

# CMP324/5 Workgroup 3 slides

January 2020



# DNO Zones

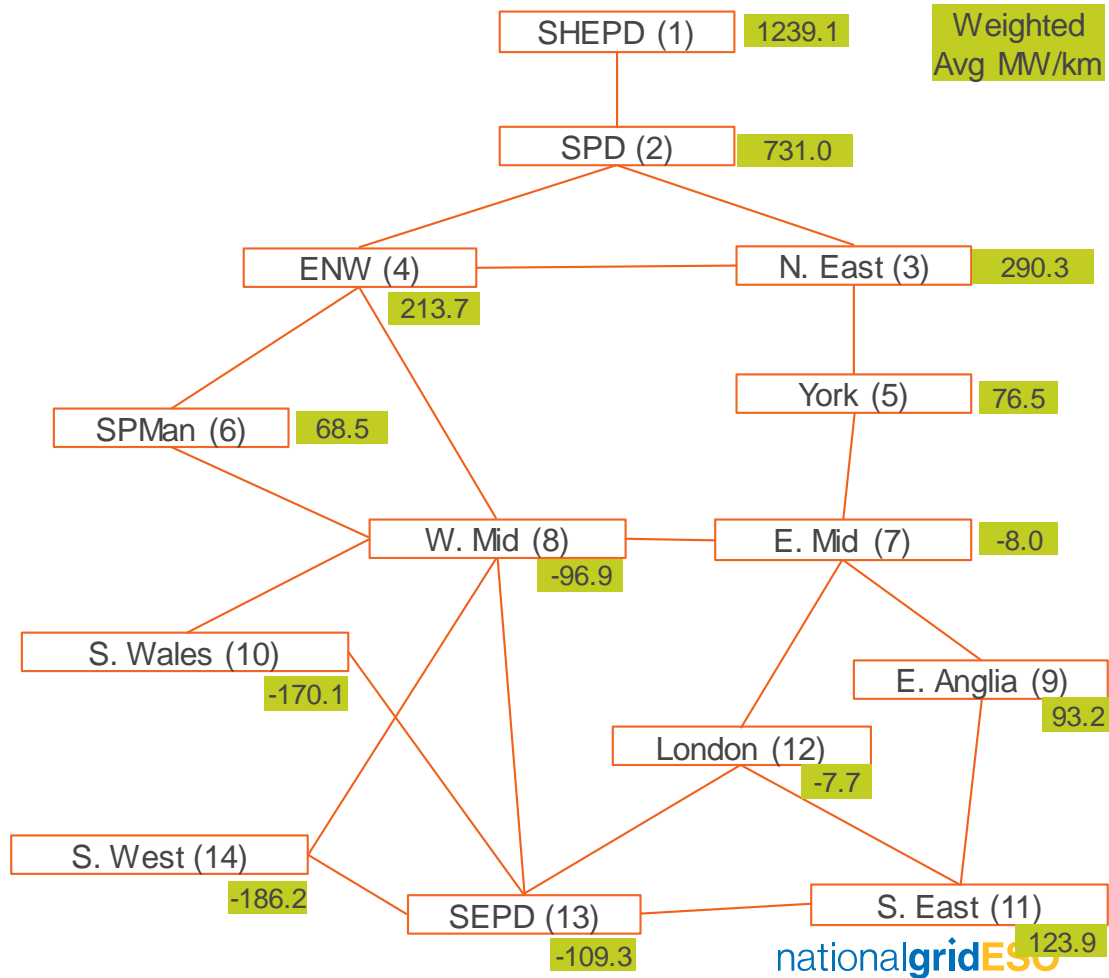
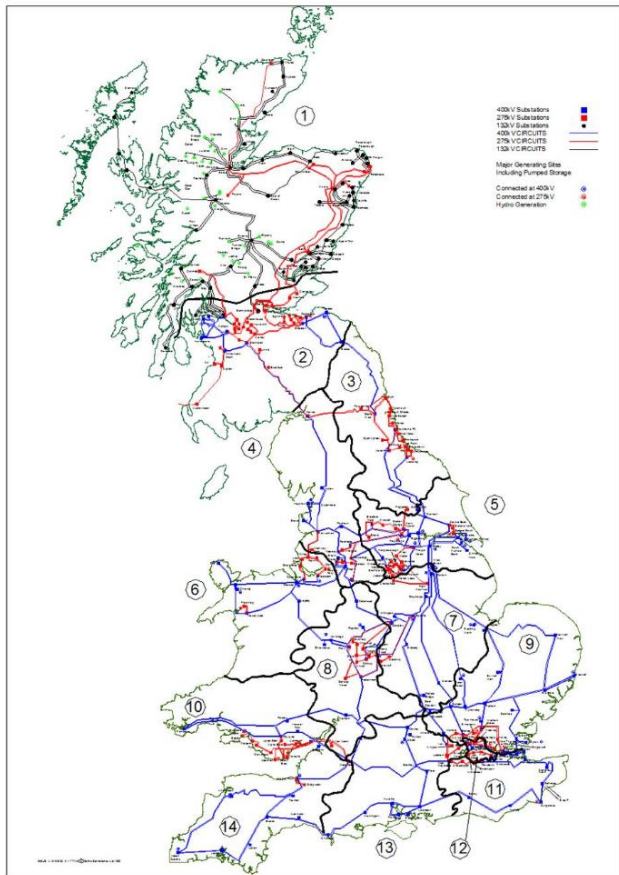


