

Balancing and Settlement Code

BSC Procedure

Smart Data Service

BSCP701

v0.93

Date: DD MM YYYY

BSC Procedure 701 relating to the Smart Data Service

1. Reference is made to the Balancing and Settlement Code and, in particular, to the definition of “BSC Procedure” in Section X, Annex X-1 thereof.
2. This is BSC Procedure 701, Version 0.93, relating to the Smart Data Service.
3. This BSC Procedure is effective from DD MM YYYY.
4. This BSC Procedure has been approved by the BSC Panel or its relevant delegated Panel Committee(s).

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Amendment Record

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1. Introduction

1.1 Purpose and Scope of the Procedure

This BSC Procedure defines the processes that the Smart Data Service (SDS) shall use to carry out the work for data collection (including data retrieval, validation and estimation) for SVA Metering Systems with Smart Segment Metering Equipment (referred to in the rest of this document as “Smart Segment Metering Systems”).

It describes the key interfaces and timetables for sending appropriate Smart Segment Metering System data values to BSC Central Systems on behalf of the relevant Supplier registered in Supplier Meter Registration Service (SMRS).

Unless otherwise stated, all requirements and processes in the document apply to both import and export.

UTC Period Level Consumption shall be collected or derived from Smart Segment Metering Systems with each Metering System being assigned a unique Metering System Identifier (MSID).

This BSC Procedure focuses on the interactions between the Supplier, SMRS, SDS and other parties seen from the perspective of the SDS.

1.2 Main Users of Procedure and their Responsibilities

This BSC Procedure should be used by Suppliers, SVA Meter Operator Agents (SVA MOAs), SDSs and by Licensed Distribution System Operators (LDSOs). For SVA MOA obligations this BSC Procedure should be used in conjunction with the Retail Energy Code (REC) Metering Operations Schedule.

1.3 Use of the Procedure

The remaining sections in this BSCP are:

Section 2 – Requirements and Responsibilities: This section sets out the core requirements for the Smart Data Service.

Section 3 - Interface and Timetable Information: this section defines in more detail the requirements of each business process.

Section 4 - Appendices: this section contains supporting information.

1.4 Balancing and Settlement Code Provision

This BSC Procedure has been produced in accordance with the provisions of the Balancing and Settlement Code (BSC). In the event of an inconsistency between the provisions of this BSC Procedure and the Code, the provisions of the Code shall prevail.

The requirements of SDS under the Code are set out in BSC Sections J ‘Party Agents and Qualification under the Code’ and S ‘Supplier Volume Allocation’. An overview of these requirements is as follows:

The functions of an SDS are defined in BSC Section J as follows: to retrieve, validate and process metered consumption data from Smart and Traditional Metering Equipment in accordance with the provisions of Section S.

SDS are subject to the Qualification Requirements of Section J.

The principal functions of a SDS are defined in Section S as:

- (a) to collect metered data;
- (b) to validate data and provide reports;
- (c) to maintain relevant standing data;
- (d) to undertake periodic Meter Advance Reconciliation to reconcile half hourly energy values with meter advances;
- (e) to sum register level data, where required for Traditional Metering Equipment, to produce SVA Metering System level data;
- (f) to received Load Shapes from the Load Shaping Service and estimate UTC Period Level Consumption for Metering Systems where this data is deemed to be erroneous, missing or unavailable from the Metering System;
- (g) to provide validated half hourly data for each SVA Metering System to BSC Central Systems; and
- (h) to provide validated UTC Period Level Consumption and SVA Metering System reports to the relevant Supplier and Licensed Distribution System Operator.

Where the Party is performing the Smart Meter Data Retrieval (SMDR) Service the principal functions of the Party are:

- (a) to retrieve metered data; and
- (b) to provide SVA Metering System level data to the relevant SDS.

1.5 Associated BSC Procedures

BSCP01	Overview of Trading Arrangements
BSCP11	Trading Disputes
BSCP537	Qualification Process for SVA Parties, SVA Party Agents and CVA MOAs
BSCP703	BSC Central Services for MHHS Metering Systems
BSCP705	Licensed Distribution for MHHS Metering systems
BSCP706	Supplier Meter Registration Service for MHHS Metering Systems
BSCP709	Supplier Requirements for MHHS Metering Systems

1.6 Acronyms and Definitions

1.6.1 Acronyms

The terms used in this BSC Procedure are defined as follows.

BSC	Balancing and Settlement Code
BSCP	BSC Procedure
CoS	Change of Supplier
CSS	Central Switching Service
DS	Data Service
DCC	Data and Communications Company
DIP	Data Integration Platform
DTN	Data Transfer Network
DUIS	DCC User Interface Specification
EMDS	Energy Market Data Specification
IF	Interface
kWh	Kilowatt hour
LDSO	Licensed Distribution System Operator
LSS	Load Shaping Service
MAR	Meter Advance Reconciliation
MDS	Market-wide Data Service
MHHS	Market-wide Half Hourly Settlement
MRS	Meter Reading Service
MS	Metering System
MSID	Metering System Identifier
MTD	Meter Technical Details
PSR	Priority Services Register
REC	Retail Energy Code
SDS	Smart Data Service
SMDR	Smart Meter Data Retriever
SMETS	Smart Metering Equipment Technical Specifications
SMRS	Supplier Meter Registration System
SSD	Supply Start Date
SVAA	Supplier Volume Allocation Agent
SVA MOA	SVA Meter Operator Agent
UTC	Co-ordinated Universal Time
WD	Working Day
Wh	Watt hour

1.6.2 Definitions

Full definitions of the above acronyms are, where appropriate, included in the Balancing and Settlement Code.

2 Requirements and Responsibilities

2.1 General Requirements

The SDS must be Qualified to operate as a Data Service in line with the Qualification Process and this and associated BSCPs.

Where an SDS provides a service to support Traditional Metering Equipment the SDS must engage with Meter Reading Service(s) and agree bilaterally how data will be communicated with the Meter Reading Service(s).

The SDS must engage with qualified (as per requirements in the Smart Energy Code) SMDR Service(s) for all Smart Metering Equipment it is responsible for. The SMDR Service may be provided by the Supplier.

The SDS must, where appropriate, make arrangements for notifications and data communications with any third party service providers eg. Meter Reading Service, SMDR.

The SDS must obtain Industry Standing Data (ISD) update notifications via the IF/PUB-047, and if required take necessary steps to obtain refreshed ISD data, maintain their records accordingly and reference/ utilise ISD as appropriate as part of the service delivery.

The SDS must process data and share outputs with other parties in line with timescales set out in this BSCP.

The SDS systems and processes must support the most up to date and accurate data being available to settlements in advance of the cut off for each formal settlement run. Data should not be provided for a Settlement Date that has already been subject to an RF Run, unless the MSID is subject to an upheld dispute.

The SDS shall implement data validation steps and techniques as prescribed in this BSCP.

The SDS must receive Annual Consumption from BSC Central Systems on IF/PUB-040 and Supplier Nominated Annual Consumption on IF/PUB-024.

The SDS must undergo Onboarding in order to realise operational access to the DIP. The SDS must provide and receive reports in line with agreed reporting requirements.

Where required, the SDS must obtain Priority Service Details from the Supplier via D0225 and maintain internal records accordingly. The SDS must, on receipt of updated PSR details, delete the previously held PSR details. The SDS must, on receipt of a de-appointment notification becoming effective, delete the previously held PSR and customer details.

The SDS must receive Notification of Customer Details from the Supplier via the D0302 and maintain records accordingly. The SDS must, on receipt of updated customer details, delete the previously held customer details.

2.2 Requirements related to Appointments

The SDS must be able to process requests to vary the conditions of an existing appointment received via the IF/PUB-033. For example change of contract code or change of SMDR. These should be validated and an outcome returned using the IF/PUB-034. In the case of rejection, a rejection reason should be provided in the response and the existing appointment will continue unamended. In the case of Related MSIDs, any accepted updates will also be applied to the Secondary MSIDs. In the case of linked Import/Export MSIDs, any accepted updates will also be applied to the Export MSID (except in the case of Smart Data Service updates where a different SDS can be appointed).

