

# System Operability Framework

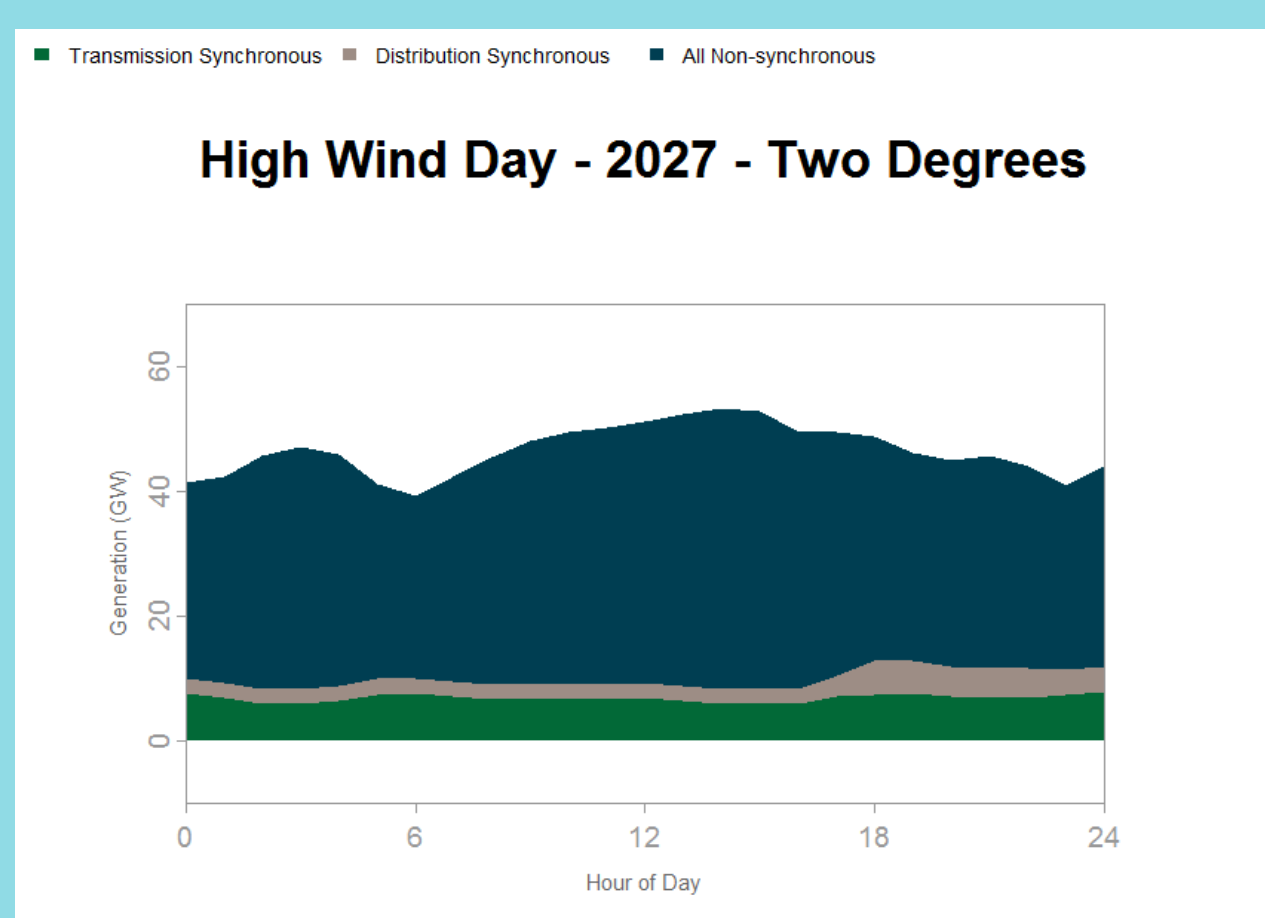
## System Operability Framework

The energy market is undergoing major changes. We are undertaking analyses to better understand how system operability may be affected. Here, we outline some of our key findings from our latest assessments.