# DNO Zones Analysis

## T&T Model uses a simplified version of the network

- Assumes one route from Generation to Demand
- Some methods already documented in CUSC to simplify the network topography (14.15.50)
- Results in a 'connectivity diagram' which is how the T&T model 'sees' the network
- Next few slides show how we've built the 'connectivity diagram' for our Proposal
- All other factors remain (e.g. Boundary Sharing Factors) unchanged.

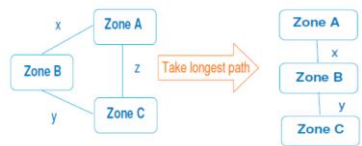
# DNO Zones Analysis



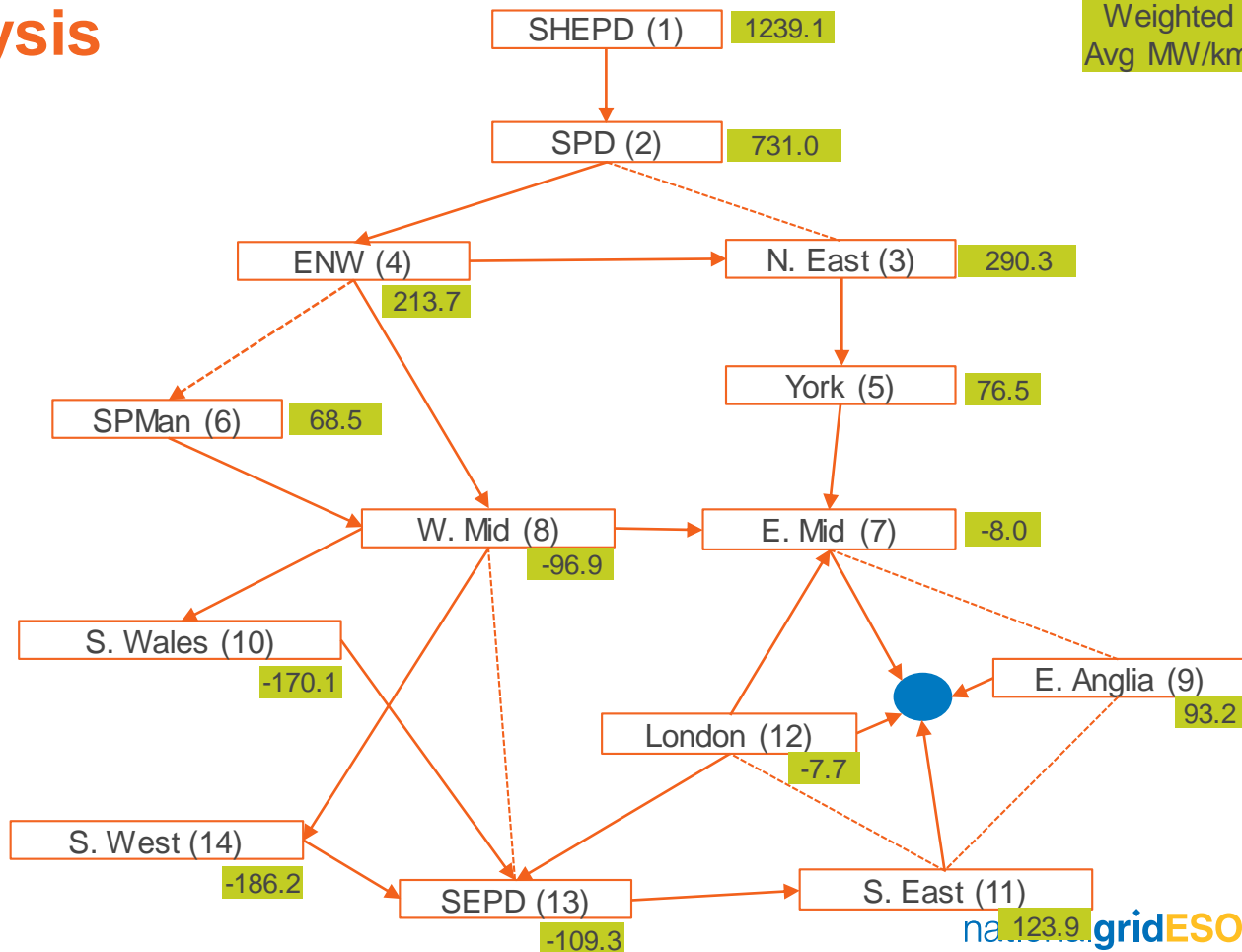
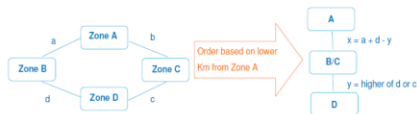
# DNO Zones Analysis

