



Scottish & Southern
Electricity Networks

Constraint Managed Zones

Pricing and Billing

April 2021



1. Summary

Please note, this is a guidance document designed to outline SSEN approaches to calculating CMZ payments and settlements. SSEN field a range of different CMZ services attracting different payment types from the options below.

The detail is not exhaustive, is not offered in way of guarantee or cannot be used as confirmation in any way of payment processes which may be applied to specific CMZ releases. SSEN reserve the right to change, delete and add to the methods below in future as improved methods and calculations are developed.

2. Types of CMZ Services

CMZ Sustain - SSEN is considering electrical networks which are approaching a point where the pre-existing network capacity cannot meet power requirements should an outage coincide with periods of highest demand where the system's firm capacity (post outage) is lower than the demand. Traditional reinforcement techniques would increase overall capacity across all time periods by including an additional circuit or by up-rating an existing one. CMZ techniques do not seek to increase capacity but will reduce or time-shift demand to avoid capacity constraints. Since capacity constraints only occur at periods of maximum demand, and only if an outage coincides, CMZ techniques need only be available during pre-defined Service Windows.

CMZ Secure - In the same manner as CMZ Sustain, SSEN will procure ahead of time the required power injection/demand response services from available DER providers based on network conditions to manage pre-planned outages.

CMZ Dynamic – SSEN will procure ahead of time, the ability of a Service Provider to deliver an agreed change in output to avoid or following a network fault, for example to avoid in N-1 scenarios overloading of the 2nd circuit or to constrain loadings during restoration or repair scenarios. Utilisation is then instructed when the fault occurs on the network (but only if loading is beyond the post fault rating of the remaining assets), or to enable constraint management during restoration activities.

CMZ Restore - Based on a static, rolling contract and utilising DER to manage networks more efficiently during fault conditions, SSEN will instruct a provider to either remain off supply, to reconnect with lower demand, or to generate into a network zone isolated from the main fault to support more efficient or effective load restoration within a specific network area.

The Dynamic and Restore services qualify for Utilisation payments, where the Secure and Sustain services qualify for both Availability and Utilisation payments. More information on these payments can be found in this document.

3. Generation & Energy Storage Providers

For both generation and energy storage systems, performance will be assessed by evaluating the metering data for the day(s) on which a CMZ Event is triggered to determine the total kWh delivered by the provider during the CMZ Event.

The energy provided by the CMZ Service Provider is compared to the contracted CMZ Capacity and Export data, and the CMZ Event will be considered successful for the purposes of the SSEN Utilisation Payment and Availability Payment where the export across the CMZ Event equates to at least 90% of the contracted CMZ Capacity and accurate to 90% for the Export data. However, there may be CMZs where this percentage may differ due to requiring a higher accuracy.

4. Demand Side Response

For Demand Side Response technologies, analysis will be required to assess the performance during a CMZ Event.

The SSEN approach to be used for assessing performance of Demand Side Response based CMZ Services compares the actual load profile during the CMZ Event against a baseline demand profile derived to represent the demand profile that would have been seen had a CMZ Event not been called.

This baseline methodology takes a day comparison approach, using day matching to establish the days to be used to derive the baseline demand profile.

The prior 10 Eligible Days (5 days for weekend CMZ Events) will need to be assessed with total daily electrical consumption (kWh) most closely matching the total daily electrical consumption on the event day (excluding the CMZ Event period) will be used to derive the baseline demand profile.

The Open Networks Project WS1A Product 7 (2021) is expected to produce an industry standard approach to baselining, when this is completed SSEN is committed to adopting that standard approach.

5. Energy Efficiency

For Energy Efficiency (EE) responses, analysis will be required to assess the performance prior to and during a CMZ Event similar to the Demand Side Response detail above.

While EE applications are rare and the precise approach has not undertaken reasonable testing or development, SSEN proposes assessing performance of Energy efficiency supported CMZ Services by comparing the actual load profile during the CMZ Event against a baseline demand profile derived to represent the demand profile from the area/assets prior to implementation of the EE devices/processes.

This baseline methodology will utilise a day comparison approach, using day matching to establish the days to be used to derive the baseline demand profile.

6. Pricing and payments

The CMZ Provider is responsible for collecting sufficient evidence to clearly demonstrate the performance of their CMZ Service to SSEN, and for undertaking a performance assessment. This will allow SSEN to determine the overall performance of the CMZ Service, and is used to derive the associated payments as described below.

