WP195 – Capacity Market and CFD Metered Data

EMRS Working Practice

Public

Table of Contents

Change Amendment Record

Version	Date	Description
1.0	9 Oct 2015	Go Live version
2.0	6 Oct 2016	Clarification of format added to Appendix 2
3.0	16 Nov 2016	Updates to clarify frequency of data submission
4.0	6 Dec 2017	Transfer to new template
5.0	17 October 2018	Addition of Storage baseline data requirements
6.0	4 February 2019	Addition of Apportioned Metering, Addition of CSV file encoding requirement

1. Introduction

Capacity Providers and CFD Generators have to submit Metered Volumes to the Settlement Services Provider (SSP). EMR Settlement Ltd (EMRS) has been appointed the SSP for both the Capacity Market (CM) and Contracts for Difference (CFD).

1.1 Scope and Purpose

The purpose of this document is to define the methods that Metered Volumes will be submitted to EMRS.

1.2 Main Users and Responsibilities

Table 1: Main Users and Responsibilities

Role	Responsibilities
Capacity Provider	To ensure Metered Volumes are submitted to EMRS
CFD Generator	To ensure Metered Volumes are submitted to EMRS
Data Collector (DC)	A data collector appointed by the CFD Generator or Capacity Provider to fulfil the requirement to submit Metered Volumes to EMRS
Electricity Settlements Company (ESC)	To appoint a Settlement Services Provider and receive / act on Meter fault reports
EMR Settlement Ltd (EMRS)	To receive Metered Volumes and load them into the EMR Settlement System
Low Carbon Contracts Company (LCCC)	To appoint a Settlement Services Provider and receive / act on Meter fault reports

1.3 Associated Documents

This working practice should be read in conjunction with the following documents:

Document
Electricity Capacity Regulations 2014[1] and all subsequent amendments
Capacity Market Rules 2014[2] and all subsequent amendments
CFD Standard Terms and Conditions and all subsequent amendments
CFD Agreement and all subsequent amendments
Private Network CFD Agreement and all subsequent amendments
BSCP01 - Overview of Trading Arrangements[3]
BSCP503 - Half Hourly Data Aggregation for SVA Metering Systems Registered in SMRS[3]
EMR Working Practice – WP197 Capacity Market Metering Test[4]
EMR Working Practice – WP22 Contracts for Difference Settlement Required Information[4]
EMR Working Practice – WP01 Overview of EMR Settlement[4]

---

[1] http://www.legislation.gov.uk/uksi/2014/2043/contents/made
[2] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/340046/capacity_market_rules.pdf
[3] https://www.elexon.co.uk/bsc-related-documents/related-documents/bscps/
[4] https://emrsettlement.co.uk/publications/working-practices/

2. Required Supplier Information

2.1 Metering Pathways

There are a number of metering pathways that can be followed to submit Metered Volumes, dependant on the circumstances of the metering installation and whether they are part of the CM or have a CFD.

EMRS can receive metered volumes from a number of sources:

- Balancing and Settlement Code Company (BSCCo);
- Half Hourly Data Aggregators (HHDA); and
- Self-submission by the CFD Generator or the Capacity Provider or their appointed data collector (DC).

Table 2 below shows the metering pathways available to CFD Generators and Capacity Providers.

Table 2: Metering Pathways

Policy	Metering Configuration Solution	Metering Pathway	Responsible for Data Submission	Data Collection and Submission	Submission Method
CM	BMU	BMU	Capacity Provider	CDCA; SAA	EMRS receive all metered volumes from SAA.
CM	Supplier Settlement	HHDA	Capacity Provider	Supplier appointed Half Hourly Data Collector (HHDC) and HHDA	Capacity Provider informs supplier they are participating in Capacity Market and supplier instructs HHDA (D0354) to send data flow (D0357)[5] to EMRS.
CM	Bespoke or Balancing Services[6]	DC or self-submission	Capacity Provider	Capacity Provider or their appointed data collector	Capacity Provider or their appointed data collector submits metered data to EMRS in the

[5] Information on these flows may be found on the Master Registration Agreement Service Company website http://dtc.mrasco.com/Default.aspx

[6] This Metering Pathway is only an option if a Capacity Provider has existing balancing services metering.

Policy	Metering Configuration Solution	Metering Pathway	Responsible for Data Submission	Data Collection and Submission	Submission Method
					defined file format.
CFD	BMU	BMU	CFD Generator	CDCA; SAA	EMRS receive all metered volumes from SAA
CFD	Supplier Settlement	Additional BMUs	CFD Generator	Supplier appointed HHDC and HHDA; SAA	CFD Generator must request a BMU from a supplier or EMRS. Then EMRS will receive metered volumes from SAA.
CFD	Private Wire (Network)	DC or self-submission	CFD Generator	CFD Generator or their appointed data collector	CFD Generator[7] submits metered data to EMRS in the defined file format.

2.2   BMU Metering Pathway

For Central Meter Registration Service (CMRS) registered sites Metered Volumes will be submitted as per the BSC processes and will not be discussed in this working practice. For more information refer to BSCP01 - Overview of Trading Arrangements[8], and how they relate to EMR Settlement in WP01 - Overview of EMR Settlement[9].

The SAA will send the Metered Volumes for all BMUs into a file that is sent via Secure File Transfer Protocol (SFTP) to EMRS. The EMRS system will pick out the relevant Metered Volumes for BMUs participating in CM or CFD. The half hourly data will be in MWh (three decimal places) and in clock time.

2.3   Additional BMU Metering Pathway

For CFD only, Supplier Meter Registration Service (SMRS) CFD Generators MPAN has to be associated with an Additional BMU (A.BMU) to allow Metered Volumes for an individual CFD Generator to be extracted from the Suppliers Base BMU. This process is not discussed in this guidance; for more information refer to Registration of BM Units for EMR[10].

---

[7] The generator can have their appointed DC submit the data to EMRS if this has been agreed with LCCC
[8] https://www.elexon.co.uk/bsc-related-documents/related-documents/bscps/
[9] https://emrsettlement.co.uk/publications/working-practices/
[10] https://www.elexon.co.uk/bsc-related-documents/bsc-guidance-notes/

A.BMU Metering pathways will submit Metered Volumes as per the BSC processes and will not be discussed in this guidance. For more information refer to BSCP01 - Overview of Trading Arrangements[11] and how they relate to EMR Settlement in WP01 - Overview of EMR Settlement[12].

As with BMUs the SAA has been configured to output the metered volumes for all Additional BMUs into a file that is sent via SFTP to EMRS. The EMRS system will pick out the relevant Metered Volumes for the Additional BMUs participating in CFD. The half hourly data will be in MWh (three decimal places) and in clock time.

