

G2 – Calculation of Supplier Demand for EMR Charging

EMRS Guidance

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Change Amendment Record

Version	Date	Description
1.0	06 August 2015	Go-Live Version
2.0	12 October 2015	Housekeeping - updated to include Guidance number
3.0	21 March 2017	New CCC I.D's added to Table 1 following BSC Change P339 'Introduction of new Consumption Component Classes for Measurement Classes E-G
4.0	01 August 2017	Transfer to new template
5.0	01 March 2018	CM to start using Gross Demand data from Delivery Year 2018 onwards
6.0	12 July 2018	Reference amendment in section 7.
7.0	22 November 2018	Changes as a result of the interim solution exempting electricity supplied to Licensed Generators or Storage Facilities from paying EMR levies and charges.
8.0	4 February 2019	Housekeeping - cosmetic updates

1. Introduction

This guidance document is to provide Suppliers with an understanding of how their charges for both Contracts for Difference (CFD) and the Capacity Market (CM) are calculated. Charges for both schemes are based on the volume of electricity supplied.

On behalf of the Low Carbon Contracts Company (LCCC) and Electricity Settlement Company (ESC), EMR Settlement Limited (EMRS) calculates Suppliers charges payable under The Contracts for Difference (Electricity Supplier Obligations) Regulation 2014¹ (as amended) and The Electricity Capacity (Supplier Payment) Regulations 2014² (as amended) as determined by these Regulations.

In accordance with the Regulations, these charges are calculated from demand data that is provided to EMRS by BSCCo at the BM Unit level, and then summed by EMRS to calculate the total demand for each Supplier for each scheme.

2. Purpose

The purpose of this document is to answer the following questions:

- What and how is the data received to perform these calculations?
- What is Gross Demand and why is it used in CFD and CM charging?
- How can Supplier verify the calculation of Gross Demand?
- Which BM Units will be used in CFD and CM charging?
- How can Supplier verify the calculation of Gross Demand?
- What is Net Demand and why is it used in CM charging?
- Which BM Units will be used in CM charging?
- Is Transmission Loss Multiplier applied for CM charging?
- How can Suppliers verify the calculation of Net Demand?
- What will be the treatment of electricity imported by power stations?
- What does an example of this calculation look like?

3. Who is this document for?

This document is for all electricity Suppliers.

4. Associated Documents

This document should be read in conjunction with:

- WP5 – Supplier Capacity Market Demand Forecast
- G5 – Supplier CFD Credit Cover
- G12 – Supplier Capacity Market Demand Forecast
- G14 – Supplier CM Credit Cover
- G15 – Capacity Market Supplier Payments
- G16 – Supplier Contracts for Difference.

¹ <http://www.legislation.gov.uk/ukxi/2014/2014/contents/made>

² <http://www.legislation.gov.uk/ukxi/2014/3354/contents/made>

5. What and how is the data received to perform these calculations?

The data used in the calculations is known as metered data which consists of Profile Data and Half Hourly Metered Consumption Data for Suppliers.

EMRS receives metered data via the BSCCo in Data Flows³ SAA-I014 Settlement Report and SAA-I042 BM Unit Gross Demand Report. Delivery Years and Financial Years from the 1 January 2018 onwards, only the SAA-I042 BM Unit Gross Demand Report shall be used for both CM and CFD schemes.

The below figure illustrates how this data is received by EMRS.

i – CFD and CM charging uses the metered data contained within the SAA-I042 (output) BM Unit Gross Demand Report.