### National Trends and Insights

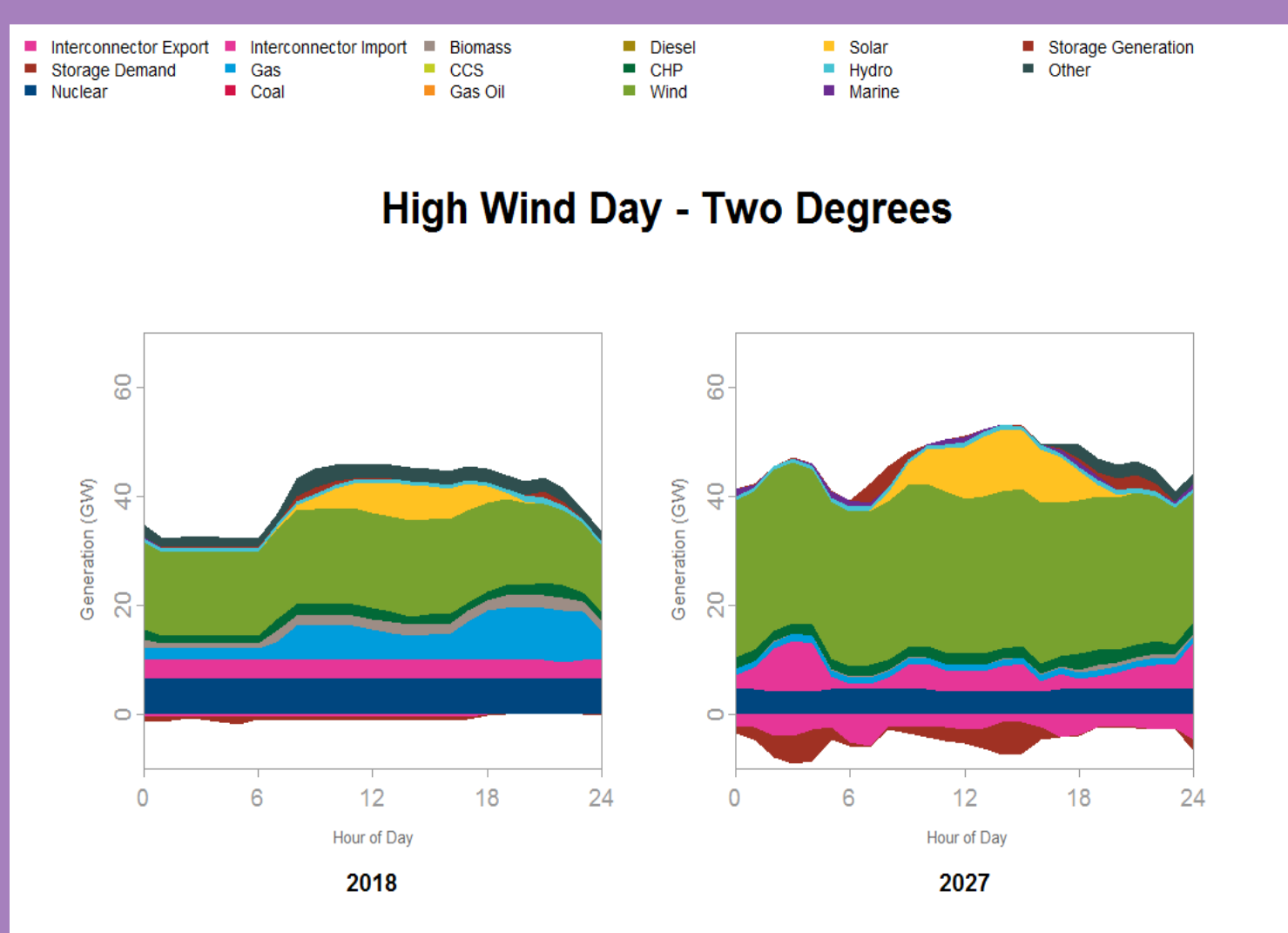
#### Trends

- Up to 94% of generation will come from low carbon sources within the coming decade
- All coal generation will be off the system by 2025
- As little as 10GW synchronous generation may be seen within the next 10 years



