Appendix A

System geographic and schematic drawings

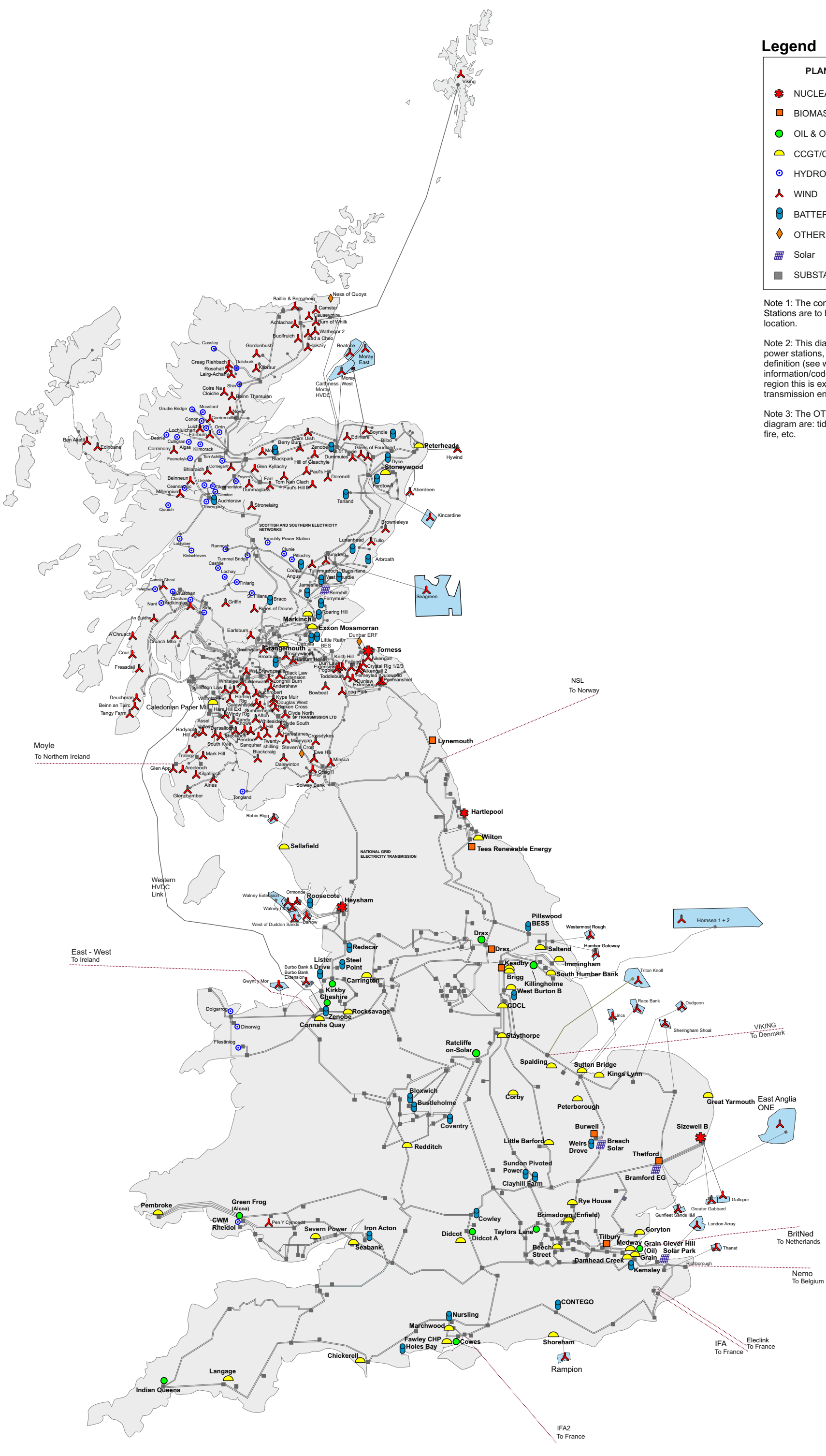
Contents

Appendix A includes a set of system geographic and schematic drawings of the current National Electricity Transmission System, with the approximate locations of existing power stations and reactive compensation plants shown. The schematics also show the National Electricity Transmission System boundaries and ETYS zones we have used in our analysis.

Each diagram illustrates the network as it has been provided and agreed by each asset owner; NESO does not own any network nor take any responsibility for each network component's accuracy on these diagrams.

Appendix A

Figure A1: GB Existing Large Power Stations*



Legend

PLANT TYPE

- NUCLEAR
- BIOMASS
- OIL & OCGT
- CCGT/CHP
- HYDRO / PUMPED STORAGE
- WIND
- BATTERY STORAGE
- OTHER
- Solar
- SUBSTATIONS

Note 1: The connections of the Large Power Stations are to be taken as an approximate location.

Note 2: This diagram contains the existing large power stations, according to the Grid Code definition (see www.neso.energy/industry-information/codes/grid-code-gc). In the NGET region this is extended to all power stations with transmission entry capacity above 25MW.

Note 3: The OTHER power plants shown in the diagram are: tidal, residual waste, recycled wood-fire, etc.

