

**SCHEDULE 8
ENERGY MATTERS****PART 1
ENERGY MATTERS – MSF****1. DEFINITIONS**

In this Part 1 of Schedule 8, the following definitions shall have the following meanings:

- 1.1 **“Aggregate Actual Consumption”** means the actual consumption of all Energy Utilities at the MSF as invoiced by the relevant utility companies for each Contract Year, excluding all Energy Utilities consumed by Traction Power.
- 1.2 **“Aggregate Energy Target”** or **“AET”** means the target total energy consumption at the MSF, excluding the energy consumption by Traction Power, set forth in the Energy Target Letter submitted by Project Co at Commercial Close and which has been accepted by the City. The AET shall include and account for all requirements of Schedule 15 – Output Specifications of the Project Agreement including standard HVAC and lighting loads, and any systems that are installed by Project Co as part of the Works and that will be maintained by Project Co as part of the Project Co Services.
- 1.3 **“Aggregate Energy Model”** means the energy model used for determining the AET.
- 1.4 **“Annual Review Meeting”** means meetings between City Representatives and Project Co Representatives to occur within 90 days of each anniversary of the Revenue Service Availability Date (or such other date as may be agreed between the City and Project Co) to discuss Energy Services.
- 1.5 **“Average Annual Cooling Degree Days”** means the most recent average annual cooling degree days for Ottawa, Ontario calculated over a 30 year period, based on data published by Environment Canada.
- 1.6 **“Average Annual Heating Degree Days”** means the most recent average annual heating degree days for Ottawa, Ontario calculated over a 30 year period, based on data published by Environment Canada.
- 1.7 **“Average Unit Rate Price”** means the average price for each standard unit of each discrete Energy Utility in a Contract Year as reported by the applicable utility companies responsible for the supply of such Energy Service.
- 1.8 **“BOMA BEST”** means the Building Operators and Managers Association of Canada’s framework for recognizing environmental best practices in existing buildings.

- 1.9 “**Corrected Aggregate Energy Consumption**” means, for a Contract Year, the sum of CAECH for each discrete Energy Service and CAECC for each discrete Energy Service plus all non-heating and non-cooling Energy Utilities consumption at the MSF for such Contract Year, excluding all Energy Utilities consumed by Traction Power for such Contract Year.
- 1.10 “**Corrected Aggregate Energy Consumption Cooling**” or “**CAECC**” means the sum of the Corrected Discrete Energy Consumption for each of the discrete Energy Utilities at the MSF for cooling energy, calculated in accordance with Part 1, Section 3.4(f)(ii).
- 1.11 “**Corrected Aggregate Energy Consumption Heating**” or “**CAECH**” means the sum of the Corrected Discrete Energy Consumption for each of the discrete Energy Utilities at the MSF for heating energy, calculated in accordance with Part 1, Section 3.4(f)(i).
- 1.12 “**Corrected Discrete Energy Consumption**” means the Discrete Energy Service Actual Consumption for each discrete Energy Service (calculated for each discrete Energy Service) corrected for each Contract Year in accordance with this Schedule 8 to reflect the climatic conditions for that Contract Year.
- 1.13 “**Discrete Energy Service Actual Consumption**” means the actual consumption of an individual Energy Service at the MSF as invoiced by the relevant utility company for each Contract Year.
- 1.14 “**Discrete Energy Targets**” or “**DET**” means the target consumption of individual Energy Services set forth in the Energy Target Letter submitted by Project Co at Commercial Close and which have been accepted by the City.
- 1.15 “**Energy Analysis Report**” has the meaning given to it in Part 1, Section 3 of this Schedule 8.
- 1.16 “**Energy Service**” means any metered provision of Energy Utilities at the MSF, other than the metered provision of Energy Utilities for the Traction.
- 1.17 “**Energy Target Letter**” means the letter submitted by Project Co at Commercial Close setting forth the AET and the DET.
- 1.18 “**Energy Utilities**” means energy/power including electricity, natural gas, fuel, oil and any other energy source used at the MSF.
- 1.19 “**Gainshare Adjustment**” means the amount payable by the City to Project Co (which amount will be included in the calculation of the Monthly Service Payment for the Contract Month following the date in which such adjustment has been determined in accordance with this Schedule 8) based on Energy Utilities consumption for each discrete Energy Service at the MSF that falls outside the set bands set out in Part 1, Section 5 of this Schedule 8.

- 1.20 “**High Cost Measures**” means, in respect of a Contract Year, energy saving measures that incur capital expenditure with a Simple Payback of greater than 36 months.
- 1.21 “**International Performance Measurement and Verification Protocol**” or “**IPMVP**” means IPMVP Volume III: Concepts and Options for Determining Energy Savings in New Construction, 2003.
- 1.22 “**Low Cost Measures**” means, in respect of a Contract Year, energy saving measures that incur capital expenditure with a Simple Payback of no greater than 36 months and are considered to be revenue items as opposed to capital investment measures.
- 1.23 “**Model National Energy Code for Buildings**” or “**MNECB**” means the current code and updates as developed by the National Research Council of Canada. Compliance to this code is demonstrated by using a performance based computer simulation tool and by following the “EE4 Modelling Guide, v 1.7”.
- 1.24 “**MSF**” has the meaning given to it in Schedule 1 – Definitions and Interpretation.
- 1.25 “**No Cost Measures**” means energy savings measures, including those related to good house-keeping, involving no material additional expenditure and/or no capital expenditure to carry out.
- 1.26 “**Painshare Adjustment**” means the deduction which may be claimed by the City from Project Co (which amount will be deducted from the calculation of the Monthly Service Payment for the Contract Month following the date in which such adjustment has been determined in accordance with this Schedule 8) based on Energy Utilities consumption for each discrete Energy Service at the MSF which falls outside the bands set out in Part 1, Section 5 of this Schedule 8.
- 1.27 “**Simple Payback**” means the number of years after which an investment will have paid for itself. Simple Payback is calculated by dividing the initial cost of the retrofit by the energy cost savings per year. Those projects with the shortest paybacks are assumed to be the most cost effective. $\text{Simple Payback} = \text{initial cost of energy retrofit} / \text{annual energy savings}$.
- 1.28 “**Traction Power**” means power used as metered at the primary side of the Traction Power transformer used for providing energy to the Light Rail Vehicles for locomotion and any power drawn from the secondary side of the Traction Power transformer.