- Add Demand Centre (blue dot)
- Add main flow directions (arrows)
- Apply CUSC rules (14.15.50)

- Parallel paths – the longest path will be taken. An illustrative example is shown below with x, y and z representing the incremental km between zones.



- Parallel zones – parallel zones will be amalgamated with the incremental km immediately beyond the amalgamated zones being the greater of those existing prior to the amalgamation. An illustrative example is shown below with a, b, c, and d representing the initial incremental km between zones, and x and y representing the final incremental km following zonal amalgamation.

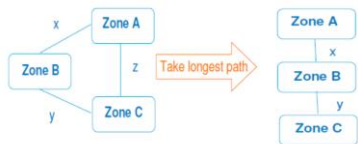


Weighted  
Avg MW/km

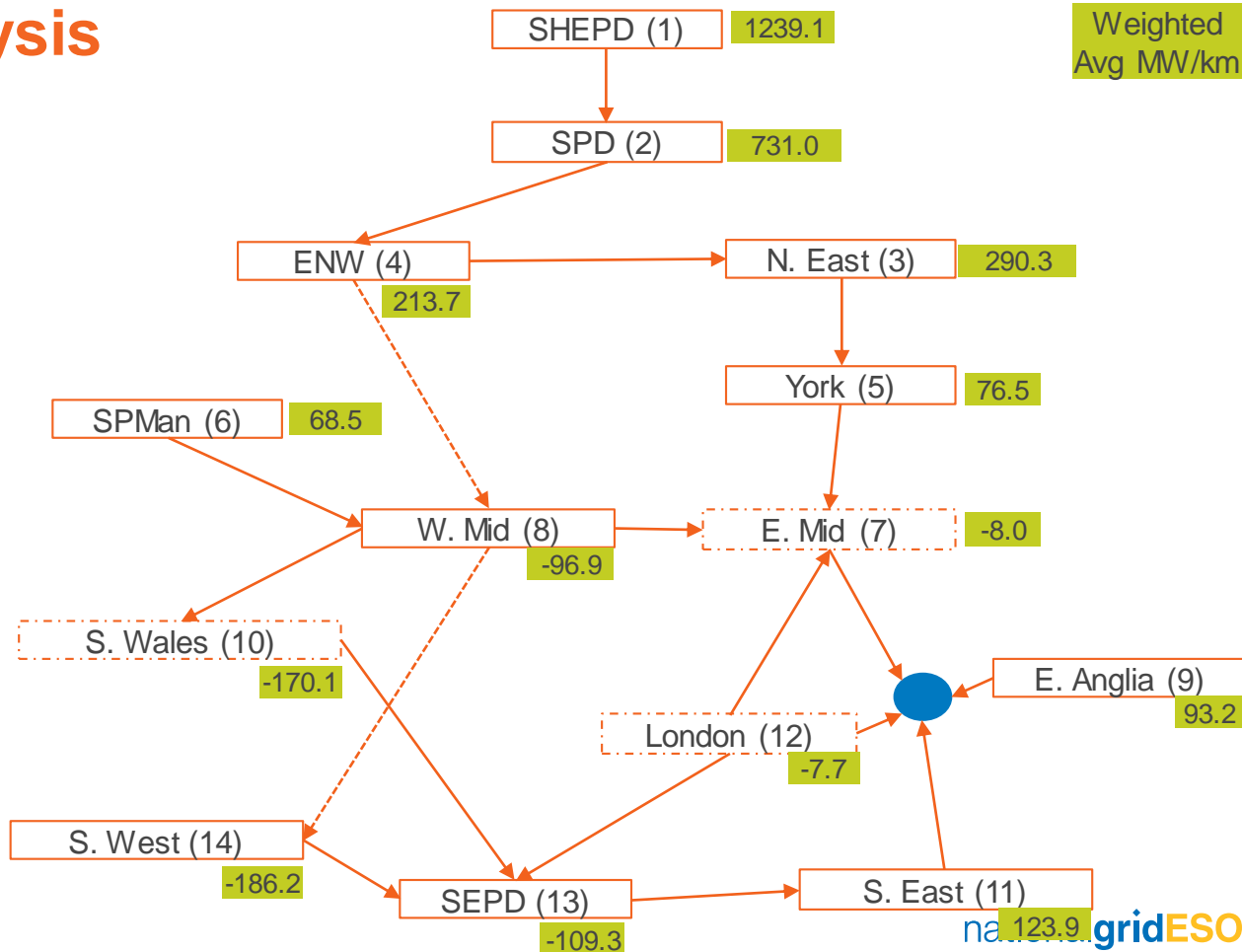
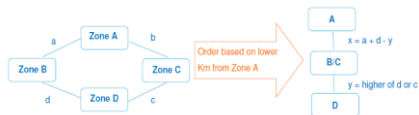
# DNO Zones Analysis

