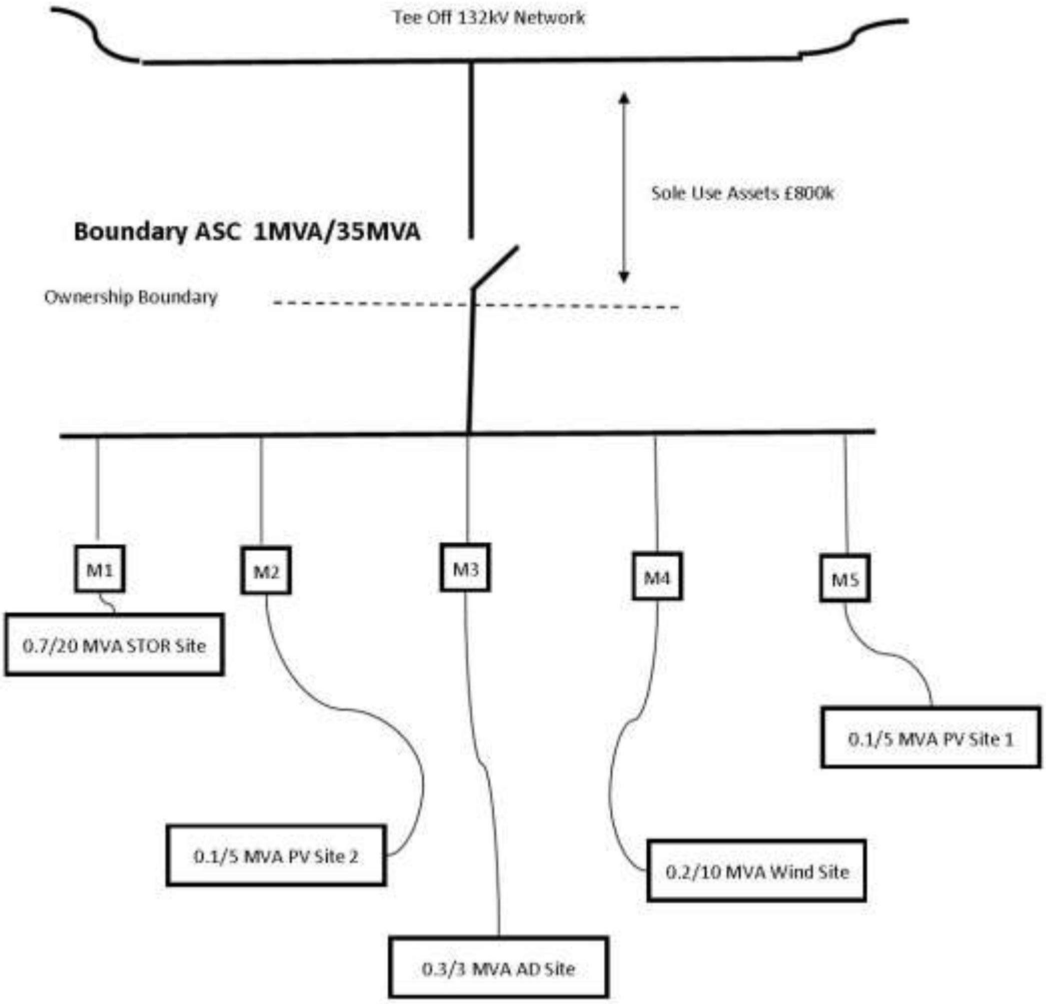
Example Energy Park Where the Total Installed Capacities of the Embedded Sites Exceeds the Agreed Capacity at the Ownership Boundary.



Total Installed Capacity
1.4MVA Imps/43 MVA Exps

In the above example of an "Energy Park" the DNO has given the connection agreement holder 5 pairs of import/export MPANs for use with the 5 embedded meters shown. Each of the 10 MPANs has been allocated a site-specific LLFC to enable trading using the "Fully Settled Metering Option" as described in the Elexon Guidance note for Licence Exempt Networks.

