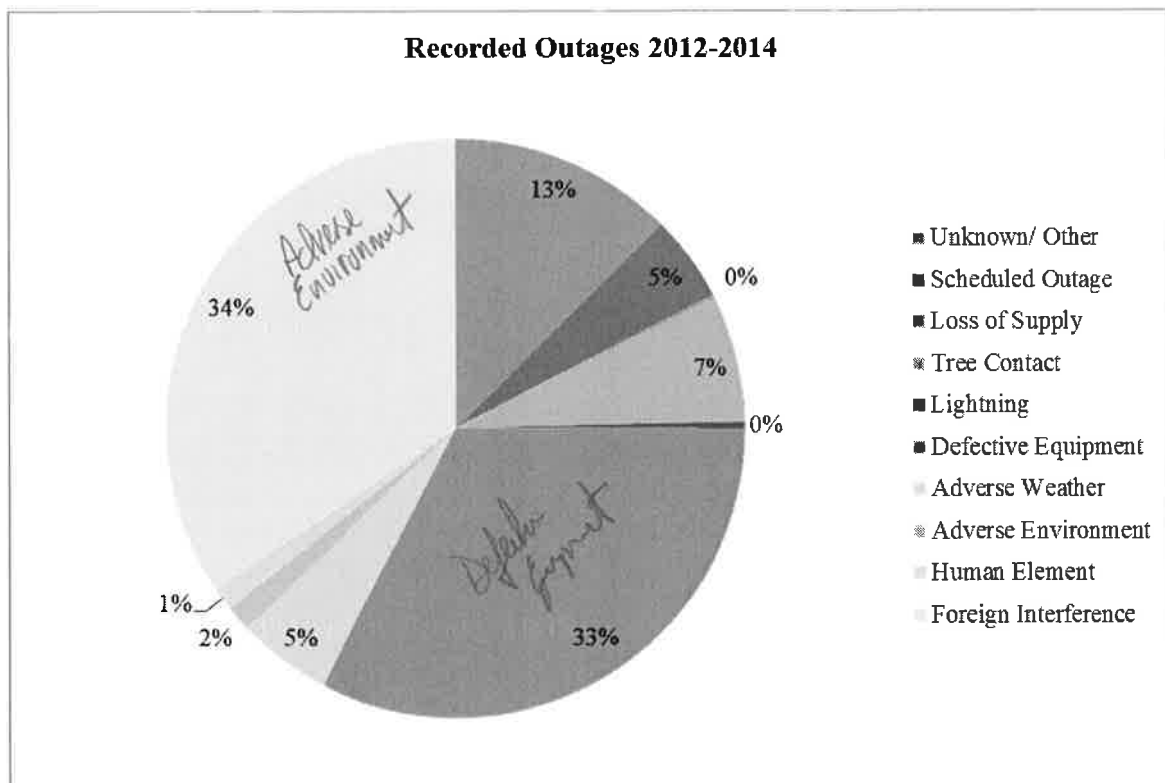
Response to Vulnerable Energy Consumers Coalition (VECC)
Interrogatory 2.0-VECC-15

Reference: E2/TB/pg.66

- a) Please update Figure 7 to show 2014 results and the period 2012 through 2014.
 - b) Please update Table 29 to include 2014 number of interruptions.
-

Response:

- a) Refer to chart below:



TAB 6

OSHAWA PUC NETWORKS INC.

Undertaking TC1.17

To illustrate calculations for the OM&A costs in the second-last line of the table in response to Part (a) of 4-Energy Probe-40.

Response:

A live version of Table 4-4 has been filed through RESS, filename "TC1.17 Table 4-4 Excel Workbook.xlsx".

The objective is to convert forecast OM&A costs to 2012 equivalent \$'s, using the IRM rate as the inflation factor. As noted in the application (Exhibit 4, page 9) this showed OM&A per customer to be lower in real terms in 2019 than the amount approved by the Board in 2012 Rate Application.

TABLE 4-4 – OM&A COSTS PER CUSTOMER

	2011	2012	2012	2013	2014	2015	2016	2017	2018	2019
	Actual	Approved	Actual	Actual	Actual	Test	Test	Test	Test	Test
OM&A per Customer \$000's except per customer										
Number of Customers	53,071	54,410	53,395	53,933	54,670	56,309	57,999	59,739	61,531	63,377
A OM&A Costs (\$000s)	10,323	11,480	11,240	11,210	11,208	12,205	12,689	12,984	13,197	13,269
OM&A per Customer	195	211	211	208	205	217	219	217	214	209
<u>Inflation Adjusted</u>										
Inflation % (IRM Rate)				1.08%	1.55%	1.45%	1.45%	1.45%	1.45%	1.45%
B OM&A Costs				11,090	10,919	11,720	12,011	12,115	12,137	12,029
C OM&A per Customer	195	211	211	206	200	208	207	203	197	190

TAB 7

and equipment. Storage in this new outdoor secured area will allow for, additional parking spaces for planned additional personnel.

