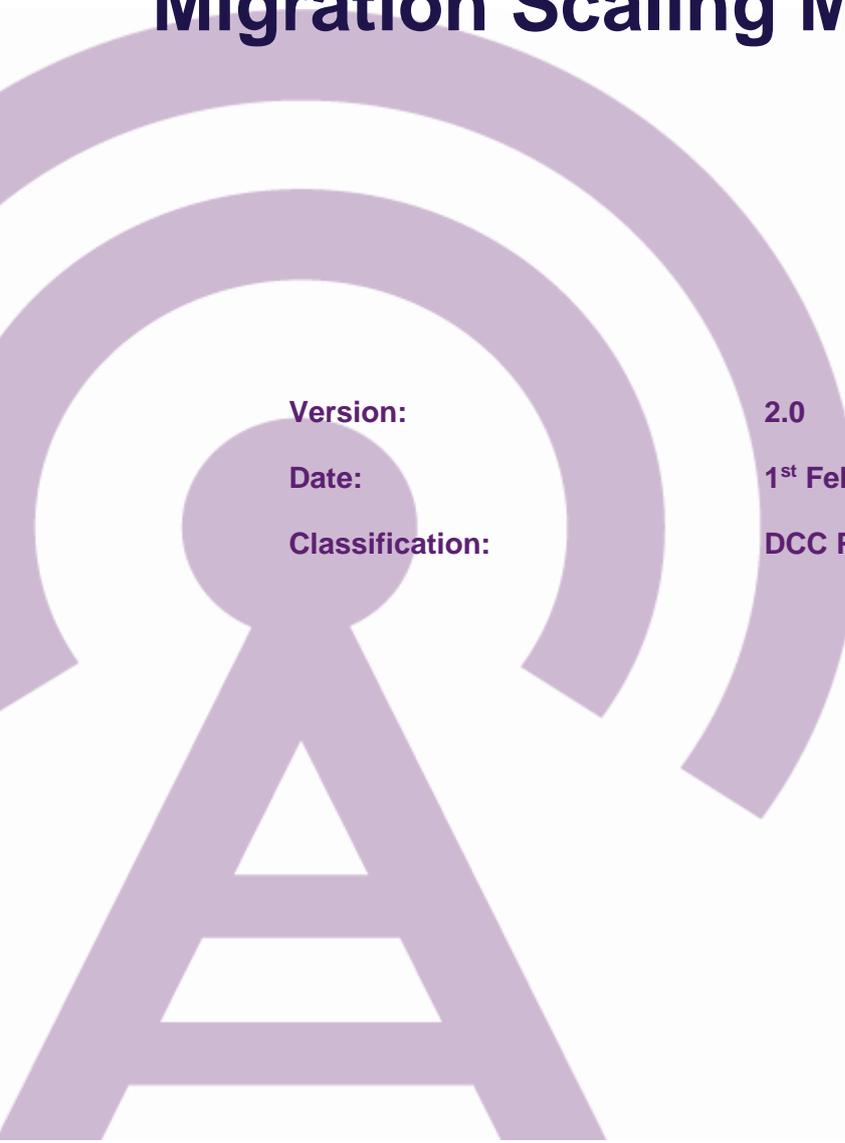


# Migration Scaling Methodology



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## 1 Introduction

1. In accordance with Clause 4.11 of the Transition and Migration Approach Document (TMAD) Appendix AL of the Smart Energy Code (SEC), the Data Communications Company (DCC) is required to prepare this document; The Migration Scaling Methodology, which prescribes the allocation of the DCC's system capacity against each Responsible Supplier's Daily Migration Demand where the DCC expects that a capacity constraint will arise.
2. In accordance with Clause 4.12 of the TMAD, the DCC is required to consult stakeholders regarding the content of this document and publish the completed document on the DCC's website. Furthermore, following initial publication, this document may only be amended following stakeholder consultation.
3. Capitalised terms in this document have the meaning set out in TMAD or, if not defined in TMAD, the SEC.