2.3 Requirements for maintaining the Customer Direct Contract indicator

The SDS must maintain records to show which MSIDs have been flagged as Customer Direct Contract and must continue to manually coordinate the appointments within the contract with other industry participants.

At any time whilst the SDS is appointed to an MSID, the SDS must register Customer Direct Contract with the SMRS (if applicable) via IF/PUB-038 within 2 working days of the Direct Contract being agreed (for evergreen contracts the flag and end date should be updated at least every three years). Where there is a rejection, the SDS must investigate and re-submit as appropriate. Customer Direct Contract data is then published to SDS and Supplier via IF/PUB-039 within 1 hour.

The SDS must have the ability to cancel or change the end date of a Customer Direct Contract using the IF/PUB-038 on the DIP.

2.4 Requirements for the Collection of UTC Period Level Consumption

The SDS must receive notifications, from Supplier, of circumstances affecting the treatment of a site, on IF/PUB-024 and process accordingly.

2.5 Requirements for the Processing of UTC Period Level Consumption

The SDS must, in exceptional circumstances when a new load shape is made available for a UTC day, reprocess and re-submit all impacted UTC Period Level Consumption data via IF/PUB-021.

The SDS must receive data and warning messages from BSC Central Systems (IF/PUB-014) and take appropriate action depending on the reason.

The SDS must receive notifications of defaulted UTC Period Level Consumption from the Market-wide Data Service (MDS) via IF/PUB-013 and process accordingly.

The SDS must, as a result of a Change of Supplier de-appointment, split Consumption Data on the day of their de-appointment during British Summer Time into two separate IF/PUB-021 messages. The Consumption Data for the settlement periods prior to the de-appointment date/time should be shared with the Outgoing Supplier. Consumption Data between the de-appointment date/time and the end of the UTC day should be shared with the Incoming Supplier & SDS as notified within the IF/PUB-037 de-

appointment message. Note: the IF/PUB-021s are also sent to LDSO and BSC Central Services.

2.6 Requirements for De-appointments and Registration Deactivation

On notice of de-appointment, SDS appointment ceases to be effective from one second before midnight clock time.

The SDS must, via the SMDR, delete any active DSP Schedules, as defined in the Smart Energy Code, in line with the de-appointment date.

The SDS must, on de-appointment, make all reasonable attempts to obtain actual consumption history up to the point of de-appointment, for Smart meters, for submission to settlements.

2.7 Requirements for Change of Energisation Status

The SDS must receive notifications, for changes to Registration Data Items including Meter Point Location, Domestic Premises Indicator, Energy Direction, Metered Status, DCC enrolment status, via IF/PUB-018 and process accordingly.

The SDS must obtain Consent Granularity and Profile Class from the SMRS via IF/PUB-026 and maintain records accordingly.

The SDS must obtain Related MSID, Associated Import Export appointments and details from SMRS via IF/PUB-036, and updates via IF/PUB-020 and maintain records accordingly.

SDS must obtain notification confirming MOA appointment and providing MSID/ Meter Technical details, via the IF/PUB-036 on the DIP and maintain records accordingly for all meter types.

2.10 Requirements for Change of Connection Type or Change of Market Segment

The SDS must be able to obtain a Change of Segment Meter Exchange confirmation with MTDs and readings via IF/PUB-006 on the DIP, even when it is from a third party MOA (i.e. not the currently appointed MOA).

The SDS must be able to obtain SMRS Change of Connection Type notifications via IF/PUB-043 on the DIP and maintain records accordingly.

The SDS must obtain Invalid Market Segment Advisory notifications, sent from the SMRS on the DIP, via IF/PUB-045.

2.11 Requirements for Off-Peak Declarations

The SDS must receive Off-Peak Declarations from the Supplier via IF/PUB-024.

3 Interface and Timetable Information

3.1 SDS accesses Industry Standing Data

REF	WHEN	ACTION	FROM	TO	INFORMATION REQUIRED	METHOD
3.1.1	On the scheduled ISD Publish Date	SDS Receives notification of ISD Update on Publish or Re-publish.	ISD	SDS	IF/PUB-047 Notification of the Publication of a Downloadable Asset	DIP Interface
3.1.2	Following 3.1.1	SDS Accesses ISD data using Distribution Delivery URI	SDS	ISD	ISD Data	Distribution Delivery URI (Uniform Resource Identifier)
3.1.3	Following 3.1.2	SDS Validates and Stores required ISD Data	SDS			Internal Process
3.1.4	If data not readable and / or incomplete.	Send notification and await receipt of ISD data flows.	SDS	ISDM	P0035 Invalid Data	Electronic or other method, as agreed
3.1.5	Following 3.1.3	Ensure all ISD affecting the accuracy of Settlement is accurately entered and used in performing its functions.	SDS			Internal Process
3.1.6	After re-publish of ISD if invalid.	SDS Receives notification of ISD Update – return to step 3.1.1	ISD	SDS	IF/PUB-047 Notification of the Publication of a Downloadable Asset	DIP Interface

3.2 Appointment of Smart Data Service

REF.	WHEN	ACTION	FROM	TO	INFORMATION REQUIRED	METHOD
3.2.1	Within 1 hour following receipt of Proposed Appointment Request via IF/PUB-033 Registration Service Request for Service Appointment	Manage Appointment Request If accepted proceed to 3.2.4. If rejected proceed to 3.2.2.	New SDS		Connection Type, contract details	Internal Process
3.2.2	Within 1 hour following receipt of Proposed Appointment Request, via IF/PUB-033 Registration Service Request for Service Appointment, where appointment is rejected	Reject Appointment, providing reason for rejection. Delete any metering details received (as soon as operationally practicable)	New SDS	SMRS	IF/PUB-034 Supplier Agent Appointment Request Response to SMRS	DIP Interface
3.2.3	Within 1 hour of notification in 3.2.2 that Appointment is rejected	Notify Appointment rejection	SMRS	Supplier New SDS	IF/PUB-035 SMRS Appointment Status Notification	DIP Interface
3.2.4	Within 1 hour following receipt of Proposed Appointment Request, via IF/PUB-033 Registration Service Request for Service Appointment, where appointment is accepted	Accept Appointment. For Smart Metering System Appointments, notify SMDR Id	New SDS	SMRS	IF/PUB-034 Supplier Agent Appointment Request Response to SMRS	DIP Interface
3.2.5	Within 1 hour of notification in 3.2.4 that Appointment is accepted	Publish SDS Appointment details	SMRS	Supplier, New SDS And SVA MOA (for Traditional Meters)	IF/PUB-035 SMRS Appointment Status Notification	DIP Interface

3.2.6	In parallel with 3.2.5, or at 2100 on SSD - 1 where the CSS status is at Secured Active, whichever is later	Publish notification of Appointment and Meter Technical Details And Publish Data Service de-appointment notification Note: a second notification will be received, if the first notification does not identify the new Data Service.	SMRS	New SDS Import and Export Suppliers LDSO SVA MOA BSC Central Systems New SDS Supplier Old SDS Supplier LDSO EES BSC Central Systems	IF/PUB-036 SMRS Notification of Supplier Agent Appointment & Supporting Info And IF/PUB-040 Notification of Annual Consumption (where available) IF/PUB-037 SMRS Notification of Supplier Agent De-Appointment	DIP Interface
3.2.7	If Supplier appointment not confirmed by CSS	Issue Lapsed Notification	SMRS	Supplier, New SDS	IF/PUB-035 SMRS Appointment Status Notification	DIP Interface
3.2.8	See Transfer of Reads procedure in 3.8 / 3.9					
3.2.9	Following receipt of IF/PUB-035, within 1WD	Send Meter Technical Details for Traditional Meters	SVA MOA	New SDS	D0149 Notification of Mapping Details D0150 Non Half-hourly Meter Technical Details	DTN Message