2. PROCEDURES FOR DETERMINING ENERGY COST SHARING

- 2.1 All Energy Utilities consumed or used for Traction Power shall not be subject to the calculation of the Gainshare Adjustment or the Painshare Adjustment as provided in Part 1, Section 5 of this Schedule 8.
- 2.2 The Discrete Energy Targets shall form the normalized 30 year benchmark for calculating the Energy Services cost sharing in respect of each discrete Energy Service at the MSF. The Discrete Energy Service Actual Consumption for each discrete Energy

- Service shall be corrected to reflect actual degree days for each Contract Year. The Corrected Discrete Energy Consumption for each discrete Energy Service shall be used to calculate Painshare Adjustments and Gainshare Adjustments. The Aggregate Energy Target and the Discrete Energy Targets shall not be altered or adjusted except by the process described in Part 1, Section 4 of this Schedule 8.
- 2.3 The measurement and verification of energy use in the MSF must adhere to IPMVP. At Final Completion, Project Co shall provide the City with a Measurement and Verification Plan, as described in IPMVP Volume III, Section 3.2, including, without limitation, a metering schedule of all proposed energy end-uses. All subsequent Energy Analysis Reports are to be based on this plan.
- 2.4 Project Co shall provide the City with a draft Energy Analysis Report within 60 days following the end of each Contract Year, which report shall include copies of all working papers to fully support the draft Energy Analysis Report. The draft Energy Analysis Report shall be consistent with the format and content requirements set out in Part 1, Section 3 of this Schedule 8.
- 2.5 As soon as practicable and in any event within 80 days following the end of each Contract Year, Project Co and the City shall convene an Annual Review Meeting to be attended by the Project Co Representative and the City Representative. At the Annual Review Meeting Project Co shall present the draft Energy Analysis Report to the City, and the City and Project Co shall discuss the Aggregate Actual Consumption and the Discrete Energy Service Actual Consumption for each discrete Energy Service for the preceding Contract Year.
- 2.6 Project Co shall assist the City Representative and afford the City Representative such information and access to the MSF, building management system records, utility meters, and by other means as may reasonably be required for the City Representative to confirm the draft Energy Analysis Report provided by Project Co to determine the Aggregate Actual Consumption and the Discrete Energy Service Actual Consumption for each separate Energy Service at the MSF for the Contract Year. The City shall promptly notify Project Co of the details of any disagreement of all or any aspect of the Energy Analysis Report, and the Parties shall then seek to agree to any matters in dispute, but where matters cannot be resolved within such 20 Business Day period (or such other period as may be otherwise agreed by the City Representative, acting reasonably) it shall be dealt with in accordance with the Dispute Resolution Procedure.
- (a) Within 20 Business Days following each Annual Review Meeting, or within such period as may be otherwise agreed between the City Representative and the Project Co Representative, acting reasonably:
- (i) The City shall confirm its acceptance of all or any aspect of the Energy Analysis Report

- (b) Subject to Part 1, Section 2.6(c), Project Co or the City, as the case may be, shall be entitled annually to a Gainshare Adjustment or a Painshare Adjustment, as the case may be, calculated in accordance with Part 1, Section 5 of this Schedule 8.
- (c) Claims made by either Project Co or the City for a Gainshare Adjustment or a Painshare Adjustment shall be made at an Annual Review Meeting. If Project Co makes a claim for Gainshare Adjustment, Project Co shall within 10 Business Days after acceptance of the Energy Analysis Report by the City Representative or within such other period as may be agreed by the City Representative and Project Co, acting reasonably, submit an account to the City setting out its calculation and justifying the quantification of the Gainshare Adjustment. If the City makes a claim for a Painshare Adjustment, the City shall, within 10 Business Days after acceptance of the Energy Analysis Report by the City Representative or within such other period as may be agreed by the City Representative and Project Co, acting reasonably, submit an account to Project Co setting out its calculations and justifying the quantification of the Painshare Adjustment.
- (d) If either Project Co or the City wishes to dispute any account presented pursuant to Part 1, Section 2.6(c) of this Schedule 8, it must do so by notice to the other Party within 10 Business Days of receipt of such account. The City Representative and the Project Co Representative shall use reasonable efforts to resolve the dispute for an additional 10 Business Days. If there is no agreement within a further 10 Business Days then either Party may refer the matter to the Dispute Resolution Procedure. If neither Party objects in accordance with this Section 2.6(d) or, following final determination of the disputed account in accordance with this Section 2.6(d), Project Co shall include the relevant Gainshare Adjustment or Painshare Adjustment as a separate item within the next invoice prepared by Project Co in accordance with Section 32.6(a) of the Project Agreement. No adjustments shall be made to the Monthly Service Payment for any claimed Gainshare Adjustment or Painshare Adjustment except in accordance with the procedure set out in Part 1, Section 5 of this Schedule 8.
- 2.7 At Commercial Close, Project Co shall deliver to the City an Energy Target Letter in form and substance satisfactory to the City, which such Energy Target Letter shall reflect the design of the MSF as at Commercial Close. In addition, Project Co shall deliver to the City for review in accordance with Schedule 10 – Review Procedure, an updated final Energy Target Letter together with a supporting Aggregate Energy Model 3 months prior to Revenue Service Availability. Any changes to the Energy Target Letter after Commercial Close shall be approved by the City and shall constitute a Variation.

