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 Network, with the approximate locations of existing large power stations and reactive compensation plants shown. The schematic diagrams also show the GB electricity transmission system boundaries and ETYS zones we have used in our analysis.

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

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Figure A1: GB Existing Large Power Stations

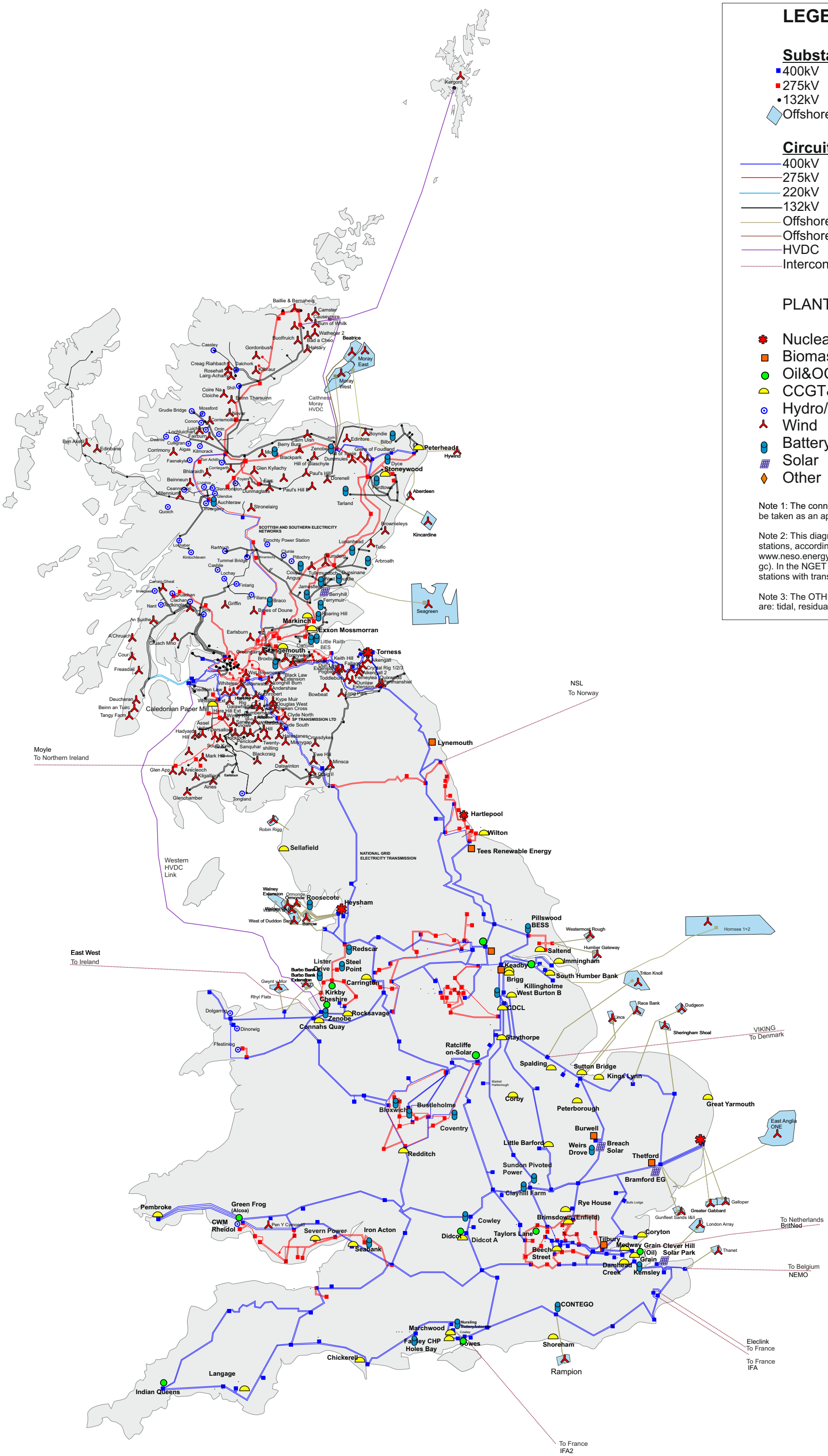
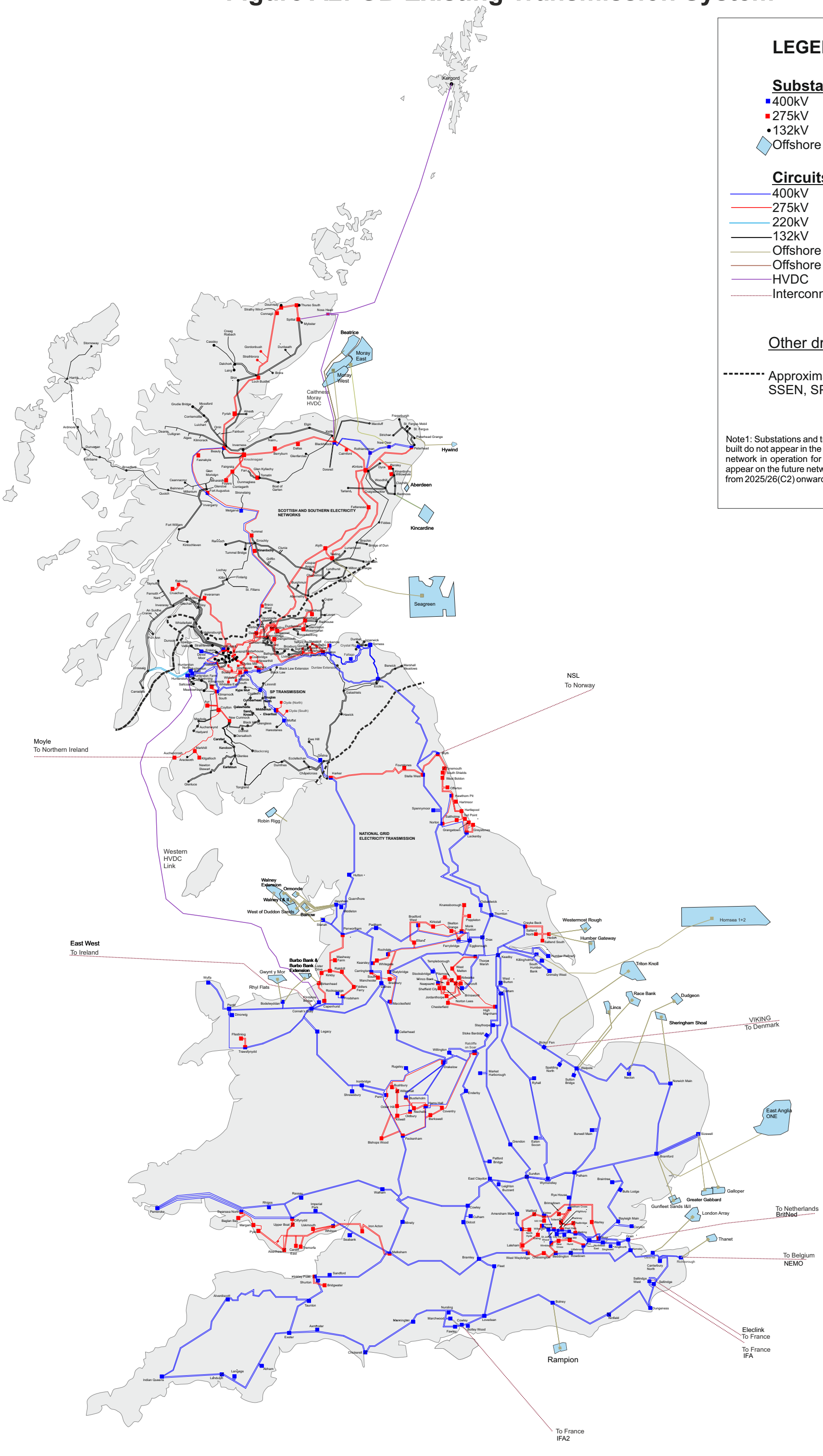