3.2.10	From SDS Appointment Start Date	Collect metered data	SDS		Refer to Section 3.3 or 3.4	Internal Process
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3.3 Collection of UTC Period Level Consumption for a DCC enrolled Smart Meter

REF.	WHEN	ACTION	FROM	TO	INFORMATION REQUIRED	METHOD
3.3.1	From Appointment Start Date	Request Meter Data depending on Consent Granularity	SDS	SMDR	<p>Where Consent Granularity is for UTC Period Level Consumption, create a read schedule for UTC Period Level Consumption plus Daily Consumption or monthly Cumulative Register Reading.</p> <p>Where Consent Granularity is for daily reads, create a read schedule for Daily Consumption plus monthly Cumulative Register Reading.</p> <p>Where Consent Granularity is for monthly reads, create a read schedule for monthly Cumulative Register Reading.</p>	Internal Process
3.3.2	At any time	Submit Customer Own or other Total Cumulative Reading(s)	Supplier	SDS	IF/PUB-041 Smart/Advanced Readings	DIP Interface
3.3.3	Following accepted Service Request	Receive Reading(s) / Consumption	SMDR	SDS	Sufficient information to populate IF/PUB-021 UTC Settlement Period Consumption Data	Internal Process
3.3.4	<p>Where reading(s) and/or consumption data is not returned as requested</p> <p>If data retrieval is successful then go to 3.3.6</p>	Request recovery of missing data	SDS	SMDR	Sufficient information to be able to submit 'On Demand' DCC Service Request for the missing data	Internal Process

REF.	WHEN	ACTION	FROM	TO	INFORMATION REQUIRED	METHOD
3.3.5	Following accepted Service Request	Receive Reading(s) / Consumption	SMDR	SDS	Sufficient information to be able to populate IF/PUB-021 UTC Settlement Period Consumption Data	Bilaterally agreed
3.3.6	On successful receipt of UTC Period Level Consumption (3.3.3 and 3.3.5)	Process Smart UTC Period Level Consumption for submission. Missing data will be estimated during data processing.	SDS		Refer to Section 3.5	Internal Process

3.4 Collection of Reads for a Traditional Meter (or non-communicating Smart Meter)

REF.	WHEN	ACTION	FROM	TO	INFORMATION REQUIRED	METHOD
3.4.1	As determined by Supplier	Schedule Site Visit for Traditional [or Smart Meter with non-functioning communications] with Meter Reading Service (MRS)	SDS	MRS		Internal Process
3.4.2	As scheduled	Attempt Meter reading and site checks	MRS		See section 4.9	Internal Process
3.4.3	Following 3.4.2, if reading could not be obtained	Notify SDS of read failure	MRS	SDS		Internal Process
3.4.4	Following 3.4.3	Notify Supplier of read failure and site checks	SDS	Supplier	D0004 Notification of Failure to Obtain Reading Data relating to the failed site visit attempt. See section 4.9	Or by any other means as agreed
3.4.5	Following 3.4.2, if reading successfully obtained	Provide reading to SDS	MRS	SDS		Internal Process
3.4.6	At any time	Submit Customer Own / Other Reading(s)	Supplier	SDS	D0010 Meter Readings	DTN Message
3.4.7	On successful receipt of reading	Commence data processing	SDS		Refer to Section 3.5	Internal Process
3.4.8	In parallel with 3.4.7	Report reading to supplier	SDS	Supplier		Bilaterally agreed

3.5 Processing of UTC Period Level Consumption and submission to BSC Central Systems

REF.	WHEN	ACTION	FROM	TO	INFORMATION REQUIRED	METHOD
3.5.1	Following successful collection of UTC Period Consumption Data, Daily Consumption Data or the Cumulative Register Reading	Validate all readings	SDS		Use of applicable method(s) in Appendix 4	Internal Process
3.5.2	Where UTC Period Consumption Data is successfully validated	Proceed to 3.5.7	SDS			Internal Process
3.5.3	After validation (success or failure) of Cumulative Register Readings	Submit to Supplier and LDSO	SDS	Supplier LDSO	IF/PUB-041 Smart/Advanced Readings Or D0010 Meter Readings	DIP Interface DTN Message
3.5.4	Following calculation and publishing of Load Shape Data by BSC Central Systems	Receive Load Shape Data for the relevant Settlement Date	LSS	SDS	IF/PUB-022 Load Shape Period Data and IF/PUB-023 Load Shape Totals Data	DIP Interface
3.5.5	Following successful validation of Daily or Cumulative Register Reading, and successful receipt of the relevant Load Shape data	Convert to Period Consumption Data	SDS		Use of applicable method(s) in Appendix 4	Internal Process
3.5.6	Where Period Consumption Data is missing or invalid	Estimate Invalid or Missing Period Consumption Data	SDS		Use of applicable method(s) in Appendix 4	Internal Process
3.5.7	Following successful validation and/or estimation of Period Consumption Data	Submit Period Consumption Data to BSC Central Systems	SDS	BSC Central Systems Supplier LDSO	IF/PUB-021 UTC Settlement Period Consumption Data	DIP Interface

3.6 Consumption Amendment/Override Reads

This process applies for Supplier-Initiated [Pre-RF] Consumption Amendments and Override Reads only.

REF.	WHEN	ACTION	FROM	TO	INFORMATION REQUIRED	METHOD
3.6.1	Where Supplier identifies a pre-RF Consumption Amendment and the Consumption Amendment meets an Agreed Minimum threshold, or for override reads	Issue Revised Settlement Period Level Consumption Or Issue Override Reads	Supplier	SDS	IF/PUB-027 Supplier Consumption Amendment Request IF/PUB-041 Smart/Advanced Readings	DIP interface
3.6.2	Following 3.6.1	SDS validates whether they were responsible for the MSID for the period of the consumption amendment/override read	SDS			Internal process
3.6.3	On successful MSID responsibility validation	Determine revised Settlement Period Level Consumption and perform Meter Period Value* (MPV) validation check (see Section 4.3) *Meter Period Value is as defined in EMDS	SDS			Internal process
3.6.4	If MSID ownership validation fails OR If MPV validation fails	Issue Consumption Amendment rejection	SDS	Supplier	IF/PUB-028 Supplier Consumption Amendment Request Response	DIP interface

REF.	WHEN	ACTION	FROM	TO	INFORMATION REQUIRED	METHOD
3.6.5	On receipt of Consumption Amendment rejection	Issue revised Consumption Amendment request (Go to 3.6.1) OR Start BSC Disputes Process (BSCP11)	Supplier	SDS BSCCo	IF/PUB-027 Supplier Consumption Amendment Request	DIP interface
3.6.6	On successful MPV validation	Submit Validated Consumption Amendments And Issue Consumption Amendment acceptance	SDS SDS	Supplier BSC Central Systems LDSO Supplier	IF/PUB-021 UTC Settlement Period Consumption Data IF/PUB-028 Supplier Consumption Amendment Request Response	DIP interface DIP Interface
3.6.7	If Validated Consumption Amendments are rejected	Issue rejection notification	BSC Central Systems	Supplier SDS LDSO	IF/PUB-014 Rejected – UTC Settlement Period Consumption Data	DIP interface

3.7 Change of Energisation Status/Change of Meter

REF.	WHEN	ACTION	FROM	TO	INFORMATION REQUIRED	METHOD
3.7.1	On Change of Energisation Status or Change of Meter	Receive notification of Change of Energisation Status and maintain records of energisation status	SMRS	SDS	IF/PUB-008 SMRS Notification of Change of Energisation Status	DIP Interface
		Receive MTDs	SMRS	SDS	IF/PUB-006 SMRS Notification of MTD Updates	DIP Interface
		and additionally for Traditional Meters	SVA MOA	SDS	D0149/D0150 Notification of Mapping Details/NHH MTDs	DTN message
3.7.2	In parallel with 3.7.1	Receive register readings	MOA	SDS	IF/PUB-041 Smart/Advanced Readings Or for Traditional Meters: D0010 Meter Readings	DIP Interface DTN message
3.7.3	On receipt of register readings	Store register readings for use in estimation processes	SDS			Internal process
3.7.4	5 working days after 3.7.1 if no register readings are received	Generate an estimate of the register readings for the relevant date, using estimation methods as set out in Appendix 4	SDS			Internal process
3.7.5	Within 5 working days after 3.7.1, once register reading is received or an estimate is generated	Send change of energisation status cumulative meter reading to Supplier and LDSO (for Traditional Meters only)	SDS	Supplier LDSO	D0010 Meter Readings	DTN message