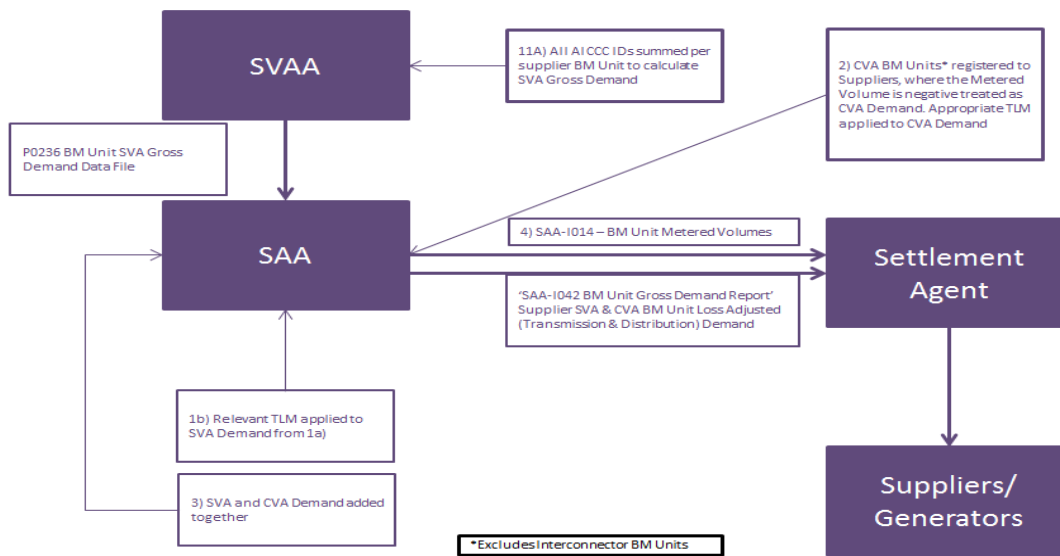


Figure 1: Metered data flows received by EMRS for Suppliers.

6. Calculation of Supplier Demand for CFD and CM Charging

6.1 What is Gross Demand and why is it used in CFD and CM charging?

The Contracts for Difference Regulations 2014 require Suppliers' CFD charges and Credit Cover requirements to be **determined based on the amount they have supplied to premises in Great Britain**. Therefore, the BSC systems were amended to report 'Gross Demand' to the EMR Settlement Service Provider.

Gross Demand is the volume of Active Import (i.e. electrical energy entering premises from the licensed distribution or transmission network), with no adjustment made for any Active Export (i.e. electrical energy generated on the premises and exported onto the licensed distribution or transmission network).

The Electricity Supplier Obligations (Amendment & Excluded Electricity) Regulations 2015⁴ will require Energy Intensive Industries (EII) and Green Excluded Electricity to be excluded from the

³ These data flows are available on the ELEXON website in the [Interface Definition Documents](#) in the NETA Interface Definition and Design: Part 2 - Interfaces to other Service Providers.

⁴ <http://www.legislation.gov.uk/ukxi/2015/721/contents/made>

calculation of Gross Demand for purposes of CFD charging. These requirements are outside the scope of this guidance. Electricity supplied to Generation licence holders for the purposes of activities related to their licensed activity are also excluded from EMR charges.⁵

Similarly, The Electricity Capacity (Amendment) Regulations 2017⁶ use the Gross Demand methodology⁷ for the calculations in the CM. Within the CM scheme, it is only periods of high demand that is used in the calculations. This is defined in the Regulations as 4pm to 7pm on any working day between November and February. EMRS use the metered volumes supplied during the specified period in the calculations.

6.2 Which BM Units will be used in CFD and CM charging?

In most cases, a Supplier's EMR charges will only be calculated using data for those BM Units for which the Supplier is the Lead Party (i.e. where the legal entity holding the supply license has registered the BM Unit under the BSC). There are certain exceptions to this where (due to the history of the site or the supply license) the legal entity supplying the premises is not the Lead Party, but EMRS will discuss such exceptions with the parties involved.

Where a Supplier is responsible for a BM Unit (either by being the Lead Party, or through one of the exceptions referred to above), the Gross Demand for that BM Unit will potentially be used in CFD and CM charging, depending on the BM Unit Type. This is set out in Table 1 below.

Table 1: BM Units used in CFD and CM Gross Demand Calculation.

BM Unit Type	Gross Demand Used in CFD/CM Charging?	How is Gross Demand Calculated?
Supplier BM Unit (type 'G' or 'S')	Yes	Aggregated values for Active Import Consumption Component Classes only (i.e. excluding Active Export), adjusted by GSP Group Correction Factor, Line Loss Factor and Transmission Loss Multiplier. Note that the Active Import (AI) Consumption Component Classes are CCCs 1-5, 9-13, 17-23, 25-26, 28, 30-31, 42-47, and 54-59.
Embedded (type 'E')	Yes, unless the BM Unit is at premises occupied for the purposes of operating a Licensable Generating Plant.	Negative values of BM Unit Metered Volume adjusted for Transmission Loss Multiplier. Positive values of BM Unit Metered Volume will not be used in the calculation.
Transmission-connected (type 'T')	Yes, unless the BM Unit is at premises occupied for the purposes of operating a Licensable Generating Plant.	Negative values of BM Unit Metered Volume adjusted for Transmission Loss Multiplier. Positive values of BM Unit Metered Volume will not be used in the calculation.
Interconnector (type 'I')	No	Not Applicable

⁵ [Information on GEE can be found in WP7 and information for EII and Licensed Generator import exemptions in WP25](#)

⁶ <http://www.legislation.gov.uk/uksi/2017/1053/contents/made>

⁷ Methodology used for Financial Years and Delivery Years 2018/19 onwards.