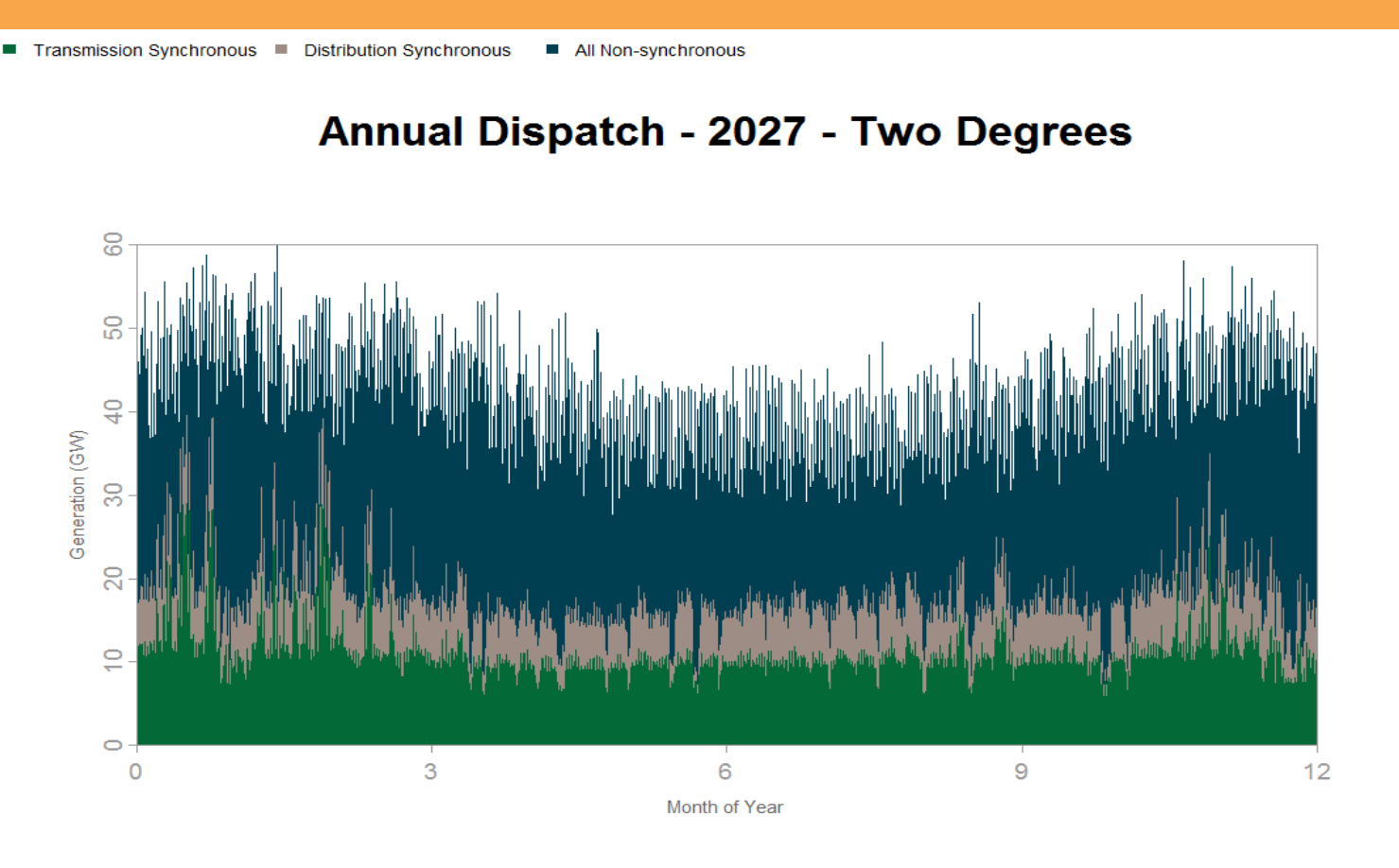
#### Changing Generation and Demand Mix

- Storage may help balance generation but could cause issues
- Forecasting uncertainty will increase as generation from intermittent sources increases
- More sources of flexibility will be required