Figure A2: GB Existing Transmission System

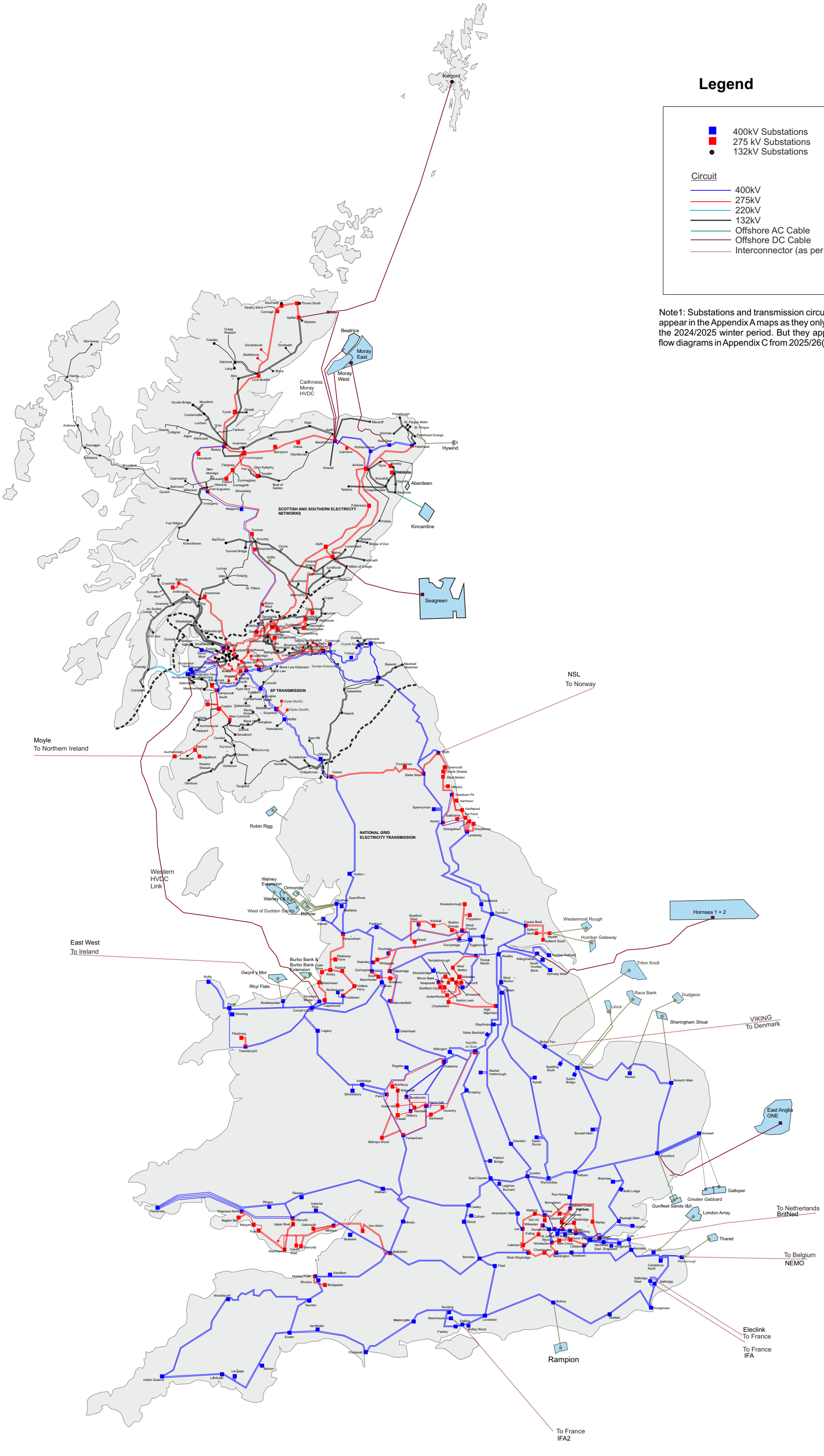
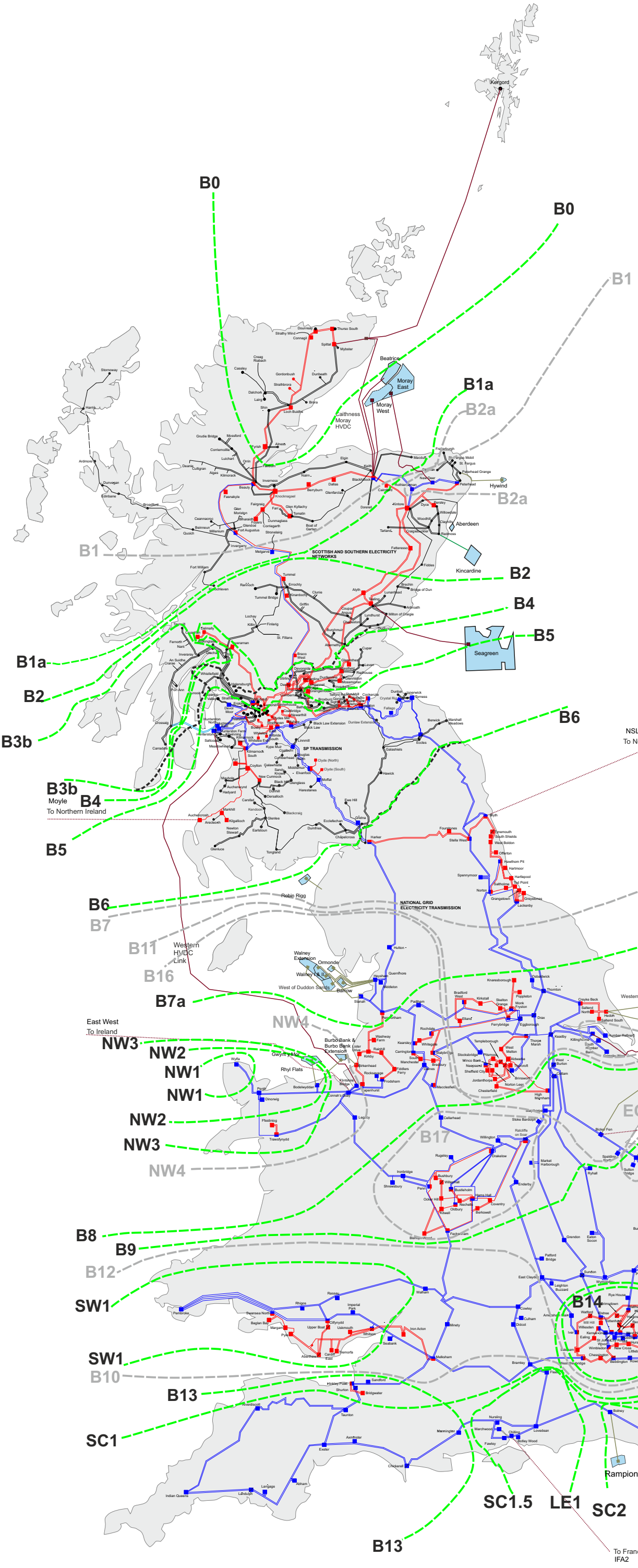