6.3 How can Supplier verify the calculation of Gross Demand?

The process for calculating Gross Demand differs depending on whether the BM Unit is a Supplier BM Unit (type 'G' or 'S'), or a CVA BM Unit (type 'E' or 'T').

Gross Demand for a Supplier BM Unit can be calculated by:

- Summing Corrected BM Unit Energy (J1638) and Corrected BM Unit Line Losses (J1639) (for Active Import CCCs only) from group SE1 of the D0296 Data Flow; and
- Applying the relevant Transmission Loss Multiplier (TLM_{ij}).

i – In the D0296 Data Flow, group SE1 includes the Corrected BM Unit Energy (J1638) and Corrected BM Unit Line Losses (J1639)

Gross Demand for a CVA BM Unit can be calculated by:

- Summing negative values of BM Unit Metered Volume (QM_{ij}); and
- Applying the relevant Transmission Loss Multiplier (TLM_{ij}).

The Transmission Loss Multiplier (TLM) is the factor applied to BM Unit in each Settlement Period in order to adjust for Transmission Losses.

The relevant TLM will be applied to Gross Demand in BSC systems for both CFD and CM metered volumes because the BSCCo adjust the metered volumes for transmission losses. This is to ensure it is consistent with BSC Configurable Items which require the Settlement Administration Agent (SAA) to provide the CFD Settlements Service Provider with a report of TLM-adjust Gross Demand.

6.4 What will be the treatment of electricity imported by power stations?

Where the Lead Party of the BM Unit(s) holds both supply and generation licenses and has registered a BM Unit that records electricity imported to a premise occupied for purposes of operating Licensed Generation or, a Licensed Storage entity, the import in the calculation of that Suppliers' demand would not be included. This is because it would not constitute supply for the purposes of the Regulations. However, where a Lead Party has registered a BM Unit that records electricity imported to a premise occupied for purposes of operating an Exemptible power station, the import of the calculation will be included of that Suppliers' demand. This is because it would constitute supply for the purposes of the Regulations.

6.5 What does an example of this calculation look like

To validate your understanding an example of how this calculation works can be located within [Appendix 1](#).

7. Calculation of Supplier Demand for CM Charging up to and including the 2017/18 Financial and Delivery Years

Financial Year and Delivery Year **2018/19** onwards use the Supplier Demand methodology described in section 6. This section describes how a Suppliers' demand will be calculated for CM charging up to and including the **2017/18** Delivery Year and Financial Year.

7.1 What is Net Demand and why is it used in CM charging?

The Electricity Capacity (Supplier Payment etc.) Regulations 2014⁸ define Net Demand for calculating CM charges as set out in Table 2 below.

Table 2: Definition of Net Demand for calculating CM charges

Definitions within the Regulations
<p>2(3) In these Regulations "net demand", in relation to an electricity Supplier ("S"), means the difference (expressed in MWh) between—(a) the amount of electricity supplied by S to premises in Great Britain, and</p> <p>(b) The amount of generated electricity for which S is responsible.</p> <p>Except that where that difference is a negative amount the net demand is zero.</p> <p>2(4) For the purposes of paragraph (3), S is responsible for an amount of generated electricity if—</p> <p>(a) S is responsible for the export of that electricity, for the purposes of Section K of the Balancing and Settlement Code as it was in force on 8th September 2014, by virtue of paragraph 1.2.2(a)(ii) of that Section (Export from Exemptible Generating Plant); and</p> <p>(b) The electricity so exported is generated by a plant that is not directly connected to the GB transmission system.</p>

Within the CM scheme, it is only periods of high demand that is used in the calculations. This is defined in the Regulations as 4pm to 7pm on any working day between November and February. EMRS use the metered volumes supplied during the specified period in the calculations.