## 2 Context / Background

4. Many energy suppliers have and are continuing to install first generation smart devices (known as SMETS1 Device Model Combinations (DMCs)) across Great Britain. However, SMETS1 Devices installed by an energy supplier are not always interoperable with and supported by another energy supplier's systems, therefore if an energy consumer decides to switch suppliers their installation may stop functioning in smart mode. The DCC has developed a plan and designed a solution for the enrolment and adoption of such Devices into its network. It will provide important shared benefits for industry and consumers; particularly the ability for all SMETS1 customers to maintain their smart services following a decision to switch supplier.
5. The plan to enrol and adopt SMETS1 Devices requires DCC to set out the approach for migrating SMETS1 Installations into the Modified DCC Total System. The detailed technical and procedural requirements of this approach are set out in the TMAD.
6. The focus of this document is the Migration of Active Meters, it is, however, important to note that the DCC is required to prioritise Dormant Meters over Active Meters in accordance with Clause 4.24 of the TMAD.
7. Given this requirement, the DCC reasonably envisages that it may have technical constraints on the supply of migration capability for Active Meters such that the aggregate Daily Migration Demand for all Responsible Suppliers may not be satisfied on every day i.e. the Daily Migration Demand Commitment will need to set at a figure lower than the requested Daily Migration Demand for one or more Responsible Suppliers on one or more days

## 3 Assumptions

8. This version of the document applies for the Initial Operating Capability (IOC). Consistent with Clause 4.12 of the TMAD, DCC will review this document and reflect any adjustments considered necessary for each of the Middle Operating Capability (MOC) and the Final Operating Capability (FOC).

9. Each Responsible Supplier may submit a Migration Authorisation (MA) file, related solely to Active Meters to the DCC to identify the Devices to be Migrated. These Devices will be identified by the Meter Point Access Number (MPAN) (for the electricity meter) and Meter Point Reference Number (MPRN) (for the gas meter). However, given that the migration needs to be performed on all Devices associated with a single SMETS1 Communications Hub Function (CHF) at the same time (i.e. applied via technical changes to the SIM within the electricity meter), the DCC's approach to these matters is based on SMETS Installations. Thus, migration demand is measured in SMETS1 Installations per day and the capacity constraints are assumed to be daily.

## 4 Algorithm - Overview

10. This document sets out a two-stage algorithmic approach to allocating migration capacity in the event that the total Migration Daily Demand exceeds the DCC's available capacity. Flat scaling is applied up to a minimum allocation threshold and demand weighted scaling applied for quantities over the minimum allocation threshold. The scaling is a daily process i.e. each day is considered independently. Furthermore, the algorithm is applied separately to each SMSO.
11. Allocations up to the minimum allocation threshold are intended to fulfil any Daily Migration Demand for a few SMETS1 Installations, thus supporting migration establishment activities for each Responsible Supplier and not impacting the smallest suppliers with limited numbers of SMETS1 Installations. The minimum allocation also avoids the situation where a very small Daily Migration Demand is reduced, thereby limiting the scope for any mop-up activities to be interrupted and also providing a degree of protection to any pilot phases. The demand weighted scaling element reduces Daily Migration Demand equitably in proportion to demand overall and scale down will impact Daily Migration Demands equitably based on relative demand.
12. The algorithm requires DCC to prescribe a minimum allocation threshold parameter,  $D_{MIN}$ , measured in SMETS1 Installations.  $D_{MIN}$  is a static input which is intended to give an element of priority to Responsible Suppliers with low demand requirements. The minimum allocation threshold ( $D_{MIN}$ ) is set at 20 SMETS1 Installations per day on this basis this should allow for any expected operational pilots with a restricted quantity to be undertaken on an unhindered basis by Responsible Suppliers.
13. As per Clause 4.8 of TMAD, each Responsible Supplier expresses their demand to migrate SMETS1 Installations comprising Active Meters operated by a specific SMSO for the relevant week four weeks in the future as an integer value for each day (disaggregated by Electricity Distributor) expressed as Daily Migration Demand in the TMAD. This information is provided by 10:00 hours each Tuesday as per Clause 4.8 (a) of TMAD. Thus, the demand input is  $d_i$ , each Responsible Supplier's requirement, measured in SMETS1 Installations.