Kergord
Baillie & Bernaheig
Camster
Causeymire
Burn of Whilk
Watherar 2
Bad a Cheo
Beatrice
Buolfruich
Halsary
Cassley
Gordonbush
Creag Riahbach
Dalchork
Kilbraur
Rosehall
Lairg-Achany
Moray East
Moray West
Coire Na Cloiche
Shin
Beinn Tharsuinn
Caithness Moray HVDC
Grudie Bridge
Mossford
Novar
Corriemoillie
Conon
Luichart
Orrin
Lochluichart
Fairburn
Dalmore
Culligran
Aigas
Kilmorack
Corrimony
Fasnakyle
Torr Achilty
Corriegarth
Bhlaraidh
Beinneun
Ceannacroc
Millennium
Glen Kyllachy
Foyers
Glenmoriston
Dunmaglass
Paul's Hill
Paul's Hill II
Auchteraw
Glendoe
Invergarry
Stronelairg
Quoich
Ben Aketil
Edinbane
Deanie
Berry Burn
Cairn Uish
Blackpark
Hill of Glaschyle
Zenobe
Dunmuies
Hill of Towie
Glens of Foudland
Boyndie
Bilbo
Edintore
Peterhead
Hywind
Dyce
Stoneywood
Dorenell
Fordtown
Aberdeen
Tarland
Brownieleys
Kincardine
Seagreen
Berryhill
Ferrymuir
Boaring Hill
Markinch
Exxon Mossmorran
Earlsburn
Little Raith
BES
Cemmes
Greengairs
Glengavel
Tornywheat
Broxburn
Torness
Keith Hill
Fallago
Aikengall
Crystal Rig 1/2/3
Aikengall 2
Fernielea
Quixwood
Dunbar
Cockenzie
Dunlaw Extension
Pogbie
Toddleburn
Dun Law Extension
West Browncastle
Black Law Extension
Whitelee
Cadderwater
Kilgallioch
Hare Hill
Hare Hill Ext
Windy Rig
Galawhistle
Harting Rig
Douglas West
Kype Muir
Broken Cross
Clyde North
Clyde South
Clyde (N)
Clyde (S)
SP TRANSMISSION LTD
Bowbeat
Long Park
Crossdykes
Minnygap
Harestanes
Twenty-shilling
Sanquhar
Blackcraig
Dalswinton
Minsca
Gorig II
Ewe Hill
Mark Hill
Glen App
Arecleoch
Airies
Glenchamber
Tongland
Deucheran
Beinn an Tuirc
Tangy Farm
Caledonian Paper Mill
Cour
Freasdail
A'Chruach
Cruach Mho
An Suidhe
Nant
Griffin
Braco
Braes of Doune
Sloy
Carraig Gheal
Finlarig
St Fillans
Invershiel
Cluanie
Quoich
Lochaber
Kinlochleven
Rannoch
Tummel Bridge
Cashlie
Lochay
Pitlochry
Clunie
Errochty Power Station
Luichart
Culligran
Dalmore
Orrin
Conon
Novar
Corriemoillie
Mossford
Grudie Bridge
Cassley
Gordonbush
Dalchork
Kilbraur
Rosehall
Lairg-Achany
Shin
Beinn Tharsuinn
Coire Na Cloiche
Creag Riahbach
Lumanhead
Tullo
Arbroath
Dumbarg
Couttie Angus
Tullymurdoch
Dupsinane
Turdale
Jamesfield
Berryhill
Ferrymuir
Boaring Hill
Markinch
Exxon Mossmorran
Seagreen
Kincardine
Brownieleys
Aberdeen
Tarland
Fordtown
Dyce
Stoneywood
Dorenell
Peterhead
Hywind
Boyndie
Bilbo
Edintore
Glens of Foudland
Dunmuies
Hill of Towie
Zenobe
Cairn Uish
Berry Burn
Blackpark
Hill of Glaschyle
Paul's Hill
Paul's Hill II
Dunmaglass
Foyers
Glenmoriston
Glendoe
Auchteraw
Invergarry
Stronelairg
Quoich
Ben Aketil
Edinbane
Deanie
Culligran
Aigas
Kilmorack
Corrimony
Fasnakyle
Torr Achilty
Corriegarth
Bhlaraidh
Beinneun
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Creag Riahbach
Carraig Gheal
Finlarig
St Fillans
Invershiel
Cluanie
Braco
Griffin
Braes of Doune
Sloy
Nant
An Suidhe
A'Chruach
Cruach Mho
Cour
Freasdail
Deucheran
Beinn an Tuirc
Tangy Farm
Caledonian Paper Mill
Earlsburn
Little Raith
BES
Cemmes
Greengairs
Glengavel
Tornywheat
Broxburn
Torness
Keith Hill
Fallago
Aikengall
Crystal Rig 1/2/3
Aikengall 2
Fernielea
Quixwood
Dunbar
Cockenzie
Dunlaw Extension
Pogbie
Toddleburn
Dun Law Extension
West Browncastle
Black Law Extension
Whitelee
Cadderwater
Kilgallioch
Hare Hill
Hare Hill Ext
Windy Rig
Galawhistle
Harting Rig
Douglas West
Kype Muir
Broken Cross
Clyde North
Clyde South
Clyde (N)
Clyde (S)
SP TRANSMISSION LTD
Bowbeat
Long Park
Crossdykes
Minnygap
Harestanes
Twenty-shilling
Sanquhar
Blackcraig
Dalswinton
Minsca
Gorig II
Ewe Hill
Mark Hill
Glen App
Arecleoch
Airies
Glenchamber
Tongland
Assel Valley
Dersalloch
Hadyard Hill
Stockbridge Pencloe
South Kyle
Sandy Knowe
Sandy Knowe Extension
Wyndford
Hill
Moy
Corriegarth