- Apply CUSC rules (14.15.50) again...

- Parallel paths – the longest path will be taken. An illustrative example is shown below with x, y and z representing the incremental km between zones.

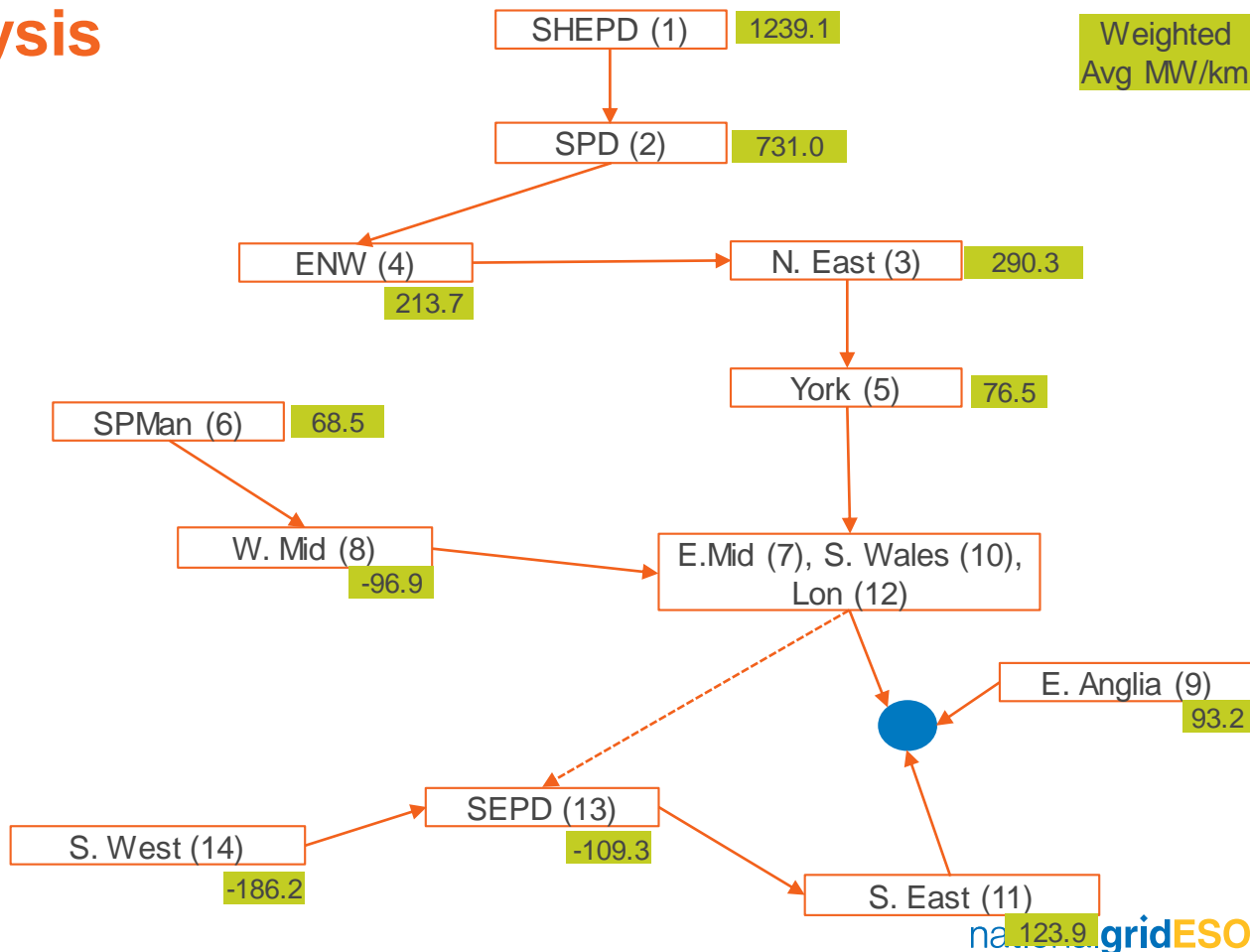


- Parallel zones – parallel zones will be amalgamated with the incremental km immediately beyond the amalgamated zones being the greater of those existing prior to the amalgamation. An illustrative example is shown below with a, b, c, and d representing the initial incremental km between zones, and x and y representing the final incremental km following zonal amalgamation.