3. CONTENT AND FORMAT OF THE ENERGY ANALYSIS REPORT

- 3.1 The Energy Analysis Report shall adhere to the IPMVP.
- 3.2 The Energy Analysis Report shall present findings of Aggregate Actual Consumption and the Discrete Energy Service Actual Consumption for each separate Energy Service for the relevant Contract Year and shall include the following:

- (a) a summary of actual usage, degree days, and breakdown by utility in megajoules and cubic meters, or other utility rate units. The summary should also highlight any exceptional changes (being changes of plus or minus 10% in consumption or pattern of use) in consumption or pattern of use since any previous survey;
 - (b) accurate and precise consumption data as provided by utility metering;
 - (c) identification of potential cost savings in respect of Energy Utilities usage at the MSF, other than the Traction Power and provide an estimate of potential Energy Service consumption savings broken down by fuel type, implementation costs, Simple Payback periods and projected savings along with identifying potential risks associated with each proposed cost savings measure. Project Co shall categorize these cost savings measures in the following categories: No Cost Measures, Low Cost Measures and High Cost Measures. Project Co shall also advise the City of projected Energy Utilities usage at the MSF, other than the Traction Power for the next 5 years and cost projections in respect of such projected Energy Utilities usage along with pricing trends and potential risks associated with each.
- 3.3 The objectives of the Energy Analysis Report are to confirm Aggregate Actual Consumption and Discrete Energy Service Actual Consumption for each individual Energy Service at the MSF in the relevant Contract Year and to provide data to calculate Corrected Aggregate Energy Consumption, Corrected Discrete Energy Consumption for each individual Energy Service and Gainshare Adjustment or Painshare Adjustment for each individual Energy Service.
- 3.4 Consistent with the objectives set out in Part 1, Section 3.3 of this Schedule 8, Project Co shall ensure that the Energy Analysis Report has the following components:
- (a) presentation of Aggregate Actual Consumption, Discrete Energy Service Actual Consumption for each individual Energy Service, and calculation of Corrected Discrete Energy Consumption for each individual Energy Service and the Corrected Aggregate Energy Consumption;
 - (b) presentation of degree day data for the relevant Contract Year;
 - (c) establishment of a basis for continued monitoring of energy and utility consumption and adjustments to the Aggregate Energy Target and/or the Discrete Energy Targets;
 - (d) utility data collected by Project Co shall be presented in the table set out in Appendix A to this Schedule 8;
 - (e) detailed analysis of all submetered end-uses;
 - (f) procedure for determining the Corrected Discrete Energy Consumption for each individual Energy Service will be calculated using the following formula (with

separate calculations to be conducted and provided for each discrete Energy Service):

- (i) Corrected Discrete Energy Consumption for the discrete Energy Service for heating energy (“CAECH”) = Discrete Energy Service Actual Consumption (Mega Joules) x Average Annual Heating Degree Days / heating degree days published by Environment Canada for the Contract Year;
- (ii) Corrected Discrete Energy Consumption for the discrete Energy Service for cooling energy (“CAECC”) = Discrete Energy Services Actual Consumption (Mega Joules) x Average Annual Cooling Degree Days / cooling degree days published by Environment Canada for the Contract Year;
- (g) outline any outstanding issues from any previous Energy Analysis Report;
- (h) adjustments to the Aggregate Energy Target and Discrete Energy Target(s);
- (i) table showing the percentage variation in Energy Utilities consumption against the Discrete Energy Target(s) and the Discrete Actual Energy Consumption for each discrete Energy Service;
- (j) tables and graphs showing the consumption, unit costs, and total costs for all purchased Energy Utilities for the previous 12 months. Breakdown of Energy Utilities types and costs for each energy use described in Part 1, Sections 3.3 and 3.4 of this Schedule 8 and any other major energy use for the previous 12 months;
- (k) appendices – The appendices shall include graphs, calculations and miscellaneous data that are relevant to the Energy Analysis Report; and
- (l) summary tables from all previous Energy Analysis Reports delivered by Project Co to the City.

3.5 Project Co shall, and it agrees that it will participate in the BOMA BEST Program. As part of the BOMA BEST Program implementation, Project Co will be required to conduct an energy audit and a water audit every 3 years (or at such other time as may be required by the BOMA BEST Program) based on the BOMA BEST Program requirements. For each year that a BOMA BEST submission is required to be prepared by Project Co (in accordance with the BOMA BEST Program requirements), a copy of such submission shall be appended to the Energy Analysis Report.

4. CORRECTED DISCRETE ENERGY CONSUMPTION AND PROCESS FOR AMENDING THE AGGREGATE ENERGY TARGET AND THE DISCRETE ENERGY TARGETS

4.1 In all cases, corrections to energy consumption targets must be consistent with the principles outlined in the IPMVP.

- 4.2 Following the acceptance of the Energy Analysis Report by the City Representative in accordance with Part 1, Section 2.6 of this Schedule 8, the data set out in the Energy Analysis Report will be used to determine the Painshare Adjustments or Gainshare Adjustments.
- 4.3 For each Contract Year, the Gainshare Adjustment and Painshare Adjustment shall be calculated in accordance with Section 5.
- 4.4 At any time commencing after the first anniversary of the Completion Date, Project Co and the City shall, acting reasonably, agree to make any adjustments to the Aggregate Energy Target and the Discrete Energy Target(s) only in the event of:
- (a) substantial climate change for the relevant time period as reported by Environment Canada compared to the 1980 to 2010 30 year average meteorological data for Ottawa, Ontario as reported by Environment Canada. Climate change can only be evidenced by a climatic authority such as Environment Canada and must be presented to the City with documented evidence of increased consumption trends in similar facilities in South-Eastern Ontario;
 - (b) changes implemented in accordance with the Project Agreement that would cause load changes or other changes in Energy Utilities usage;
 - (c) changes in the utilization of the MSF from that generally described in the Project Agreement.
- 4.5 Pursuant to Part 1, Section 4.4, Project Co may elect to propose a correction to the Aggregate Energy Target and the Discrete Energy Targets in direct proportion to any substantial change in occupation hours of the MSF.
- 4.6 The Party requesting an amendment to the Aggregate Energy Target and the Discrete Energy Target(s) shall appoint, subject to the other Party's approval (acting reasonably) and pay for a complete energy audit to be conducted by a third party auditor. The energy audit shall include a detailed computer simulation of Energy Utilities use by function and a comprehensive evaluation of Energy Utilities use patterns. The energy auditor shall prepare a report making a recommendation regarding amendments to the Aggregate Energy Target and Discrete Energy Target(s). Both the City and Project Co must agree to the amended Aggregate Energy Target and Discrete Energy Target(s) within 20 Business Days following receipt of such report. If there is no agreement within a further 10 Business Day period, then either Party may refer the matter to Dispute Resolution Procedure.
- 4.7 Any amendment to the Aggregate Energy Target and the Discrete Energy Target(s) shall only affect the Monthly Service Payment (as a result of any Painshare Adjustments or Gainshare Adjustments) from the date on which the amendment is effective and shall not, for greater certainty, have a retrospective effect on any other previous Monthly Service Payments except where the Dispute Resolution procedure adjudicates in favour of Project Co, whereby the payments shall be prorated to 30 days after the Energy Auditors report.