Kergord
Stornoway
Harris
Ardmore
Dunvegan
Edinbane
Broadford
Dalmally
Taynuilt
Fort William
Kinlochleven
Fort Augustus
Invergarry
Melgarve
Quoich
Ceannacroc
Millenium
Glen Moriston
Glenshiel
Foyers
Corriegarth
Stronelairg
Knocknagael
Fairgreig
Glen Kyllachy
Tomatin
Dunmaglass
Boat of Garten
Fasnakyle
Beauly
Inverness
Nairn
Dallas
Berryburn
Glenfarclas
Blackhillock
Keith
Elgin
Dorenell
Caithness Moray HVDC
Grudie Bridge
Mossford
Corriemollie
Luichart
Orrin
Fairburn
Aigas
Kilmorack
Culligran
Dearnle
Fyrish
Ashaig
Alness
Dounreay
Thurso South
Strathy Wind
Connagill
Spittal
Mybster
Creag Riabach
Cassley
Gordonbush
Strathbrora
Dunbeath
Dalchork
Lairg
Brora
Shin
Loch Buidhe
Beatrice
Moray East
Moray West
Caithness Moray HVDC
Fraserburgh
St Fergus Mobil
St Fergus
Peterhead Grange
Peterhead
Hywind
Strichen
New Deer
Macduff
Rothienorman
Cairnford
Kintore
Dyce
Persley
Kingsford
Clayhills
Aberdeen
Redmoss
Tarland
Craigiebuckler
Woodhill
Fetteresso
Fiddes
Kincardine
SCOTTISH AND SOUTHERN ELECTRICITY NETWORKS
Tummel
Errochty
Kinardochy
Clunie
Griffin
Tummel Bridge
Rannoch
Lochay
Killin
Finlarig
St Fillans
Alyth
Tealing
Lunanhead
Brechin
Bridge of Dun
Arbroath
Coupar Angus
Lindhurst
Milton of Craigie
Dudhope
Blairhumm
Abernethy
Cupar
Seagreen
Braco West
Devonside
Westfield
Rosyth
Dunfermline
Glenrothes
Leven
Cockenzie
Dunbar
Innerwick
Torness
Crystal Rig
Fallago
Berwick
Marshall Meadows
Eccles
Galashiels
Hawick
Black Law Extension
Dunlaw Extension
Linmill
Kype Muir
Coalburn
Douglas
Cumberhead
Glenlee
Kilmarnock South
Coylton
Galawhistle
Middleton
Clyde (North)
Clyde (South)
Elvanfoot
Moffat
Harestanes
Glenglass
Dersalloch
Carsfad
Kendoon
Blackcraig
Ecclefechan
Gretna
Ewe Hill
Dumfries
Chapelcross
Harker
Tongland
Glenluce
Auchencrosh
Markhill
Kirkcallioch
Newton Stewart
Earlstoun
Maybole
Auchencrynd
Hadyard
Dalmellington
Carrick
Meadowhead
Hunterston
Hunterston Farm
Kilbirnie
Saltcoats
Whitelee
Whitelee Extension
Wishaw
Strathaven
Stonehouse
Bothwell
Coalburn
Lanark
Braidwood
Carnwath
Crossaig
Port Ann
Dunoon
Inveraray
An Suidhe
Crarae
Ardkinglass
Cruachan
Inveraman
Nant
Fernoch
Dalmally
Taynuilt
Lochay
Killin
Finlarig
St Fillans
Tummel Bridge
Griffin
Kinardochy
Errochty
Clunie