2.4 HHDA Metering Pathway

For SMRS registered sites in CM only, the Capacity Provider can use a HHDA to submit Metered Volumes to EMRS. The process is defined in BSCP50311 - Half Hourly Data Aggregation for SVA Metering Systems Registered in SMRS.

In a SMRS registered site the Capacity Market Unit (CMU) can use the existing Half Hourly Meter used for settlement, as long as this only comprises assets related to the CMU, to determine the Metered Volumes for the CMU.

The Capacity Provider must inform their appointed Supplier that they require their metered volumes to be used in the Capacity Market. This supplier will inform the appointed HHDA to provide Metered Volumes to EMRS.

The Metered Volumes will be downloaded by the appointed HHDC who will pass them on to the appointed HHDA. The HHDA will submit the metered volumes to EMRS.

This process will use four data flows in the Data Transfer Catalogue (DTC) to achieve this. These new data flows are:

- D0354 – Supplier notification to HHDA of Metering Systems to be reported in relation to the Capacity Market (To be used for both initial notification and for updates, including end dating the instruction);

- D0355 – HHDA uses to notify a Supplier that their Capacity Market Reporting Notification has been accepted, including verification of the notification;

- D0356 – HHDA uses to notify a Supplier that their Capacity Market Reporting Notification has been rejected, giving the reason for rejection; and

- D0357 – HHDA uses to send half hourly metered data for use by the CM SSP (EMRS) in calculating CM data.
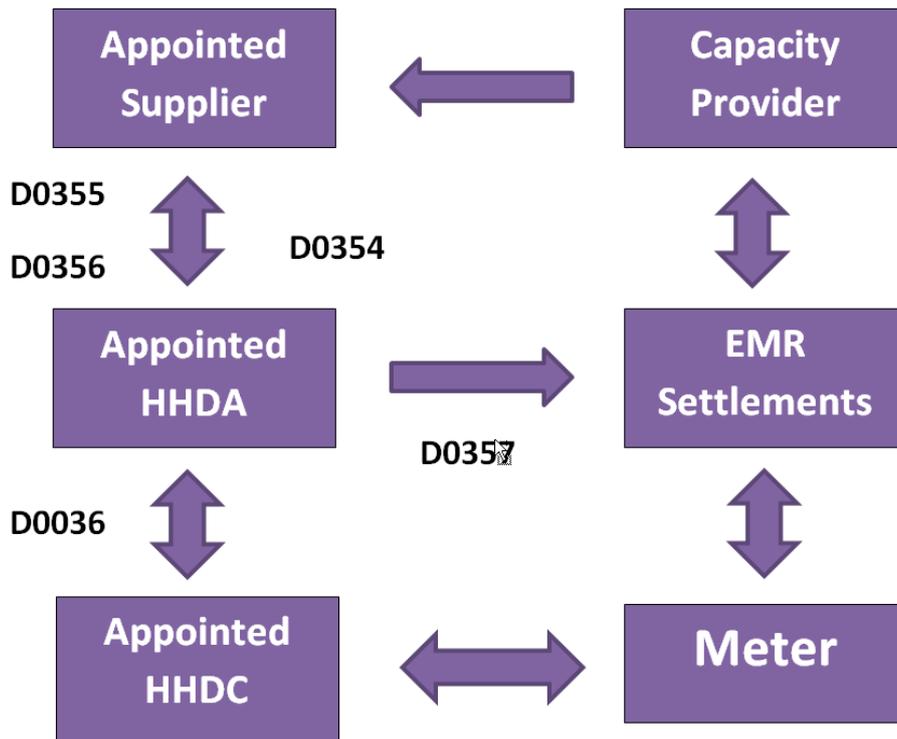

Figure 1: Data flows created to enable HHDA Metering Pathway

The half hourly data sent by the HHDA will be in kWh (one decimal place) and in clock time.

If a Capacity Provider is Aggregating CMUs the HHDA will send the D0357 flow for each component in the CMU and the EMR Settlement system will perform the aggregation.

2.5 DC Metering Pathway

An existing Balancing Services Capacity Provider (if they are using a Half Hourly Meter), a Capacity Provider using a Bespoke Metering Configuration Solution and a CFD Generator operating on a Private Network can submit metered volumes by using a DC.

The DC can download the Metered Volumes and perform a main and check comparison of the half hourly data[13]. Only the main Meter data should be provided to EMRS using a CSV defined file format (Appendix 2) uploaded via SFTP. The requirements of the CSV file are defined in Appendix 1. In CFD the CFD Generator has to have prior agreement with the LCCC for the DC to submit data directly. This should be done through the contract manager at LCCC.

If the main Meter data is incorrect due to a fault the check Meter data will be submitted to EMRS. The DC shall inform the Capacity Provider / CFD Generator of the fault and it is the responsibility of the Capacity Provider / CFD Generator to inform ESC / LCCC of the metering fault.

---

[13] The main and check data comparison is not applicable where a Capacity Provider is not using a Half Hourly Meter (existing Balancing Services) or is Aggregating sites with a demand less than 1MW and does not require a check Meter.

The half hourly data sent by the DC will be in kWh (one decimal place) and in clock time. The method to deal with clock change days is described in Appendix 1 and an example is provided in Appendix 7 Clock Change.

An existing Balancing Services Capacity Provider (if they are not using a Half Hourly Meter) can use their own data collection system (Instation) to collect information from the Metering System and convert it into the required Settlement Period CSV format for submission to EMRS. This has to be an automated process to comply with this metering pathway.

Refer to Appendices 3 to 7 for examples using the CSV file.

2.6 Self-Submission Metering Pathway

An existing Balancing Services Capacity Provider, a Capacity Provider using a Bespoke Metering Configuration Solution and a CFD Generator operating on a Private Network can submit Metered Volumes by self-submission (this can include a manual process).

The Capacity Provider / CFD Generator can download the Metered Volumes and perform a main and check comparison of the half hourly data[14]. Only the main Meter data should be provided to EMRS using a CSV defined file format (Appendix 2) uploaded via SFTP. The requirements of the CSV file are defined in Appendix 1.

If the main Meter data is incorrect due to a fault the check Meter data will be submitted to EMRS. It is the responsibility of the Capacity Provider / CFD Generator to inform ESC / LCCC of the metering fault.

The half hourly data sent by the Capacity Provider / CFD Generator will be in kWh (one decimal place) and in clock time. The method to deal with clock change days is described in Appendix 1 and an example is provided in Appendix 7 Clock Change.

Refer to Appendices 3 to 7 for examples using the CSV file.

Table 3 gives an overview of the frequency of EMR data submission for CM and CFD required for EMR Settlement:

Table 3: Frequency of EMR Data Submission

Type	Metering Pathway	Capacity Market	Contracts for Difference
CMRS	BMU	In accordance with SAA timetable	In accordance with SAA timetable
SMRS	Additional BMU	N/A	In accordance with SAA timetable

---

[14] The main and check data comparison is not applicable where a Capacity Provider is not using a Half Hourly Meter (existing Balancing Services) or is Aggregating sites with a demand less than 1MW and does not require a check Meter.

