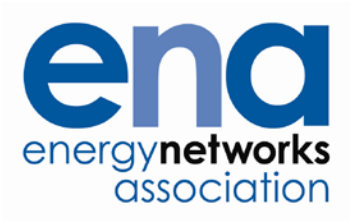
Managing Unmetered Energy Street Lighting Inventories (MUESLI)



Issue 1.2

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INTRODUCTION

This document has been endorsed by the ADEPT Lighting Group, ELEXON, the Energy Networks Association, the Institution of Lighting Professionals, the UK Lighting Board and the Local Government Technical Advisers Group as representing good practice in establishing, maintaining and auditing inventories for unmetered street lighting supplies.

Section 1. Guides unmetered supply customers in the proper establishment and maintenance of unmetered supply inventories. (Page 4)

Section 2. Guides Distribution Network Operators on appropriate practices when checking that inventories are accurate and being properly maintained. (Page 8)

Section 3. Establishes procedures for remedial actions if Material Irregularities or Discrepancies are identified. (Page 13)

Document Control appears on page 14

The document applies to Great Britain, but not to Northern Ireland where different regulations apply. The processes and procedures outlined in the document are recommended to all authorities with a responsibility for unmetered electricity supplies.

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This document is hosted on the Website of the Institution of Lighting Professionals, with links to it being provided on a number of other sites. Within the body of this document there are abbreviated links to key documents held on other websites which can be accessed when viewing on line, with their full web addresses being listed on page 15.

DEFINITIONS:

BSC – Balancing & Settlement Code**.**

BSCP520 – Balancing & Settlement Code Procedure 520**.** Sets out the requirements for UMS registered in Supplier Meter Registration Service (SMRS).

Charge Code - A 13 digit number identifying a specific type of UMS equipment and its power value (circuit watts).

Correction Factor – A scaling factor, normally deduced from a Primary Audit and applied to a customer's current inventory pending inventory rectification.

Customer – in this context a highway, road or local authority that has an Unmetered Supply inventory in Great Britain; responsible for maintaining a detailed inventory of all their UMS equipment and providing regular updates to their Unmetered Supplies Operator.

DCUSA – Distribution Connection and Use of System Agreement.

DNO / IDNO - Distribution Network Operator, or Independent Distribution Network Operator.

EAC – Estimated Annual Consumption, used for billing and settlement.

ELEXON - the body responsible for the Balancing and Settlement Code (BSC).

Extension Audit – A targeted audit prompted by the findings of a Primary Audit to test specific aspects of the inventory.

GIS – Geographic Information System – a system that captures, stores, analyses, manages, and presents data with reference to geographic location, in this context specifically relating to the customer's unmetered inventory.

GPS - Global Positioning System a satellite based navigational system providing reliable location information.

Material Discrepancies– inaccuracy in the inventory resulting in under or over declared energy consumption beyond a margin of error.

Material Irregularities – errors in descriptions, locations, Charge Codes, or other inventory fields which when aggregated may not necessarily result in a Material Discrepancy, but which nevertheless need to be corrected.

MEWP – Mobile Elevated Work Platform (i.e. cherry-picker).

Micro-Audit – A targeted on-street audit by DNO staff.

(MA) Meter Administrator – An agent qualified under the BSC, appointed by the Customer when trading energy on a half hourly basis.

(NMO) National Measurement Office - an Executive Agency of the Department for Business, Innovation and Skills with the role of ensuring UK measurement is accurate, fair and legal.

(NTC) National Terms of Connection – Terms issued via DCUSA, approved by Ofgem and applicable to all customers on all GB distribution networks.

Ofgem – The Office of Gas & Electricity Markets.

OID –Operational Information Document, the Elexon 'Guide to Unmetered Supplies under the BSC'.

Power Factor – A ratio of the real power to apparent power flowing in a circuit.

Primary Audit – A large-scale random on-street audit carried out by auditors appointed by the UMSO.