3.8 Transfer of Reads – Smart Meters

REF	WHEN	ACTION	FROM	TO	INFORMATION REQUIRED	METHOD
3.8.1	On Appointment Start Date	Attempt Meter read	New SDS Old SDS		Midnight UTC reads for Total Cumulative from the Daily Read Logs	Internal Process
3.8.2	Within 1 hour following Notification of successful De-Appointment (In BST, within 1 hour after the end of the UTC day following de-appointment) if actual data recovered	Send midnight UTC readings for cumulative and time-of-use settlement registers. Reading for midnight (clock time) should be deemed as per section 4.8.	Old SDS	New Supplier New SDS Old Supplier	IF/PUB-041 Smart / Advanced Readings	DIP Interface
3.8.3	Within 5WD following Notification of successful De-Appointment if no data recovered from Smart Meter, or Smart Meter is known non-communicating	Send estimated midnight UTC readings for cumulative and time-of-use settlement registers.	Old SDS	New Supplier New SDS Old Supplier	IF/PUB-041 Smart / Advanced Readings	DIP Interface
3.8.4	Within 5WD of Appointment Start Date	Validate Actuals/Estimates received from Old SDS against any data retrieved directly from the Meter and publish cumulative register read	New SDS	New Supplier	IF/PUB-041 Smart / Advanced Readings	DIP Interface

3.9 Transfer of Reads – Traditional Meters

REF.	WHEN	ACTION	FROM	TO	INFORMATION REQUIRED	METHOD
3.9.1	On receipt of D0010 (Customer Own Read) from New Supplier, within 2WD	Validate Customer Own Read based on meter read history. If valid, share with New Supplier and Old Data Service. Otherwise, advise New Supplier only.	Old Supplier	New Supplier Old Data Service	D0010 Meter Readings	DTN Message
3.9.2	On receipt of D0010 (validated Customer Own Read) from Old Supplier, within 2WD	Forward reading (marked as valid by Old Supplier) to new Data Service to initiate data collection activities	New Supplier	New Data Service	D0010 Meter Readings	DTN Message
3.9.3	Within 5WD of Appointment Start Date, if no valid customer read received	Generate closing read estimates (midnight UTC on the day following de-appointment), for settlement registers and share with Supplier and New Data Service. If a valid customer read (for SSD) is received after estimation has started, this must be used in data processing and shared with new SDS and Supplier	Old Data Service	New Data Service Old Supplier LDSO	D0010 Meter Readings	DTN Message
3.9.4	Within 5WD of Appointment Start Date, on receipt of D0010 (estimated closing read) from Old Data Service.	Forward estimates to New Supplier and Commence data collection activities	New Data Service	New Supplier	D0010 Meter Readings	DTN Message

4. Appendices

4.1 Smart Data Service Validation and Estimation

This appendix sets out the Smart Data Service (SDS) requirements for validation of Consumption data and register reads and the estimation processes required where data is invalid or missing. It also sets out the estimation process for Metering Systems where the customer has opted-out of provision of UTC Period Level data for Market-wide Half Hourly Settlement.

This Appendix also sets out the methodology by which Meter Advances are calculated based on Register Readings for smart and Traditional Meters. It also describes how such Meter Advances are used or are converted into new values to be used within the estimation processes.

The following validation scenarios are covered in This Appendix:

- SDS smart Meter data at UTC Period Level
- SDS smart Meter data versus Traditional Meter Readings
- General Validation Requirements for Register Readings
- Validation of smart Meter data
- Validation of smart Register Reading
- Identifying Load Shape Categories using Registration data
- Meter Advances, Actual Daily Advances, Daily Consumptions and Daily Advance Estimates
- Calculation of Meter Advances for different Meter types:
 - Smart meters with daily advances or daily consumptions
 - Traditional non-E7 Metering systems: single rate or multi-rate
 - Traditional meters with Switched Load

This Appendix sets out how to identify Load Shape Categories for each Metering Point and the estimation methodologies to be used using each type of advance that is available.

The defined term UTC Period Level Consumption refers to import or export data that is of UTC Period granularity and the same duration as a Settlement Period (E.g. 30 minutes).

The SDS must have flexibility to the duration of a UTC Period. The SDS must be able to process varying durations of a UTC Period. The UTC Period will not change in a UTC date and there will not be different UTC durations per Load Shape Category.

SDS accesses smart Meter Data

The SDS will access smart Meter data using its SMDR Service. The SMDR Service can be provided by the Supplier using their own Data and Communications Company (DCC) credentials under the Smart Energy Code (SEC) to schedule Service Requests. Otherwise, the SMDR Service can be provided by another entity procured by the Supplier as part of the SDS using the MDR User role developed under the SEC. The Service Requests available to Suppliers and MDR User are set out in the SEC Appendix AD.

SDS smart Meter data with UTC Period Level Consumption

Where UTC Period Level Consumption is available for Settlement from the Meter for either Import or Export this data shall be used for Settlement provided it is deemed valid according to the requirements set out below. Otherwise it shall be deemed invalid and not used for Settlement.

SDS Smart Meter versus Traditional Meter Readings

For smart Metering (import or export) Systems the Total Cumulative Register Readings for either Import or Export or Daily Consumption shall be used in calculating Meter Advances. For Traditional Meters the Settlement Registers as identified in the Meter Technical Detail shall be used in the calculations. Where smart Meters cannot be remotely communicated with, the Cumulative Total can either be read at site or be provided by the Supplier if Customer own read.

4.2. General Validation Requirements for Register Readings

The SDS shall validate all Register Read data before it is used for Settlement or estimation. The initial reading may need to be validated once a further reading becomes available. The SDS shall re-estimate or re-publish all data with new data if more recent valid data is received while the data is prior to Final Reconciliation. The minimum validation rules apply equally for whether the reading to be validated lies after other valid Meter readings, before other valid Meter readings or between other valid Meter readings. If the Register Read fails any of the validation checks it shall be deemed invalid.

The SDS shall always use actual Register Reading data, where available, in favour of Supplier supplied reads. The exception to this rule, is where Supplier provides an “Agreed” or “Override” reading, in these cases the SDS must use this data in its estimation calculation(s) with the acceptance that the supplier will have taken greatest of care when deciding to submit these readings and that the resulting impact on settlement submissions is the supplier’s responsibility to monitor and resolve.

All SMETS2 meters have the same length on the internal billing data log (10 characters long) and, for the display, it will be 5 digits if the meter is single phase and 6 digits if it is polyphase. The information on display digits is provided on appointment of the SDS and updates whenever the data item changes (e.g. on Meter exchange). Where the SDS retrieves readings remotely from smart Meters, they shall ensure that the number of register digits is consistent with the number of register digits defined as part of the Registration Data against the Meter Asset where display data has been collected. Where necessary, the leading digits from the reading shall be adjusted to ensure this consistency when calculating Meter advances for estimation purposes. This requirement applies to SMETS 2 Version 3.1 or above (or for other Meter Types where there is known to be a difference between the number of digits held in the internal register and those displayed on the Meter).

The validation requirements described below are the minimum requirements that the SDS shall carry out for each Settlement register:

Check Meter Serial Number

Check that where data is collected at site the Meter Serial Number (MSN) for the Traditional Metering Systems to which the SDS has been appointed is the same as the serial number provided by the MOA in the Meter Technical Details and the Registration data for that Metering System.