Type	Metering Pathway	Capacity Market	Contracts for Difference
SMRS	HHDA	In accordance with SAA timetable	N/A
Existing Balancing Services	DC	At least weekly	N/A
	Self-Submission	At least weekly	N/A
Private Network / Bespoke	DC	At least weekly	14:00 on the fifth Working Day following relevant Settlement Day[15]
	Self-Submission	At least weekly	14:00 on the fifth Working Day following relevant Settlement Day[15]

For CFD Generators and Capacity Providers not using BSC process for submission of Metered Volumes, section 4.1.6 and 4.2.6 specifies the frequency of data submission.

2.7 CM data submission

Metered volumes are primarily used if a System Stress Event occurs during a Capacity Market Warning. They are also used for DSR reports, Baseline Demand calculations, monitoring or if requested by ESC. The latter could be for test purposes, for example demonstrating satisfactory performance. This data must be submitted to EMRS no later than 9 Working Days after the end of the month in which the relevant Settlement Period occurs.

However, **EMRS strongly advises and requests that data is submitted at least weekly and ideally daily.** This approach is advised so that the process of sending metered data becomes an embedded process ensuring that the data is available for settlement calculations, monitoring and allows some time to rectify any issues, for example if the submission is not compliant with the CSV format or there is missing data.

Meter volumes are used to carry out settlement calculations after a Stress Event. These calculations only happen once and use the best data we have available at the time. This means if inaccurate, estimated or no data has been submitted then this is what will be used in the settlement calculations. Where no metered data has been submitted the worst presumed position is used in the calculations.

---

[15] The CFD Generator has to have prior agreement with the LCCC for the DC to submit data directly to EMRS. This should be done through the contract manager at LCCC. The submission deadline given here allows some time to resolve any incidents with the submission. The contractual deadline is 14.00 on the sixth Working Day following relevant Settlement Day

If metered data required is missing then you will be considered to be in Data Default where your payments, such as monthly Capacity Payments, will be suspended until you provide the missing data. Providing the missing data will bring you out of data default and your payments will resume, but it will not rectify settlement calculations already carried out.

The Capacity Provider is responsible for arranging the submission of data. You should **look to provide metered data from the first day of the relevant Delivery Year. However, if you have Demand Side Response (DSR) or Storage CMUs you should submit data from at least six weeks prior to the start of the Delivery Year.** This is to provide data for DSR and Storage Baseline calculations and monitoring checks[16].

Additionally, if you have DSR CMU(s) you may need to obtain a DSR Test Certificate[17] from the CM Delivery Body. This requires relevant Capacity Providers to provide six weeks worth of metered data to EMRS, typically by the end of August. More details on obtaining a DSR Test Certificate can be found on the CM Delivery Body website[18].

The CM Rules ask:

> For a Generating CMU it is only Relevant Settlement Periods in which a System Stress Event has occurred during a Capacity Market Warning that are required to be submitted.
>
> For a DSR CMU it is:
>
> - each relevant Settlement Period;
>
> - each Settlement Period which is used for baselining or capability testing, and the Settlement Period immediately before and immediately after each such Settlement Period or which is used for de-rating; and
>
> - such other Settlement Periods as ESC may request.
>
> For a Generating Unit that constitutes a storage facility it is:
>
> - each relevant Settlement Period;
>
> - each Settlement Period which is used for baselining or capability testing, and the Settlement Period immediately before and immediately after each such Settlement Period or which is used for de-rating; and
>
> - such other Settlement Periods as ESC may request.

However, you must submit metered volumes on a Settlement Day Basis i.e. any file submitted must be for a complete Settlement Day and not just Settlement Periods within a Settlement Day.

---

[16] See the Capacity Market Rules Schedule 2 Section 3 for Baseline Calculations and Section 4 for monitoring
[17] See the Capacity Market Rules Section 13.2
[18] https://www.emrdeliverybody.com/cm/home.aspx
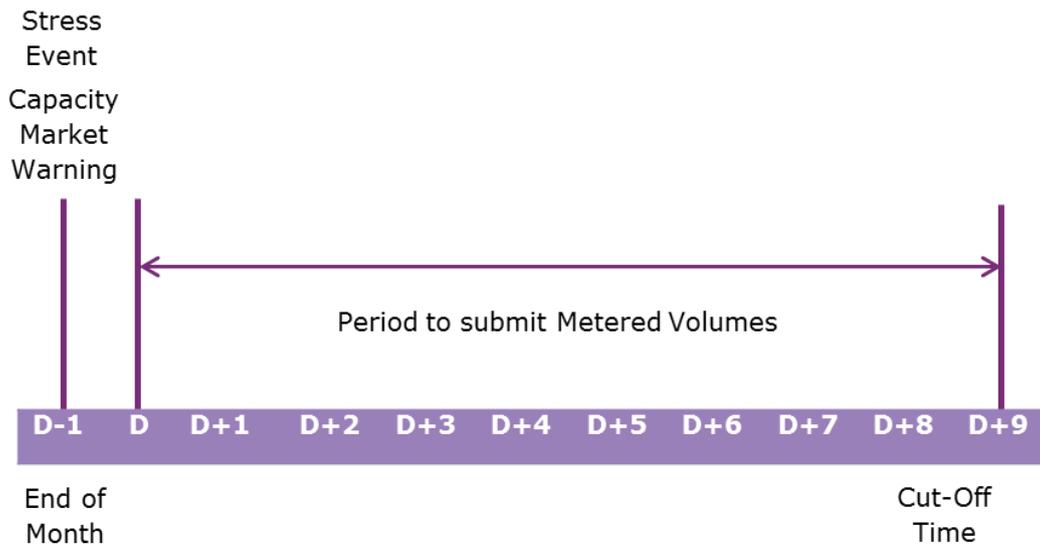
This process is illustrated in Figure 2.

Figure 2: Capacity Provider metered volumes submission timeline

2.8   CFD data submission

The CFD Generator is responsible for submitting data to EMRS. For a CFD Generator operating on a Private Network data will be submitted by the CFD Generator in the previously described CSV format.

The provision of metered volumes to EMRS has to be completed by the Metered Output Cut-Off Time; where the Metered Output Cut-Off Time means, in relation to each Billing Period, 14:00 on the sixth Working Day following such Billing Period. In this instance the Billing Period is equivalent to a Settlement Day; means the period from 00:00 hours to 24:00 hours on each day.

However, **EMRS strongly advises and requests that data is submitted by 14.00 on the fifth Working Day.** This aligns the submission timeline to the BSC and allows some time to rectify any issues, for example if the submission is not compliant with the CSV format or there is missing data.