$d_i$  is the Daily Migration Demand (aggregated across Electricity Distributors) for each Responsible Supplier (identified by its EUI-64 number) for  $i=1$  to  $n$ .

In the case where a Responsible Supplier has multiple EUI-64 numbers, it will be required to submit a separate Daily Migration Demand requirement in relation to each EUI-64 number that it will subsequently use when submitting Migration Authorisations for the same Migration Week.

14. For each day on which DCC is considering commencing Migration Authorisations, the DCC determines  $C_{TOT}$  the total envisaged capacity of Migration Authorisations that the DCC can commence on a day net of planned migration for Dormant Meters because dormant demand is treated as the priority as described in Clause 4.24 of TMAD.  $C_{TOT}$  isn't a fixed value; it will change based on planned Dormant Meter Migrations as well as for changes in system capacity / operational performance experience. In the circumstances that the DCC is fully committed to migrating Dormant Meters on a day then  $C_{TOT}$  would be zero.  $C_{TOT}$  represents an upper limited on the total of Daily Migration Demand Commitment for all Responsible Suppliers.

$C_{TOT}$  is DCC's total capacity for Active Meters as determined by DCC.

15. The objective of the algorithm is to determine  $c_i$  measured in SMETS1 Installations where

$c_i$  is the Daily Migration Demand Commitment (which is not dis-aggregated by Electricity Distributor) allocated by the algorithm to each Responsible Supplier for  $i=1$  to  $n$ .

16. Within each week, the DCC will calculate the daily total of Daily Migration Demand and determine days where the total demand exceeds the DCC's expected total capacity for all Daily Migration Demand Commitment.
17. In circumstances where the daily total of Daily Migration Demand is less than total capacity, then no scaling is required and thus no further action is required. For days where demand exceeds capacity, the DCC will perform the necessary calculations and provide a Daily Migration Demand Commitment to each Responsible Supplier by 10:00 hours each Tuesday as per Clause 4.8 (b) of TMAD.
18. The DCC will also provide a summary report by 17:00 hours each Tuesday as per Clause 4.8 (c) of TMAD.

## 5 Algorithm - Detail

### 5.1 No Scaling

19. If supply exceeds demand, then no scaling is needed. Each supplier is allocated a level of Daily Migration Demand Commitment equal to their Daily Migration Demand and no further algorithmic processing is required i.e.

If

$$\sum_{i=1..n}(d_i) \leq C_{TOT}$$

Then

$$c_i = d_i$$

### 5.2 Flat Scaling Stage

20. The first stage of the algorithm allocates capacity up to the minimum allocation threshold parameter equally. In the circumstances that there is insufficient supply such that all suppliers can't be allocated up to the minimum allocation threshold

parameter then the minimum allocation threshold parameter is scaled down for the day to an adjusted minimum allocation threshold parameter ( $AD_{MIN}$ ) each supplier allocated the lower of their demand, and the adjusted minimum.

If

$$\sum_{i=1...n}(\min(d_i, D_{MIN})) > C_{TOT}$$

Then set  $AD_{MIN}$  at the maximum integer value that satisfies this equation

$$\sum_{i=1...n}(\min(d_i, AD_{MIN})) \leq C_{TOT}$$

and  $fc_i$  is the capacity allocated to Responsible Supplier  $i$  from the flat scaling stage for  $i=1$  to  $n$  as

$$fc_i = \min(d_i, AD_{MIN})$$

else

$fc_i$  is the capacity allocated to Responsible Supplier  $i$  from the flat scaling stage for  $i=1$  to  $n$  as

$$fc_i = \min(d_i, D_{MIN})$$

### 5.3 Demand Weighted Scaling Stage

21. For the second stage of the algorithm, the total remaining capacity is calculated following adjustment for any allocation from the flat scaling stage. The total remaining capacity is then allocated on a demand weighted basis based on remaining demand share.