Checks for Zero consumption

Check for zero Consumption, where the zero Consumption on the Meter register is not expected based on available previous history for the Metering System collected following the SDS appointment, and if so:

- check for previous zero consumption patterns for import Metering Systems
- check for zero export patterns for export Metering Systems
- check Site Visit Report
- check whether Metering System is being treated as a Long Term Vacant site as notified by the Supplier.
- for smart Meters check whether the Metering System is disabled as notified by the Supplier.
- Check if site is de-energised.

If zero explained by historical Consumption, Site Visit Reports, remote disablement or Metering System being settled on at zero then valid, otherwise invalid.

Check for Negative Consumption

Check for negative Consumption and if so:

- check for Meter Register rollover – check the calculation has been performed correctly.
- check if the previous Meter register reading is a deemed reading and that the reading prior to the deemed reading is an actual Meter register reading, and that the current Meter register reading advance creates a positive Consumption with respect to the last actual Meter register reading (i.e. obtained prior to the deemed reading), making allowance for any Meter register rollover. If so then reading valid, otherwise invalid.

4.3. Validation of smart Meter data

SDS validation requirements (General)

The SDS shall perform all of the appropriate general validation checks set out in Section 4.2.

The SDS shall validate all Active Import and Active Export data and Register Read (ElecActiveImportRegisterConsumption or ActiveExportRegisterValue as set out in Smart Energy Code: Appendix AF) data before it is used for Settlement or estimation. The SDS shall process or re-estimate and publish if more recent data is received while the data is prior to Final Reconciliation or if the Metering System is subject to an upheld dispute.

SDS checks data is from expected source

The SDS shall validate that the data has been received from one of the expected source(s), i.e. from the DCC, MRS, Metering Systems, SMRS or Supplier associated with the Metering System. This includes consumption data, notifications and MTDs.

SDS stores data

The SDS must store all data for the appropriate amount of time according to the non-functional requirements set out in the BSC for validation, estimation, error resolution and audit purposes.

SDS checks SMDR data is for expected Metering System and Meter

The SDS shall validate that data has been received for the expected combination of Metering System and Electricity Smart Meter Equipment (ESME) GUID (Globally Unique Identifier) as set out in the Registration data.

The SDS shall record all occurrences where data entering Settlements has been changed by/ or following instruction from the Supplier. E.g. Theft Data or following a manifest error.

When SDS carries out validation, it shall retain the original reading value and the reason for failure, where the value is invalid.

SDS validates data recognising any alarms and alerts

The SDS shall take account of any appropriate alarms or data quality alerts notified by the Supplier when validating data. In the absence of actual consumption the only notification that should impact validation and estimation are:

- Long Term Vacant Sites
- Supply remotely disabled

SDS validates UTC Period Level Consumption is not negative

The SDS shall validate that every period of UTC Period Consumption data is not NULL and is greater than or equal to 0.

SDS validates UTC Period Level Consumption data against permissible maximum energy

UTCP data is received in Watt hours (Wh) and will need to be converted to kilo-Watt hours (kWh) and to three decimal places prior to validation and processing. During validation where the energy recorded exceeds the limits in the table below, for one or more given UTC Period, the SDS will take the action defined below.

	Max. kW	Max kWh / UTC Period	Permissible Allowed: kWh per Half Hour
Smart Meter Consumption	90	45	60

If valid the SDS shall enter the actual data into Settlements else replace the actual data with estimated data and enter this into Settlements once all other validation checks are completed.

Validation of smart Meter Register Readings

The SDS shall validate the Total Cumulative Register Readings using the general validation requirements set out above where appropriate to smart Meters.

Reconciliation for smart Meter Advance Reconciliation

The SDS shall validate that the sum of the UTC Period Level Consumption data is equal to the consumption between register reads or against the daily consumption values sourced from the Metering System at a minimum of once a month. If data previously submitted to the MDS is deemed invalid a replacement estimate will be calculated by the SDS using the methods in this Appendix.

A Meter Advance Reconciliation (MAR) is the reconciliation of the advance on the Meter register between two specific date(s) and time(s) compared with the summation of the relevant UTC Period Level Consumption Data used in Settlement over the same date(s) and time(s).

Care should be exercised where the Meter register reading does not align with the end of a UTC Period, and this should be taken into consideration in the reconciliation, as described below.

The SDS shall use a level of tolerance set to take into account the period over which the check was performed. The maximum levels are $\pm 0.7\%$ where the check is carried out at least on a weekly basis for monthly data or $\pm 5\%$ where the check is carried out on a daily basis using daily data. Data failing the Meter Advance Reconciliation check will be deemed invalid.

Where data has been deemed invalid the SDS shall escalate with the Supplier (Fault Notification Process). Appropriate action should be taken if the cause of the discrepancy can be identified. If the UTC Period Level Consumption data is deemed valid following investigation then the data can be published, otherwise the SDS shall estimate all UTC Periods within the period of the MAR.

SDS identifies missing or corrupted data

If the UTC Period Level Consumption is missing, uncollected or corrupted (E.g., non-numeric data) or if for any other reason the data is deemed to be invalid then the data shall be estimated using the data estimation processes for Smart Meters set out in below. The data shall be provided to the BSC Central Systems in line with the settlement timetable.

4.4 Load Shapes

The following sets out how Load Shapes are identified by the SDS for use in the estimation Methods set out in Section 4.8. The processes for calculating Load Shapes are set out in BSCP703.

Identifying Load Shape Categories (LSC) using Registration data

The SDS shall use the Registration data for each Metering System. The following Data Items required to identify the appropriate Load Shape Category 'C':

Data Item	Definition
Market Segment Indicator	An enumeration of Smart/Advanced/Unmetered. Must be S for SDS processing.
GSP Group ID	Identifies the distinct grid supply point group (physical region of the country) where the metering point is located.
Domestic Premises Indicator	A flag that indicates if the Metering System of the registration appointment is used to identify domestic premises.
Measurement Quantity ID	Identifies UTC Period if the data is Active Import or Active Export. The Measurement Quantity Table in ISD maps Measurement Quantity ID to the Direction of Flow Indicator which matches the Registration data item.
Connection Type Indicator	Whole Current (W), Low Voltage Current Transformer (L), High Voltage Current Transformer (H) or Extra High Voltage Current Transformer (E). Must be W for SDS Processing

The SDS should also validate that the Metering System is in the correct Market Segment (S) and has the correct Connection Type indicator (W) on each update received from the SMRS and updates to the Industry Standing Data (ISD). The SDS shall identify the correct Load Shape for the Metering System based upon the Registration data. If the Metering System is a Traditional Meter and Profile Class 02 or 04 then the SDS must be aware of the Off-Peak Period in order to correctly apply the Period Meter Advances (PMAs) to the Load Shapes. The Data Items are set out in ISD Entity table M4.

Load Shape Data Items

The Load Shape data items can be found in: IF/PUB-022 - Consumption Central Settlement LSS Period to Data Service

Load Shape Totals definition using ISD

The following Load Shape totals will be provided for each LSC:

Load Shape Total	Description
Load Shape total	The sum of all LS Period Values for the UTC Date.
Load Shape peak total	The sum of LS Period Values for UTC times (07:00 to 00:00) or (00:00 to 00:30 and 07:30 to 00:00) as defined in ISD
Load Shape off-peak total	The sum of LS Period Values for UTC times (00:00 to 07:00) or (00:30 to 07:30) as defined in ISD
Load Shape 7 day rolling total	The sum of the Load Shape Total defined above and the Load Shape Total for the past 6 UTC Dates.
Load Shape 7 day rolling peak total	The sum of the Load Shape Peak Total defined above and the Load Shape Peak Total for the past 6 UTC Dates.
Load Shape 7 day rolling off-peak total	The sum of the Load Shape Off-Peak Total defined above and the Load Shape Off-Peak Total for the past 6 UTC Dates.