If the metered volumes have not been received by the Metered Output Cut-Off Time the estimation process will be used. This technique varies depending on the circumstances of the CFD Generator, e.g. Baseload or Intermittent and whether it is subject to the BSC or the Private Network Agreement. This process will be conducted by EMRS as per the rules in the relevant CFD Agreement.

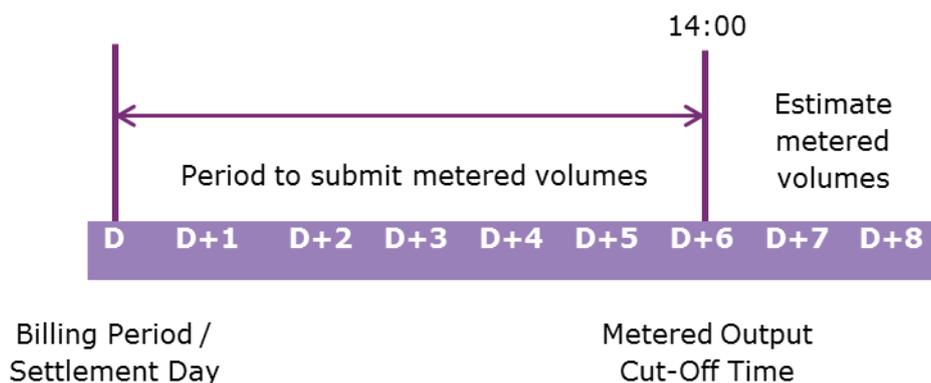This process is illustrated in Figure 3.

Figure 3: CFD Generator metered volumes Submission Timeline

If metered volumes are subsequently made available to EMRS for estimated periods the recalculation process will be conducted by EMRS as per the rules in the relevant CFD Agreement.

The reference to the conditions is the same whether the CFD Agreement is the standard terms and conditions or the Private Network Agreement. However the method of estimation and recalculation differs in the two Agreements.

Apportioned Metering

If your site is and Offshore Wind site built in multiple phases, it must meet the requirements of either a Single Metering or Apportioned Metering Phasing Agreement. The net Metered Volume is recorded for the whole project (i.e. all phases) and is achieved via one central metering point. The total Metered Volume from the central point is then apportioned to each individual phase based on the sum of the Turbine Installed Capacity of the Active Turbines of that phase.

The CFD Generator must submit the Scheme Name to the EMRS Metering team, to enable the Aggregation Rule to be created for each phase of the project. The CFD Generator must then complete the Settlement Required Information check with EMRS. Once the check has been completed an SFTP account will be set up for you by EMRS.

The CFD Generator must submit an encrypted Apportioned Metering Data Interface File in the format specified in Appendix 8 via SFTP to EMRS daily from the Generator's Confirmed Start Date. The file related to the Settlement Date must be submitted no later than one working day after the Settlement Date. This is stated in *10.1 CFD (Phase 1) (Apportioned) Agreement*.

3.   Interface and Timetable Information

Metering pathways that are BMU, A.BMU and HHDA will submit Metered Volumes as per the BSC processes and will not be discussed in this working practice. For more information refer to BSCP01 - Overview of Trading Arrangements, BSCP503 - Half Hourly Data Aggregation for SVA Metering Systems Registered in SMRS19 and how they relate to EMR Settlement in WP01 - Overview of EMR Settlement[19].

This working practice will focus on self-submission by the CFD Generator and the Capacity Provider; or their appointed data collector.

3.1   Self-Submission by a CFD Generator

The process is for self-submission of Metered Volumes by the CFD Generator, or their appointed Data Collector. Both parties will be referred to as Generator in the process.

Ref	Condition	When	Action	From	To	Input Information Required	Method
3.1.1		As soon as reasonably practicable after a Settlement Day and by 4 WD after the Settlement Day	Collect Metered Volume from all meters related to the Facility Metering Equipment	Generator		Meter Technical Details ("Key Meter Details")	Internal Process

---

[19] https://www.elexon.co.uk/bsc-related-documents/related-documents/bscps/

Ref	Condition	When	Action	From	To	Input Information Required	Method
3.1.2		Same WD as 3.1.1	Perform Main / Check Metered Volume Comparison Check and check for metering alarms If passed and no alarms continue to 3.1.5 If failed continue to 3.1.3 If any alarms continue to 3.1.3	Generator		Metered Volumes	Internal Process
3.1.3	Private Network 31.5	Following 3.1.2 and same WD as 3.1.1	Report fault to LCCC & EMRS	Generator	LCCC EMRS	Nature of fault, date and time it occurred and any impact of the fault on previously submitted Metered Volumes	Email
3.1.4		Following 3.1.2 and same WD as 3.1.1	Create CSV file for Metered Volumes (use Metered Volumes of Main Meter or if there is an issue with the Main Meter use the Check Meter Metered Volumes)	Generator		Metered Volumes (CSV format requirements in Appendix 1 & 2)	Internal Process

Ref	Condition	When	Action	From	To	Input Information Required	Method
3.1.5		Following 3.1.4 and within 1 WD and by 14.00 on 5th WD or no later than 14:00 on the 6th WD after the Settlement Day ("Metered Output Cut-Off Time")	Submit Metered Volumes CSV file	Generator	EMRS	CSV file - Metered Volumes	SFTP
3.1.6		Following 3.1.5	Load Metered Volumes **END PROCESS**	EMRS		CSV file - Metered Volumes	Internal Process

3.2   Self-Submission by a Capacity Provider

The process is for self-submission of Metered Volumes by the Capacity Provider, or their appointed Data Collector. Both parties will be referred to as Capacity Provider in the process.

Ref	Rule or Regulation	When	Action	From	To	Input Information Required	Method
	Rule 14.5.1 & 14.5.2	Weekly or ad-hoc when missing data identified	Request to Capacity Provider to submit missing data	EMRS	Capacity Providers		Email/Telephone Call
3.2.1		At least weekly	Collect Metered Volume from all meters related to the CMU Components	Capacity Provider		Meter Technical Details ("Key Meter Details")	Internal Process
3.2.2		Same WD as 3.2.1	Where applicable; Perform Main / Check Metered Volume Comparison Check and check for metering alarms If passed and no alarms continue to 3.2.5 If failed continue to 3.2.3 If any alarms continue to 3.2.3	DC		Metered Volumes	Internal Process

Ref	Rule or Regulation	When	Action	From	To	Input Information Required	Method
3.2.3		Following 3.2.2 and same WD as 3.2.1	Report fault to ESC & EMRS	Capacity Provider	ESC EMRS	Nature of fault, date and time it occurred and any impact of the fault on previously submitted Metered Volumes	Email
3.2.4		Following 3.2.2 and same WD as 3.2.1	Create CSV file for Metered Volumes (use Metered Volumes of Main Meter or if there is an issue with the Main Meter use the Check Meter Metered Volumes)	Capacity Provider		Metered Volumes (CSV format requirements in Appendix 1 & 2)	Internal Process
3.2.5	Rule 14.5.5	Following 3.2.4 and by 9 WD after the end of month Stress Event Occur.	Submit Metered Volumes CSV file **END PROCESS**	Capacity Provider	EMRS	CSV file - Metered Volumes	SFTP

4. Contact Information

For all queries please contact:

Contact Organisation	Contact
EMR Settlement Ltd	Telephone: 020 7380 4333 Email: contact@emrsettlement.co.uk

5. Acronyms and Definitions

A list of acronyms and definitions can be found in the 'Acronyms and Definition' document on the EMRS website[20].