Figure A2: GB Existing Transmission System



LEGEND

Substations

- 400kV
- 275kV
- 132kV
- Offshore windfarm

Circuits

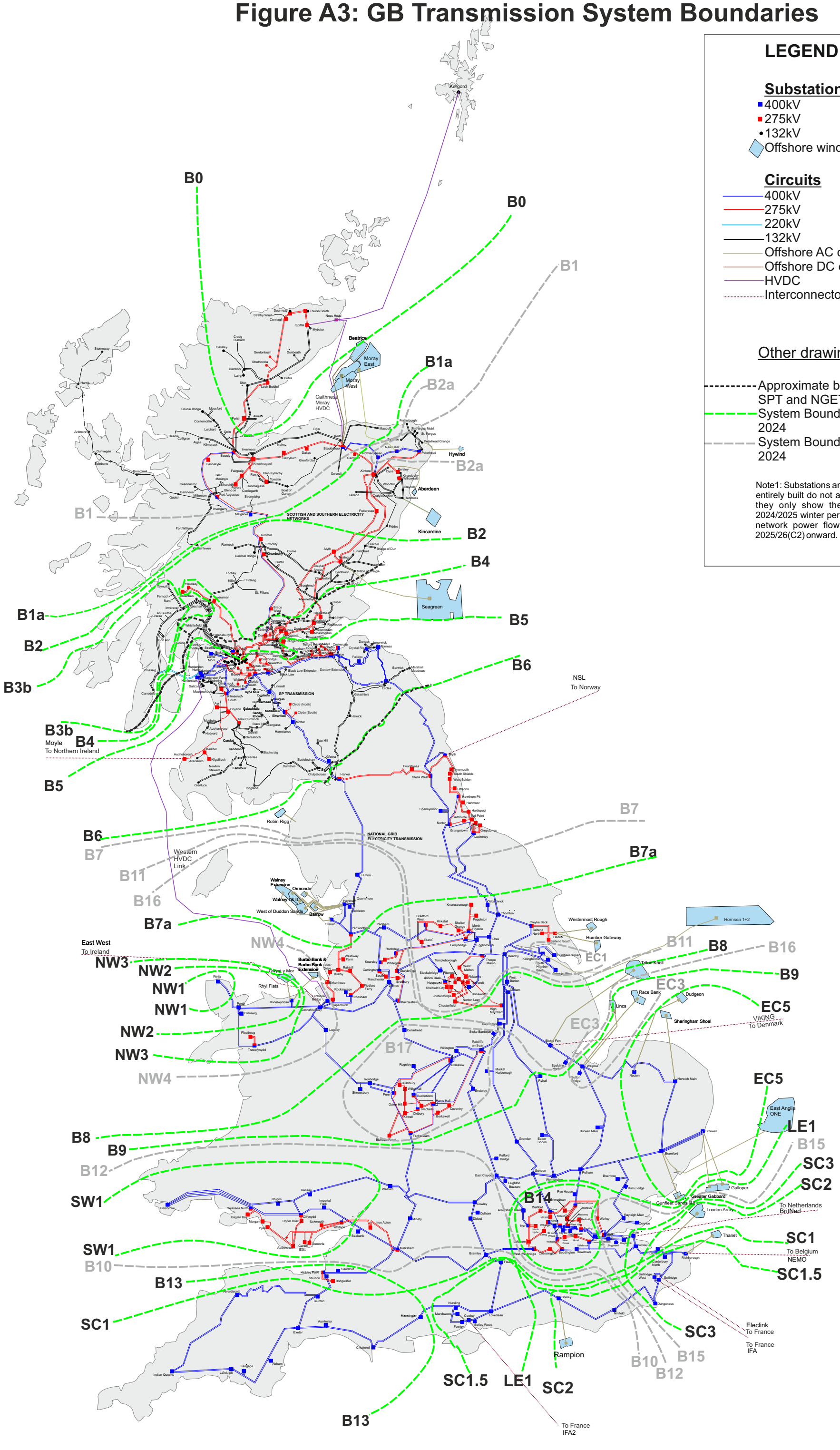
- 400kV
- 275kV
- 220kV
- 132kV
- Offshore AC cable
- Offshore DC cable
- HVDC
- Interconnectors (as per IC register)

Other drawings

- Approximate border between SSEN, SPT and NGET

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 A3: GB Transmission System Boundaries



LEGEND

Substations

- 400kV
- 275kV
- 132kV
- Offshore windfarm

Circuits

- 400kV
- 275kV
- 220kV
- 132kV
- Offshore AC cable
- Offshore DC cable
- HVDC
- Interconnectors (as per IC register)

Other drawings

- Approximate border between SSEN, SPT and NGET
- System Boundary - used on ETYS 2024
- System Boundary - not used on ETYS 2024

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 A4: GB Existing Transmission System

