

A landscape photograph of a green field at sunset. The sun is a bright, glowing orb in the upper right sky, casting a warm orange and yellow light. The sky is filled with soft, wispy clouds. In the background, a dark line of trees separates the field from the horizon. Overlaid on the image are several bright green, glowing light trails that curve across the middle of the frame, suggesting movement or energy. The foreground is a lush green field with some darker patches, possibly from shadows or different types of vegetation.

Model Assumptions & Resilience Requirement

Model Assumptions

Factor	User Defined Model Input Assumption by		
	Optimistic Scenario	Central Scenario	Challenging Scenario
1 Restoration Target	As stated	As stated	As stated
2 Average time taken for DNO to provide first block load	2 hrs	2.5 hrs	3 hrs
3 Average DNO time between block loads	20mins	25mins	30mins
4 Initial block load failure rate	1 in 33 chance	1 in 20 chance	1 in 10 chance
5 England and Wales Telecoms Resilience	100%	90%	80%
6 Scottish Telecoms resilience	100%	80%	60%
7 SO power island resourcing limit	2	2	2
8 SO power island resourcing limit	2	2	2
9 Percentage of each operational generator held for Margin	10%	10%	10%
10 Time increase factor for control room night shifts	5%	10%	20%
11 Operational conditions for linking neighbouring islands	Best Case	Typical Case	Adverse Case
12 Black Start Event (Any Season or Winter only)	As stated	As stated	As stated
13 Percentage of Wind generation permitted beyond minimum threshold	20%	20%	20%
14 Island size required before any Wind generation is permitted	1GW	1GW	1GW
15 Scottish island size required before any Moyle Interconnector permitted	1GW	1GW	1GW
16 Percentage of northern England generation above 5GW to Scotland	30%	25%	20%
17 Other Scottish hydro daily average hours of water generation	4hrs x rating	3hrs x rating	2hrs x rating
18 Inclusion of Links from north England to southern Scotland	Included	Included	Included
19 Percentage of embedded Scottish hydro accessible to skeleton network	90%	70%	50%
20 Inclusion of Wind Capacity	As stated	As stated	As stated
21 Restoration required for single synchronised island	20GW	20GW	20GW
22 Genset unplanned outage rate	1 in 60	1 in 50	1 in 40
23 National restoration before single synchronised island achieved		20GW	
24 Planned outage rate	Fixed - (2015/6)		
25 Moyle Capacity (if included) Ireland to Scotland	250MW	150MW	100MW

Model Assumptions

INPUT PAGE - USER DEFINED PARAMETERS COMMON TO ALL

Restoration Target Point

100% of Peak Demand

USER DEFINED BLACK START CONDITIONS

Time taken for DNOs to provide first Block Load

Two and a half hours

Initial Block Load rejection (failure) rate

5%

Average time for DNOs to provide subsequent Block Loads

25 minutes

Sub-station teleswitching resilience (time)

72 hours

England & Wales Telecoms Resilience

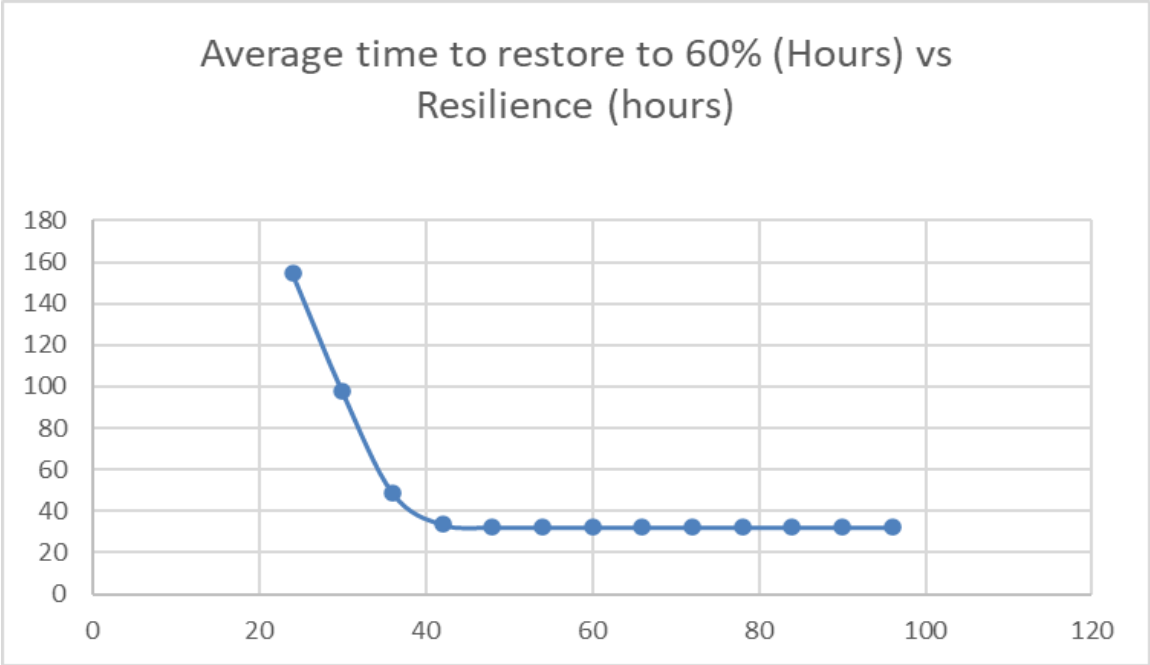
90%

Scottish Telecoms Resilience

80%

Model Results

Using the most recent 2023 model (Monte-Carlo simulation techniques) the relationship between average restoration time for 60% demand vs resilience duration for all generators is below



Resilience (hours)	Average time to restore to 60% (Hours)
72	32.1
60	32.1
54	32.1
48	32.1
42	33.5
36	48.8
30	97.5
24	154.4

Note: Whilst it looks like 48 hours is sufficient, all this really tells us is that for these particular conditions, we energise most transmission connected generators within 2 days. There are doubtless many reasons why this might not occur on the day. For example, if deploying the plans proves more difficult than expected due to staffing, technical failures, switching problems, trips etc then it is quite possible that we could need 72 hours to reach most of the main stations.