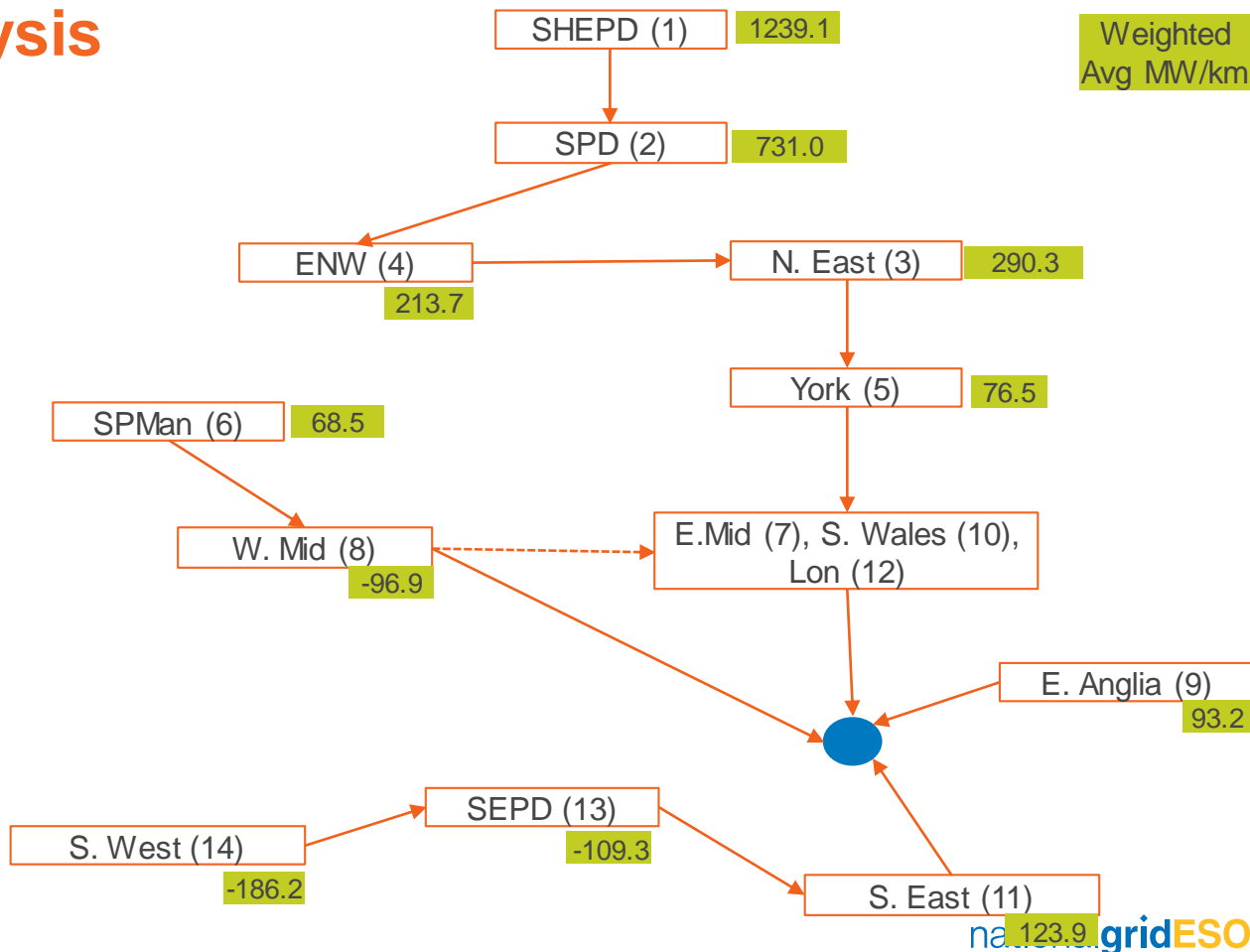
# DNO Zones Analysis

- Make the following into parallel zones
  - S. Wales
  - London
  - E. Mid
- Removes E. Mid and Lon 'star' connections
  - Multiple inputs/outputs