Figure A3: GB Transmission System Boundaries



Legend

- 400kV Substations
- 275 kV Substations
- 132kV Substations

Circuit

- 400kV
- 275kV
- 220kV
- 132kV
- Offshore AC Cable
- Offshore DC Cable
- Interconnector (as per IC register)
- System Boundary - used on ETYS 2024 publication
- System Boundary - not used on ETYS 2024 publication

Note 1: Substations and transmission circuits that are not entirely built do not appear in the Appendix A maps as they only show the network in operation for the 2024/2025 winter period. But they appear on the future network power flow diagrams in Appendix C from 2025/26(C2) onward.

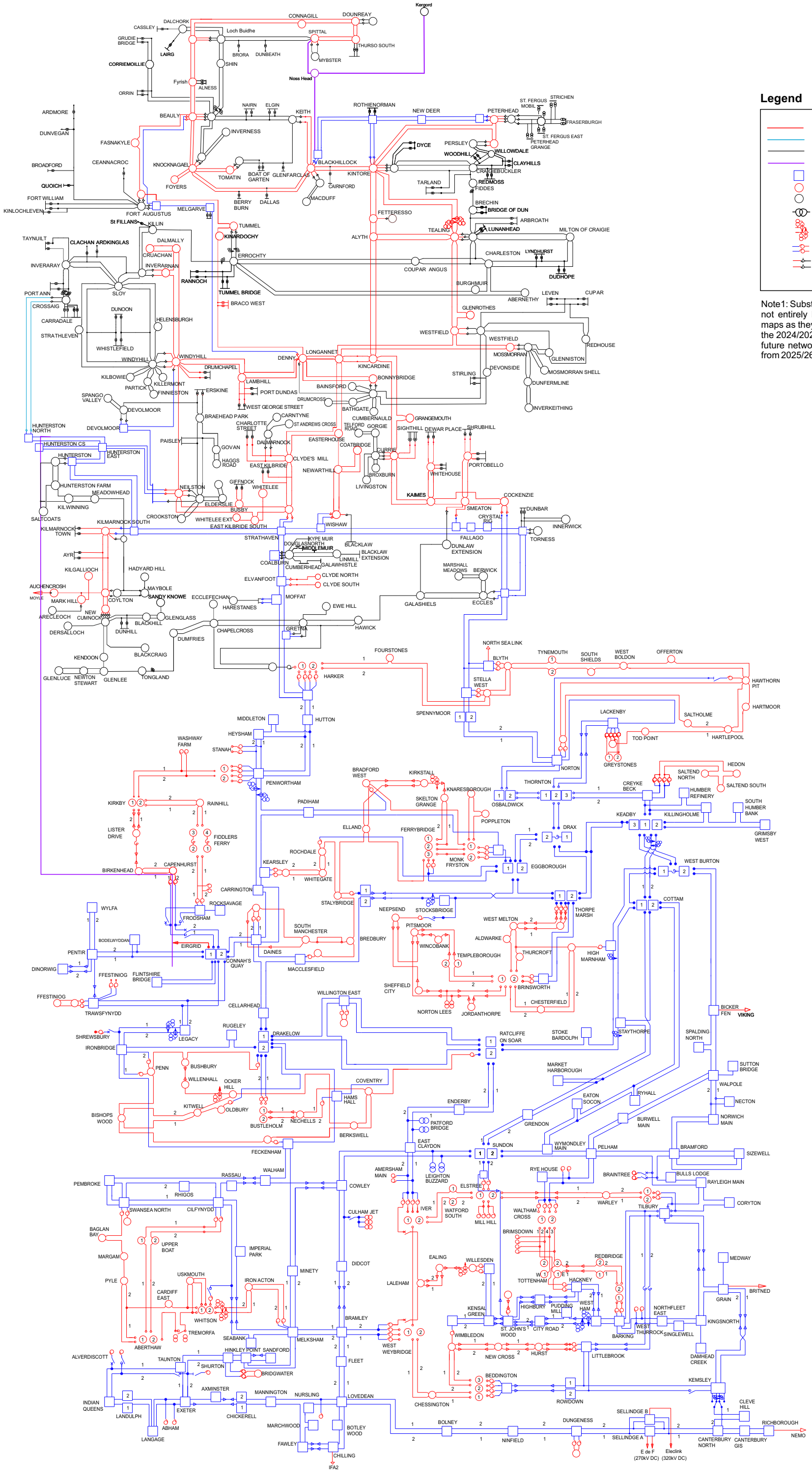
Note 2: The system boundaries marked on green have been used in ETYS 2024 publication and the ones marked on grey have not been used in ETYS 2024 publication.