SSEN TRANSMISSION

SP TRANSMISSION

NATIONAL GRID ELECTRICITY TRANSMISSION

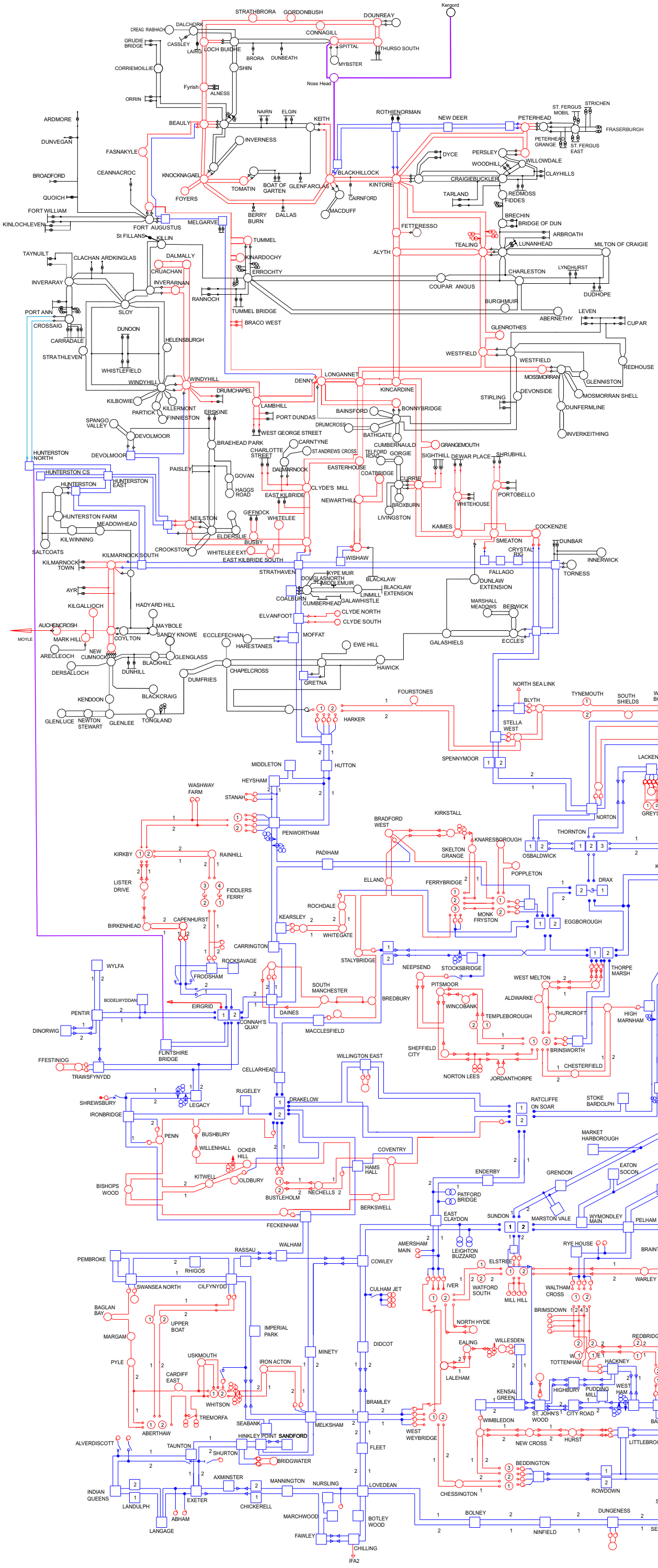
Legend

Circuits
- 400kV circuit
- 275kV circuit
- 220kV circuit
- 132kV circuit
- Interconnector link
- HVDC circuit
- Section change to underground cable

Substations
- 400kV substation
- 275kV substation
- 132kV substation
- Substation run solid
- Substation run split
- substation with no busbar connection (Tee point)

Components
- transformer - same voltage on both sides
- Auto-transformer
- QB (quadrature booster)
- 400kV/275kV transformer
- 275kV/132kV transformer
- series reactor
- Circuit breaker
- Disconnector/isolator
- switch disconnector
- load switch/breaker

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.



