Design Variation Charging Arrangements Update

CISG

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Amendment options update

- Adjustment to charging boundaries
  1. LV assets
  2. Generator only spurs
- Multiple 132kV Expansion Factors

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Adjustment to charging boundaries I - Sub transmission assets

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Sub 132kV connection boundary

- Establishment of the connection charging boundary so that all sub-transmission voltage assets (sole and shared) are charged as connection assets
- Allows generators to make an efficient decision based on cost reflective discount
- Requires sharing rules to be determined for shared sites
  - E.g. 50:50 or apportioned by TEC
- Step changes/legacy issues

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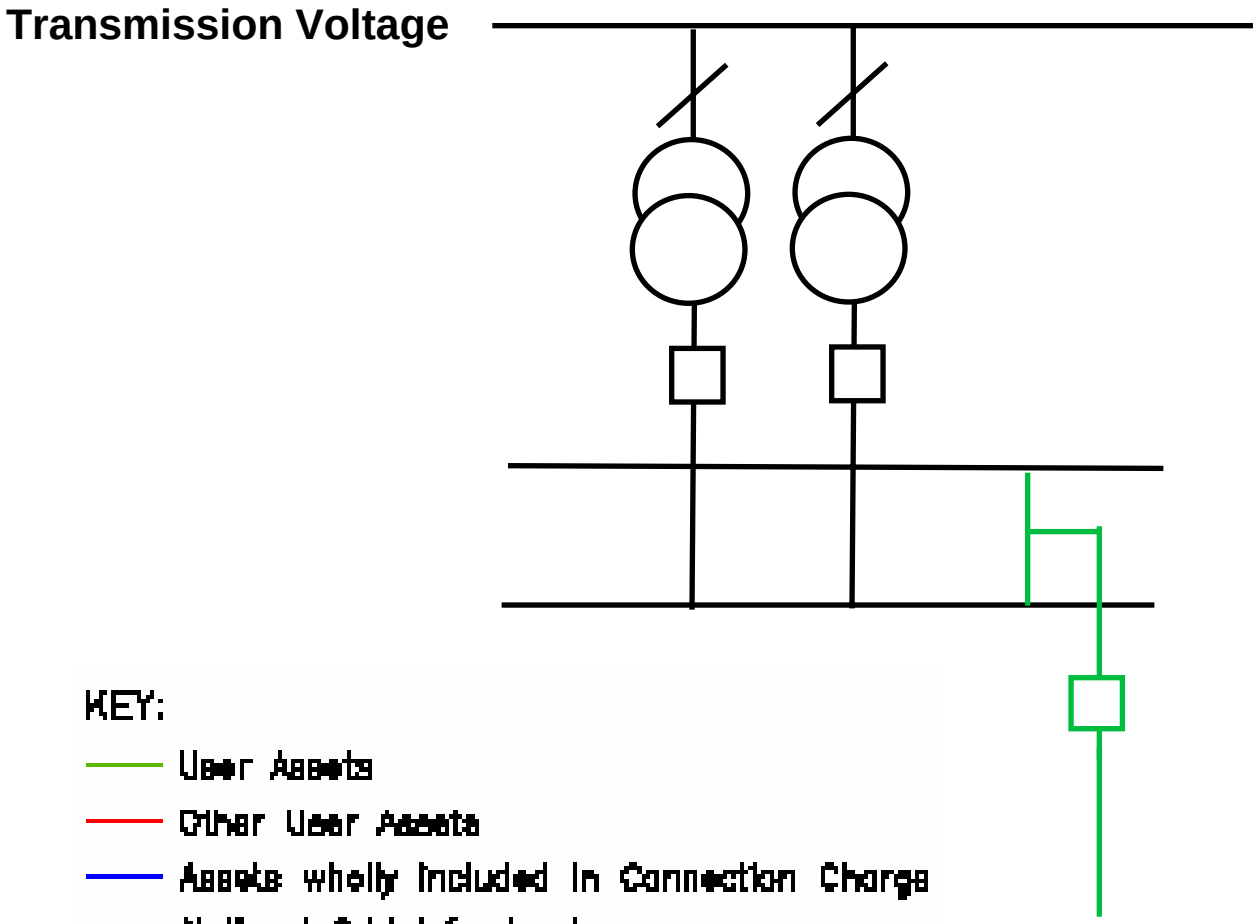
Existing typical charging & connection boundary for designs within queue