5. CALCULATION OF GAINSHARE ADJUSTMENT OR PAINSHARE ADJUSTMENT**5.1 Comparing Annual Energy Target**

- (a) After the acceptance of the Energy Analysis Report as described in Part 1, Section 3 for each Energy Year, the Corrected Discrete Energy Consumption for each Energy Service shall be compared to the Discrete Energy Target for each Energy Service, and:
- (i) if the Corrected Discrete Energy Consumption in respect of any discrete Energy Service is greater than 105% of the Discrete Energy Target in respect of such Energy Service then Project Co shall calculate the Painshare Adjustment set out in Part 1, Section 5.2 and deduct it from the Monthly Service Payments accordingly in accordance with Schedule 20 – Payment Mechanism;

The table below shows the banding mechanism used for calculating the Painshare Adjustment to Project Co and the City for each Energy Service.

Energy Service	Year “X”	Painshare then equals:
If the Variance from DET for the purposes of calculating Painshare in the previous year was:	0 to 5%	0
If the Variance from DET for the purposes of calculating Painshare in the previous year was:	> 5%	100%

- (ii) if the Corrected Discrete Energy Consumption in respect of any Energy Service is less than 95% of the Discrete Energy Target in respect of such Energy Service, then Project Co shall calculate the Gainshare Adjustment set out in Part 1, Section 5.2.

The table below shows the banding mechanism used for calculating the Gainshare Adjustment to Project Co and the City for each Energy Service.

Energy Service	Year “X”	Gainshare then equals:
If the Variance from DET for the purposes of calculating Gainshare in the previous year was:	0 to 5%	0
If the Variance from DET for the purposes of calculating Gainshare in the previous year was:	> 5% to 20%	50%

If the Variance from DET for the purposes of calculating Gainshare in the previous year was:	> 20%	100%
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- (b) If Project Co is subject to a Painshare Adjustment with respect to an Energy Year, then Project Co shall submit a detailed remediation plan within fourteen (14) days of the calculation of the Painshare Adjustment to explain how it will reduce the relevant Discrete Energy Service Actual Consumption such that it will not exceed the 105% threshold established in Part 1, Section 5.1(a)(i), above, for the subsequent Energy Year. If Project Co is not successful in its remediation plan such that the Painshare Adjustment in Part 1, Section 5.1(a)(i) is applied with respect to such Discrete Energy Service Actual Consumption for such Energy Year, then the Painshare Adjustment set out in Part 1, Section 5.2 will be calculated and apply again the following year.

5.2 The formulae to calculate the Gainshare Adjustment and the Painshare Adjustment set out in this Section 5.2 are based on the table in Part 1, Section 5.1 of this Schedule 8. For the avoidance of doubt, if Corrected Discrete Energy Consumption in respect of a discrete Energy Utility falls within a set band above or below the relevant Discrete Energy Target (i.e.: no more than 5% above or below the benchmark) no Gainshare Adjustment or Painshare Adjustment will be made for that Energy Utility in that year.

- (a) For the purposes of Part 1, Section 5.2(b):

A = the Corrected Discrete Energy Consumption during the relevant year for a particular Energy Service in units e.g. megajoules; m³, etc.

B = the Discrete Energy Target for the relevant year for a discrete Energy Service in units e.g. megajoules; m³, etc.

- (b) In respect of every year following the Revenue Service Availability Date:

IF: $A < \frac{95B}{100}$ then Project Co shall be entitled to claim and be paid a Gainshare Adjustment ('GS') for that year, where

if $\frac{80B}{100} < A < \frac{95B}{100}$ then $GS = 0.5 \left(\frac{95B}{100} - A \right)$ * Average Unit Rate Price

but if $A < \frac{80B}{100}$ then $GS = \left[\left(\frac{80B}{100} - A \right) + \frac{B}{13.3} \right]$ * Average Unit Rate Price

(In the above formula, a factor of 13.3333 is used to divide B. This is obtained by multiplying the range of the 2nd band by the percentage of Project Co pain/gain. The range of the 2nd band is 20%-5%= 15% and the Project Co gain percentage is 50%. The product is 7.5% which results in the factor of 13.3333.)

BUT IF: $A > \frac{105B}{100}$ then the City shall be entitled to deduct a Painshare Adjustment ('PS') where

$$\text{if } A > \frac{105B}{100} \text{ then } PS = \left(A - \frac{105B}{100} \right) * \text{Average Unit Rate Price}$$

6. SUPPLY OF ENERGY

6.1 The City shall from time to time as required enter into contracts with Energy Utilities suppliers for the supply of Energy Utilities to the MSF and shall be responsible for all payments due pursuant to such supply contracts.

**SCHEDULE 8
ENERGY MATTERS****PART 2
ENERGY MATTERS – TRACTION POWER****1. DEFINITIONS**

In this Part 2 of Schedule 8, the following definitions shall have the following meanings:

- 1.1 **“Aggregate Actual Traction Power Consumption”** or **“AATPC”** means the actual consumption of all Electric Energy for Traction Power (including Traction Power used at the MSF) as invoiced by the relevant utility company or generator for each Contract Year.
- 1.2 **“Aggregate Energy Target Traction Power”** or **“AETTP”** means the total energy consumption, set forth in the Energy Target Letter submitted by Project Co at Commercial Close and which has been accepted by the City. The AETTP shall include and account for all requirements of RFP Schedule 10 – Preliminary Service Plan, and Schedule 15 – Output Specifications of the Project Agreement and any systems that are installed by Project Co for Traction Power (including Traction Power used at the MSF as part of the Works and that will be maintained by Project Co as part of the Project Co Services.
- 1.3 **“Aggregate Energy Model Traction Power”** means the energy model used for determining the AETTP.
- 1.4 **“Annual Review Meeting Traction Power”** means meetings between City Representatives and Project Co Representatives to occur within 90 days of each anniversary of the Revenue Service Availability Date (or such other date as may be agreed between the City and Project Co) to discuss Energy Services.
- 1.5 **“Average Annual Cooling Degree Days”** means the most recent average annual cooling degree days for Ottawa, Ontario calculated over a 30 year period, based on data published by Environment Canada.
- 1.6 **“Average Annual Heating Degree Days”** means the most recent average annual heating degree days for Ottawa, Ontario calculated over a 30 year period, based on data published by Environment Canada.
- 1.7 **“Average Unit Rate Price Traction Power”** means the average price for each standard unit of each discrete Energy Utility used for Traction Power in a Contract Year as reported by the applicable utility companies responsible for the supply of such Energy Service.
- 1.8 **“Corrected Aggregate Energy Consumption Traction Power”** means, for a Contract Year, the sum of CAECHTP for each discrete Energy Service related to heating of the vehicle or equipment and CAECCTP for each discrete Energy Service related to cooling