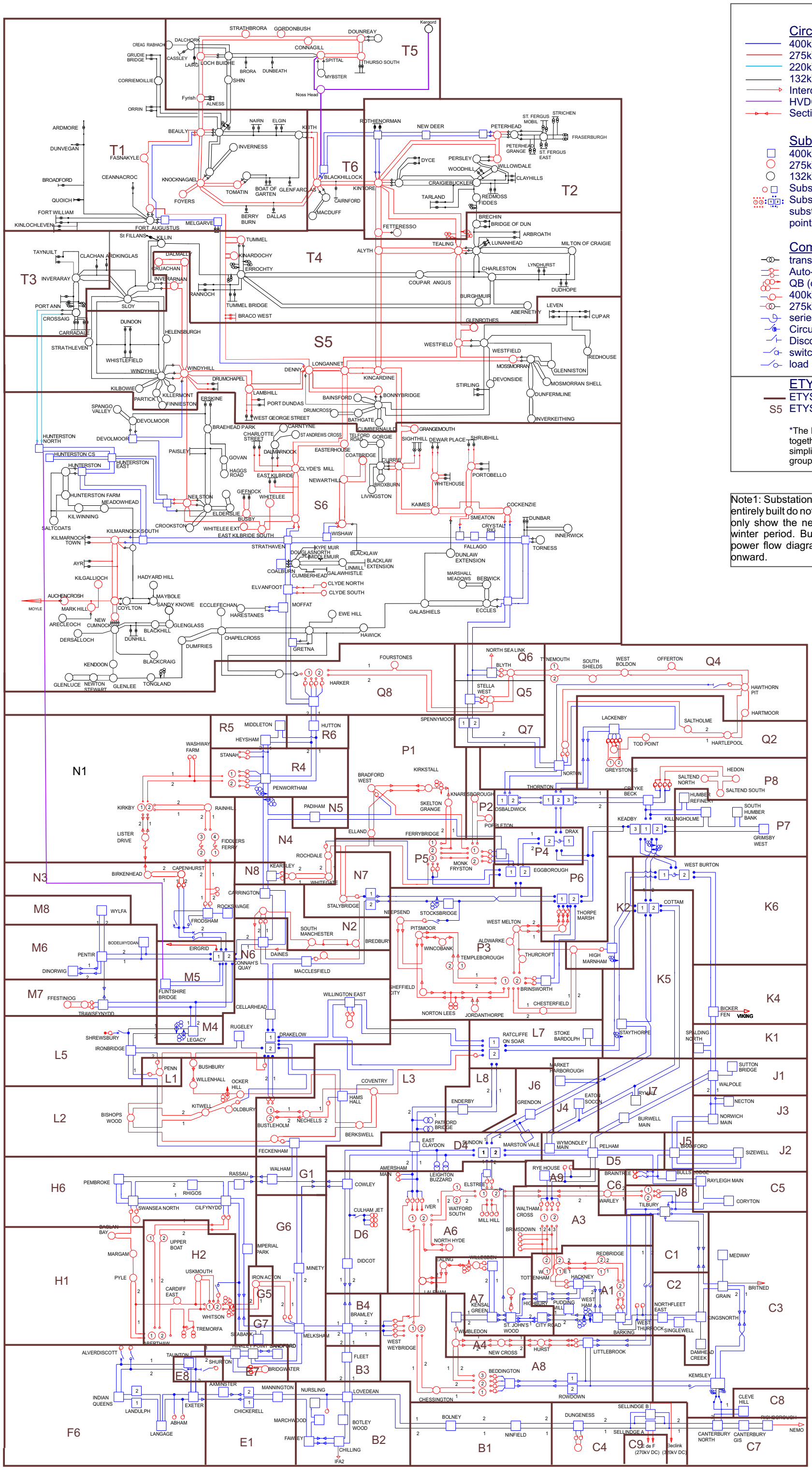
* ETYS - Electricity Ten Year Statement

Figure A5: GB Transmission System ETYS Zones*

SSEN TRANSMISSION

SP TRANSMISSION

NATIONAL GRID ELECTRICITY TRANSMISSION



Legend

Circuits
- 400kV circuit
- 275kV circuit
- 220kV circuit
- 132kV circuit
- Interconnector link
- HVDC circuit
- Section change to underground cable

Substations
- 400kV substation
- 275kV substation
- 132kV substation
- Substation run solid
- Substation run split
- substation with no busbar connection (Tee point)

Components
- transformer - same voltage on both sides
- Auto-transformer
- QB (quadrature booster)
- 400kV/275kV transformer