  - T&T model cannot model zones with many inputs and/or outputs
- Will still result in tariffs for 14 zones



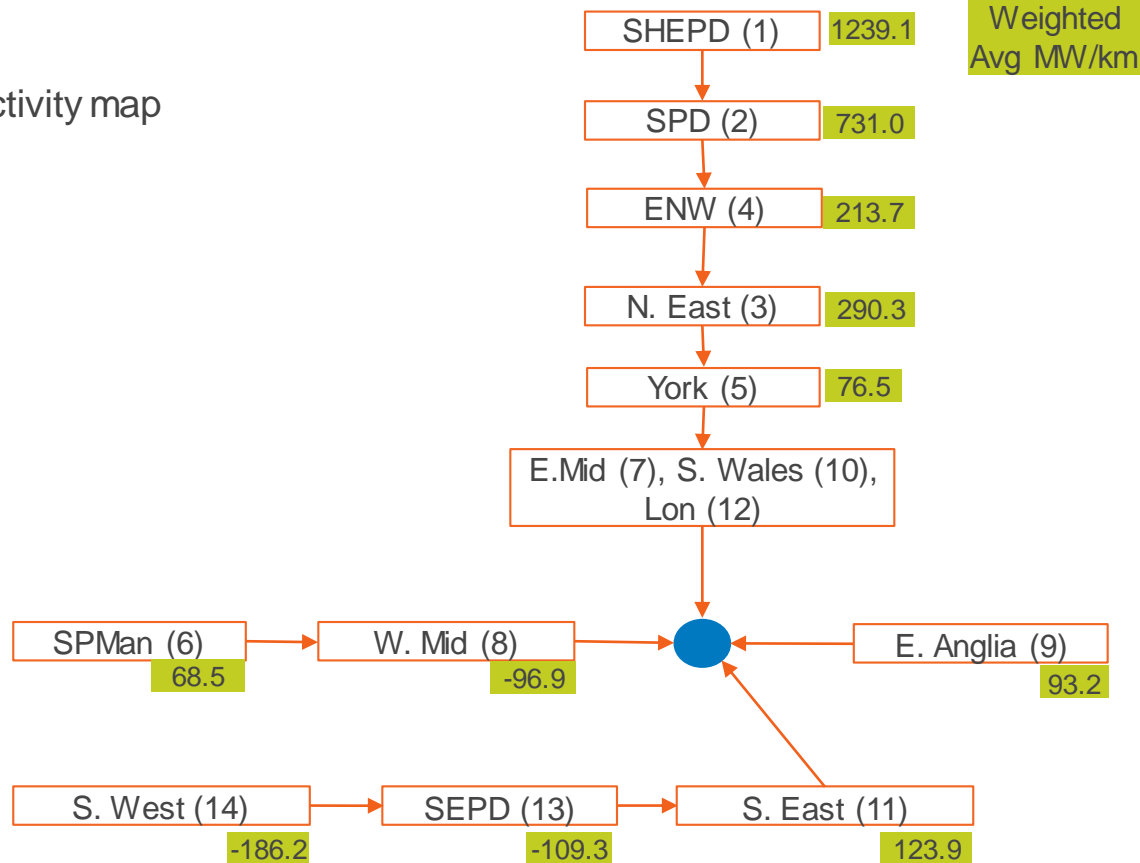
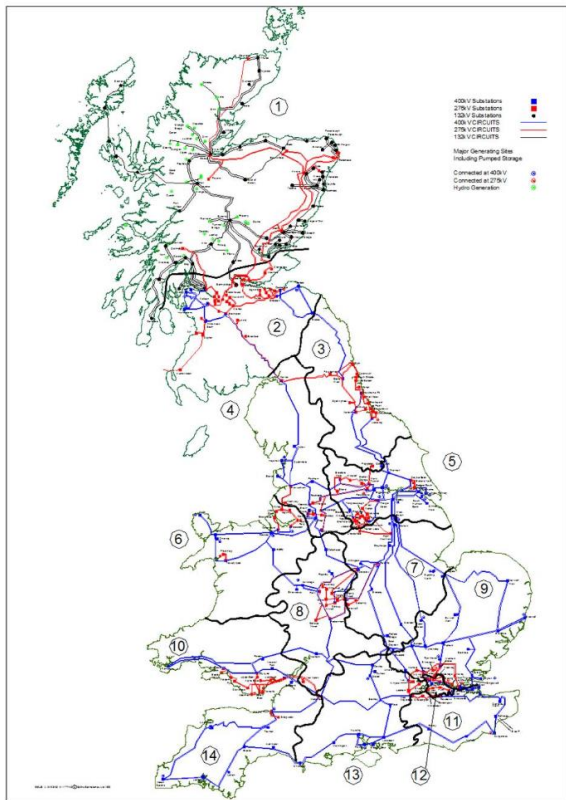
# DNO Zones Analysis