If

$$\sum_{i=1...n}(fc_i) \leq C_{TOT}$$

Then set  $wc_i$  as the capacity allocated to Responsible Supplier  $i$  from the demand weighted scaling element for  $i=1$  to  $n$  calculated as

$$wc_i = (C_{TOT} - \sum_{i=1...n}(fc_i)) \times (d_i - fc_i) \div (\sum_{i=1...n}(d_i - fc_i))$$

NB each  $wc_i$  should be rounded down to an integer value.

Else, set  $wc_i$  as the capacity allocated to Responsible Supplier  $i$  from the demand weighted scaling element for  $i=1$  to  $n$  as

$$wc_i = 0$$

### 5.4 Overall Allocation

22. Where scaling is applied, the Daily Migration Demand Commitment for each Responsible Supplier,  $c_i$ , is flat capacity plus the scaled capacity for  $i=1$  to  $n$ .

$$c_i = fc_i + wc_i$$

## 6 Worked Examples

23. Three illustrative scenarios are present for differing levels of capacity against the same demand from the Responsible Suppliers for a single day based on a minimum allocation threshold of 20 SMETS Installations per day without a breakdown by Electricity Distributor or SMSO.
24. The first scenario has no constraint and demand is fully met. The constraint increases in the second and third scenario and thus demand commitment is scaled appropriately.
25. The first scenario is presented in Figure 1 below, setting out a base case where no scaling is required because capacity is sufficient to meet the aggregated demand from all Responsible Suppliers.

<b>D<sub>MIN</sub></b> - Minimum demand threshold parameter		20						
<b>C<sub>TOT</sub></b> - DCC's Total Capacity (excluding Dormant Demand)		1,200						
Total Demand		1,000						
Shortfall?		NO						
<b>AD<sub>MIN</sub></b> - Adjusted Minimum		20						
Total Remaining Capacity		-						
Allocated Demand Total		1,000						
Responsible Supplier	1	2	3	4	5	6	7	
<b>d<sub>i</sub></b> - Energy suppliers' demand	640	294	1	50	2	6	7	
<b>fc<sub>i</sub></b> - Flat Scaling Allocation	20	20	1	20	2	6	7	
Remaining Demand	620	274	0	30	0	0	0	
<b>wc<sub>i</sub></b> - Demand Weighted Allocation	620	274	0	30	0	0	0	
<b>c<sub>i</sub></b> - Total Commitment Allocation	640	294	1	50	2	6	7	
Percentage of reduction	0%	0%	0%	0%	0%	0%	0%	
NB all numbers are " <i>SMETS1 Installations</i> ". The data is illustrative and has some adjustments for rounding.								

Figure 1 – SCENARIO 1 - Base Case - No Scaling

26. Figure 2 presents a second scenario where there is sufficient capacity such that each Responsible Supplier can be allocated the minimum level but some scaling is required above the minimum.

$D_{MIN}$ - Minimum demand threshold parameter		20					
$C_{TOT}$ - DCC's Total Capacity (excluding Dormant Demand)		400					
Total Demand		1,000					
Shortfall?		YES					
$AD_{MIN}$ - Adjusted Minimum		20					
Total Remaining Capacity		324					
Allocated Demand Total		400					
Responsible Supplier	1	2	3	4	5	6	7
$d_i$ - Energy suppliers' demand	640	294	1	50	2	6	7
$fc_i$ - Flat Scaling Allocation	20	20	1	20	2	6	7
Remaining Demand	620	274	0	30	0	0	0
$WC_i$ - Demand Weighted Allocation	217	96	0	11	0	0	0
$C_i$ - Total Commitment Allocation	237	116	1	31	2	6	7
Percentage of reduction	(63%)	(61%)	0%	(38%)	0%	0%	0%
NB all numbers are " <i>SMETS1 Installations</i> ". The data is illustrative and has some adjustments for rounding.							