#### Reduction in Synchronous Generation

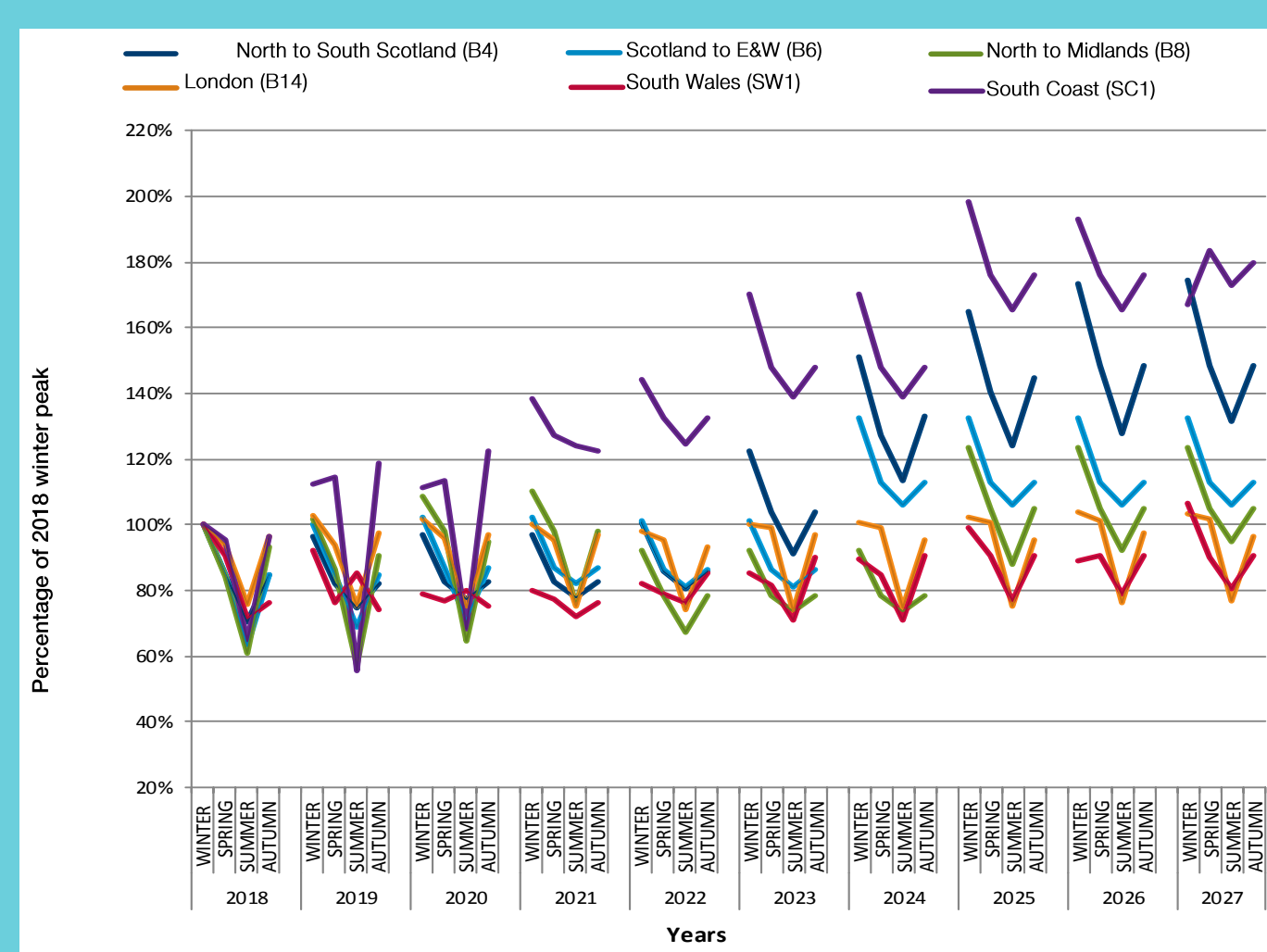
- Synchronous generation is predicted to decline across all scenarios, year round
- We need to continue working with industry to realise a secure and operable low fault level system