Figure A4: GB Existing Transmission System

SSEN TRANSMISSION

SP TRANSMISSION

NATIONAL GRID ELECTRICITY TRANSMISSION



Legend

- 400kV Circuit
- 275kV Circuit
- 220kV Circuit
- 132kV Circuit
- HVDC Circuit
- 400kV Substation
- 275kV Substation
- 132kV Substation
- Transformer
- Quadrature booster
- 275/400 kV Transformer
- 275/132 kV Transformer

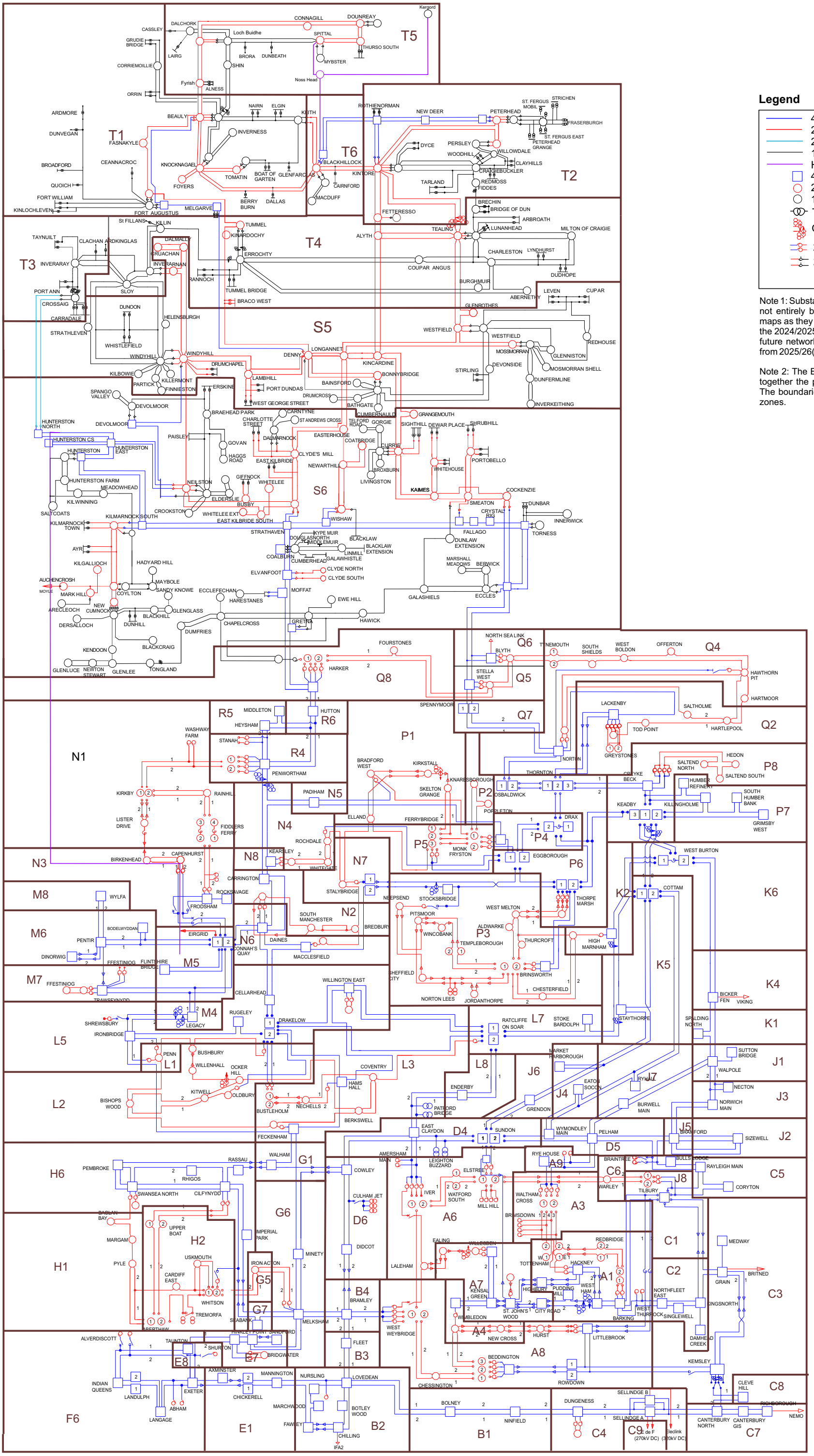
Note1: Substations and transmission circuits that are not entirely built do not appear in the Appendix A maps as they only show the network in operation for the 2024/2025 winter period. But they appear on the future network power flow diagrams in Appendix C from 2025/26(C2) onward.