Figure 2 – SCENARIO 2 - Scaling above the Minimum Allocation

27. The third scenario within Figure 3 has very limited capacity and the minimum allocation is reduced down from 20 to 18.

$D_{MIN}$ - Minimum demand threshold parameter		20					
$C_{TOT}$ - DCC's Total Capacity (excluding Dormant Demand)		70					
Total Demand		1,000					
Shortfall?		YES					
$AD_{MIN}$ - Adjusted Minimum		18					
Total Remaining Capacity		0					
Allocated Demand Total		70					
Responsible Supplier	1	2	3	4	5	6	7
$d_i$ - Energy suppliers' demand	640	294	1	50	2	6	7
$fc_i$ - Flat Scaling Allocation	18	18	1	18	2	6	7
Remaining Demand	622	276	0	32	0	0	0
$WC_i$ - Demand Weighted Allocation	0	0	0	0	0	0	0
$C_i$ - Total Commitment Allocation	18	18	1	18	2	6	7
Percentage of reduction	(97%)	(94%)	0%	(64%)	0%	0%	0%
NB all numbers are " <i>SMETS1 Installations</i> ". The data is illustrative and has some adjustments for rounding.							

Figure 3 – SCENARIO 3 - Minimum Allocation Reduced

## 7 Implementation

28. This Section sets out the regime for the submission of the Daily Migration Demand to the DCC and the reporting of the Daily Migration Demand Commitment to the Responsible Supplier.
29. Each week each Responsible Supplier can submit a Daily Migration Demand for each relevant SMSO by uploading a Comma Separated Value (CSV) file, specified in Section 8, to DCC SharePoint Folder: <SEC Parties>/SMETS1 Migration/ Notifications/Outbox by 10:00 each Tuesday.
30. Where a Daily Migration Demand request cannot be processed due to errors (e.g. invalid EUI-64 Number), DCC shall use the submission from the previous Migration Week pertaining to that Responsible Supplier consistent with Clause 4.9 of the TMAD. For clarity, if the Responsible Supplier has not previously submitted a Daily Migration Demand for the previous Migration Week, then that Responsible Supplier shall not be allocated with any Daily Migration Demand Commitment capacity for the Migration Week in question.
31. If a supplier does not wish to Migrate any SMETS1 Installations in a Migration Week, the supplier should submit a zero Daily Migration Demand request for the Migration Week in question. If not DCC shall use the submission from the previous Migration Week pertaining to that Responsible Supplier consistent with Clause 4.9 of the TMAD.
32. The CSV file can be prepared; either by using the Excel Macro Enabled Workbook accompanying this document or exported from an internal system within the Responsible Supplier's information technology landscape. The CSV specification has been defined in Section 8 of this document.
33. The DCC does not require the submitted CSV files to be digitally signed.
34. Only the latest version of CSV file will be processed, should the Responsible Supplier make multiple submissions for the same processing week.
35. Submissions made after 10:00 on Tuesday will be ignored, the DCC will revert to the latest submission made prior to 10:00 or if no new submission has been made, to processing the previous submission as per Clause 4.9 of the TMAD.
36. Upon receipt of the data the DCC will apply the allocation algorithm, as described above and produce the output files.
37. The DCC will upload the Migration Demand Commitment CSV file, referred to in Section 9, to <SEC Parties>/SMETS1 Migration/ Notifications/Inbox by 10:00 on the following Tuesday.