---

6.   Appendices

6.1   Appendix 1 CSV File Requirements

The defined format for the Self-Submission Metering Pathway CSV file may be found in Appendix 2. Refer to Appendices 3 to 7 for examples of the CSV file.

Metered Volumes must be sent for each Settlement Day in the same file, and each file can contain more than one Settlement Day. For example if the downloads are not taken at weekends and three days are submitted on a Monday.

Where Metered Volume data is from multiple meters this can be submitted on one CSV file.

The format of the CSV file has to use piped delimiters and not commas for it to be accepted by the EMR settlement system. If the CSV file is to be created using MS Excel the default list separator in Windows will have to be changed using the method described below:

i)   Go to Control Panel;

ii)   Select Region and Language;

iii)   Select Additional Settings;

iv)   Change the comma (,) to a pipe (|) character in List Separator box; and

v)   Press Apply and then ok.

When the file is generated in Excel it should be saved as type CSV (comma delimited). Open the newly created file with Notepad or WordPad (right click on file and select open with either program). On the last line (END|##||) remove the unnecessary pipes at the end of the line and save the file, ensuring that the encoding is either ASCII or UTF-8.

There are two options for the submission of Metered Volumes using this CSV format:

i)   Net Active Energy – for each Settlement Period the Net Active Energy is calculated by subtracting Active Import from the Active Export; and

ii)   Active Import & Active Export – separate data for Active Import and Active Export Energy. EMRS will combine the data and convert to Net Active Energy.

The method of data submission must be provided to EMRS (this will include whether the file is Net Active Energy or Active Import & Active Export) so that the file information (e.g. meter serial numbers) can be linked to the correct CFD Generator / Capacity Provider and the associated Aggregation Rule.

This will be provided as part of WP197- the CFD Settlement Required Information process[21] and WP198 - the Capacity Market Metering Test[21] for Bespoke or Balancing Services Metering

---

[21] https://emrsettlement.co.uk/publications/working-practices/

Configuration Solution CMUs. During this process the CSV filename and Metered Entity Identifier will be agreed with EMRS. A procedure must be in place to create the CSV file and submit it.

If the Active Energy has been aggregated in the CSV file the convention is that an Export value is positive (+ve) and an Import value is negative (-ve). The formula is Active Export (AE) minus Active Import (AI), so in a Settlement Period where the prevailing load direction switches from Import to Export and AI is 27.5 kWh and AE is 398.2 kWh the net value would be 398.2 – 27.5 = 370.7 kWh.

If the Active Energy has not been aggregated and there is a separate CSV file for AI and AE the same convention as in aggregation must be followed. This is to allow AI to be identified by a negative (-ve) and AE as a positive (+ve). The aggregation rule to get net Active Energy (AE + AI), where AI is a negative number, will give the correct result.

So if the AI was 27.5 kWh for a Settlement Period this would be reported as -27.5 in the CSV file. If there is AE in the same Settlement Period due to the prevailing load direction reversing and this was 398.2 kWh it would be reported as 398.2 kWh in the CSV file. The EMR Settlement System would then apply the aggregation rule to get net Active Energy.

So in this instance Net Active Energy is (AE + AI) = (398.2 + (-27.5)) = 370.7 kWh.

The Half Hourly data sent by the Capacity Provider or CFD Generator will be in kWh (one decimal place) and in clock time.

6.1.1 Filename

The naming convention for the CSV filename and the Metered Entity Identifier within it has to be unique for each Meter associated with each CFD Generator or CMU. This will have been agreed with EMRS prior to Metered Volume data being submitted, see format in Table 4.

Table 4: Naming Convention

Filename		Metered Entity Identifier	
Part 1	**Part 2**	**Part 1**	**Part 2**
CMU / CFD Sender Identifier (and if applicable for multiple components being submitted the Metered Entity Identifier as well)	Date of Submission	Metered Component Identifier (Meter Serial Number or CMU Component ID)	Data Format (e.g. AI, AE, Net)

The filename will consist of the identity of the sender and the date on which it has been submitted. For example if the sender was John Smith Wind Energy Ltd and the sender ID agreed with EMRS was JSWEL; and the date of submission was 5 April 2015; the filename for that data would be JSWEL_05_04_2015.CSV.

One CSV file can contain both the AI and AE Metered Volume for a day; this would only have one file header. The CSV file can contain multiple days of data but again would only have one file header.

To identify the Metered Volumes within the CSV file the Metered Entity Identifier should be a unique character set (up to a maximum of 18 alpha numeric characters). The CFD ID or CMU ID cannot be used in isolation as the unique identifier as this would not be unique as there may be multiple meters used by that CFD Generator or CMU to derive Metered Volume. The Meter serial number or CMU Component ID will be used as the unique reference in the Metered Entity Identifier.

Any Metered Entity Identifier chosen will also have to indicate whether the file of Metered Volume is net, AI or AE.

An example of the Metered Entity Identifier could be:

XY14Z12345NET00000   where XY14Z12345 is the serial number of the meter that the Metered Volumes are from and NET signify that the Metered Volumes are net Active Energy. The five zeroes have no significance and are used to fill the remaining characters (18 character field).

For existing Balancing Services CMUs where there is no physical Half Hourly Meter the Metered Entity Identifier would have to refer to the CMU Component that the Metered Volume is from. An example of the Metered Entity Identifier could be:

XYZ1234567NET00000   where XYZ1234567 is the reference number to identify the CMU Component that the Metered Volumes are from and NET signify that the Metered Volumes are net Active Energy. The five zeroes have no significance and are used to fill the remaining characters (18 character field).

6.1.2 Clock Change

Although the Meter is set to UTC (GMT) the data must be submitted in clock time (i.e. BST/GMT). On a day where there is a clock change there will not be 48 periods submitted for that day.

When the clocks go forward an hour on the last Sunday in March the time will switch from GMT to BST at 01:00 GMT. There are only 46 Settlement Periods on this day. It will begin as normal at 00:00 (GMT) and 00:30 (GMT) respectively. At 01:00 (GMT), the clocks will change to BST so instead of Settlement Period three beginning at 01:00 (GMT), it will begin at 02:00 (BST). Settlement Period four will begin at 02:30 (BST) and so on until Settlement Period 46 begins at 23:30 (BST).