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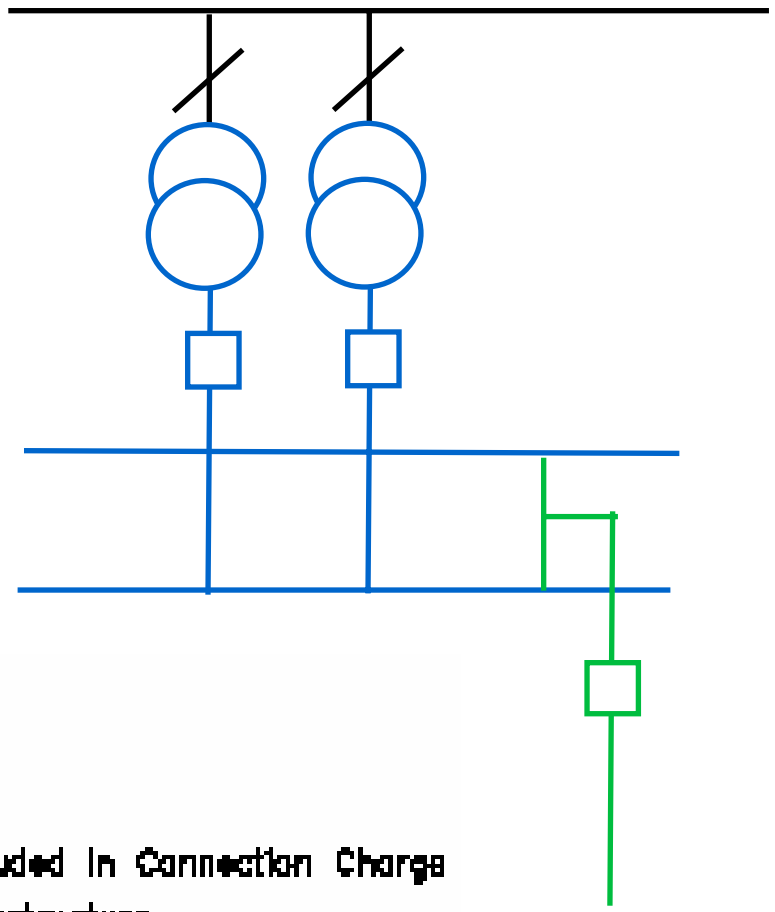
Revised boundary

Transmission Voltage



KEY:

- User Assets
- Other User Assets
- Assets wholly included in Connection Charge
- National Grid Infrastructure

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In order to gauge magnitude…

- From KEEMA report expected <132kV asset replacement for SPTL TO area is:
  - 23 transformers (£16.1m)
  - 56 units of switchgear (£22.4m)
    - Assume half would be affected
  - Assume same again for new build
- Will decrease the residual element of TNUoS tariff equally across all demand zones and all generation zones
  - £0.76 Demand
  - £0.28 Generation
- N.b. Figures are illustrative and data gathering exercise must be completed to improve accuracy

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Sub transmission charging boundary

- Pros
  - True capital cost signal given to user
  - Closer consistency for different connection standards and different geographic locations
- Cons
  - If shared, rules complex
  - Does not deal with circuit
  - Legacy issues

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Adjustment to charging boundary II – Generator only spurs

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Generator only spurs

- Remove transmission spurs that connects generation only from infrastructure
- Fund by connection charges
- Sharing rules required

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Generator only spurs

- Pros
  - Full & accurate cost reflection of OHL and substation cost of connection
  - Allow user to make most efficient decision
  - TO can show investment was justified
- Cons
  - Barrier to entry as increased security is required
  - May discourage full utilisation of existing spurs
  - Affected by the wider decisions of TO network development

What is the correct balance between the two?

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Creation of Multiple 132kV Expansion Factors

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Multiple expansion factors

- Existing 132kV Expansion Factors are derived using a weighted average of the incremental cost of uprating the circuit to 275/400kV (1.0) and the true cost of 132kV (2.87)
- This amendment would identify which circuits are likely to be uprated and apply a lower expansion factor. The true unadjusted expansion factor would be applied to the remainder

- This would be applied to cables also, but the relative impact is far smaller

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Multiple expansion factors

- Within SHETL's Sevn Year Statement 500km (12%) of 132kV circuit are identified as planned uprating
- It is expected that several times more kms would be uprated.
- Changes to zonal boundaries have not been considered although likely to be required

Zone Name	Zonal Tariff (£/kW)
North Scotland	0.97
Peterhead	0.96
Western Highland & Skye	0.83
Central Highlands	0.71
Argyll	0.01
Stirlingshire	-0.01
South Scotland	-0.04
Auchencrosh	-0.02
ALL OTHER ZONES	-0.03

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Multiple expansion factors

- Pros
  - Nodal marginal costs more accurate
  - Discount will increase significantly
  - Future uprated notes will see a more stable and accurate charge
  - Significance will increase as number of 132kV circuit for intermittent generation increases
- Cons
  - Zoning will absorb some of the potentially increased accuracy
  - May result in changes to zonal boundaries
  - More ‘judgement’ needed subjectivity. Will be ‘wrong’
  - Increase to administration required
  - Predictability – charge set after design assessment and build

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Conclusions/ Next steps

- Further analysis with more comprehensive data set
- Additional consultation at industry forums when results known
- Standard formal charging consultation process to follow

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