The base data for a performance assessment will be 30-minute interval metered power data (kW). The approach used by SSEN to assess performance of the CMZ Service will depend on the type of technology being used. The results of the assessment should be included in the Invoice submitted to SSEN.

4.1 Availability payment

SSEN Availability Payments are paid to secure the required service for a period of time, without committing to using the service itself unless it is required. For example, SSEN may pay £150 per megawatt per day (£150/MW/day) to a generator between 16:00-20:00 over a specific day, week or season where we expect demand to increase in a CMZ Sustain scenario. The payment is to ensure that a capacity (i.e. 2MW) is available for that period of time, if we actually use the service in that period then we could also pay a utilisation fee for the power actually provided. Availability can be general,

where we know the required time periods ahead of time and form these as part of the contract, or targeted, where we identify the required time periods in response to a specific network condition post contract placement. We calculate availability as seen from this section.

The Availability payment equation, seen below, determines the total the Availability payments made to the DER over the desired settlement period (which in most cases will be monthly), using the agreed contracted £/MW/day price and number of days the DER has been asked to be available for SSEN's CMZ.

SSEN Availability Payment (AP_m) can be paid during the period requested within the service notification instruction by SSEN to the CMZ Provider, which will be an amount calculated in accordance with the following formula:

$$AP_m = \left(\sum_{j \in Pp} A \times CM \times FO_j \times FU_j \right)$$

where:

- $\sum_{j \in Pp}$ is the summation over all Settlement Periods j , in the set Period (P) of Settlement Periods (days) in the Availability Period "p";
- AP_m Availability Payment during period (p), where m is used to represent the period for one month;
- j Settlement period j in the set period;
- A Contracted availability price;
- CM CMZ capacity contracted OR requested service capacity, in MW;
- FO_j Binary factor, equal to zero if a declaration of unavailability.
- FU_j Binary factor related to the delivery of contracted capacity during a CMZ Event and to the provision of complete data. If $MW < 90\%$ contracted capacity or Requested Capacity, $FU_j = 0$, otherwise 1. Also, if less than 90% of the data is reported $FU_j = 0$.

4.2 Utilisation payment

SSEN Utilisation payments are usually linked directly to the amount of power provided or reduced in response to a specific instruction. For example, SSEN pays a storage device £150 per megawatt hour (£150/MWh) for exporting power, or a demand response service for dropping the equivalent power when we suffer an outage on our network.

The Utilisation payment equation, seen below, determines the total the Utilisation payments made to the DER over the desired settlement period (which in most cases will be monthly), using the agreed contracted £/MWh price and the provided energy for SSEN's CMZ.

SSEN Utilisation Payment (UP_m) can be paid post Event by SSEN to the CMZ Provider which will be an amount calculated in accordance with the following formula:

$$UP_m = \sum_{j \in Pp} U \times E$$

where:

$\sum_{j \in Pp}$ is the summation over a Settlement Period j, in the set Period (P) of Settlement Periods (days) in the Utilisation Period “p”;

UP_m Utilisation Payment during period (p), where m is used to represent the period for one month;

U is the contracted Utilisation Price, in £/MWh;

E is the Energy Delivered, estimated in accordance with sections generation and energy storage and Demand Side Response, as applicable, in MWh. This MWh is capped at a value no greater than the total contracted CMZ Capacity multiplied by the duration of the CMZ Event;

j Settlement period j in the set period.

7. Interaction with other services

If a CMZ Provider is contracted for the Sustain Service, they must ensure that they can provide the required generation increase or demand reduction to SSEN during the contracted service window. For CMZ Services that have no service windows, such as Dynamic and Restore, then they have no obligation to respond to an instruction or availability request.

Contracting with SSEN to become a CMZ Provider does not preclude the CMZ Provider from contracting for other grid services, for instance with the System Operator, as long as such services do not impair the provision of the required CMZ Service to SSEN within any stipulated availability windows. For the avoidance of doubt, if the CMZ Provider is providing service during the Service Window to another party, but at the same time they can comply with the CMZ Service requirement, they will not be in breach of the CMZ Agreement with SSEN. However, for any reason should a provider fail to meet their contracted CMZ requirements repeatedly SSEN may be unable to continue to contract with the service.

8. Billing and payments

SSEN uses a separate Billing and Payment process within its legacy systems for which details are [available here](#), the Flexible Power Billing and Payment process is under development for SSEN adoption. Therefore, SSEN will provide an update for this when available.