When the clocks go back an hour on the last Sunday in October the time will switch from BST to GMT at 01:00 GMT. There are 50 Settlement Periods on this day. It will begin as normal at 00.00 (BST), 00.30 (BST), 01.00 (BST) and 01.30 (BST) respectively. At 02.00 (BST), the clocks

will change to GMT so instead of Settlement Period five beginning at 02.00 (BST), Settlement Period five will begin at 01.00 (GMT). Settlement Period six will begin at 01.30 (GMT) and so on until Settlement Period 50 begins at 23.30 (GMT).

6.1.3 Main / Check Comparison

This test is only applicable to a Metering System that has a Main and Check Meter installed. The method of comparing the Main and Check Metered Volumes is to calculate the percentage difference for a half hour period and check it is less than 1.5 times the accuracy requirements of that prescribed for the individual Meters at full load.

For the Main and Check Metered Volume comparison check to be passed the following condition must be true:

$$\% \, Difference \left(\left(\frac{Main \; kWh - Check \; kWh}{Main \; kWh} \right) \times 100 \right) < (1.5 \times Meter \; Accuracy)$$

The accuracy limit of the Meters at full load and Unity Power factor can be found in the relevant Code of Practice (CoP), CFD Private Network Technical System Requirements or CM Bespoke Technical Requirements. For example in a CoP3 site the Meter accuracy limit at full load and Unity Power Factor for Active Energy is ±1.0%.

So if in a half hourly period the Main Meter recorded 357.6 kWh and the Check Meter recorded 357.5 kWh on a CoP3 site the formula would be:

$$\% \, Difference \left(\left(\frac{357.6 - 357.5}{357.6} \right) \times 100 \right) < (1.5 \times 1.0)$$

The % difference between the Main and Check Meter data would be 0.03% and this would be less than the maximum permissible difference of 1.5%.

This is done for every half hour period. Allowance shall be made for low load. All comparison test failures shall be investigated by the Capacity Provider or CFD Generator and reported to EMRS.

6.2 Appendix 2 CSV file format

The defined format for the Self-Submission Metering Pathway CSV file is the following:

HDR|<File Type>|<Sender (EMR ID)>|Timestamp (YYYYMMDDHHMISS) in UTC

MID|<Meter Identifier Type>|<Metered Entity Identifier>|<Settlement Date>

VAL|<Settlement Period>|<Actual/Estimated Flag>|<kWh energy value> Period 1

VAL|<Settlement Period>|<Actual/Estimated Flag>|<kWh energy value> Period 2

.

.

.

VAL|<Settlement Period>|<Actual/Estimated Flag>|<kWh energy value> Period 48

END|<Number of lines>

NOTE: There must be an additional carriage return at the bottom of the file (i.e. after END|<Number of lines>) to allow the file to be loaded.

Where,

HDR – File header (one record per file)

MID – Meter Identifier (one record per day and one meter identifier)

VAL – Half hour values (48 per day)

END – End file record with number of lines included

Meter Identifier Type – MSID

Metered Entity Identifier – Up to 18 characters

6.3   Appendix 3 CSV File Example

In this example the site is a CFD Generator operating on a Private Network that is intermittent (e.g. a wind farm). The sender EMR ID is ABCD1234, the Meter Identifier Type is MSID and the Metered Entity Identifier is either XY14Z12345NET00000 or XY14Z12345AE000000 and XY14Z12345AI000000 depending on the submission method.

All the data is actual data and is tagged as 'A'. If any of the data was estimated the applicable Settlement Periods would be tagged with an 'E'.

The timestamp when the file was created is 11th December 2014 at 12:15 GMT. The half hourly data is for the 10th December 2014.

The half hourly data recorded by the meter for the 10th December 2014 is in the Table 5 below. From Settlement Period 1 to Settlement Period 16 the prevailing direction of the load is Import due to the wind speed being low. In Settlement Period 17 the wind speed increases to change the prevailing load direction from Import to Export, in this period there is Active Import and Active Export recorded.

The wind speed remains high enough for the prevailing load to be Export until Settlement Period 30. During Settlement Period 31 the wind speed decreases to change the prevailing load direction from Export to Import, in this period there is Active Import and Active Export recorded.

From Settlement Period 32 to Settlement Period 40 the prevailing direction of the load is Import due to the wind speed being low. In Settlement Period 41 the wind speed increases to change the prevailing load direction from Import to Export, in this period there is Active Import and Active Export recorded.

The wind speed remains high enough for the prevailing load to be Export until Settlement Period 48, the end of the day.

Table 5: Example half-hourly meter data

Settlement Period	Active Import (kWh)	Active Export (kWh)	Net Active Energy (AE − AI) (kWh)
1	26.4	0.0	-26.4
2	25.9	0.0	-25.9
3	26.2	0.0	-26.2
4	26.1	0.0	-26.1
5	26.3	0.0	-26.3
6	25.9	0.0	-25.9
7	25.8	0.0	-25.8
8	26.0	0.0	-26.0
9	26.3	0.0	-26.3
10	26.2	0.0	-26.2
11	26.5	0.0	-26.5
12	26.1	0.0	-26.1
13	26.2	0.0	-26.2
14	25.7	0.0	-25.7
15	25.8	0.0	-25.8
16	26.1	0.0	-26.1
17	6.7	97.6	90.9
18	0.0	120.4	120.4
19	0.0	150.6	150.6
20	0.0	200.3	200.3

Settlement Period	Active Import (kWh)	Active Export (kWh)	Net Active Energy (AE − AI) (kWh)
21	0.0	276.4	276.4
22	0.0	350.8	350.8
23	0.0	320.6	320.6
24	0.0	300.4	300.4
25	0.0	310.5	310.5
26	0.0	281.2	281.2
27	0.0	243.1	243.1
28	0.0	169.7	169.7
29	0.0	100.9	100.9
30	0.0	87.7	87.7
31	9.4	43.3	33.9
32	24.9	0.0	-24.9
33	25.1	0.0	-25.1
34	26.2	0.0	-26.2
35	25.7	0.0	-25.7
36	25.9	0.0	-25.9
37	26.0	0.0	-26.0
38	26.3	0.0	-26.3
39	25.8	0.0.	-25.8
40	25.7	0.0	-25.7
41	13.2	57.6	44.4
42	0.0	85.4	85.4

Settlement Period	Active Import (kWh)	Active Export (kWh)	Net Active Energy (AE − AI) (kWh)
43	0.0	198.7	198.7
44	0.0	312.9	312.9
45	0.0	400.8	400.8
46	0.0	390.2	390.2
47	0.0	410.8	410.8
48	0.0	427.5	427.5

6.4 Appendix 4 Net Active Energy

From the metered data in the Table 5 the Net Active Energy can be calculated for each Settlement Period by subtracting the Active Import from the Active Export. Where the convention is that net Import is negative and net export is positive. The data is in kWh to one decimal place.