- 275kV/132kV transformer
- series reactor
- Circuit breaker
- Disconnector/isolator
- switch disconnector
- load switch/breaker

ETYS zones components
- ETYS zones lines
- S5 ETYS zones names

*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.

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.

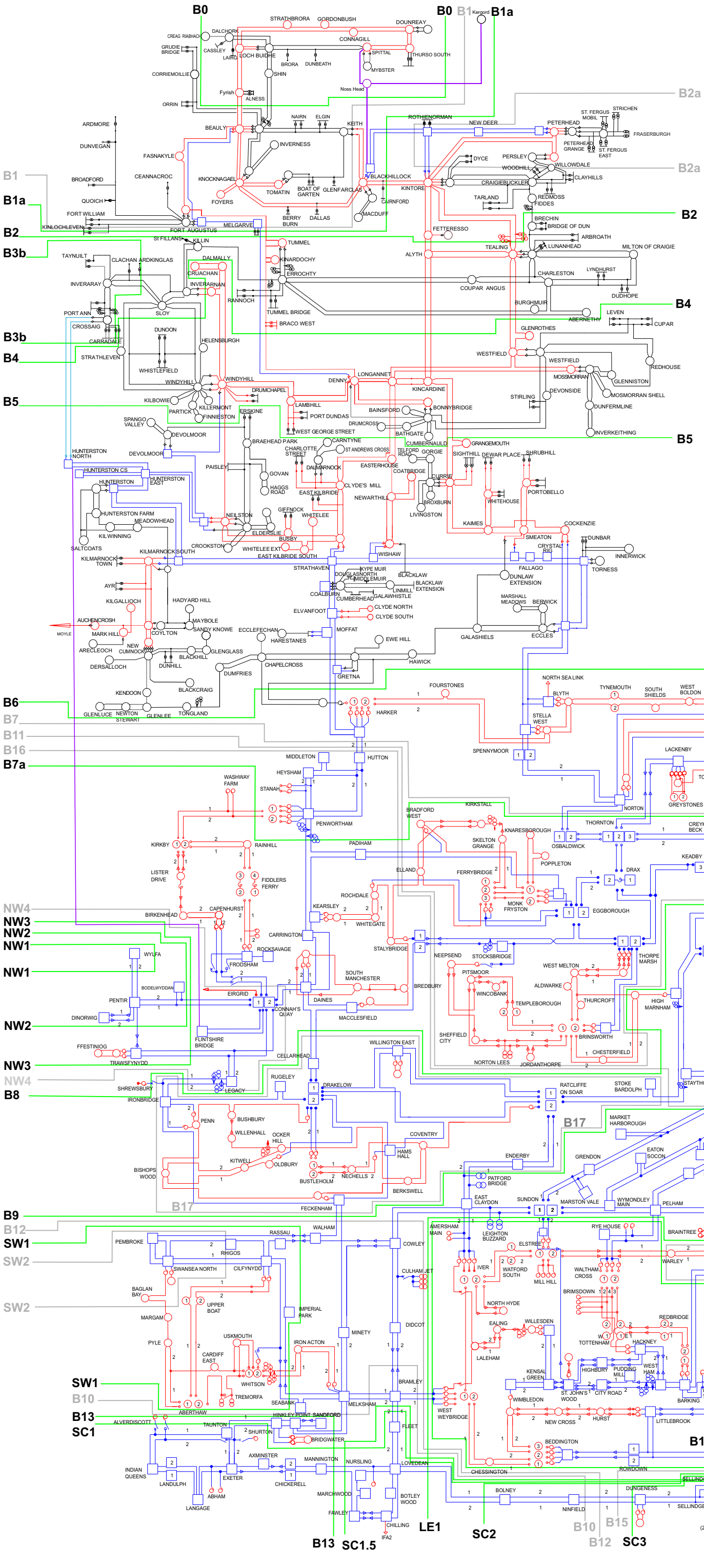
* ETYS - Electricity Ten Year Statement

Figure A6: GB Transmission System Boundaries

SSEN TRANSMISSION

SP TRANSMISSION

NATIONAL GRID ELECTRICITY TRANSMISSION



Legend

Circuits
- 400kV circuit
- 275kV circuit
- 220kV circuit
- 132kV circuit
- Interconnector link
- HVDC circuit
- Section change to underground cable