- of the vehicle or equipment, plus adjustments reflecting variations in passenger loading and removal of all traction energy used for Stage 2 Additional Vehicle testing and commissioning and driver training, plus all non-heating and non-cooling Energy Utilities consumption for Traction Power.
- 1.9 **“Corrected Aggregate Energy Consumption Cooling Traction Power”** or **“CAECCTP”** means the sum of the Corrected Discrete Energy Consumption for each of the discrete Energy Utilities for cooling energy, calculated in accordance with Part 2, Section 3.3(h)(ii). In order to apply CAECCTP, Project Co must have separate metering for this cooling energy or have a specific methodology identified in the Energy Target Letter that identifies the procedures for isolating the cooling energy from the balance of the total energy used for Traction Power.
- 1.10 **“Corrected Aggregate Energy Consumption Heating Traction Power”** or **“CAECHTP”** means the sum of the Corrected Discrete Energy Consumption for each of the discrete Energy Utilities for heating energy, calculated in accordance with Part 2, Section 3.3(h)(i). In order to apply CAECHTP, Project Co must have separate metering for this heating energy or have a specific methodology identified in the Energy Target Letter that identifies the procedures for isolating the heating energy from the balance of the total energy used for Traction Power.
- 1.11 **“Corrected Aggregate Energy Consumption Passenger Loading”** or **“CAECPL”** means the sum of the Corrected Discrete Energy Consumption for each of the discrete Energy Utilities for passenger loading, calculated in accordance with Part 2, Section 3.3(h)(iii). In order to apply CAECPL, Project Co must have a specific methodology identified in the Energy Target Letter that identifies the procedures for isolating the energy relating to passenger density from the balance of the total energy used for Traction Power.
- 1.12 **“Corrected Discrete Energy Consumption Traction Power”** or **“Corrected Discrete Energy Consumption”** means the Discrete Energy Service Actual Consumption for each discrete Energy Service (calculated for each discrete Energy Service) corrected for each Contract Year in accordance with this Schedule 8 to reflect the climatic conditions and passenger loading for that Contract Year.
- 1.13 **“Discrete Energy Service Actual Consumption”** means the actual consumption of an individual electric Energy Service for Traction Power (including Traction Power used at the MSF) as invoiced by the relevant utility company for each Contract Year.
- 1.14 **“Energy Analysis Report Traction Power”** has the meaning given to it in Part 2, Section 3 of this Schedule 8.
- 1.15 **“Energy Service Traction Power”** or **“Energy Service”** means any metered provision of Energy Utilities used for the Traction Power System as metered from the primary side of the Traction Power supply transformer used for providing energy to the Light Rail Vehicles for locomotion and any power drawn from the secondary side of the Traction Power transformer.

- 1.16 “**Energy Target Letter**” means the letter submitted by Project Co at Commercial Close setting forth the AETTP.
- 1.17 “**Energy Utilities**” means energy/power including electricity and any other energy source used in Traction Power, including Sustainable Energy.
- 1.18 “**Gainshare Adjustment**” means the amount payable by the City to Project Co (which amount will be included in the calculation of the Monthly Service Payment for the Contract Month following the date in which such adjustment has been determined in accordance with this Schedule 8) based on the AATPC that falls outside the set bands set out in Part 2, Section 5 of this Schedule 8.
- 1.19 “**High Cost Measures**” means, in respect of a Contract Year, energy saving measures that incur capital expenditure with a Simple Payback of greater than 36 months.
- 1.20 “**Low Cost Measures**” means, in respect of a Contract Year, energy saving measures that incur capital expenditure with a Simple Payback of no greater than 36 months and are considered to be revenue items as opposed to capital investment measures.
- 1.21 “**No Cost Measures**” means energy savings measures, including those related to good house-keeping, involving no material additional expenditure and/or no capital expenditure to carry out.
- 1.22 “**Painshare Adjustment**” means the deduction which may be claimed by the City from Project Co (which amount will be deducted from the calculation of the Monthly Service Payment for the Contract Month following the date in which such adjustment has been determined in accordance with this Schedule 8) based on Energy Utilities consumption for the AATPC which falls outside the bands set out in Part 2, Section 5 of this Schedule 8.
- 1.23 “**Simple Payback**” means the number of years after which an investment will have paid for itself. Simple Payback is calculated by dividing the initial cost of the retrofit by the energy cost savings per year. Those projects with the shortest paybacks are assumed to be the most cost effective. $\text{Simple Payback} = \text{initial cost of energy retrofit} / \text{annual energy savings}$.
- 1.24 “**Traction Power**” means power used as metered at the primary side of the Traction Power transformer used for providing energy to the Light Rail Vehicles for locomotion and any power drawn from the secondary side of the Traction Power.

2. PROCEDURES FOR DETERMINING ENERGY COST SHARING

- 2.1 All Energy Utilities consumed or used for Traction Power shall be subject to the calculation of the Gainshare Adjustment or the Painshare Adjustment as provided in Part 2, Section 5 of this Schedule 8.
- 2.2 The Aggregate Energy Target Traction Power shall form the normalized 30 year benchmark for calculating the Energy Services cost sharing in respect to the AATPC.