HDR|STEP001|ABCD1234|20141211121500

MID|MSID|XY14Z12345NET00000|20141210

VAL|1|A|-26.4

VAL|2|A|-25.9

VAL|3|A|-26.2

VAL|4|A|-26.1

VAL|5|A|-26.3

VAL|6|A|-25.9

VAL|7|A|-25.8

VAL|8|A|-26.0

VAL|9|A|-26.3

VAL|10|A|-26.2

VAL|11|A|-26.5

VAL|12|A|-26.1

VAL|13|A|-26.2

VAL|14|A|-25.7

VAL|15|A|-25.8

VAL|16|A|-26.1

VAL|17|A|90.9

VAL|18|A|120.4

VAL|19|A|150.6

VAL|20|A|200.3

VAL|21|A|276.4

VAL|22|A|350.8

VAL|23|A|320.6

VAL|24|A|300.4

VAL|25|A|310.5

VAL|26|A|281.2

VAL|27|A|243.1

VAL|28|A|169.7

VAL|29|A|100.9

VAL|30|A|87.7

VAL|31|A|33.9

VAL|32|A|-24.9

VAL|33|A|-25.1

VAL|34|A|-26.2

VAL|35|A|-25.7

VAL|36|A|-25.9

VAL|37|A|-26.0

VAL|38|A|-26.3

VAL|39|A|-25.8

VAL|40|A|-25.7

VAL|41|A|44.4

VAL|42|A|85.4

VAL|43|A|198.7

VAL|44|A|312.9

VAL|45|A|400.8

VAL|46|A|390.2

VAL|47|A|410.8

VAL|48|A|427.5

END|51

6.5   Appendix 5 Separate Active Import & Active Export

From the metered data in the Table 5 the CSV file can be populated for Active Import and Active Export. This is an example of a combined file for AE and AI data. The data is in kWh to one decimal place.

HDR|STEP001|ABCD1234|20141211121500

MID|MSID|XY14Z12345AE000000|20141210

VAL|1|A|0.0

VAL|2|A|0.0

VAL|3|A|0.0

VAL|4|A|0.0

VAL|5|A|0.0

VAL|6|A|0.0

VAL|7|A|0.0

VAL|8|A|0.0

VAL|9|A|0.0

VAL|10|A|0.0

VAL|11|A|0.0

VAL|12|A|0.0

VAL|13|A|0.0

VAL|14|A|0.0

VAL|15|A|0.0

VAL|16|A|0.0

VAL|17|A|97.6

VAL|18|A|120.4

VAL|19|A|150.6

VAL|20|A|200.3

VAL|21|A|276.4

VAL|22|A|350.8

VAL|23|A|320.6

VAL|24|A|300.4

VAL|25|A|310.5

VAL|26|A|281.2

VAL|27|A|243.1

VAL|28|A|169.7

VAL|29|A|100.9

VAL|30|A|87.7

VAL|31|A|43.3

VAL|32|A|0.0

VAL|33|A|0.0

VAL|34|A|0.0

VAL|35|A|0.0

VAL|36|A|0.0

VAL|37|A|0.0

VAL|38|A|0.0

VAL|39|A|0.0

VAL|40|A|0.0

VAL|41|A|57.6

VAL|42|A|85.4

VAL|43|A|198.7

VAL|44|A|312.9

VAL|45|A|400.8

VAL|46|A|390.2

VAL|47|A|410.8

VAL|48|A|427.5

MID|MSID|XY14Z12345AI000000|20141210

VAL|1|A|-26.4

VAL|2|A|-25.9

VAL|3|A|-26.2

VAL|4|A|-26.1

VAL|5|A|-26.3

VAL|6|A|-25.9

VAL|7|A|-25.8

VAL|8|A|-26.0

VAL|9|A|-26.3

VAL|10|A|-26.2

VAL|11|A|-26.5

VAL|12|A|-26.1

VAL|13|A|-26.2

VAL|14|A|-25.7

VAL|15|A|-25.8

VAL|16|A|-26.1

VAL|17|A|-6.7

VAL|18|A|0.0

VAL|19|A|0.0

VAL|20|A|0.0

VAL|21|A|0.0

VAL|22|A|0.0

VAL|23|A|0.0

VAL|24|A|0.0

VAL|25|A|0.0

VAL|26|A|0.0

VAL|27|A|0.0

VAL|28|A|0.0

VAL|29|A|0.0

VAL|30|A|0.0

VAL|31|A|-9.4

VAL|32|A|-24.9

VAL|33|A|-25.1

VAL|34|A|-26.2

VAL|35|A|-25.7

VAL|36|A|-25.9

VAL|37|A|-26.0

VAL|38|A|-26.3

VAL|39|A|-25.8

VAL|40|A|-25.7

VAL|41|A|-13.2

VAL|42|A|0.0

VAL|43|A|0.0

VAL|44|A|0.0

VAL|45|A|0.0

VAL|46|A|0.0

VAL|47|A|0.0

VAL|48|A|0.0

END|100

6.6   Appendix 6 Settlement Days Combined

The example below demonstrates the convention to be used when sending multiple days data in one CSV file.

The metered data in Table 5 has been used for the Net Active Energy for both the 9th and 10th December 2014. Where the convention is that net Import is negative and net export is positive. The data is in kWh to one decimal place.