Substations
- 400kV substation
- 275kV substation
- 132kV substation
- Substation run solid
- Substation run split
- substation with no busbar connection (Tee point)

Components
- transformer - same voltage on both sides
- Auto-transformer
- QB (quadrature booster)
- 400kV/275kV transformer
- 275kV/132kV transformer
- series reactor
- Circuit breaker
- Disconnector/isolator
- switch disconnector
- load switch/breaker

System boundaries
- 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.

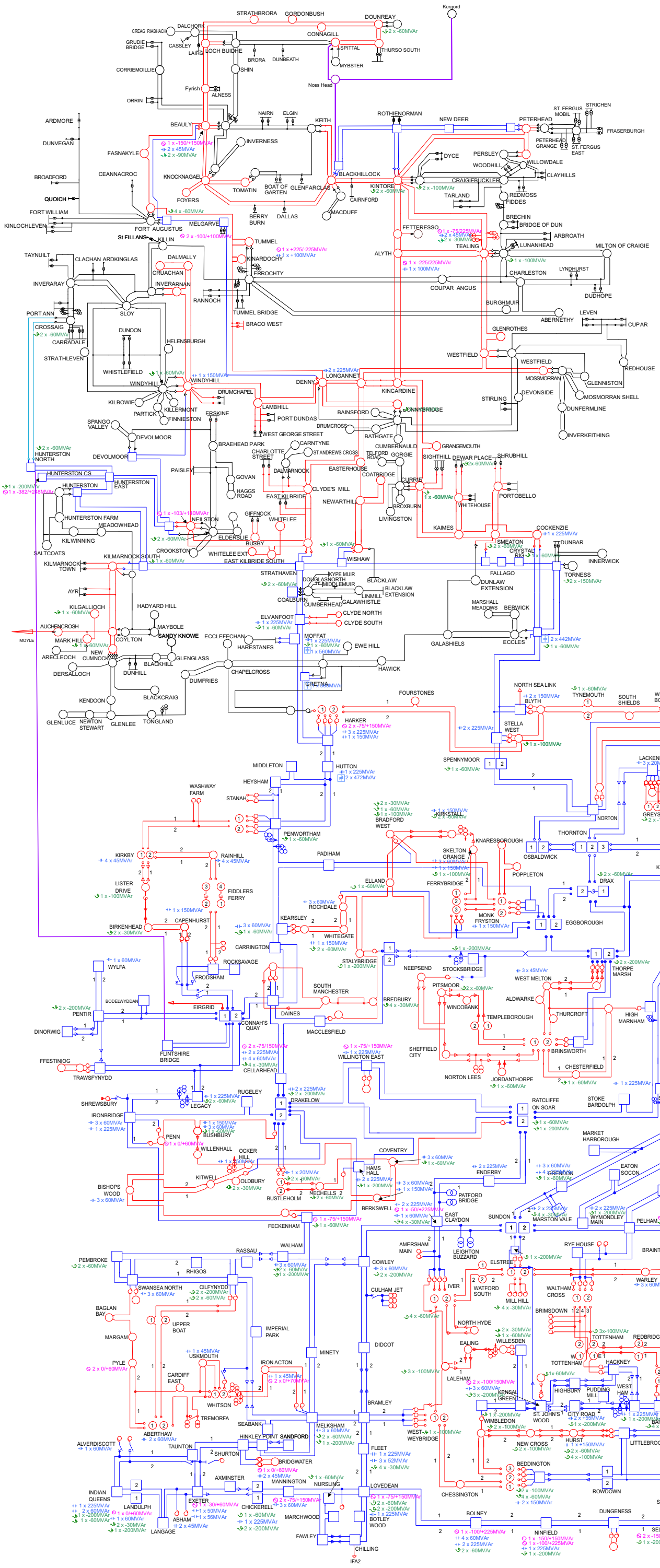
* ETYS - Electricity Ten Year Statement

Figure A7: GB Reactive Compensation Plant

SSEN TRANSMISSION

SP TRANSMISSION

NATIONAL GRID ELECTRICITY TRANSMISSION



Legend

Circuits
- 400kV circuit
- 275kV circuit
- 220kV circuit
- 132kV circuit
- Interconnector link
- HVDC circuit
- Section change to underground cable

Substations
- 400kV substation
- 275kV substation
- 132kV substation
- Substation run solid
- Substation run split
- substation with no busbar connection (Tee point)