Process Audits – An audit of customers management systems, processes and procedures in maintaining and updating the unmetered inventory.

Switch Regime – a code that identifies the operating hours for equipment; this information together with the Charge Code allows annual consumption (kWh) to be calculated for unmetered equipment.

Summary Inventory - a summarised version (prepared and/or agreed by the UMSO) of the detailed inventory provided to the UMSO by the Customer including a Central Management System control file where appropriate;

UMS – An unmetered electricity supply under the provisions of the 'Electricity (Unmetered Supply) Regulations 2001', SI No 3263 : 2001

UMSO – Unmetered Supplies Operator – a function of the DNO concerned with the accurate settlement of unmetered electricity.

Working Days – Mon-Fri excluding Bank Holidays.

Section 1 Guides Unmetered Customers in the proper establishment and maintenance of unmetered supply inventories

1.1. UNMETERED SUPPLY REGULATIONS

1.1.1. The Electricity Act 1989, Schedule 7, paragraph (1) provides that where the customer of n electricity supplier is to be charged by reference to the quantity of electricity supplied, the supply shall be given through and the quantity of electricity recorded by a meter. Paragraph (1A) of Schedule 7 (inserted by the Utilities Act 2000) provides that an electricity supplier may give a supply other than through a meter in such circumstances as prescribed by regulation. The regulations defining circumstances in which electricity supply may be unmetered are the 'Electricity (Unmetered Supply) Regulations of 2001', SI 2001 No 3263. The circumstances are detailed as follows:

(1) Subject to sub-paragraphs (2) and (3), an unmetered supply may be given where —

a. the electrical load is of a predictable nature, and
b. either

(i). the electrical load is less than 500W; or

(ii). it is not practical for a supply of electricity to be given through an appropriate meter at the premises due to —

(aa) the anticipated metering costs in the particular case being significantly higher than the usual metering costs associated with that size of electrical load;
(bb) technical difficulties associated with providing such a meter in the particular case; or
(cc) operation of law so as to prohibit or make excessively difficult the provision of such a meter in the particular case.

(2) Subject to regulation 4[1], an unmetered supply shall only be given where the authorised distributor, authorised supplier and the customer have agreed to such a supply.

(3) An unmetered supply which does not fall into the categories given in sub-paragraph (1) and which is first given prior to the date on which these Regulations came into force and which has been so supplied since that date, may continue to be an unmetered supply where the authorised distributor, authorised supplier and customer concerned agree to such continuation.

Government guidance on the application of the regulations can be found here

[1] See SI 2001:No3263 for regulation 4

1.2. NATIONAL TERMS OF CONNECTION

1.2.1. The National Terms of Connection (NTC) can be located here. These set out the conditions that the customer and DNO agree for maintaining the connection to its network. When customers enter into a contract with an electricity supplier, they also agree with the DNO to accept these terms as the supplier has been appointed as the agent of the DNO to make such an agreement.

1.2.2. The NTC contain four sections. Section 1 applies to all connections, and Section 4 applies specifically to unmetered supplies. Section 4 includes the requirement to compile an inventory of apparatus, identifying the location and sufficient detail to allow calculation of the electricity consumption.

1.2.3. The detail can be in a form (including computer readable form) as the UMSO agrees with the customer, but will preferably be in the standard format defined by ELEXON and detailed under paragraph 1.5.

1.2.4. Where the information is not provided together with Charge Codes and Switch Regimes and in the file format set out in the Unmetered Supplies Operational Information Document the UMSO may charge the customer its costs in converting the information.

1.3. **THE BALANCING & SETTLEMENT CODE (BSC)**

1.3.1. Section ‘S’ paragraph 8 of the BSC can be found here and amongst other things it provides for the UMSO to calculate the consumption for each Unmetered Supply on its system and to notify the relevant Supplier or its Agent accordingly. The BSC also requires the UMSO to prepare a revised summary inventory and/or a new EAC as appropriate, as soon as reasonably practicable after there has been a material change in the inventory to which a certificate relates.