The Load Shape Totals can be found in: IF/PUB-023 Load Shape Totals Data

4.5. Period Meter Advances, Actual Daily Advances, Actual Daily Consumption and Daily Advance Estimates

The estimation methods will use different types of advances according to the estimation Method being deployed:

Advance Type	Definition	DCC Service Request/ Traditional
Period Meter Advance (PMA) ¹	A Meter Advance is defined as an Advance calculated over two or more UTC DateTimes, where the time is part way through a UTC period it shall be deemed to be at the start of the UTC period, where the time of the reading is not available it shall be deemed to have occurred at midnight.	SRV4.6.1 (Import) SRV4.6.2 (Export) or Manual Read for Traditional
Actual Daily Advance (ADA)	An advance calculated between two consecutive midnight reads for the Total Cumulative Register of a smart Meter	SRV4.6.1 (Import) SRV4.6.2 (Export) or Manual Read for Traditional
Actual Daily Consumption (ADC)	A Daily consumption value collected from a smart Meter	SRV4.17
Daily Advance Estimate (DAE)	An estimated advance to be used for a UTC Date until an actual Advance is available.	NA

Validation of ADA and ADC Values

For the purposes of the document the term Daily Advance (DA) refers to either an ADA or ADC. DA values must follow the general validation processes set out in Sections 4.2 and 4.3.

Daily Advance Estimate Calculations

The Daily Advance Estimate will depend on the type of Advance that is available for a Metering System and in the following hierarchy (a to c):

- a) For a Period Meter Advance (PMA) the DAE is calculated by dividing the Meter Advance, using the actual datetime readings, by the duration of the Meter Advance and extrapolating to 24 hours);
- b) The average of the previous 7 consecutive DAs: otherwise

¹ The PMA calculation will be deemed to cover from mid-night to mid-night on the days the read occurred regardless to the timing of the reading. This allows PMAs to be allocated to whole UTC dates when applying estimation methods.

- c) where daily advance records are available [either in the past or future] and less than 90 days different from the UTC Date requiring a daily advance - use the mean actual Meter advance from the closest 4 weeks for the same Day Type (as defined in ISD).

Where DAEs are required to be calculated the SDS shall use the most recent data based on the event that triggered the estimation. If no DAE can be calculated then the next appropriate Method of estimation below shall be used noting if the Metering System is for Active Import or Active Export.

4.6 Traditional Meter Advances for single and Multi-Rate Metering Systems

Single Rate Metering Systems and Multi-Rate E7 Traditional Metering Systems with Switched Load

The SDS shall calculate a single Period Meter Advance (PMA) for two valid Meter Readings by differencing the earlier read from the next available.

Where the Traditional Metering System is not Profile Class 02 or 04 and the Meter is multi-rate but no Register is associated with switched load the SDS shall calculate a single Period Meter Advance (PMA) by firstly calculating a PMA for each Settlement Register then summing the PMAs into a single value.

Multi-Rate Traditional Metering Systems with Switched Load

Where the Registration Data identifies the Traditional Metering System is in Profile Class 02 or 04 with switched load capability the SDS shall calculate two Period Meter Advance (PMA) one for the Peak Load Register(s) and one for the Off-peak Register(s) for the Metering System as identified by the Traditional Meter Technical Details (MTDs). This approach can be used for any Traditional Meter with E7 or other Switched load duration (e.g. E8 or E10). However, the load during the switched period will be allocated to a 7 hour window regardless of duration. The switched load register can be identified on the retained D0149/ D0150 and the SSC/ TPR combination in the 'frozen MDD' tables.

4.7. SDS Estimation: General

SDS Estimates of UTC Period Level Consumption

Where UTC Period Level Consumption has been retrieved and has passed validation, estimation will not be required and the Settlement Period Quality Indicator should be set to A.

The SDS shall ensure that UTC Period Level Consumption data will be estimated for any periods of missing or invalid data using a number of estimation techniques. The Method to be used will be dependent on the data available at the times of estimation. Estimated data will be labelled with the estimation technique used.

Estimation must be re-calculated if newer consumption/ export data becomes available for a Settlement Day that is prior to Final Reconciliation.

The SDS amends consumption data following detection of theft from RPU service or other Consumption adjustments

The SDS must enter UTC Period Level Consumption data into settlement in the appropriate time period when notified by the Supplier according to the rules set out in the BSC or BSC subsidiary documents. The SDS shall apply the most applicable estimation method and set the Estimation Reason Code to 'Adjustment'.

The SDS estimates UTC Period Level consumption data where a Meter Advance is not available

The SDS must be able to estimate the consumption for UTC Periods where a Meter Advance is not available according to the Estimation Rules and method and flag each estimation according to its method.

SDS validates estimated data

When UTC Period Level Consumption data has been estimated, this data shall be validated against the Maximum Permissible Limit prior to being used in subsequent processing. Any data that fails validation following estimation shall be flagged appropriately and investigated. If deemed to be correct it shall be passed as valid. Otherwise, it shall be recalculated using an alternative Method before being allowed to be used.

SDS receives actual UTC Period data when data has previously been estimated

If the SDS receives new data, and this new data from an expected source and is successfully validated, it shall be published in accordance with the timescales for Load Shaping (if not concluded) or Reconciliation Runs prior to Final Reconciliation.

SDS receives new data when data has previously been estimated

If the SDS receives new Meter Register data which is not UTC Period Level Consumption data but allows a better estimate to be calculated the SDS must recalculate the estimate using the appropriate Estimation Method and publish in accordance with the timescales for Reconciliation Runs prior to Final Reconciliation.

Estimation for Export data

Export may be estimated for Traditional Meters with an Export register or smart Meters with communication issues (that prevent UTC Period Level Consumption data being collected) provided there is a valid Meter Advance that spans the UTC Date. Otherwise, the SDS shall estimate zero data for export Metering Systems using Method 9 below where such UTC Period Level Consumption data or Register Reading data is unavailable. If subsequently the UTC Period Consumption is retrieved (and successfully validated) the estimated data shall be replaced.

4.8. SDS Estimation Methods

Identifiers used in this Appendix

The following Identifiers are used in this Appendix and form part of the Technical Glossary (link below table):

Identifier	Data item
<i>C</i>	Load Shape Category
<i>D</i>	UTC Date
<i>E</i>	Previous UTC Date
<i>j</i>	UTC Period
<i>k</i>	MS
<i>M</i>	Missing UTC Periods
<i>N</i>	Period Meter Advance duration
<i>P</i>	Valid available Periods
<i>X</i>	DA 7 Day Average DA Data
<i>Y</i>	Year

Where notified by a Supplier that a site is Long Term Vacant (LTV) or remotely disabled the SDS shall use Methods 12 or 13 respectively. Otherwise, the SDS shall use the following hierarchy when estimating UTC Period Consumption. Where Load Shape data is used in the estimation Method it is assumed that the SDS has identified the correct Load Shape 'C' for the Metering System from the Registration data and ISD. The SDS shall apply the estimation flags to the data as defined below and the reason for estimation should also be recorded (e.g. Opted-out (Consent Granularity<>H) or no communications):

Method 0: SDS processes Supplier provided 'Agreed' or 'Override' Readings and Consumption Amendments

The Supplier can provide and Override, Agreed Readings (IF/ PUB-041) or a Consumption Amendment (IF/PUB-027). The (IF/ PUB-041) can be used for a number of scenarios including read on install, removal or change of energisation status.

Agreed or Override readings

This reading shall be used by the SDS even where actual valid reading data from the meter is available. Where the Supplier has provided an Agreed Read or and 'Override' Read then the SDS shall process the data as follows:

Calculate a Period Meter Advance (PMA) using the reading provided and another valid reading to determine the Meter Advance Period N (PMA_N) where N is the period between the two readings.