- Need to break the 'parallel zone star'
- Do this by connecting W.Mid straight to Demand Center
- Involves removing the fewest links to make the configuration work
- These 'star' corrections not in CUSC and so would need to be added
  - Would suggest a method which involves the fewest number of changes to resolve the issue.



# DNO Zones Analysis

- This results in the following connectivity map



# DNO Zones Analysis

## Updated the draft tariffs to incorporate the revised connectivity map



- Node-to-zone mapping also included in the attached sheet.
- Tariff variation due to changed connectivity assumption.

| Generation - Wider Tariff Elements |                   | (14 Gen zones_V2)    |                          |                              |                 | Examples                |                             |                  |
|------------------------------------|-------------------|----------------------|--------------------------|------------------------------|-----------------|-------------------------|-----------------------------|------------------|
| Zone No.                           | Zone Name         | Peak Security (£/kW) | Year Round Shared (£/kW) | Year Round Not Shared (£/kW) | Residual (£/kW) | 80% Conventional Carbon | 80% Conventional Low Carbon | 40% Intermittent |
| 1                                  | Northern Scotland | 3.399                | 16.743                   | 17.690                       | -5.124          | 25.821                  | 29.359                      | 19.263           |
| 2                                  | Southern Scotland | 3.430                | 9.669                    | 10.644                       | -5.124          | 14.556                  | 16.685                      | 9.387            |
| 3                                  | Northern          | 3.899                | 6.149                    | 1.917                        | -5.124          | 5.228                   | 5.611                       | -0.747           |
| 4                                  | North West        | 2.557                | 4.736                    | 1.201                        | -5.124          | 2.184                   | 2.424                       | -2.028           |
| 5                                  | Yorkshire         | 4.459                | 2.126                    | 0.000                        | -5.124          | 1.036                   | 1.036                       | -4.273           |
| 6                                  | N Wales & Mersey  | 3.222                | 1.903                    | 0.000                        | -5.124          | -0.380                  | -0.380                      | -4.363           |
| 7                                  | East Midlands     | 3.424                | -0.214                   | -0.007                       | -5.124          | -1.877                  | -1.878                      | -5.217           |
| 8                                  | Midlands          | 1.985                | -2.693                   | 0.000                        | -5.124          | -5.293                  | -5.293                      | -6.201           |
| 9                                  | Eastern           | -1.981               | 2.591                    | 0.000                        | -5.124          | -5.033                  | -5.033                      | -4.088           |
| 10                                 | South Wales       | 7.144                | -0.214                   | -4.512                       | -5.124          | -1.761                  | -2.664                      | -9.722           |
| 11                                 | South East        | -4.290               | 3.442                    | 0.000                        | -5.124          | -6.660                  | -6.660                      | -3.747           |
| 12                                 | London            | -2.364               | -0.214                   | 0.000                        | -5.124          | -7.659                  | -7.659                      | -5.210           |
| 13                                 | Southern          | -2.220               | -3.038                   | 0.000                        | -5.124          | -9.774                  | -9.774                      | -6.339           |
| 14                                 | South Western     | 0.494                | -5.175                   | 0.000                        | -5.124          | -8.769                  | -8.769                      | -7.194           |