1.4. **BSC PROCEDURE 520 – UNMETERED SUPPLIES**

1.4.1. The BSC Procedure (BSCP) can be found here and sets out the requirements for UMS registered in Supplier Meter Registration Service (SMRS).

Metering data for Settlement purposes shall be derived utilising either:-

a) an Equivalent Meter (EM) providing Half Hourly (HH) data; or

b) an Estimated Annual Consumption (EAC)

1.5. STANDARD UNMETERED SUPPLY INVENTORY FORMAT

1.5.1. The standard format for unmetered supply inventories is documented in Section 7 of ELEXON's 'Operational Information Document', which can be downloaded here. It should be noted that this inventory subset is that required to account for energy consumption purposes only, and is not to be taken as that for adequate asset management purposes. It is strongly recommended that this guide is read in detail before attempting to compile or revise an unmetered inventory.

1.5.2. The format has been developed to provide the information required for the operation of BSCP520 and the auditing requirements of UMSOs in a standard way. It is expected to be of particular benefit to Customers having business with more than one UMSO and to suppliers of inventory software who wish to provide a standard extract package for their customers.

1.5.3. It is not intended to supersede arrangements where both the customer and the UMSO agree to a different format. With respect to the longer 13 digit Charge Code, the UMSO will continue to support the previous seven digit Charge Code format for a period of time (to be agreed with the UMS Customer). The standard fields are as detailed below:-

Field 1 Road Reference
The National Street Gazetteer Unique Street Reference Number is preferred because it provides a better location than the combination of road name and town. It is also a very useful sort field when checking for duplicate records. For motorways the route number will be used instead e.g. M25, A1(M), etc.

Field 2 Town, Parish or District name

Field 3 Road Name, for Motorways this will be the route number e.g. M25, A1(M) etc.

Field 4 Location, i.e. o/s No 42, junction of West Street, opposite No 4 etc.

Field 5 Unit Type
B=bollard, F=school crossing flasher, L=street light, M=miscellaneous, P=pillar, R=refuge beacon, S=sign light, T=traffic signal equipment, Z=zebra crossing.

Field 6 Unit Identity, i.e. column reference identifier as marked on the unit (if any).

Field 7 Central Management System, Unit Reference
Where this field is populated, the Switch Regime code in Field 10 shall be reported as either 998 or 999.

Field 8 BSCP520 Charge Code for the apparatus

Field 9 No of items on this Charge Code at this location

Field 10 BSCP520 Switch Regime

Field 11 No. of Controls

In the case of isolation pillars which only contain a time control device and no other load consuming device then the number of time control devices shall be entered in field 11, the appropriate Charge Code in field 12 and 'P' in field 5. Zeros shall be entered in fields 8 & 9. Similarly for locations where the control is remote and accounted for elsewhere in the inventory, then zero is entered against field 11.

Field 12 BSCP520 Charge Code for the control device

Fields 13, 14 Grid References or Latitude and Longitude

Data is to be inserted in these fields when available. The increasing use of GPS equipment provides very accurate location data which may supplement or be in addition to the location in Field 4.

Field 15 Exit Point (optional)

"Y" identifies if the equipment is connected directly to the distribution network, "N indicates fed via some private distribution network, i.e. a sign light looped from a lighting column, or column fed from a cabinet or pillar via private distribution cables. "U" indicates unknown.

1.6. CHARGE CODES AND SWITCH REGIMES

1.6.1. Charge Codes and Switch Regimes are used within the UMSO and Meter Administrator systems to calculate electricity consumed. When using a piece of equipment drawing energy via an unmetered supply, it must be listed in the inventory with an appropriate Charge Code. The Charge Code identifies the energy drawn by the unit and the Switch Regime identifies the hours of operation. They can be obtained from the ELEXON website here.