## 8 Macro Enabled Microsoft Excel Workbook

38. The solution created for the provision of Daily Migration Demand is a Macro Enabled Microsoft Excel Workbook titled SMETS1 Migration Demand Template v1.0.xlms, which accompanies this document as a separate Excel file.
39. A workbook should be completed for each Responsible Supplier's SMSO.
40. When using this spreadsheet solution, the Responsible Supplier will need to enable macros with Microsoft Excel to permit it file to operate as designed.
41. The following instructions, with appropriate screenshots, describe how to complete the Daily Migration Demand template for a Migration Week.
42. Open workbook with macros enabled and input data into blue coloured cells, as in the example shown below. Note, the SEC Party ID, EUI-64 number, week starting date and SMSO are mandatory. You may submit up to a maximum of twenty-five rows for each Electricity Distributor demand, as appropriate.



Generate CSV

### SMETS1 Migration Demand Template v1.0

SEC Party ID:	AAA123
EUI-64 Number:	70-B3-D5-1F-30-00-A0-08
SMSO:	CGI – Instant Energy
Week Starting (Mon):	21 January 2019

Daily data must begin at row 13 and be within the blue cell range

Electricity Distributor	MON	TUE	WED	THU	FRI	SAT	SUN
10 Eastern England	2,000	1,000	3,400	2,350	1,100	0	0
12 London	500	600	450	400	350	100	0

Figure 4 – SCREENSHOT 1 – Migration Excel Template

43. On completion of data input click Generate CSV file button. Provided data passes internal validation you will be provided with standard Excel file save dialog box. Use this to navigate to the folder you want to save output CSV file to (see below). Note, the CSV file name is automatically created, which should not be altered (see Figure 5 and paragraph 46 for file naming convention). For clarity, if the Daily Migration Demand is submitted to DCC with an invalid CSV file name, the whole file will be rejected.

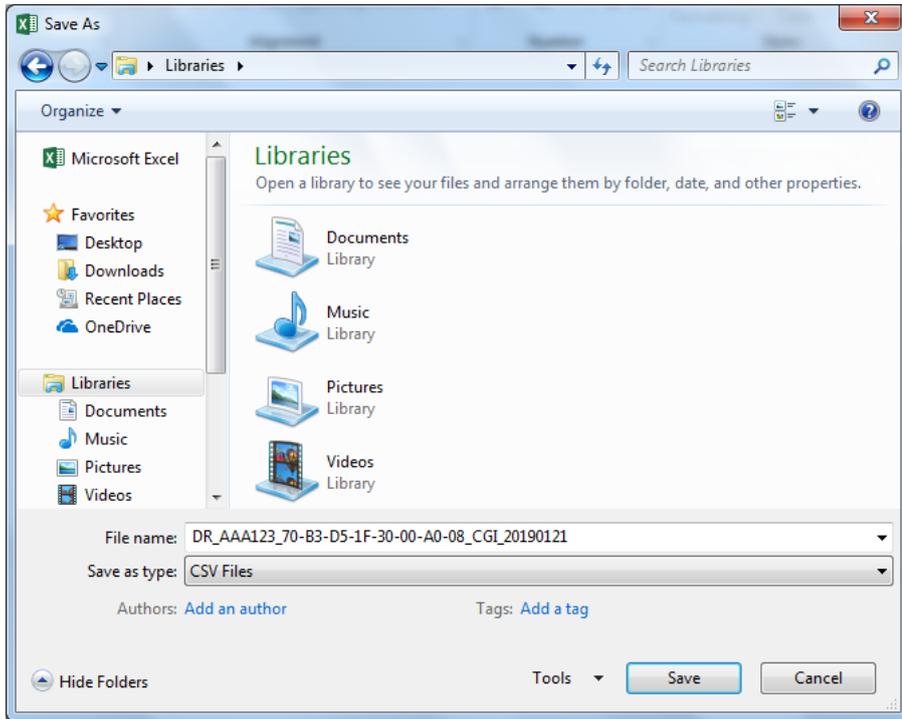


Figure 5 – SCREENSHOT 2 – Migration Excel Template

44. For Responsible Suppliers who prefer to create their own CSV files a file specification is given below.
45. A CSV file is created by each Responsible Supplier, containing a row for each Electricity Distributor, as required. The file specification is given in the following text and file layout table below;