Major Tools and Equipment

The need for new and replacement tools and equipment is essential to perform jobs safely and efficiently. Annual expenditure of \$50,000 is based on historic trend for replacements.

Outage Management System

OPUCN plans to implement an Outage Management System (OMS) to have better visibility on the occurrence of system or customer outages and to improve its communication to its customers on which areas are experiencing an outage, how many customers are affected, and the anticipated outage response and restoration time, all in order to enhance overall customer satisfaction. Customer preferences for investments to improve restoration time and provide updated information on outages was evident in the results of the Utility *PULSE* customer surveys discussed in Part II, Section 1.

The OMS will integrate with OPUCN's GIS, SCADA, CIS and AMI Smart Meters with the objective of improving reliability through automated detection of fault and reduced response and restoration time.

OPUCN will be able to proactively and automatically contact customers to advise of system outages either related to one customer or an affected area. Similarly, through a web portal associated with the OMS, customers will have ability to retrieve updated information regarding the cause and location of an outage and expected restoration time.

Total estimated project cost over the two year period 2014-2015 is approximately \$925,000.



Oshawa Power & Utilities

Smart Grid Roadmap and Financial Analysis

April 17, 2014

UtiliWorks™

Building Smart Utility Solutions

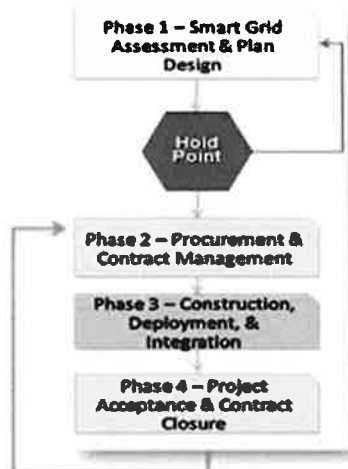
put forth by the Ontario Long Term Energy Plan. Of these 23 programs, we identified 13 that were deemed to be suitable for Oshawa's system and are recommended for further development. Of the 13 recommended programs, six (remote connect/disconnect, enhanced IVR, outage management, automated switching, demand management, and load control) have been initiated by Oshawa PUC and our recommendation is to continue to advance these programs. Seven others (prepaid metering, AMI process redesign, AMI extension, billing system redesign, SCADA upgrade, voltage monitoring, and transmission management) are not currently being pursued and UtiliWorks recommends initiating activities in these program areas. The net capital cost to enhance the existing programs and pursue the new programs is estimated at \$12.22 million over a ten-year period.

The results of the recommended program offer the potential to generate significant benefits to Oshawa and the customers it serves. Some of the key findings of our analysis include:

- Reduction in system peak by between 2-4% by 2024
- Potential reduction in overall system usage by 0.2%
- Elimination of approximately one million minutes of customer outage annually
- Estimated reduction in CO₂ emissions by over 200 metric tons over a ten-year period
- Potential to reduce emissions of other greenhouse gases
- Potential job creation benefits

If Oshawa elects to proceed with this project, UWC recommends that, where possible, the goals are quantified and baselined so that Oshawa PUC can measure progress and verify that these goals are, in fact, achieved. UWC will assist with the identification and development of relevant Key Performance Indicators (KPIs) that are specific to Oshawa and to each specific project if Oshawa elects to proceed.

The figure below illustrates our standard phase progression methodology. We recommend deploying one project at a time with a narrower scope in the beginning rather than all projects at once. With this approach it is possible to get the project fundamentals working and assimilated into the utility organization before moving to the next Smart Metering project. The phase progression is repeated until all projects are installed within the Oshawa system.



2014-2019 MATERIAL CAPITAL EXPENDITURES BY PROJECTS SORTED BY CATEGORY		2014 NET	2015 NET	2016 NET	2017 NET	2018 NET	2019 NET
CAPITAL	BRIEF PROJECT DESCRIPTION	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
GENERAL PLANT							
Outage Management System (OMS fully integrated with SCADA, GIS, AMI, CIS, IVR) Phase 1 carried over from 2014.	Need to proactively provide timely updated communication to customer on outage status. Remotely operate switching, identify outage areas and reduce overall restoration time and outage duration through faster fault identification and automated data mgmt	\$75	\$850				

Phase 1 involved the data preparedness and accuracy including secondary connectivity in the GIS, to allow integration of the AMI, CIS and GIS.