Consumption Amendments

The Supplier will provide a gross volume, together with a 'Consumption Amendment Period Start Date' and a 'Consumption Amendment Period End Date'. This data shall be processed as though it is a PMA for the Meter Advance Period N (PMA_N) where N is the period between the 'Consumption Amendment Period Start Date' and 'Consumption Amendment Period End Date'

The SDS shall calculate UTC Period data using the PMA (spanning the UTC Period and scaling the Load Shape and daily totals data from the LSS, and store these records as "E0"

Calculation for UTC Period j on UTC Date D and Supplier provided Meter Advance Period N where LS_TOT_N is the Load shape totals summed over Meter advance period N using PMA_N :

$$UTCP_{Dj} = LSPV_{Dj} / LS_TOT_N * PMA_N$$

Method A: SDS estimates data for smart Meter where there is one missing UTC period; DA is available (Import or Export)

Where 47 UTC Periods are valid and 1 UTC Period of data is missing or invalid in a UTC day and a DA is available, use the daily advance to calculate the missing time period data and flag the calculated data as "A" flag.

$$UTCP_{Dj} = (DA_D) - \text{Sum}(\text{UTC Period Level Consumption}_D)$$

Where j is the missing UTC period to be estimated and $\text{UTC Period Level Consumption}_D$ is the data collected and validated from the smart Meter.

Method 1: SDS estimates data for smart Meter where there is more than one missing UTC period; ADA Import and Export or ADC Import only is available

Where 2 or more UTC Periods of data are missing or invalid in a UTC day and at least one UTC period of data is valid and a DA is available, use the DA and the available/valid UTC period consumption to calculate the sum of the missing consumption.

Allocate this consumption to the relevant UTC periods using the appropriate load shape obtained from the LSS. Flag the estimated data as "E1" flag.

Calculation for missing UTC periods j of UTC Date D with valid/available periods P and missing periods M :

$$UTCP_{Dj} = \frac{LSPV_{Dj}}{\sum_M LSPV_{Dj}} (DA_D - \sum_P UTCP_{DP})$$

Where DA is the ADA and LSPV is the Load Shape Period Value published by the Load Shaping Service.

Method 2: SDS estimates data for smart Meter where there is no UTC Period Consumption; DA available

Where all UTC Periods of data are missing or invalid for a UTC Date and a DA is available, allocate the daily advance consumption to the UTC Periods using the appropriate load shape obtained from the LSS. Flag the estimated data as "E2" flag.

Calculation for UTC Period j on UTC Date D and LS_TOT_D is the Load shape total for UTC Date D ;

$$UTCP_{Dj} = LSPV_{Dj} / LS_TOT_D * DA_D$$

Where the MSID is for Domestic Import and has switched load and the MSID's Consent Granularity $\langle \rangle$ 'H' and the SDS has received an IF / PUB-024 'Supplier Advisory Notification to Data Service' notifying the Peak and Off-Peak proportions the SDS shall calculate the $OFF_Peak_Consumption_D$ and the $Peak_Consumption_D$ by applying the proportions notified to the DA. The SDS shall then calculate the UTC Period Level Consumption ($UTCP_{Dj}$) as follows:

$$UTCP_{Dj} = LSPV_{Dj} / LS_TOT_OFF_D * OFF_Peak_Consumption_D \text{ for periods } j \text{ in the Off-peak period}$$

AND

$$UTCP_{Dj} = LSPV_{Dj} / LS_TOT_PEAK_D * Peak_Consumption_D \text{ for periods } j \text{ in Peak period}$$

For UTC Period ' j ' on UTC Date ' D ' and where $LS_TOT_OFF_D$ is the Load shape off-peak total and $LS_TOT_PEAK_D$ is the Peak Load shape total.

Method 3: SDS estimates for smart Meters using non-daily Meter advances

In the absence of a DA consumption data to calculate daily Meter advances, the SDS shall calculate UTC Period data for any period where valid actual UTC Period data is not present, from a valid PMA spanning the UTC Period and scaling the Load Shape and daily totals data from the LSS, and store these records as "E3"

Calculation for UTC Period j on UTC Date D and Meter Advance Period N where LS_TOT_N is the Load shape totals summed over Meter advance period N and $UTCP_N$ is the sum of the valid actual UTC period data during the PMA and $LSPV_N$ is the sum of the LSPV values that coincide with the valid actual UTC period data during the PMA::

$$UTCP_{Dj} = (LSPV_{Dj} / (LS_TOT_N - LSPV_N)) * (PMA_N - UTCP_N)$$

Method 4: SDS estimates where smart Meter daily register reads are unavailable but daily register read history is present (Import only)

For Settlement Periods where valid actual consumption data is available the data shall be used. For other Settlement Periods where DA value for the relevant UTC day is unavailable from the smart Meter but a DA is available [either in the past or future] and less than 90 days different from the UTC Date requiring a daily Meter advance - use the average actual Meter advance from the closest 4 weeks for the same Day Type (DAE). The average will then be applied to the appropriate Load Shape for the UTC Date. Record the estimated as "E4".

Calculation for UTC Period j on UTC Date D and using DAE_X (DA) based on the DA average data X and where LS_TOT_D is the Load Shape total:

$$UTCP_{Dj} = LSPV_{Dj} / LS_TOT_D * (DAE_X)$$

Method 5: SDS estimates for smart Meters where previous DAs are available (Import only)

For Settlement Periods where valid actual consumption data is available the data shall be used. For other Settlement Periods where the DA for the UTC date is unavailable and the most recent actual settlement data is 7 consecutive DAs prior to the UTC Date being processed, the SDS shall calculate the UTC Period data using the average of the most recent 7 consecutive actual daily advances along with the load shape and load shape rolling total from the LSS. This estimate shall be stored as type "E5".

Calculation for UTC Period j on UTC Date D and using DAE_X (DA) for the period X is the most recent actual settlement data is 7 consecutive previous DAs and where $LS_ROLL_TOT_D$ is the Load shape 7 day rolling total:

$$UTCP_{Dj} = LSPV_{Dj} / LS_ROLL_TOT_D * (DAE_X * 7)$$

Method 6: SDS estimates for non-smart Meters with PMAs available (Import and Export)

Where non-smart Meter advances spanning the UTC period are available the advances shall be summed across all Settlement Registers. The PMA will be applied to the load shapes for the Meter advance period using the appropriate load shape and daily totals notified by the LSS. This data will be recorded as ""E6"".

Calculation for UTC Period j on UTC Date D and Meter Advance Period N where LS_TOT_N is the Load Shape totals LS_TOT_D summed over Meter advance period N :

$$UTCP_{Dj} = LSPV_{Dj} / LS_TOT_N * PMA_N$$

Where the non-smart Meter has switch load (Economy 7 customers), the SDS applies the PMAs to the Peak (PMA_PEAK_N) and Off-Peak (PMA_OFF_N) Periods as appropriate. The Peak and Off-Peak Meter advances shall be identified using the relevant MTD and the Periods they are applied to as set out in the Load Shape categories in ISD.

Calculation for UTC Period j on UTC Date D and Meter Advance Period N where $LS_TOT_OFF_N$ is the Load shape off-peak total summed over the PMA Period N and $LS_TOT_PEAK_N$ is the Load Shape total summed over the PMA Period N :

$$UTCP_OFF_{Dj} = LSPV_{Dj} / LS_TOT_OFF_N * PMA_OFF_N \text{ for } j \text{ in Off-peak period}$$

AND

$$UTCP_PEAK_{Dj} = LSPV_{Dj} / LS_TOT_PEAK_N * PMA_PEAK_N \text{ for } j \text{ in Peak period}$$

Method 7: SDS estimates where no recent Meter data is available (Import only)

For Settlement Periods where valid actual consumption data is available the data shall be used. For other Settlement Periods where daily DA values and register consumption data are unavailable and the most recent actual settlement data is a period covered by actual Meter register advances the SDS shall calculate the UTC Period data using the Daily Estimated Advance (DAE) defined above and the load shape and load shape rolling total from the LSS. This estimate shall be store as type ""E7""