RECORD/FIELD NAME	OPTIONALITY	FIELD TYPE	FIELD LENGTH	DESCRIPTION
<b>File type Indicator</b>	Mandatory	Char	2	Set to 'DR' indicates this file contains demand requirement data.
<b>SEC Party ID</b>	Mandatory	Text	6	6-characters value. "AAA123"
<b>EUI-64 Number</b>	Mandatory	Text	23	Must be a valid EUI-64 number for the Responsible Supplier in EUI-64 format with hyphen in between.  "A1-B2-C3-D4-E5-F6-A7-B8"
<b>SMSO</b>	Mandatory	Char	3	BRG – British Gas CGI – Instant Energy DXC – DXC Technology EDM – EDM MDS – Morrison Data Services SCM – Secure Meters TRL – Trilliant

RECORD/FIELD NAME	OPTIONALITY	FIELD TYPE	FIELD LENGTH	DESCRIPTION
<b>Week starting (Mon)</b>	Mandatory	Date	8	Must be valid Monday date. date format YYYYMMDD
<b>Electricity Distributor</b>	Mandatory	Integer	2	Valid values: 10 to 32 inclusive and 35.
<b>Mon</b>	Optional	Integer	MAX 8	Blank or zero or positive integer
<b>Tue</b>	Optional	Integer	MAX 8	
<b>Wed</b>	Optional	Integer	MAX 8	
<b>Thu</b>	Optional	Integer	MAX 8	
<b>Fri</b>	Optional	Integer	MAX 8	
<b>Sat</b>	Optional	Integer	MAX 8	
<b>Sun</b>	Optional	Integer	MAX 8	
<b>Creation Date</b>	Mandatory	Date	8	System date of file creation. Format: YYYYMMDD
<b>Creation Time</b>	Mandatory	Time	8	System time of file creation. Format: hh:mm:ss
<b>New line</b>				

Figure 6 – CSV Input File Specification

46. Output CSV files are named according to the following convention:
- (file type indicator)\_(SECPartyID)\_(EUI64 number)\_(SMSO)\_(week starting date (YYYYMMDD)).csv

e.g. **DR\_AAA123\_70-B3-D5-1F-30-00-A0-08\_CGI\_20190121.csv**

47. An example CSV file DR\_AAA123\_70-B3-D5-1F-30-00-A0-08\_CGI\_20190121.csv accompanies this document and represents a supplier with two Electricity Distributors demand requests.

## 9 Migration Demand Commitment File

48. The Daily Migration Demand files provided by Responsible Suppliers to DCC are consumed by the migration allocation process. On completion a Migration Demand Commitment file is created for each valid Daily Migration Demand file supplied, detailing the allocation made by DCC for each day of the Migration Week being considered and for each SMSO.
49. The CSV file name for the Migration Demand Commitment shall be identical to the Daily Migration Demand CSV file name, as specified in paragraph 46 above, except the first two characters is set to 'DC' to indicate demand commitment data.
50. The format of the Migration Demand Commitment file is identical to the Daily Migration Demand file, as specified in paragraph 45 above, except the Attribute 'File Type Indicator' is set to 'DC' to indicate demand commitment data and the data is aggregated by Electricity Distributor.

51. In addition, and to create an audit trail, the aggregate value of the original demand requirement data is also output in the Migration Demand Commitment file and has the Attribute 'File Type Indicator' set to 'DT' to indicate the Demand Total.
52. An example of a Migration Demand Commitment file accompanies this document:  
DC\_AAA123\_70-B3-D5-1F-30-00-A0-08\_CGI\_20190121.csv.