The final components of the project are scheduled for completion over 2014 and 2015. In 2014, the forecast expenditure of approximately \$75 thousand covers the subject matter expert services of an independent third party consultant to:

- help define OPUCN business requirements,
- prepare the RFP for bidders' quotes and help select OMS vendor,
- provide process maps for existing and proposed business operations for "before" and "after" the OMS is in service.
- Project "start up" and implementation of a "pilot system" to refine design criteria for successful integration of all systems

In 2015, the forecast expenditure of approximately \$850 thousand covers:

- Purchase of OMS including interface requirements
- Integration services from vendors of other systems (AMI, GIS, SCADA, CIS, IVR) and necessary enhancements or upgrades
- Services from third party independent consultant to:
 - Project manage
 - Create test plan - including functional, system integration, stress performance, and user acceptance elements.
 - Prepare test cases

OSHAWA PUC NETWORKS INC.

Response to Board Staff Interrogatory 2.0-Staff-12

Ref:

1. Exhibit 2/ Tab B/ p. 72/ Table 31
2. Exhibit 2/ Tab B/ p. 71, p. 85, and p. 92
3. Exhibit 2/ Tab B/ Schedule 1/ OPA Letter
4. Exhibit 2/ Tab B/ Schedule 4/ p. 12 (Capital Expense Forecast)

In OPUCN's capital investment summary table (Reference 1), one entry is dedicated to "Ministry of Energy Approved Micro Grid Project". Further, at page 85 of Reference 2, OPUCN states that: "OPUCN's contribution to this project is its labour in kind".

At page 71 of Reference 2, OPUCN states that it "has adopted those UtiliWorks recommendations that will most affordably and cost effectively increase efficiencies to OPUCN system operations, improve on system outage durations, and minimize outage impact on its customers. The overall capital investment towards a "smarter grid" over the five year planning period is approximately \$2.6 million or 4% of the total overall DS Plan."

At Reference 3, the OPA Letter confirms that there are no future capital investments to accommodate FIT or microFIT initiatives over the 2015-2019 period.

At page 92 of Reference 2, and elsewhere in the pre-filed evidence, OPUCN affirms that system service expenditures are to incorporate new technologies that relate to grid modernization, many of which are 'smartening' the grid.

At Reference 4, the UtiliWorks' report provides a forecast of costs and benefits for OPUCN's Smart Grid initiatives. The forecast shows that while distribution operations will benefit from Smart Grid initiatives, the largest beneficiary over 2015-2019 are distributed resources, which according to the report include distributed generation, energy storage and demand response.

OEB staff notes that demand response is currently included in CDM initiatives.

- a) Respecting the micro-grid pilot project, please explain why 'labour in kind' is accounted for as a capital expenditure.
- b) Please explain how distribution operations would benefit further from additional capital spending in Smart Grid than what would already be accomplished through "smart" System Service upgrades.

- c) In the absence of planned future distributed resources, please explain how additional Smart Grid capital expenditures will provide an incremental benefit to OPUCN's customers?
-

Response:

- a) The microgrid project is a build, install and grid connect project. We expect the capital contribution from the Ministry of Energy (Smart Grid Funding) to be applied to 50% of the project capital cost. OPUCN are completing the remainder of the project using its resources and are seeking rate relief for only that portion of the project.
- b) Some of the additional smart grid benefits to Distribution Operations:
- i. Develop real-time support for outage notification and restoration leading to improved response and reduced outage time.
 - ii. Improved safety and reliability through automated switching.
 - iii. Improved quality of service through active voltage monitoring.
 - iv. Deploying sensing equipment and video surveillance for substation monitoring thereby improving reliability and mitigating losses.
- c) Below find the accumulated benefits for each of the OPUCN Smart Grid projects submitted. The benefit over cost ratio in recommended projects exceed 1.0 supporting the business case to proceed.

<i>(All figures in \$000)</i>		Total Benefits
Metering	AMI Process Redesign	\$850.1
	Remote Connect/Disconnect	\$1,133.8
	AMI Extension	\$101.1
	Prepaid Metering	\$4,726.0
Customer Service	Billing System Redesign	\$282.2
	Enhanced IVR	\$1,388.5
Distribution Operations	Outage Management	\$2,165.6
	Voltage Monitoring	\$1,174.9
	Feeder Gateway Temperature Monitoring	\$1,196.2
	Automated Switching	\$379.5
Distributed Resources	Transmission Management	\$1,875.4
	Demand Management	\$2,645.8
	Load Control	\$10,583.1