Whilst each MPAN appears in Settlements as a "normal" EHV HH metered site, the above scenario poses problems for DUOS billing under the EDCM pricing model. These problems arise because of the mix of technologies sharing the EHV connection. The non-co-incident nature of these technologies make it possible to fit more generating units than the network could ordinarily absorb. These problems might be solved by modifying the methodology in similar ways to those described below.

The EDCM Fixed Charge

The EDCM fixed charge is currently set as a percentage of the Sole Use Asset Value. Using the value in the example would result in a Fixed Charge of £800,000 * 0.0125 = £10,000 per annum for the point of connection. This could be recovered by setting the fixed charge applicable to each of the 10 MPANs in proportion to their installed capacities. For example;

The Export MPAN for the Anaerobic Digester connected to "M3" has an installed capacity of 3000kVA. This could be used in proportion to the Total of installed capacities such that the fixed charge for this MPAN in DUOS would be calculated as;

£10,000 * (3000kVA/44.400kVA) / 365 days *100 = 185.117 pence per day.

Using the same methodology, the calculation of the fixed charge for the 0.2MVA import MPAN for the windfarm on "M4" gives;

£10,000 *(200kVA/44,400kva)/ 365 days * 100 = 12.341 pence per day.

The EDCM Capacity Charge

The HH profiled readings for all 5 of the embedded meters would be summated together for use in the engineering models to represent the power flows at the boundary point of connection. The resulting engineering factors would then be entered in the EDCM pricing model, configured for a single generation connection, and this would return boundary pence per kVA capacity charges for use in DUOS billing.

Note that in the above example the total of the installed capacities is greater than that quoted in the connection agreement for the boundary point of connection. Equipment is fitted at boundary is programmed to constrain off individual embedded units in the unlikely event that co-incident behaviour by all of the embedded sites would result in the connection agreement values being exceeded. In this scenario, if DUOS billing is configured to use the actual installed import/export kVA capacities for each MPAN and also configured to use the boundary capacity charge then it will be overcharging across the 10 MPANs.

Suppose that the resulting EDCM boundary pence per kVA charges for the above energy park are 5 pence per kVA per day for the imports and 0.05 pence per kVA for the exports. A suggested addition to the EDCM methodology is to reduce these values applicable at the embedded meter positions as follows;

For a boundary import capacity charge of 5p per kVA per day;
5p per kVA per day * 1,000kVA / 1,400 kVA = Embedded 3.57p per kVA per day.

For the boundary export capacity charge of 0.05p per kVA per day.
0.05p per kVA per day * 35,000/43,000 = Embedded 0.041 pence per kVA per day.

Note that reducing the kVA capacities for each individual MPAN in DUOS would not work. This is because it is likely that the meter readings would then routinely exceed these values resulting in excess capacity charges being applied. Indeed the proposed solution does not fully solve this problem whereby DUOS might apply excess charges at the embedded meter position when no co-incident excess power is observed at the boundary.

The EDCM Super-Red Unit Charge

This element of the EDCM charging is location dependent. The engineering and pricing models do not consider any EHV sites in isolation from their neighbours. Where present, import super-red rates are always positive. Export super-red rates are always negative which represents credits paid from DUOS to the registered supplier of the site.

In the example intermittent generators (the wind and PV generators) are assigned a zero “F Factor”. In the example the non-intermittent generators (The STOR and AD sites) would be assigned a non-zero “F Factor”. The size of this factor has a bearing on the size of any super-red credits that might be allocated by the power flow analysis. The intermittent and the non-intermittent “F Factors” combine to result in a non-zero “F Factor” which is an average for all the generators sharing the EHV connection. If the combined power flow analysis then produces non-zero super-red unit charges (generation credits) then the non-intermittent generators may receive less than if they were connected directly to the DNO, conversely the intermittent generators would receive more.