HDR|STEP001|ABCD1234|20141212121500

MID|MSID|XY14Z12345NET00000|20141209

VAL|1|A|-26.4

VAL|2|A|-25.9

VAL|3|A|-26.2

VAL|4|A|-26.1

VAL|5|A|-26.3

VAL|6|A|-25.9

VAL|7|A|-25.8

VAL|8|A|-26.0

VAL|9|A|-26.3

VAL|10|A|-26.2

VAL|11|A|-26.5

VAL|12|A|-26.1

VAL|13|A|-26.2

VAL|14|A|-25.7

VAL|15|A|-25.8

VAL|16|A|-26.1

VAL|17|A|90.9

VAL|18|A|120.4

VAL|19|A|150.6

VAL|20|A|200.3

VAL|21|A|276.4

VAL|22|A|350.8

VAL|23|A|320.6

VAL|24|A|300.4

VAL|25|A|310.5

VAL|26|A|281.2

VAL|27|A|243.1

VAL|28|A|169.7

VAL|29|A|100.9

VAL|30|A|87.7

VAL|31|A|33.9

VAL|32|A|-24.9

VAL|33|A|-25.1

VAL|34|A|-26.2

VAL|35|A|-25.7

VAL|36|A|-25.9

VAL|37|A|-26.0

VAL|38|A|-26.3

VAL|39|A|-25.8

VAL|40|A|-25.7

VAL|41|A|44.4

VAL|42|A|85.4

VAL|43|A|198.7

VAL|44|A|312.9

VAL|45|A|400.8

VAL|46|A|390.2

VAL|47|A|410.8

VAL|48|A|427.5

MID|MSID|XY14Z12345NET00000|20141210

VAL|1|A|-26.4

VAL|2|A|-25.9

VAL|3|A|-26.2

VAL|4|A|-26.1

VAL|5|A|-26.3

VAL|6|A|-25.9

VAL|7|A|-25.8

VAL|8|A|-26.0

VAL|9|A|-26.3

VAL|10|A|-26.2

VAL|11|A|-26.5

VAL|12|A|-26.1

VAL|13|A|-26.2

VAL|14|A|-25.7

VAL|15|A|-25.8

VAL|16|A|-26.1

VAL|17|A|90.9

VAL|18|A|120.4

VAL|19|A|150.6

VAL|20|A|200.3

VAL|21|A|276.4

VAL|22|A|350.8

VAL|23|A|320.6

VAL|24|A|300.4

VAL|25|A|310.5

VAL|26|A|281.2

VAL|27|A|243.1

VAL|28|A|169.7

VAL|29|A|100.9

VAL|30|A|87.7

VAL|31|A|33.9

VAL|32|A|-24.9

VAL|33|A|-25.1

VAL|34|A|-26.2

VAL|35|A|-25.7

VAL|36|A|-25.9

VAL|37|A|-26.0

VAL|38|A|-26.3

VAL|39|A|-25.8

VAL|40|A|-25.7

VAL|41|A|44.4

VAL|42|A|85.4

VAL|43|A|198.7

VAL|44|A|312.9

VAL|45|A|400.8

VAL|46|A|390.2

VAL|47|A|410.8

VAL|48|A|427.5

END|100

6.7 Appendix 7 Clock Change

The example below demonstrates the convention to be used on a clock change day. When the clocks go forward an hour the Settlement Day will have 46 periods; when the clocks go back an hour the Settlement Day will have 50 periods.

The metered data in the Table 5 has been used for the Net Active Energy for both days, with 2 periods removed on a short day and 2 added on a long day. The 2014 clock change days have

been used in the example below; clocks went forward on the 30th March 2014 and the clocks went back on the 26th October 2014. The convention is that net Import is negative and net export is positive. The data is in kWh to one decimal place.

Clocks go forward

HDR|STEP001|ABCD1234|20140331121500

MID|MSID|XY14Z12345NET00000|20140330

VAL|1|A|-26.4

VAL|2|A|-25.9

VAL|3|A|-26.2

VAL|4|A|-26.1

VAL|5|A|-26.3

VAL|6|A|-25.9

VAL|7|A|-25.8

VAL|8|A|-26.0

VAL|9|A|-26.3

VAL|10|A|-26.2

VAL|11|A|-26.5

VAL|12|A|-26.1

VAL|13|A|-26.2

VAL|14|A|-25.7

VAL|15|A|-25.8

VAL|16|A|-26.1

VAL|17|A|90.9

VAL|18|A|120.4

VAL|19|A|150.6

VAL|20|A|200.3

VAL|21|A|276.4

VAL|22|A|350.8

VAL|23|A|320.6

VAL|24|A|300.4

VAL|25|A|310.5

VAL|26|A|281.2

VAL|27|A|243.1

VAL|28|A|169.7

VAL|29|A|100.9

VAL|30|A|87.7

VAL|31|A|33.9

VAL|32|A|-24.9

VAL|33|A|-25.1

VAL|34|A|-26.2

VAL|35|A|-25.7

VAL|36|A|-25.9

VAL|37|A|-26.0

VAL|38|A|-26.3

VAL|39|A|-25.8

VAL|40|A|-25.7

VAL|41|A|44.4

VAL|42|A|85.4

VAL|43|A|198.7

VAL|44|A|312.9

VAL|45|A|400.8

VAL|46|A|390.2

END|49

Clocks go back

HDR|STEP001|ABCD1234|20141027121500

MID|MSID|XY14Z12345NET00000|20141026

VAL|1|A|-26.4

VAL|2|A|-25.9

VAL|3|A|-26.2

VAL|4|A|-26.1

VAL|5|A|-26.3

VAL|6|A|-25.9

VAL|7|A|-25.8

VAL|8|A|-26.0

VAL|9|A|-26.3

VAL|10|A|-26.2

VAL|11|A|-26.5

VAL|12|A|-26.1

VAL|13|A|-26.2

VAL|14|A|-25.7

VAL|15|A|-25.8

VAL|16|A|-26.1

VAL|17|A|90.9

VAL|18|A|120.4

VAL|19|A|150.6

VAL|20|A|200.3

VAL|21|A|276.4

VAL|22|A|350.8

VAL|23|A|320.6

VAL|24|A|300.4

VAL|25|A|310.5

VAL|26|A|281.2

VAL|27|A|243.1

VAL|28|A|169.7

VAL|29|A|100.9

VAL|30|A|87.7

VAL|31|A|33.9

VAL|32|A|-24.9

VAL|33|A|-25.1

VAL|34|A|-26.2

VAL|35|A|-25.7

VAL|36|A|-25.9

VAL|37|A|-26.0

VAL|38|A|-26.3

VAL|39|A|-25.8

VAL|40|A|-25.7

VAL|41|A|44.4

VAL|42|A|85.4

VAL|43|A|198.7

VAL|44|A|312.9

VAL|45|A|400.8

VAL|46|A|390.2

VAL|47|A|410.8

VAL|48|A|427.5

VAL|49|A|425.4

VAL|50|A|405.1

END|53

6.8 Appendix 8 Apportioned Metering Data Interface File

The Apportioned Metering Data Interface File should meet the following requirements:

- Be in CSV format without commas and space

- All Phases must be submitted in one file

- Multiple Settlement Dates can be submitted in one file or separately

The file will contain the following information:

- Scheme Name

- CFD ID

- Settlement Date

- Version Number: can only be whole number

- Sum of the Turbine Installed Capacity of each of the Phased Project Active Turbines

- Sum of the Turbine Installed Capacity of each of the Phase Active Turbines

	A	B	C	D	E	F
1	CFD Apportioned Metering					
2	Shared Metering Apportioning Group	CFD_ID	Settlement Date	Version Number	sum of the Turbine Installed Capacity of each of the Phased Project Active Turbines	sum of the Turbine Installed Capacity of each of the Phase Active Turbines
3	EMRGEN	INV_EMR_001	01/04/2019	1	550	150
4	EMRGEN	INV_EMR_002	01/04/2019	1	550	250
5	EMRGEN	INV_EMR_003	01/04/2019	1	550	150
6	<END>					