Figure A5: GB Transmission System ETYS* Zones

SSEN TRANSMISSION

SP TRANSMISSION

NATIONAL GRID ELECTRICITY TRANSMISSION



Legend

- 400kV Circuit
- 275kV Circuit
- 220kV Circuit
- 132kV Circuit
- HVDC Circuit
- 400kV Substation
- 275kV Substation
- 132kV Substation
- Transformer
- Quadrature booster
- 275/400 kV Transformer
- 275/132 kV Transformer

Note 1: Substations and transmission circuits that are not entirely built do not appear in the Appendix A maps as they only show the network in operation for the 2024/2025 winter period. But they appear on the future network power flow diagrams in Appendix C from 2025/26(C2) onward.

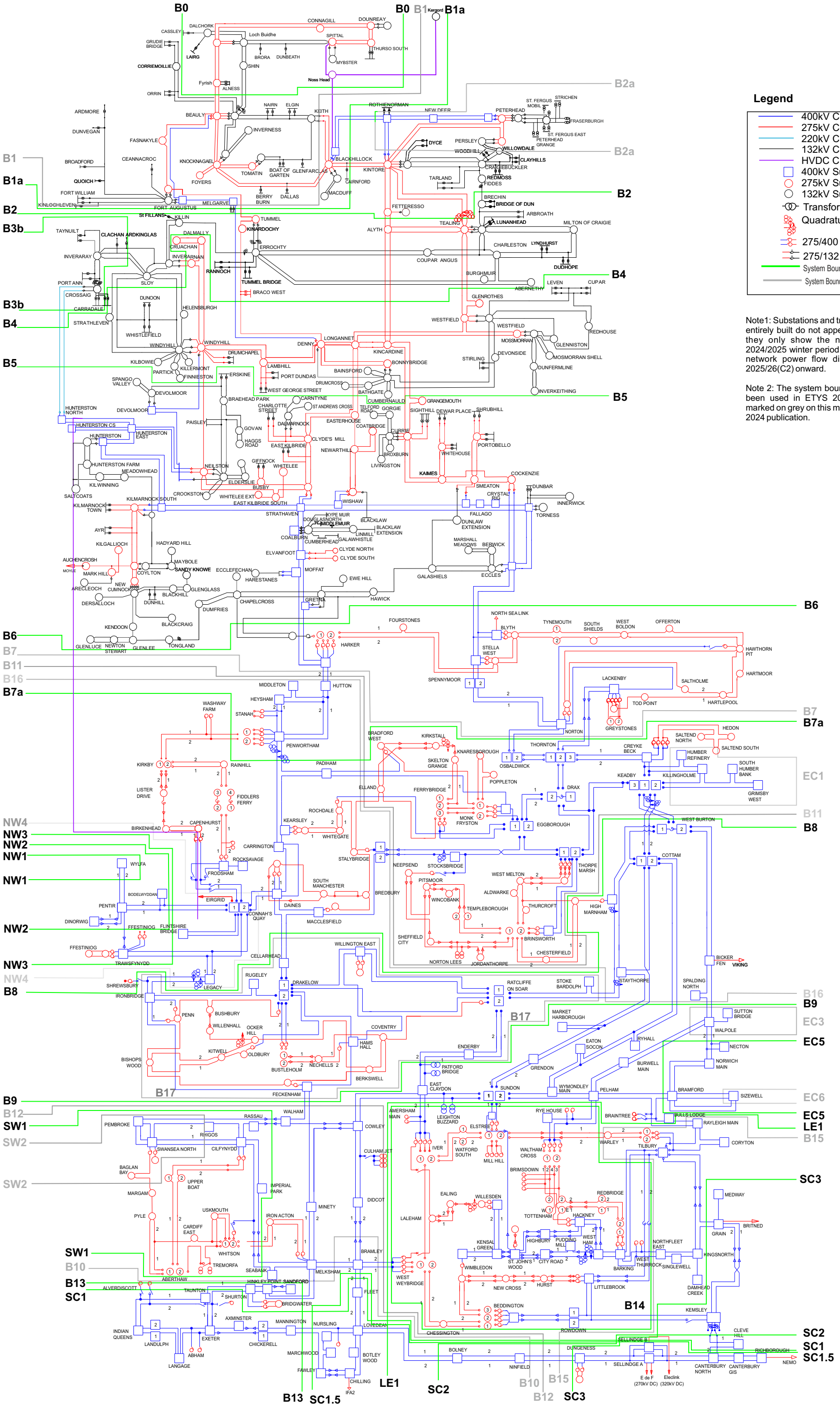
Note 2: The ETYS zones are a useful tool to group together the parts of the network for simplification. The boundaries are defined by grouping the ETYS zones.