Components
- transformer - same voltage on both sides
- Auto-transformer
- QB (quadrature booster)
- 400kV/275kV transformer
- 275kV/132kV transformer
- series reactor
- Circuit breaker
- Disconnector/isolator
- switch disconnector
- load switch/breaker

Reactive compensation components
- Static Var Compensator (SVC)
- Mechanically Switched Capacitor/ Static Shunt Compensator 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

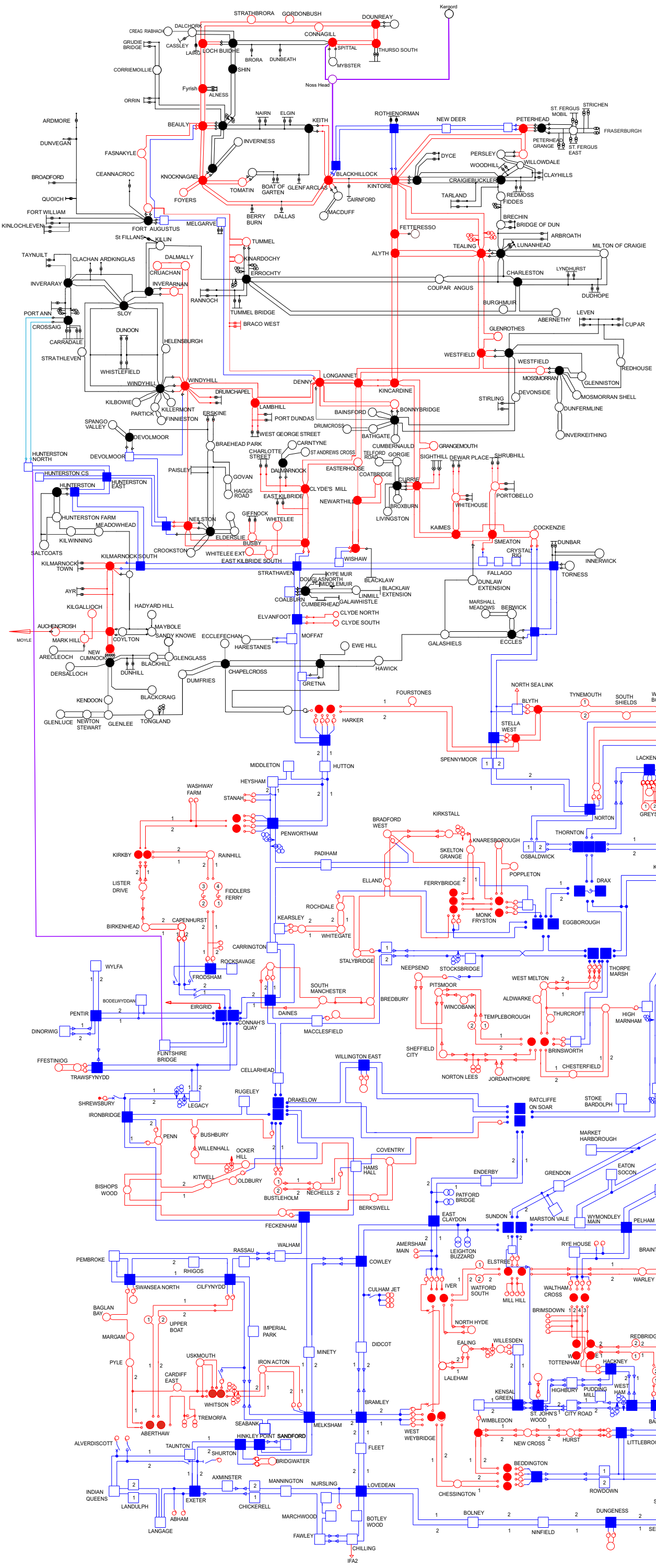
Note3: The -103/+140 Mvar at Neilston substation is a hybrid synchronous condenser, a combined synchronous condenser and static compensator (STATCOM).

Figure A8: GB Existing MITS* Substation

SSEN TRANSMISSION

SP TRANSMISSION

NATIONAL GRID ELECTRICITY TRANSMISSION



Legend

Circuits
- 400kV circuit
- 275kV circuit
- 220kV circuit
- 132kV circuit
- Interconnector link
- HVDC circuit
- Section change to underground cable

Substations
- 400kV substation
- 275kV substation
- 132kV substation
- Substation run solid
- Substation run split
- substation with no busbar connection (Tee point)

Components
- transformer - same voltage on both sides
- Auto-transformer
- QB (quadrature booster)
- 400kV/275kV transformer
- 275kV/132kV transformer
- series reactor
- Circuit breaker
- Disconnector/isolator
- switch disconnector
- load switch/breaker

MITS components
- 400kV MITS substation
- 275kV MITS substation
- 132kV MITS substation

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).

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: Abreviations and definitions as per CUSC and SQSS:

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

MITS Substation = Transmission substation with more than 4 Main System Circuits connecting at that substation;

Main System Circuit = Transmission Circuits but excluding a Grid Supply Point Transformer;

Transmission Circuit = either an onshore or an offshore transmission circuit;

Onshore Transmission Circuit = 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.

* ETYS - Electricity Ten Year Statement