### Regional Trends and Insights

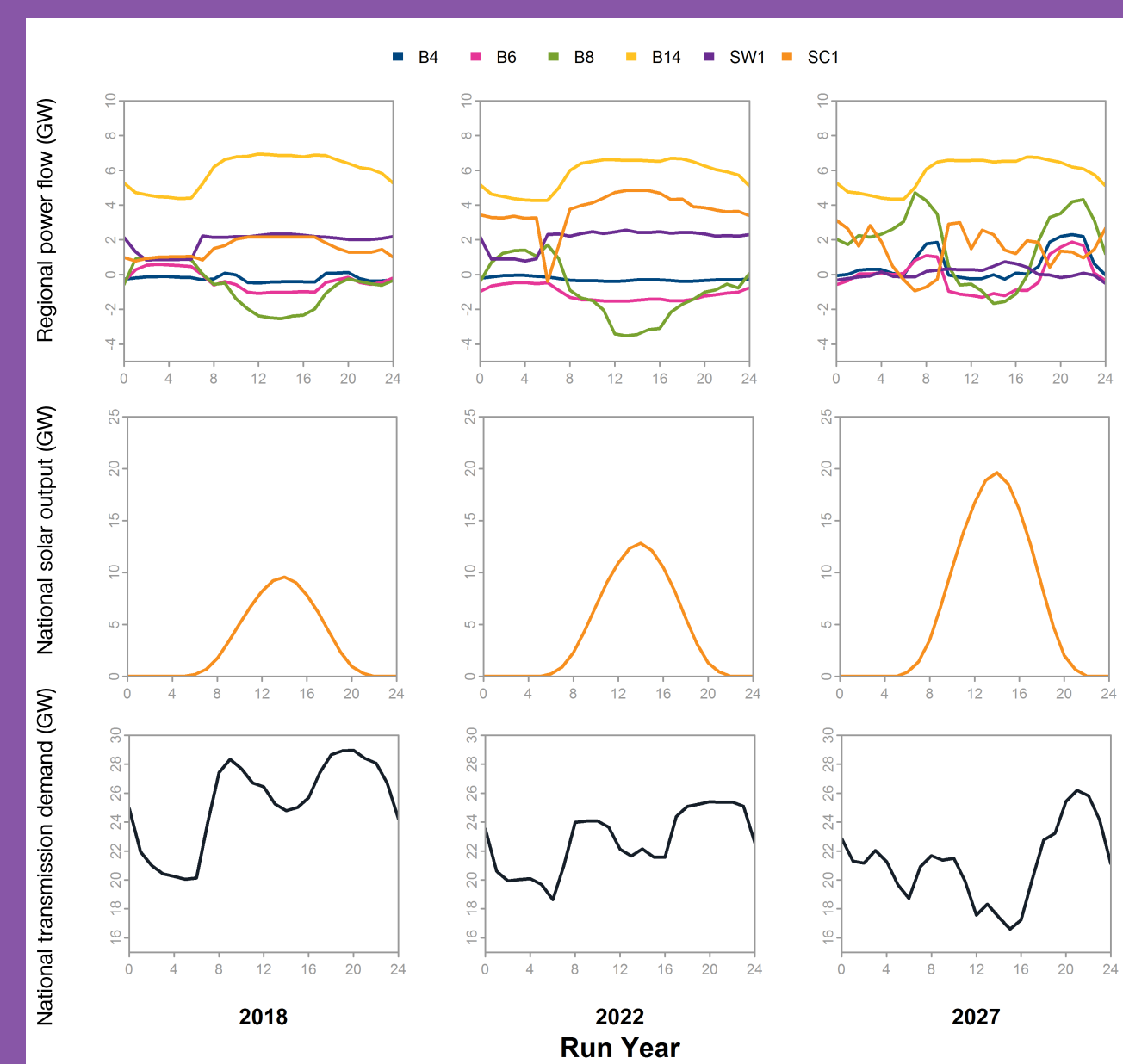
#### Trends

- Winter peak is no longer the only time the network will be heavily used
- More flexible resources and dynamic voltage support are needed