7.2 Which BM Units will be used in CM charging?

The BM Units used for CM charging are the same as those used in CFD charging (see section 7 above). But the calculation differs, because CM charging is based on Net Demand:

Table 3: BM Units used in CM Net Demand Calculation

BM Unit Type	Net Demand used in CM Charging?	How is Net Demand Calculated?
Supplier BM Unit (type 'G' or 'S')	Yes	BM Unit Metered Volumes. Both positive and negative values of BM Unit Metered Volumes will be used in the calculation, adjusted by GSP Group Correction Factor, Line Loss Factor and Transmission Loss Multiplier will not be applied.
Embedded (type 'E')	Yes, unless the BM Unit is at premises occupied for the purposes of operating a	BM Unit Metered Volume. Both positive and negative values of the BM Unit Metered Volume will be used in the calculation, and Transmission Loss Multiplier will not be applied.

⁸ <http://www.legislation.gov.uk/ukxi/2014/3354/made>

BM Unit Type	Net Demand used in CM Charging?	How is Net Demand Calculated?
	Licensable Generating Plant.	
Transmission-connected (type 'T')	Yes, unless the BM Unit is at premises occupied for the purposes of operating a Licensable Generating Plant.	Negative values of BM Unit Metered Volume. Positive values of BM Unit Metered Volume will not be used in the calculation, and Transmission Loss Multiplier will not be applied.
Interconnector (type 'I')	No	Not Applicable

7.3 Is Transmission Loss Multiplier applied for CM charging?

TLM is not applied to the Net Demand for CM charging.

7.4 How can Suppliers verify the calculation of Net Demand?

Net Demand can be calculated from BM Unit Metered Volume:

- For Supplier BM Units (type 'G' or 'S') and Embedded BM Units (type 'E'), all values of BM Unit Metered Volume contribute to Net Demand; but
- For Transmission-connected BM Units (type 'T'), only negative values of BM Unit Metered Volume contribute to Net Demand.

7.5 What does an example of the calculation look like?

To validate your understanding an example of how this calculation works can be located within Appendix 1.

8. Need more information?

For more information, please visit our website www.emrsettlement.co.uk or email us at contact@emrsettlement.co.uk.

9. Acronyms and Definitions

A list of acronyms and definitions can be found in the 'Acronyms and Definition' document on our website⁹.

⁹ <https://www.emrsettlement.co.uk/documentstore/publications/acronyms-definitions.pdf>

10. Appendices

10.1 Appendix 1 – Example of CFD and CM Charging

To validate your understanding here is an example of how to calculate your demand for EMR charging. Consider a hypothetical Supplier with four BM Units¹⁰ as follows:

- BM Unit 1 (id '2__AXXX000') is a Supplier BM Unit containing a number of customers (i.e. demand only);
- BM Unit 2 ((id '2__BXXX000') is a Supplier BM Unit containing both customers and Embedded Generation;
- BM Unit 3 (id 'E_XXXX-1') is an embedded licence exempt power station; and
- BM Unit 4 (id 'T_XXXX-2') is a directly-connected exempt export power station.

10.2 Appendix 2 – Calculation of Gross Demand for CFD and CM¹¹

BM Units 1 and 2 are Supplier BM Units, and the calculation of Gross Demand therefore takes into account only those Consumption Component Classes (CCC) related to Active Import.

For example, suppose that the D0296¹² data flow shows the following consumption data (in a given Settlement Period):

Table 4: CCC related to the BM Units 1 and 2.

CCC ID	CCC Description	Corrected Energy for BM Unit 1 (from data item J1638 or J1639 ¹³)	Corrected Energy for BM Unit 2 (from data item J1638 or J1639 ¹⁴)
1	Active Import (Half Hourly metered)	3,125.4273 MWh	478.1983 MWh
4	Active Import Losses (Half Hourly metered)	287.3191 MWh	32.6712 MWh
6	Active Export (Half Hourly metered)	0	983.9812 MWh
8	Active Export Losses (Half Hourly metered)	0	75.3165 MWh
18	Active Import (NHH profiled)	4,871.9513 MWh	393.8712 MWh
21	Active Import Losses (NHH profiled)	492.7134 MWh	40.6143 MWh

Gross Demand is calculated by summing those CCCs corresponding to Active Import, which in this example is CCCs 1, 4, 18 and 21:

- BM Unit 1 (id '2__AXXX000') is a Supplier BM Unit containing a number of customers (i.e. demand only);

¹⁰ Every Supplier is required to have at least fourteen Base BM Units (one per GSP Group). But to keep the example simple we only consider two Base BM Units.

¹¹ CM charging for Financial Year and Delivery Year 2018/19 onwards uses Gross Demand.