- The Corrected Aggregate Energy Consumption shall be used to calculate Painshare Adjustments and Gainshare Adjustments. The Aggregate Energy Target Traction Power shall not be altered or adjusted except by the process described in Part 2, Section 4 of this Schedule 8.
- 2.3 The measurement and verification of energy use for the Traction Power will be through metered use measured at the primary side of the Traction Power supply transformer. At Final Completion, Project Co shall provide the City with a Measurement and Verification Plan, including, without limitation, a metering schedule of all proposed energy end-uses. All subsequent Energy Analysis Reports are to be based on this plan.
- 2.4 Project Co shall provide the City with a draft Energy Analysis Report Traction Power within 60 days following the end of each Contract Year, which report shall include copies of all working papers to fully support the draft Energy Analysis Report Traction Power. The draft Energy Analysis Report Traction Power shall be consistent with the format and content requirements set out in Part 2, Section 3 of this Schedule 8.
- 2.5 As soon as practicable and in any event within 80 days following the end of each Contract Year, Project Co and the City shall convene an Annual Review Meeting to be attended by the Project Co Representative and the City Representative. At the Annual Review Meeting Project Co shall present the draft Energy Analysis Report Traction Power to the City, and the City and Project Co shall discuss the Aggregate Actual Consumption Traction Power for the preceding Contract Year.
- 2.6 Project Co shall assist the City Representative and afford the City Representative such information and access to the Traction Power records, utility meters, and by other means as may reasonably be required for the City Representative to confirm the draft Energy Analysis Report Traction Power provided by Project Co to determine the Aggregate Actual Consumption Traction Power for the Contract Year. The City shall promptly notify Project Co of the details of any disagreement of all or any aspect of the Energy Analysis Report Traction Power, and the Parties shall then seek to agree to any matters in dispute, but where matters cannot be resolved within such 20 Business Day period (or such other period as may be otherwise agreed by the City Representative, acting reasonably) it shall be dealt with in accordance with the Dispute Resolution Procedure.
- (a) Within 20 Business Days following each Annual Review Meeting, or within such period as may be otherwise agreed between the City Representative and the Project Co Representative, acting reasonably:
- (i) The City shall confirm its acceptance of all or any aspect of the Energy Analysis Report Traction Power; and
 - (ii) Subject to Part 2, Section 4 of this Schedule 8, Project Co and the City shall agree to any adjustments to the Aggregate Energy Target Traction Power.

- (b) Subject to Part 2, Section 2.6(c), Project Co or the City, as the case may be, shall be entitled annually to a Gainshare Adjustment or a Painshare Adjustment, as the case may be, calculated in accordance with Part 2, Section 5 of this Schedule 8.
- (c) Claims made by either Project Co or the City for a Gainshare Adjustment or a Painshare Adjustment shall be made at an Annual Review Meeting. If Project Co makes a claim for Gainshare Adjustment, Project Co shall within 10 Business Days after acceptance of the Energy Analysis Report Traction Power by the City Representative or within such other period as may be agreed by the City Representative and Project Co, acting reasonably, submit an account to the City setting out its calculation and justifying the quantification of the Gainshare Adjustment. If the City makes a claim for a Painshare Adjustment, the City shall within 10 Business Days after acceptance of the Energy Analysis Report by the City Representative or within such other period as may be agreed by the City Representative and Project Co, acting reasonably, submit an account to Project Co setting out its calculations and justifying the quantification of the Painshare Adjustment.
- (d) If either Project Co or the City wishes to dispute any account presented pursuant to Part 2, Section 2.6 of this Schedule 8, it must do so by notice to the other Party within 10 Business Days of receipt of such account. The City Representative and the Project Co Representative shall use reasonable efforts to resolve the dispute for an additional 10 Business Days. If there is no agreement within a further 10 Business Days then either Party may refer the matter to the Dispute Resolution Procedure. If neither Party objects in accordance with this Section 2.6 or, following final determination of the disputed account in accordance with this Section 2.6, Project Co shall include the relevant Gainshare Adjustment or Painshare Adjustment as a separate item within the next invoice prepared by Project Co in accordance with Section 32.6(a) of the Project Agreement. No adjustments shall be made to the Monthly Service Payment for any claimed Gainshare Adjustment or Painshare Adjustment except in accordance with the procedure set out in Part 2, Section 5 of this Schedule 8.
- 2.7 At Commercial Close, Project Co shall deliver to the City an Energy Target Letter Traction Power in form and substance satisfactory to the City, which such Energy Target Letter Traction Power shall reflect the design of the Traction Power system. In addition, Project Co shall deliver to the City for review in accordance with Schedule 10 – Review Procedure, an updated final Energy Target Letter Traction Power together with a supporting Aggregate Energy Model Traction Power 3 months prior to the Revenue Service Availability. Any changes to the Energy Target Letter Traction Power after Commercial Close shall be approved by the City and shall constitute a Variation.

3. CONTENT AND FORMAT OF THE ENERGY ANALYSIS REPORT TRACTION POWER

- 3.1 The Energy Analysis Report Traction Power shall present findings of Aggregate Actual Consumption Traction Power for the relevant Contract Year and shall include the following:
- (a) a summary of actual usage, degree days, passenger loadings, and breakdown by utility in megajoules and cubic meters, or other utility rate units. The summary should also highlight any exceptional changes (being changes of plus or minus 10% in consumption or pattern of use) in consumption or pattern of use since any previous survey.
 - (b) accurate and precise consumption data as provided by utility metering.
 - (c) identification of potential cost savings in respect of Energy Utilities for the Traction Power and provide an estimate of potential Energy Service consumption savings broken down by fuel type, implementation costs, Simple Payback periods and projected savings along with identifying potential risks associated with each proposed cost savings measure. Project Co shall categorize these cost savings measures in the following categories: No Cost Measures, Low Cost Measures and High Cost Measures. Project Co shall also advise the City of projected Energy Utilities for the Traction Power for the next 5 years and cost projections in respect of such projected Energy Utilities usage along with pricing trends and potential risks associated with each.
- 3.2 The objectives of the Energy Analysis Report Traction Power are to confirm Aggregate Actual Consumption in the relevant Contract Year and to calculate Gainshare adjustments.
- 3.3 Consistent with the objectives set out in Part 2, Section 3.2 of this Schedule 8, Project Co shall ensure that the Energy Analysis Report Traction Power has the following components:
- (a) total Vehicle Kilometres for the relevant year;
 - (b) presentation of Aggregate Actual Consumption Traction Power;
 - (c) presentation of degree day data for the relevant Contract Year;
 - (d) presentation of passenger loadings for the relevant Contract Year;
 - (e) establishment of a basis for continued monitoring of energy consumption and adjustments to the Aggregate Energy Target Traction Power;
 - (f) utility data collected by Project Co shall be presented in the table set out in Appendix B to this Schedule 8;