Calculation for UTC Period j on UTC Date D and using DAE (PMA) for the most recent PMA period N and $LS_ROLL_TOT_D$ is the Load shape 7 day rolling total:

$$UTCP_{Dj} = LSPV_{Dj} / LS_ROLL_TOT_D * (DAE_N * 7)$$

Where the Meter is a non-smart Meter that has switched load, or a Domestic Import MSID Consent Granularity \leq 'H' and the SDS has received an IF / PUB-024 'Supplier Advisory Notification to Data Service' notifying the Peak and Off-Peak proportions, the SDS shall calculate the DAE (DAE_OFF) to the off-peak Period defined for the Load Shape Category (Off-Peak or Low) UTC Period and the DAE (DAE_PEAK) from the non-smart Meter Data or by applying the proportions, notified by the Supplier, where a Smart DA is unavailable. The SDS allocates the DAE (DAE_OFF) to the off-peak Period defined for the Load Shape Category (Off-Peak or Low) UTC Period and the DAE (DAE_PEAK) to the Normal (Peak or Normal) UTC Periods as follows:

Calculation for UTC Period j on UTC Date D and using DAE (PMA) N where $LS_ROLL_OFF_D$ is the Load shape 7 day rolling off-peak total and $LS_ROLL_PEAK_D$ is the Load shape 7 day rolling peak total :

$$UTCP_OFF_D = LSPV_{Dj} / LS_ROLL_OFF_D * (DAE_{N_OFF} * 7) \text{ for } j \text{ in Off-peak period}$$

AND

$$UTCP_PEAK_{Dj} = LSPV_{Dj} / LS_ROLL_PEAK_D * (DAE_{N_PEAK} * 7) \text{ for } j \text{ in Peak period}$$

Method 8: SDS estimates using an Annual Consumption (AC) or a Supplier Nominated Annual Consumption (SNAC)

Where only an Annual Consumption value, or Supplier Nominated Annual Consumption (AC_Y) provided on the IF/PUB-024 for a year Y is available then the SDS shall process the data as follows and store these records as "E8":

Where a year of Load Shape Totals (LS_TOT_Y) are available then the calculation for UTC Period j on UTC Date D is as follows:

$$UTCP_{Dj} = LSPV_{Dj} / (LS_TOT_Y) * AC_Y$$

OR

Where less than a year of Load Shape Totals are available then the SDS shall use the Annual Consumption (AC_Y) to calculate a DAE for the Settlement Date D :

$$DAE_D = AC_Y / 365$$

Then the calculation for UTC Period j on UTC Date D is as follows:

$$UTCP_{Dj} = LSPV_{Dj} / LS_ROLL_TOT_D * (DAE_D * 7)$$

Method 9: SDS estimates where no Meter data or Daily Advance Estimate (DAE) is available (Import Only)

Where there is no previous data is available the SDS shall use the appropriate load shape. This data will be recorded as "E9".

Calculation for UTC Period j on UTC Date D :

$$UTCP_{Dj} = LSPV_{Dj}$$

Method 10: SDS estimates Export where no UTC Period Level Consumption for a UTC date or Meter Advance spanning the UTC date is available)

Where there is no UTC Period Consumption for export and a Meter Advance that spans the UTC date cannot be calculated. The SDS shall estimate the data as zero. This data will be recorded as "ZE1"

Calculation for UTC Period j on UTC Date D :

$$UTCP_{Dj} = 0$$

Method 11. Estimation for Long Term Vacant Sites

Where the Supplier has notified a Flag to identify that a Site is LTV and in cases where no access to consumption data is available, then in the presence of this flag the SDS will estimate zero. This data will be recorded as “ZE2” and the estimation reason code ‘LTV’ should identify it as LTV.

$$UTCP_{Dj} = 0$$

Method 12. Estimation where a Site where Supply is disabled

Where the Supplier has notified a Flag to identify a Site where the supply is disabled [smart Meters] and in cases where no access to consumption data is possible, then in the presence of this flag the SDS will estimate zero. This data will be recorded as “ZE3” and estimation reason code set as ‘Disabled’ to identify that the supply is disabled.

$$UTCP_{Dj} = 0$$

Method 13. Estimation for a Site where Supply is de-energised

In the absence of Actual data recovered from the Smart Meter or an absence of Advanced Meter Reading received from the MRS or Supplier, no submission to settlements is required in these circumstance (ie. there is no need to submit zero estimated consumption for de-energised MSIDs).

Deeming Reads on Change of Supplier (CoS) or Change of Data Service by outgoing SDS

For import where there is a Change of Supplier (CoS) and no cumulative total CoS reading (or Peak and Off-Peak readings) is available the outgoing SDS shall estimate a deemed Meter Reading(s) by calculating a DAE from a previous PMA (where available) and extrapolating from the last Meter Reading for the MSID until the CoS date using Method 7 above.

For export the last available meter reading shall be deemed to be valid.

The deemed reading shall be provided to the incoming SDS and the Supplier using the D0010 or IF/PUB-041 as appropriate.

Deeming Reads on Change of Supplier (CoS) by incoming SDS

For import where there is a CoS and no CoS reading is available, from the outgoing SDS, the incoming SDS shall estimate a deemed Meter Reading(s) by calculating a DAE following the first PMA calculated for the Site and extrapolating backwards from the first Meter Reading collected by the incoming SDS for the MSID back until the CoS date using Method 7 above. This reading shall be used for estimation where UTCP Period Level data is unavailable.

For export the first available meter reading shall be deemed to be valid.

The deemed reading shall be provided to the outgoing SDS and the Supplier using the IF/PUB-041.

Back-Stop Readings. The SDS shall calculate back-stop readings where required

1. Change of metering: As a 'back-stop' in situations where no reading(s) are provided alongside the change in metering, the SDS shall, after 5wd, generate an estimated reading(s) for the Date of the Removal of the previous meter(s) using the most appropriate method above. Any newly installed meter shall be assumed to have been installed with an index position of Zero.
2. Change of energisation: As a 'back-stop' in situations where no reading(s) are provided alongside the change in Energisation Status, the SDS shall where required, by 5wd, generate an estimated reading(s) for the Date of the Change of Energisation Status (reflecting the nature of the Energisation Change) using the most appropriate method above.

Estimation Reason Codes

The following are the initial set out Estimation Reason Codes to Estimated Methods:

Estimation Reason Code	Commentary	Estimation Methods
Opt Out	The customer has Opted Out of providing HH Data for Settlement (Consent Granularity <>H)	Any estimation Methods where the MSID has a Consent Granularity <>H
Missing	The data is missing	Methods 1 & 2 where periods are missing. Method 9 where no data is available.
Invalid	The data failed validation	Any estimation Method used where actual data had been collected but failed validation.
Comms. Fault	There is a communications fault with the smart Meter	Any estimation Method where the SDS (MDR) is unable to contact a smart Meter or aware of an issue via the Supplier
De-Energised	The Metering System is de-energised	Method A or Method 1 where actual data appears on Meter where registration data says it is de-energised
LTV	The Supplier has flagged the Metering System as Long Term Vacant	Method 11

Disabled	The Supplier has flagged the Metering System as remotely disabled	Method 12
Consumption Amendment	The Supplier has provided adjusted Settlement data	Method 0
Non-Smart	The meter is non-smart so has to be estimated	Method 6

4.9. Site Checks of SVA Metering System - Site Visit Report

The following checks shall be carried out by the SDS when visiting the site of an SVA Metering System:

1. Any changes to site which could affect the Load Shape Category registered in SMRS
2. Energisation Status (i.e. on/off)
3. Number of Maximum Demand Register Resets where appropriate
4. Zero reading on a Maximum Demand Register, if fitted
5. Whether the Maximum Demand Register is on full scale, if fitted
6. Any evidence of suspected faults to the SVA Metering System
7. Any evidence of damage to LDSO equipment
8. Whether any timeswitch is set to the incorrect time
9. Evidence of tampering with the SVA Metering System or LDSO equipment, particularly seals
10. Evidence of stopped meters (particularly zero advance on occupied premises)
11. Evidence of supply being taken when the meters are de-energised
12. That the time and date shown on the Meter are correct