Considerations for a Backgrounds CUSC Mod Proposal

1. Generation scaling Factors

a. Minimum scaling factors

Should the minimum scaling of variable plant in YR (Year Round) be 10% (as proposed in mod CMP424 quick fix) or something different, such as 0% or 2%? There does not appear to be hard evidence for the proposed 10%, and may be helpful to gathering evidence for what level this should be set at under this more in-depth review.

b. Year Round (YR) scaling factors: especially for Interconnectors and Energy Storage

Interconnectors are currently modelled as 100% fixed generation in YR, while energy storage (batteries and Pumped Storage) are modelled at 50% fixed generation in YR. These should be reviewed to ensure scaling factors provide an appropriate reflection of future operations. It appears more cost reflective to scale both storage and interconnectors at 0% generation in the Year Round Background. This would be particularly important if a lower demand assumption was used for the Year Round background and would also largely resolve the negative scaling issue for variably scaled generation in a more appropriate way. Also review fixed scaling factors of other technologies.

2. Technology Classifications - Carbon vs low carbon

a. Improve use of terminology regarding "carbon" versus "low carbon"

Full definitions and reasoning behind the definitions of Carbon versus Low Carbon are limited, difficult to find and are likely in need of a review due to changes in the market since they were developed in 2015. The original purpose was to discriminate between inflexible generation, which were classed as "low carbon", versus flexible technologies, which were classed as "carbon". The terminology may have been a reasonable proxy at the time, but it would now be helpful to change to a different terminology that was clearer and more accurate.

Commented [AJ1]: I may have the wrong end of the stick here and happy to be corrected but I think it is really dangerous to use the terms Carbon and Low Carbon where it may be better to use terms use as Controllable Generation and Non Controllable Generation otherwise pumped storage and storage which could be charged by renewable sources are being labelled in the wrong way,

These categories are used to calculate the Not Shared Year-Round and Shared Year-Round tariffs. The categorisation is based on generators' impact on the transmission network, and do not reflect carbon intensity or energy policies. "Carbon" means "flexible generators" and "Low Carbon" means "inflexible generators".

Table 1.6 Categorisation of Low Carbon and Carbon generation

Carbon	Low Carbon
Coal	Wind
Gas	Hydro (excl. Pumped Storage)
Biomass	Nuclear
Oil	Marine
Electricity Storage (including Pumped Storage)	Solar
Interconnectors	Tidal

The categorisation will be updated from time to time, to include new technologies.

Source: Statement of use of system charges: download (nationalgrideso.com)

b. Treat CCUS as Carbon like CCGT, not Low Carbon like Nuclear

As more CCUS is added to the Transport model, it's treatment becomes increasingly important. As CCUS will likely operate in a similar way to a CCGT, operating flexibly and with similar patterns of BM bid and offer pricing, the current classification of it as Low Carbon, being treated in the same way as Nuclear may not be appropriate.

Commented [AJ2]: As above - may be worth stating this is controllable rather than Low carbon.

c. Class some flexible hydro as "carbon", due to high flexibility

It may be more cost reflective to split treatment of hydro generation into two classes to include flexible hydro (with long-duration storage), versus inflexible hydro (e.g. with minimal storage, run of river, or part of a cascade). Hydro with storage tends to operate more flexibly and closer to other "carbon" technologies, so the current classification as "Low Carbon" does not appear to be appropriate for them.

Commented [AJ3]: Suggest we use the word controllable

Commented [AJ4]: Suggest we use the term Non-Controllable

d. How will thermal generation from hydrogen be classified when included e.g. carbon like CCGTs ?

Thermal generation of electricity using hydrogen is likely to exhibit operational dispatch in a similar way to CCGTs and CCUS, so there may be a case for it to be classified as "carbon" instead of "low carbon".

3. Other Technology Classification issues

a. Treat PV differently to Onshore wind – separate out PV out in the T&T model

Commented [AJ5]: Not sure what TT is.

Currently PV and Onshore wind have the same category in the Transport model. Given their differences in operating and system requirements, there appears to be a case to treat PV differently with regards to both modelling in the Transport model backgrounds and calculation of charges.

b. How to model embedded generation in the T&T backgrounds

Can the data inputs be improved so that demand and embedded generation can each be modelled on a gross basis in the T&T model backgrounds?

4. Demand

a. Demand split between YR (Year Round) & PS (Peak Security)

Should demand have PS and YR applied differently to each other to reflect the way flexible demand responds in different conditions? E.g. Peak Security demand should include peak avoidance actions, while Year Round demand should include flexible demand more likely to turn-up, such as EV and electrolyser demand.

b. Flexible future demand, e.g. electrolysers

Should some types of flexible demand be identified and treated differently from other types of demand, regarding both modelling in T&T backgrounds and charges.

5. Model design

a. Parallel zone issue with zone 22

Due to the nature of the parallel zones around zone 22, there can be a large variability in the zone 22 tariffs due to a flip between shared and not shared, even with just small changes in model inputs. This looks more likely in future years. How should this be dealt with to ensure stability for generation and demand in that zone?

b. Any issues arising from offshore grid, e.g. offshore local charges

Consider how the model needs to be developed to take account of Offshore grid, including things like offshore local charges. For consistency, should offshore local circuits be included in the T&T model background load flow calculations in the same way as current onshore local circuits?

c. MITS node definition

Is the current MITS node definition still suitable for all locations, including both onshore and offshore situations, or do some amendments need to be put in place to ensure the modelling is reflective. Is this being adequately dealt with elsewhere?