- (g) detailed analysis of all submetered end-uses;
- (h) procedure for determining the Corrected Discrete Energy Consumption Traction Power for each individual Energy Service will be calculated using the following formula (with separate calculations to be conducted and provided for each discrete Energy Service):
 - (i) Corrected Discrete Energy Consumption Traction Power for the discrete Energy Service for heating energy (“CAECHTP”) = Discrete Energy Service Actual Consumption (Mega Joules) x Average Annual Heating Degree Days / heating degree days published by Environment Canada for the Contract Year.
 - (ii) Corrected Discrete Energy Consumption for the discrete Energy Service for cooling energy (“CAECCTP”) = Discrete Energy Services Actual Consumption (Mega Joules) x Average Annual Cooling Degree Days / cooling degree days published by Environment Canada for the Contract Year.
 - (iii) Corrected Discrete Energy Consumption for the discrete Energy Service for passenger loadings shall be calculated using the same energy model referenced in Part 2 Section 1.3 and as defined in the specific methodology identified in the Energy Target Letter that identifies the procedures for isolating the energy relating to passenger loading from the balance of the total energy used for Traction Power.
- (i) outline any outstanding issues from any previous Energy Analysis Report;
- (j) adjustments to the Aggregate Energy Target Traction Power;
- (k) tables and graphs showing the consumption, unit costs, and total costs for all purchased Energy Utilities for the previous 12 months. Breakdown of Energy Utilities types and costs for each energy use described in Part 2, Section 3.2 and 3.3 of this Schedule 8 and any other major energy use for the previous 12 months;
- (l) appendices – The appendices shall include graphs, calculations and miscellaneous data that are relevant to the Energy Analysis Report Traction Power; and
- (m) summary tables from all previous Energy Analysis Reports Traction Power delivered by Project Co to the City.

4. CORRECTED DISCRETE ENERGY CONSUMPTION AND PROCESS FOR AMENDING THE AGGREGATE ENERGY TARGET TRACTION POWER

- 4.1 In all cases, corrections to energy consumption targets must be consistent with the principles outlined in the Part 2 of this Schedule 8.

- 4.2 Following the acceptance of the Energy Analysis Report Traction Power by the City Representative in accordance with Part 2, Section 2.6 of this Schedule 8, the data set out in the Energy Analysis Report Traction Power will be used to determine the Painshare Adjustments or Gainshare Adjustments.
- 4.3 For each Contract Year the Gainshare Adjustment and Painshare Adjustment shall be calculated in accordance with Part 2, Section 5.
- 4.4 At any time commencing after the first anniversary of the Completion Date, Project Co and the City shall, acting reasonably, agree to make any adjustments to the AETTP and/or the Corrected Aggregate Energy Consumption Traction Power only in the event of:
- (a) changes implemented in accordance with the Project Agreement that would cause load changes or other changes in Energy Utilities usage;
 - (b) changes in the utilization of Traction Power from that generally described in the Project Agreement;
 - (c) substantial climate change for the relevant time period as reported by Environment Canada compared to the 1980 to 2010 30 year average meteorological data for Ottawa, Ontario as reported by Environment Canada. Climate change can only be evidenced by a climatic authority such as Environment Canada and must be presented to the City with documented evidence of increased consumption trends in similar facilities in the South-Eastern Ontario.
- 4.5 Pursuant to Part 2, Section 4.4, Project Co may elect to propose a correction to AETTP in direct proportion to any substantial change in use to Traction Power.
- 4.6 The Party requesting an amendment to the AETTP shall appoint, subject to the other Party's approval (acting reasonably) and pay for a complete energy audit to be conducted by a third party auditor. The energy audit shall include a detailed computer simulation of Energy use by function and a comprehensive evaluation of Energy Utilities use patterns. The energy auditor shall prepare a report making a recommendation regarding amendments to the AETTP. Both the City and Project Co must agree to the amended AETTP within 20 Business Days following receipt of such report. If there is no agreement within a further 10 Business Day period, then either Party may refer the matter to Dispute Resolution Procedure.
- 4.7 Any amendment to the AETTP shall only affect the Monthly Service Payment (as a result of any Painshare Adjustments or Gainshare Adjustments) from the date on which the amendment is effective and shall not, for greater certainty, have a retrospective effect on any other previous Monthly Service Payments. Except where the Dispute Resolution procedure adjudicates in favour of Project Co whereby the payments shall be prorated to 30 days after the Energy Auditors report.

5. CALCULATION OF GAINSHARE ADJUSTMENT OR PAINSHARE ADJUSTMENT

5.1 Comparing Annual Energy Target

(a) After the acceptance of the Energy Analysis Report Traction Power described in Part 2, Section 3 for each Energy Year, the Corrected Aggregate Energy Consumption Traction Power shall be compared to the AETTP and:

- (i) if the Corrected Aggregate Energy Consumption Traction Power is greater than 110% of the AETTP then Project Co shall calculate the Painshare Adjustment set out in Part 2, Section 5.2 and deduct from the Monthly Service Payments accordingly in accordance with Schedule 20 – Payment Mechanism;

The table below shows the banding mechanism used for calculating the annual Painshare Adjustment to Project Co and the City for each Energy Service.

Energy Service	Year “X”	Painshare then equals:
If the Variance from AETTP for the purposes of calculating Painshare in the previous year was:	0 to 10%	0
If the Variance from AETTP for the purposes of calculating Painshare in the previous year was:	> 10%	100%

- (ii) if the Corrected Aggregate Energy Consumption Traction Power is less than 95% of the AETTP, then Project Co shall calculate the Gainshare Adjustment set out in Part 2, Section 5.2.

The table below shows the banding mechanism used for calculating the annual Gainshare Adjustment to Project Co and the City for each Energy Service.

Energy Service	Year “X”	Gainshare then equals:
If the Variance from AETTP for the purposes of calculating Gainshare in the previous year was:	0 to 5%	0
If the Variance from AETTP for the purposes of calculating Gainshare in the previous year was:	> 5% to 20%	50%
If the Variance from AETTP for the purposes of	> 20%	100%

calculating Gainshare in the previous year was:		
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- (b) If Project Co is subject to a Painshare Adjustment with respect to an Energy Year, then Project Co shall submit a detailed remediation plan within fourteen (14) days of the calculation of the Painshare Adjustment to explain how it will reduce the Corrected Aggregate Energy Consumption Traction Power such that it will not exceed the 110% threshold established in Part 2, Section 5.1(a)(i), above, for the subsequent Energy Year. If Project Co is not successful in its remediation plan such that the Painshare Adjustment in Part 2, Section 5.1(a)(i) is applied with respect to such Corrected Aggregate Energy Consumption Traction Power for such Energy Year, then the Painshare Adjustment set out in Part 2, Section 5.2 will be calculated and apply again the following year.