¹² <https://dte.mrasco.com/DataFlow.aspx?FlowCounter=0296&FlowVers=1&searchMockFlows=False>

¹³ <https://dte.mrasco.com/SearchFlowsByDataItems.aspx>

¹⁴ <https://dte.mrasco.com/SearchFlowsByDataItems.aspx>

- BM Unit 2 ((id '2__BXXXX000') is a Supplier BM Unit containing both customers and Embedded Generation;

BM Units 3 and 4 are CVA BM Units (and are not at premises occupied for the purposes of operating a Licensable Generating Plant), so their Gross Demand is calculated from any negative values of BM Unit Metered Volume (QMij).

Any positive values represent generation, and are not included in the calculation. For example, suppose the BM Unit Metered Volumes are as stated in Table 5 below:

Table 5: Metered Volumes for BM Units 3 and 4

BM Unit	Metered Volume (QMij)
E_XXXX-1	312.412 MWh
T_XXXX-2	-11.612 MWh

The BM Unit Metered Volume for E_XXXX-1 is positive, representing generation, and is therefore not relevant to the calculation of Gross Demand. The BM Unit Metered Volume for T_XXXX-2 is negative, representing demand, and therefore this 11.612 MWh must be added in to the calculation.

The final step of the Gross Demand calculation is to adjust all of the demand values for transmission losses, by applying the appropriate Transmission Loss Multiplier.

For example, suppose that BM Units 1 to 3 are in off taking Trading Units (and the off taking TLM was calculated to be 1.0106512 in this half hour)¹⁵; and BM Unit 4 is in a delivering Trading Unit (and was calculated to be 0.9901318 in this half hour).

The value of Gross Demand for the Supplier in this half hour would be **9,837.8227 MWh**, calculated as demonstrated in Table 6:

Table 6: Illustrates the Gross Demand for the Supplier calculation

BM Unit	Demand (calculated as described above)	TLM	Loss-adjusted demand
2__AXXXX000	8777.4111	1.0106512	8870.9011
2__BXXXX000	945.355	1.0106512	955.4242
E_XXXX-1	0	1.0106512	0
T_XXXX-2	11.612	0.9901318	11.4974
GROSS DEMAND FOR SUPPLIER			9837.8227 MWh

10.3 Appendix 3 – Calculation of Net Demand¹⁶

The Net Demand calculation differs from the Gross Demand calculation in two key respects:

- Any Active Export from Embedded Generation (but not transmission-connected generation) is netted off the demand (subject to a constraint that the Supplier’s overall demand in the half hour cannot become negative); and
- Transmission losses are not applied.

In the example given above, this means that CCCs 6 and 8 should be netted off the demand:

- For BM Unit 1: $3125.4273 + 287.3191 + 4,871.9513 + 492.7134 = 8777.4111$ MWh
- For BM Unit 2: $478.1983 + 32.6712 - 983.9812 - 75.3165 + 393.8712 + 40.6143 = -113.9427$ MWh

¹⁵ In each half hour there are two values of TLM: one for BM Units in off taking Trading Units, and one for BM Units in delivering Trading Units. The SAA-I014 settlement report shows the relevant value for each BM Unit.

¹⁶ CM charging for Financial Year and Delivery Year 2017/18 and prior years uses Net Demand. Also, reconciliation invoices from settlement dates relating to prior Delivery Years continue to use Net Demand.

However, in practice a Supplier would not need to calculate these values from the CCC data in the D0296 data flow, because central systems already do the calculation, and report the values as the BM Unit Metered Volume on the settlement report.

- For example, the BM Unit Metered Volume for BM Unit 1 (2__AXXX000) would be -8777.411 MWh.

For the CVA BM Units, both the 312.412 MWh of Active Export on E_XXXX-1 and the 11.612 MWh of Active Import on T_XXXX-2 are taken into account in the calculation.

The net demand for the Supplier is therefore **8,362.668 MWh**, calculated as follows:

Table 7: Illustrates the Net Demand for the Supplier calculation for CM

BM Unit	QMij	Demand
2__AXXX000	-8777.411	8777.411
2__BXXX000	113.9427	-113.943
E_XXXX-1	312.412	-312.412
T_XXXX-2	-11.612	11.612
NET DEMAND FOR SUPPLIER		8362.668 MWh

Note however that if the metered volume for T_XXXX-2 had been positive, it would not have been taken into account (because the BM Unit is Transmission-connected).

Lastly, Net Demand is capped at zero. In this example, if the Supplier was no longer the Lead Party on BM Unit 1 but retained BM Unit 2 it would led to an overall negative Net Demand value of -414.743 but this would be set to 0.