1.7. REQUIRED INVENTORY ACCURACY

1.7.1. Section 'S' of the BSC states at 8.1.3 that the standards of accuracy for Unmetered Supplies shall be no worse than those which apply generally under the Code for metered electricity. If metered most lighting installations would fall under the provisions of the Code of Practice 8 for metering which can be viewed here. The overall in-service limits for error are given in section 4.2.4 as +2.5% to –3.5%. Similarly the Meter Certification Regulations which can be seen here allow the same permitted margins of error for a meter. It follows that for unmetered inventories to be considered as compliant with the BSC, they must be within +2.5% to -3.5% of the consumption as assessed by independent audit.

Section 2. This section guides Distribution Network Operators on appropriate practices when checking that inventories are accurate and being properly maintained.

2.1. AUTHORITY TO AUDIT

2.1.1. The National Terms of Connection include (section 4, clause 7.8) provisions for UMSOs to audit unmetered supply inventories. These audits will be undertaken at not less than six monthly intervals, and costs will be met by the UMSO, unless Material Irregularities or Discrepancies are discovered. Where Material Irregularities or Discrepancies exist then costs may be levied on the Customer and subsequent audits may be undertaken at less than six monthly intervals until such time as the inventory reaches the required level of accuracy.

2.2. AUDIT TERMS OF REFERENCE

2.2.1. The terms of reference for audits should be to determine whether or not Material Discrepancies exist, as regards compliance with the acceptable margin of error of between +2.5% and -3.5% of the energy consumption. Any inaccuracies in terms of descriptions or locations should also be addressed as part of the audit process, but will not influence the overall objective of determining accuracy in declared energy consumption.

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2.4. AUDITS

2.4.1. Process Audits

These audits will primarily assist the UMSO in prioritising the need for Micro or Primary Audits. Typically they will audit the Customer management systems, processes and procedures seeking evidence of inventory updating, emanating from maintenance, scheme and adoption processes, and how these processes result in timely issue of updated inventory information to the UMSO. Such audits would typically last no more than a Working Day.

2.4.2. Micro Audits

UMSOs may carry out targeted Micro-Audits without prior notice for any UMS equipment classes and any customer groups. These may be instigated for a variety of reasons, for example to check for the inclusion of new equipment classes such as Automatic Number Plate Reader equipment or public transport information displays, to ensure that recently adopted roads or improvement schemes are being accounted for, or to check for undeclared third party connections. These Micro-Audits may be carried out by UMSO staff and will typically be a visual inspection to compare targeted locations with the submitted inventory.

Following a Micro-Audit the UMSO may prepare a short report for the Customer and, if appropriate convene a meeting to discuss the results and agree necessary actions. Customers will be expected to rectify any omissions in the inventory in accordance with the NTC, but for the avoidance of doubt a Micro-Audit will not result in the application of a Correction Factor to be applied to the EAC or Summary Inventory. Micro Audits, as with Process Audits, may influence the UMSO programme for Primary Audits. UMSOs may also pursue arrears under Schedule 6 of the Electricity Act 1989 should that be appropriate. The Act can be accessed here.

2.4.3. Primary Audits

The Primary Audit is a large-scale random on-street audit carried out by auditors appointed by the UMSO and will determine whether or not it is appropriate to apply a Correction Factor to the customers EAC or Summary Inventory.

a. At least 10 Working Days notice will be provided to Customers who are to undergo a Primary Audit in line with the National Terms of Connection. It is anticipated that in normal circumstances a more generous period of notice will be offered. The UMSO will offer to meet with Customers in order that the audit process may be explained and any questions addressed.

b. Customers will be encouraged to demonstrate their inventory management practices and the controls they have in place. Customers will also be invited to provide inventory data for metered street furniture (where applicable) in order to facilitate efficient auditing.

c. Customers (or their representatives) will be invited to observe the Primary Audit as it is undertaken.

d. The Primary Audit will be based on random samples of equipment within defined geographical limits. These samples, however, should be balanced to ensure a mix of areas and appropriate proportions of columns, signs, bollards etc. However, it must remain fundamentally random.