Figure A6: GB Transmission System Boundaries

SSEN TRANSMISSION

SP TRANSMISSION

NATIONAL GRID ELECTRICITY TRANSMISSION



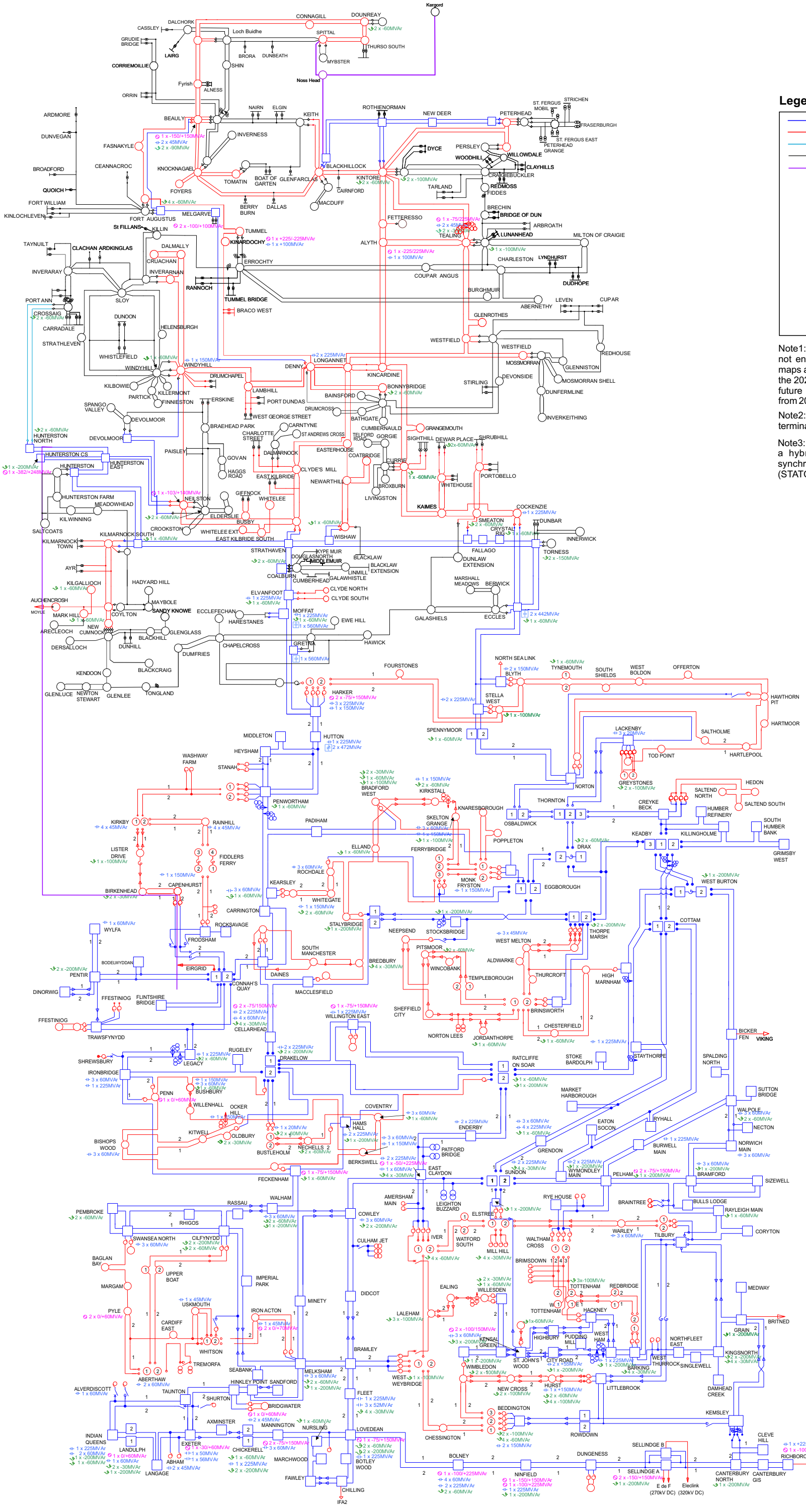
Legend

- 400kV Circuit
- 275kV Circuit
- 220kV Circuit
- 132kV Circuit
- HVDC Circuit
- 400kV Substation
- 275kV Substation
- 132kV Substation
- Transformer
- Quadrature booster
- 275/400 kV Transformer
- 275/132 kV Transformer
- System Boundary - used on ETYS 2024 publication
- System Boundary - not used on ETYS 2024 publication

Note1: Substations and transmission circuits that are not entirely built do not appear in the Appendix A maps as they only show the network in operation for the 2024/2025 winter period. But they appear on the future network power flow diagrams in Appendix C from 2025/26(C2) onward.

Note 2: The system boundaries marked on green have been used in ETYS 2024 publication and the ones marked on grey on this map have not been used in ETYS 2024 publication.

Figure A7: GB Reactive Compensation Plant



Legend

- 400kV Circuit
- 275kV Circuit
- 220kV Circuit
- 132kV Circuit
- HVDC Circuit
- 400kV Substation
- 275kV Substation
- 132kV Substation
- Transformer
- Quadrature booster
- 275/400 kV Transformer
- 275/132 kV Transformer
- SVC
- MSC/STATCOM
- Reactor
- Series Capacitor

Note1: Substations and transmission circuits that are not entirely built do not appear in the Appendix A maps as they only show the network in operation for the 2024/2025 winter period. But they appear on the future network power flow diagrams in Appendix C from 2025/26(C2) onward.