5.2 The formulae to calculate the Gainshare Adjustment and the Painshare Adjustment set out in this Part 2, Section 5.2 are based on the table in Part 2, Section 5.1 of this Schedule 8. For the avoidance of doubt, if Corrected Aggregate Energy Consumption Traction Power falls within a set band above or below the relevant AETTP (i.e.: no more than 10% above or 5% below the benchmark) no Painshare Adjustment or Gainshare Adjustment will be made for that Energy Utility in that year.

- (a) For the purposes of Part 2, Section 5.2(b):

A = the Corrected Aggregate Energy Consumption Traction Power during the relevant year for a particular Energy Service in units e.g. megajoules; m³, etc.

B = the AETTP for the relevant year in units e.g. megajoules; m³, etc.

- (b) In respect of every year following the Revenue Service Availability Date:

IF: $A < \frac{95B}{100}$ then Project Co shall be entitled to claim and be paid a Gainshare Adjustment ('GS') for that year, where

if $\frac{80B}{100} < A < \frac{95B}{100}$ then $GS = 0.5 \left(\frac{95B}{100} - A \right) * \text{Average Unit Rate Price}$

but if $A < \frac{80B}{100}$ then $GS = \left[\left(\frac{80B}{100} - A \right) + \frac{B}{13.3} \right] * \text{Average Unit Rate Price}$

(In the above formula, a factor of 13.3333 is used to divide B. This is obtained by multiplying the range of the 2nd band by the percentage of Project Co pain/gain. The range of the 2nd band is 20%-5%= 15% and the Project Co gain percentage is 50%. The product is 7.5% which results in the factor of 13.3333.)

BUT IF: $A > \frac{110B}{100}$ then the City shall be entitled to deduct a Painshare Adjustment ('PS') where

if $A > \frac{110B}{100}$ then $PS = \left(A - \frac{110B}{100} \right) * \text{Average Unit Rate Price}$

6. SUPPLY OF ENERGY

6.1 The City shall from time to time as required enter into contracts with Energy Utilities suppliers for the supply of Energy Utilities for Traction Power and shall be responsible for all payments due pursuant to such supply contracts.

**APPENDIX A
ENERGY ANALYSIS REPORT SUBMITTAL REQUIREMENTS – ENERGY MATTERS – MSF**

	Thirty Year Average for Ottawa	Contract Year	% variance between Average Annual Heating Days/Average Annual Cooling Days and Contract Year
Heating Degree Days	Average Annual Heating Days: [●]	Contract Year Heating Days (as provided by Environment Canada): [●]	
Cooling Degree Days	Average Annual Cooling Days: [●]	Contract Year Cooling Days (as provided by Environment Canada): [●]	

Total Energy Summary	Discrete Energy Targets		Actual Consumption		Corrected Discrete Energy Consumption		Percent Variance between vi and ii	Painshare Adjustment or Gainshare Adjustment
	Usage	Cost for Contract Year (calculated based on Discrete Energy Targets multiplied by average unit cost of each discrete Energy Utility)	Usage	Cost for Contract Year	Usage	Corrected Cost for Contract Year (calculated based on Corrected Discrete Energy Consumption for each of the discrete Energy Utilities multiplied by average unit cost of each such discrete Energy Utilities)		
	i	ii	iii	iv	v	vi	vii	viii
Electricity								
Natural Gas								
Oil / Other								

Total Energy Summary	Discrete Energy Targets		Actual Consumption		Corrected Discrete Energy Consumption		Percent Variance between vi and ii	Painshare Adjustment or Gainshare Adjustment
	Usage	Cost for Contract Year (calculated based on Discrete Energy Targets multiplied by average unit cost of each discrete Energy Utility)	Usage	Cost for Contract Year	Usage	Corrected Cost for Contract Year (calculated based on Corrected Discrete Energy Consumption for each of the discrete Energy Utilities multiplied by average unit cost of each such discrete Energy Utilities)		
Aggregate sums	[To include Aggregate Energy Target]		[Aggregate Actual Consumption: ●]		[Corrected Aggregate Energy Consumption: ●]			

**APPENDIX B
ENERGY ANALYSIS REPORT SUBMITTAL REQUIREMENTS – ENERGY MATTERS – TRACTION POWER**

	Thirty Year Average for Ottawa	Contract Year	% variance between Average Annual Heating Days/Average Annual Cooling Days and Contract Year
Heating Degree Days	Average Annual Heating Days: [●]	Contract Year Heating Days (as provided by Environment Canada): [●]	
Cooling Degree Days	Average Annual Cooling Days: [●]	Contract Year Cooling Days (as provided by Environment Canada): [●]	

	Planned Passenger Loading	Average Passenger Loading Contract Year	% variance between Planned Passenger Loading and Average Passenger Loading Contract Year
Passenger Loading Early Morning	[●]	[●]	
Passenger Loading Morning Peak			
Passenger Loading Midday			
Passenger Loading Afternoon Peak			
Passenger Loading Early Evening			
Passenger Loading Late Evening (M-Th)			
Passenger Loading			

	Planned Passenger Loading	Average Passenger Loading Contract Year	% variance between Planned Passenger Loading and Average Passenger Loading Contract Year
Late Evening (Fri)			
Passenger Loading Night (M-Th)			
Passenger Loading Night (Fri)			
Passenger Loading Saturday Daytime			
Passenger Loading Saturday Evening			
Passenger Loading Saturday Night			
Passenger Loading Sunday Daytime			
Passenger Loading Sunday Evening			

Total Energy Summary	Aggregate Energy Target Traction Power		Aggregate Actual Traction Power Consumption		Corrected Aggregate Energy Consumption Traction Power		Percent Variance	Painshare Adjustment or Gainshare Adjustment
	Usage	Cost for Contract Year	Usage	Cost for Contract Year	Usage	Corrected Cost for Contract Year		
	i	ii	iii	iv	v	vi	vii	viii
Electricity								
Aggregate sums	[Aggregate Energy Target]		[Aggregate Actual Consumption •]					