e. The Primary Audit sample will be dependent on the size of the inventory, but shall not be less than 1% of the total inventory subject to a minimum of 200 units. The sample will be deemed to be sufficient to determine the Correction Factor, if appropriate.

f. The independent auditors will have appropriate electrical accreditation (e.g. G39, Sector-Scheme approved, or equivalent) and suitable training in related aspects such as traffic management and working on the highway. Full risk assessments will be prepared for all activities.

g. The UMSO as 'works promoter' will coordinate activity under the Traffic Management Act or New Roads and Street Works Act as appropriate and arrange for necessary permits or notices which may be required in order to occupy road-space. It will be expected that on motorways or other strategic roads the deployment of any MEWP will normally be undertaken under the shadow of scheduled maintenance activities.

h. The auditors will examine pertinent elements to compare inventory entries with what exists on the street, specifically focussing on:-

Field 5 Unit Type
Field 8 Charge Code for the apparatus
Field 9 No of items on this Charge Code at this location
Field 10 Switch Regime
Field 12 Charge Code for the control device

Any inaccuracies in the Customer inventory will be recorded against the entry. Any equipment identified within the defined geographical limits of the audit for which there is no record in the unmetered inventory, nor evidence that a meter is fitted, will be noted, photographed and an accurate record of the location made, including GPS coordinates where appropriate.

i. The audit contractors will utilise a MEWP to randomly confirm any assumptions made from ground level.

j. In addition to the Primary Audit, auditors may investigate any specific concerns in Extension Audits. However, these targeted, non-random aspects will be separately reported.

k. Further to the Primary Audit the auditor may carry out GIS Analysis of the full inventory.

l. The UMSO will provide a comprehensive report explaining the methodology, summary results and including all supporting detailed information. This will include any Extension Audits and GIS Analysis. This will be provided to the client for their review at least two weeks prior to a post-audit meeting.

m. A post-audit meeting will be convened to discuss the results, including any proposed Correction Factor, and agree any actions that may be required in respect of inventory accuracy. This meeting will provide an opportunity for the customer to query any aspects of the audit. For example, in the case of equipment identified as an omission: it may be accounted for under a metered supply; the equipment may be the responsibility of a wholly different party; or clarifications may be required in respect of road names or locations.

n. Following the post-audit meeting the UMSO will re-calculate as necessary any level of error in the inventory.

o. The calculation of any error will detail both under-recorded (or non-recorded) items and those items where the inventory has overstated the energy consumed. Any Correction Factor must include the 'net' balance of these two categories in the interests of obtaining appropriate consumption values.

p. The UMSO may seek to charge for the reasonable costs incurred in carrying out the Primary Audit and any Extension Audit, only if Material Irregularities or Discrepancies have been discovered.

q. During a Primary Audit the auditor may also be commissioned to undertake Power Factor measurement of a subset of lamp columns (typically 10%).

r. The modelled impact of Power Factor will be reported separately and will not contribute to any possible Correction Factor. The UMSO may however require the Customer to take action to improve the Power Factor to an acceptable level as set out in the National Terms of Connection Section 4 Para 14. This could involve the repair and/or the replacement of Customer's equipment as necessary.

2.4.4. Extension Audits

These will not necessarily be a feature of all Primary Audits, however UMSOs may wish their auditor to explore specific points not sufficiently covered within the main random sample. This could include social housing areas (which, it is noted, may no longer be the direct responsibility of the local authority) or the inclusion of newly adopted highways. Extension audits may also arise from issues identified within the Primary Audit which then warrant further checking and investigation (e.g. a fundamental error in the declaration of traffic signal equipment).

Section 3 Remedial actions if Material Irregularities or Discrepancies are identified.

3.1.1. Should Material Irregularities or Discrepancies be identified, the Customer will, within one calendar month of the post audit review meeting, submit an action plan to achieve compliance.

3.1.2. Where Material Discrepancies are identified, depending on the scale of accuracy and the anticipated timescales to correct any errors, the UMSO may propose an interim Correction Factor to be applied to the EAC or comparable adjustment to the Summary Inventory as an interim measure, pending rectification of the inventory.