| Variation (V2 - V1) |                      |                          |                              |                 |
|---------------------|----------------------|--------------------------|------------------------------|-----------------|
| Zone No.            | Peak Security (£/kW) | Year Round Shared (£/kW) | Year Round Not Shared (£/kW) | Residual (£/kW) |
| 1                   | 0.000                | -0.112                   | 0.112                        | -0.007          |
| 2                   | 0.000                | -0.112                   | 0.112                        | -0.007          |
| 3                   | 0.000                | 0.571                    | -0.571                       | -0.007          |
| 4                   | 0.000                | 0.029                    | -0.029                       | -0.007          |
| 5                   | 0.000                | 0.000                    | 0.000                        | -0.007          |
| 6                   | 0.000                | 0.000                    | 0.000                        | -0.007          |
| 7                   | 0.000                | -2.117                   | 2.117                        | -0.007          |
| 8                   | 0.000                | -4.596                   | 4.596                        | -0.007          |
| 9                   | 0.000                | 0.000                    | 0.000                        | -0.007          |
| 10                  | 0.000                | 4.512                    | -4.512                       | -0.007          |
| 11                  | 0.000                | 0.000                    | 0.000                        | -0.007          |
| 12                  | 0.000                | -3.656                   | 3.656                        | -0.007          |
| 13                  | 0.000                | -6.480                   | 6.480                        | -0.007          |
| 14                  | 0.000                | 0.000                    | 0.000                        | -0.007          |

# Other options for consideration

## 25-30 zones

### (Reverse Calculate £/MW threshold)

- Assume 25 to 30 zones is the 'optimum' amount of zones
- Use the lowest £/MW difference that results in the number of zones within the range
- Not enough time to do analysis on this option ahead of the Workgroup
- Expected to be computationally complex however

## 'Do nothing' option

- Keep the current 27 generation zones as-is
- Remove the £/MW methodology so ESO complaint with CUSC
- Add requirement for ESO to rezone at each price control (i.e. RII03) or SCR decision; including creating the methodology
- Allows rezoning to accommodate for Access & Forward Looking Charges

# Pros/Cons of options



# Pros & Cons Summary

| Option | DNO Zones  | ETYS Zones  | RPI Indexation   | '25-30 zones'   | 'Do nothing'   |
|--------|--|---|--|---|--|
| Pros   | <ul style="list-style-type: none"> <li>+ Long-term methodology (1)</li> <li>+ Zonal stability (2)</li> <li>+ Full D/T alignment</li> <li>+ Simplicity</li> <li>+ No Ofgem RIIO2 decision needed (5)</li> </ul> | <ul style="list-style-type: none"> <li>+ Long-term methodology (1)</li> <li>+ <u>Potential</u> zonal stability (2)</li> <li>+ Alignment to NETS topography</li> </ul> | <ul style="list-style-type: none"> <li>+ Long-term methodology (1)</li> <li>+ Cost reflectivity signal maintained</li> <li>+ Keeps up with growth of NETS</li> </ul> | <ul style="list-style-type: none"> <li>+ Some cost reflectivity signals</li> </ul>  | <ul style="list-style-type: none"> <li>+ Simplicity</li> <li>+ Short term zone stability</li> <li>+ New methodologies can account for A&amp;FLC SCR</li> <li>+ No Ofgem RIIO2 decision needed (5)</li> </ul> |
| Cons   | <ul style="list-style-type: none"> <li>- Cost reflectivity signal weakened</li> </ul>  | <ul style="list-style-type: none"> <li>- Zoning process not transparent</li> <li>- Assumes ETYS/TNUoS processes continue to align</li> </ul>                          | <ul style="list-style-type: none"> <li>- Long-term zone uncertainty (4)</li> <li>- Will break T&amp;T model eventually (3)</li> </ul>                                | <ul style="list-style-type: none"> <li>- Zoning process not transparent</li> <li>- Long-term zone uncertainty (4)</li> <li>- Assumes 25-30 zones is optimum</li> <li>- Computationally complex</li> </ul> | <ul style="list-style-type: none"> <li>- Long-term zone (4) and methodology uncertainty</li> <li>- Requires update each Price Control &amp;/or SCR decision</li> <li>- 'Long grass' solution</li> </ul>      |

# Year Round vs Combined Year Round + Peak

**Adjusting the methodology used to determine the nodal prices out of scope (as the proposal is dealing with how you zone once the nodal prices are calculated)**

- **Nodal prices need to be calculated from one background of the T&T model – these are Year Round or Peak backgrounds currently**
- **The Year Round background used for the purposes of rezoning (as has most MW/km)**
- **A new ‘Combined Year Round & Peak’ background would need to be created**
- **Depending on how the ‘Combined Year Round & Peak’ snapshot is created, this is likely to;**
  - Lead to more generation zones
  - Remove ‘smooth’ cost signals between zones (e.g. North is positive, slowly decreasing to negative in South)
- **Will be a significant amount of work to update the T&T model to do this**