Note2: Reactive compensation plants at the HVDC terminals are not listed on this diagram

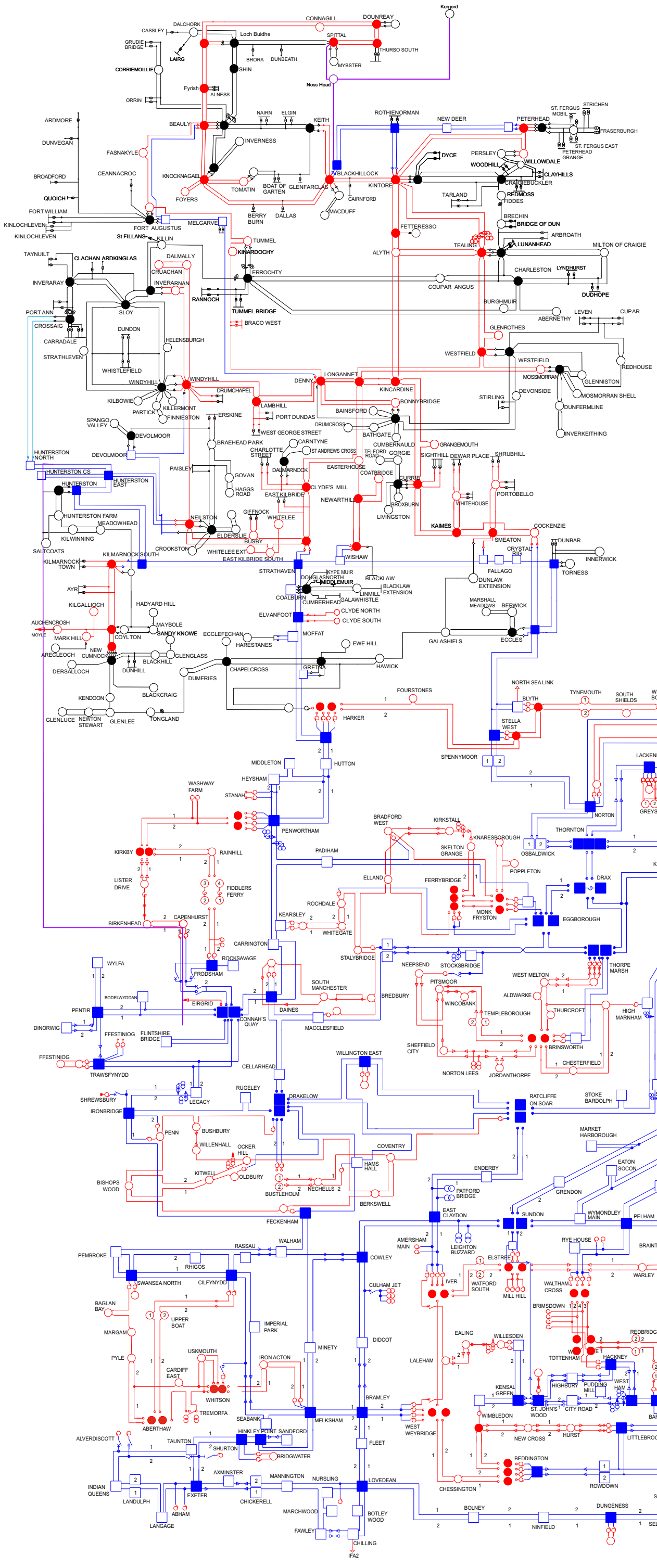
Note3: The -103/+140 Mvar at Neilston substation is a hybrid synchronous condenser, a combined synchronous condenser and static compensator (STATCOM).

Figure A8: GB Existing MITS Substation

SSEN TRANSMISSION

SP TRANSMISSION

NATIONAL GRID ELECTRICITY TRANSMISSION



Legend

- 400kV Circuit
- 275kV Circuit
- 220kV Circuit
- 132kV Circuit
- HVDC Circuit
- 400kV Substation
- 275kV Substation
- 132kV Substation
- Transformer
- Quadrature booster
- 275/400 kV Transformer
- 275/132 kV Transformer

MITS Substations (Notes 3 and 4)

- 400kV
- 275kV
- 132kV

Note1: Substations and transmission circuits that are not entirely built do not appear in the Appendix A maps as they only show the network in operation for the 2024/2025 winter period. But they appear on the future network power flow diagrams in Appendix C from 2025/26(C2) onward.

Note2: Some definitions as per CUSC and SQSS:
MITS Substation (CUSC) = a Transmission substation with more than 4 Main System Circuits connecting at that substation;
Main System Circuit (CUSC) = means Transmission Circuits but excluding a Grid Supply Point Transformer;
Transmission Circuit (SQSS) = This is either an onshore or an offshore transmission circuit;
Onshore Transmission Circuit (SQSS) = part of the onshore transmission system between two or more circuit-breakers which include, for example, transformers, reactors, cables and overhead lines and DC converters but excludes busbars, generation circuits and offshore transmission circuits.

Note3: The MITS substation map is for Connect and Manage (C&M) purposes and should not be used for the purpose of TNUoS local circuit charges (which are derived from MITS node instead of MITS substation).

Note4: Acronyms
MITS - Main Interconnected Transmission System
CUSC - Connection and Use of System Code
SQSS - Security & Quality of Supply Standard
TNUoS - Transmission Network Use of System