3.1.3. The Correction Factor will be determined based on the findings of the Primary Audit as detailed below and then applied to the entire inventory. In exceptional cases a further, quantified adjustment may be warranted on account of Extension Audits or GIS analysis.

3.1.4. The UMSO will endeavour to agree the Correction Factor with the Customer. In the event that this approach cannot be agreed the UMSO may impose this adjustment in order to meet its obligations under the Balancing & Settlement Code and associated procedures. Where a Correction Factor is imposed and the Customer continues to dispute the measure, the Customer may request a determination by Ofgem.

3.1.5. The applied Correction Factor will be reviewed and reduced or removed, as applicable, on receipt of details of the steps taken by the Customer and submission of improved inventory data.

3.1.6. Should errors in descriptions, locations, Charge Codes, or other inventory fields which when aggregated do not result in a Correction Factor being applied but which nevertheless illustrate poor inventory maintenance, the customer must consider appropriate management action to improve confidence in the data. Material Irregularities will be taken into account by the UMSO when scheduling future audits and impact on their ability to agree future EACs or Summary Inventories. Where the results of an audit show a significant number of errors, which when aggregated do not combine to justify the application of a Correction Factor, then the DNO may still contest that these errors would constitute Material Irregularities or Discrepancies such that they are justified in recharging the cost of the audit to the customer, as provided for at clause 7.8.2 of the National Terms of Connection.

3.2. CALCULATION OF CONSUMPTION

A calculation will be made in accordance with appendix 4.4 of the BSCP 520 (expressed in kWh p/a) for the defined geographic limits of the Primary Audit and compared with a similar calculation using the latest agreed inventory data for the same geographical limits. The Balancing and Settlement Code Procedure can be accessed from the 'Related Content' section of the ELEXON website here

3.3. CORRECTION FACTOR

$$CF = \frac{A}{B}$$

Where CF = Correction Factor
A = Audited consumption in kWh
B = Inventory consumption in kWh

But if CF is between 0.975 and 1.035 then the inventory is deemed to be sufficiently accurate and a correction factor will not be applied.

Document Control:

June 2015 - Issue 1.2 updates Hyperlinks from issue 1.1

SCHEDULE OF PREVIOUSLY ABREVIATED WEBSITE ADDRESSES

The 'Electricity (Unmetered Supply) Regulations of 2001', SI 2001 No 3263
http://www.legislation.gov.uk/uksi/2001/3263/made.

Government guidance on the application of SI 2001 No 3263
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/299381/Guidance_on_Unmetered_Supply_Regulations_V2.0_-_March_2014.pdf

The National Terms of Connection
http://www.connectionterms.org.uk/assets/files/National%20Terms%20Of%20Connection_7%20November%202013.pdf

The Balancing and Settlement Code (BSC)
http://www.elexon.co.uk/bsc-related-documents/balancing-settlement-code/bsc-sections/

The BSC Procedure (BSCP)
http://www.elexon.co.uk/bsc-related-documents/balancing-settlement-code/bsc-sections/

The 'Unmetered Supplies Operational Information' document can be found at
http://www.elexon.co.uk/pages/chargecodesandswitchregimes.aspx.

Charge Code and Switch Regimes
http://www.elexon.co.uk/pages/chargecodesandswitchregimes.aspx.

Code of Practice for metering (issue 8)
http://www.elexon.co.uk/bsc-related-documents/related-documents/codes-of-practice/

Meter Certification Regulations (procedure for certification)
http://www.legislation.gov.uk/uksi/1998/1566/regulation/7/made

Schedule six of the Electricity Act 1989
http://www.legislation.gov.uk/ukpga/1989/29/schedule/6/enacted

Managing Unmetered Energy Street Lighting Inventories
https://www.theilp.org.uk/documents/unmetered-electricity/muesli-issue-1.2.pdf