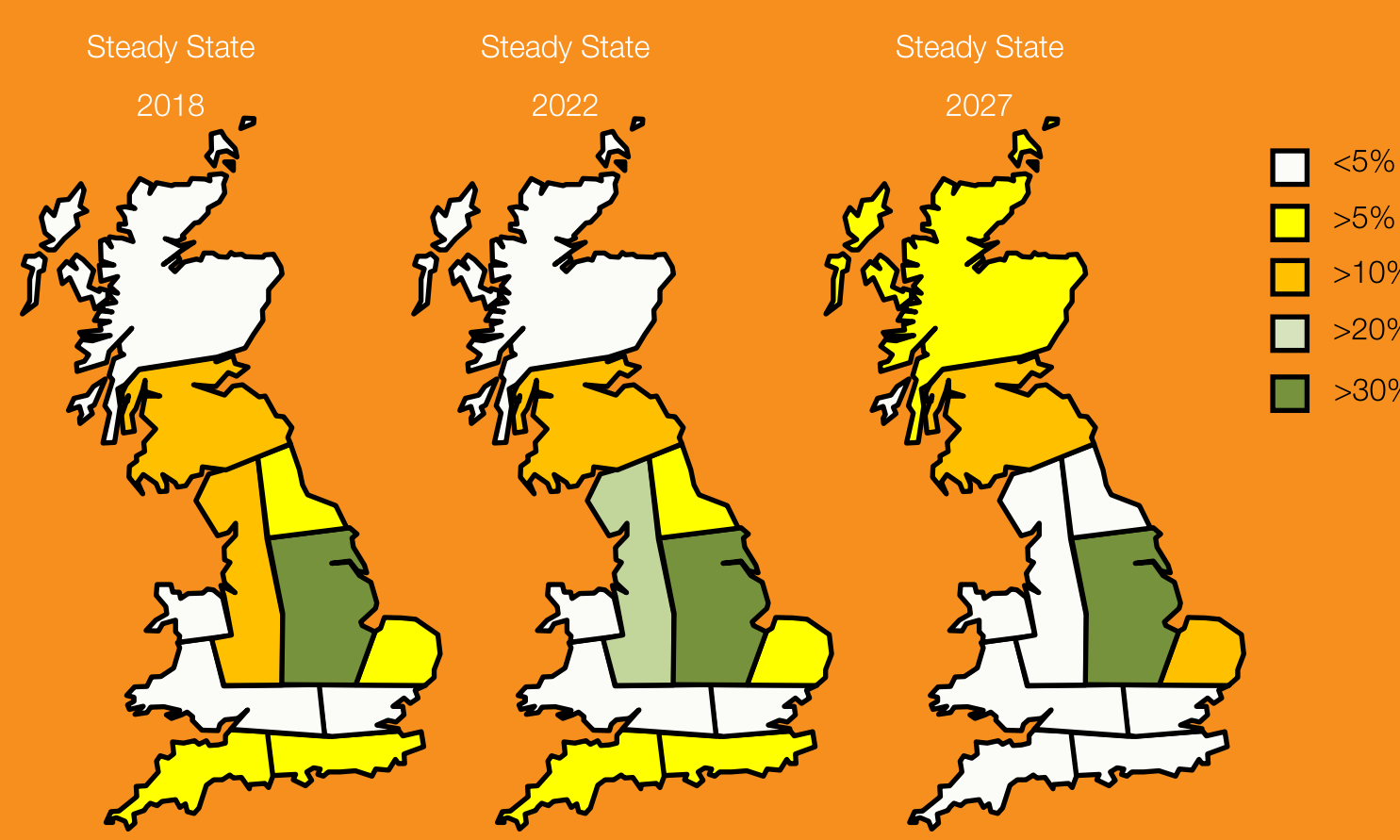
#### Changing Generation and Demand Mix

- Flows on the Transmission system are likely to be more volatile in the future
- Weather conditions will drive the majority of this volatility



#### Reduction in Synchronous Generation

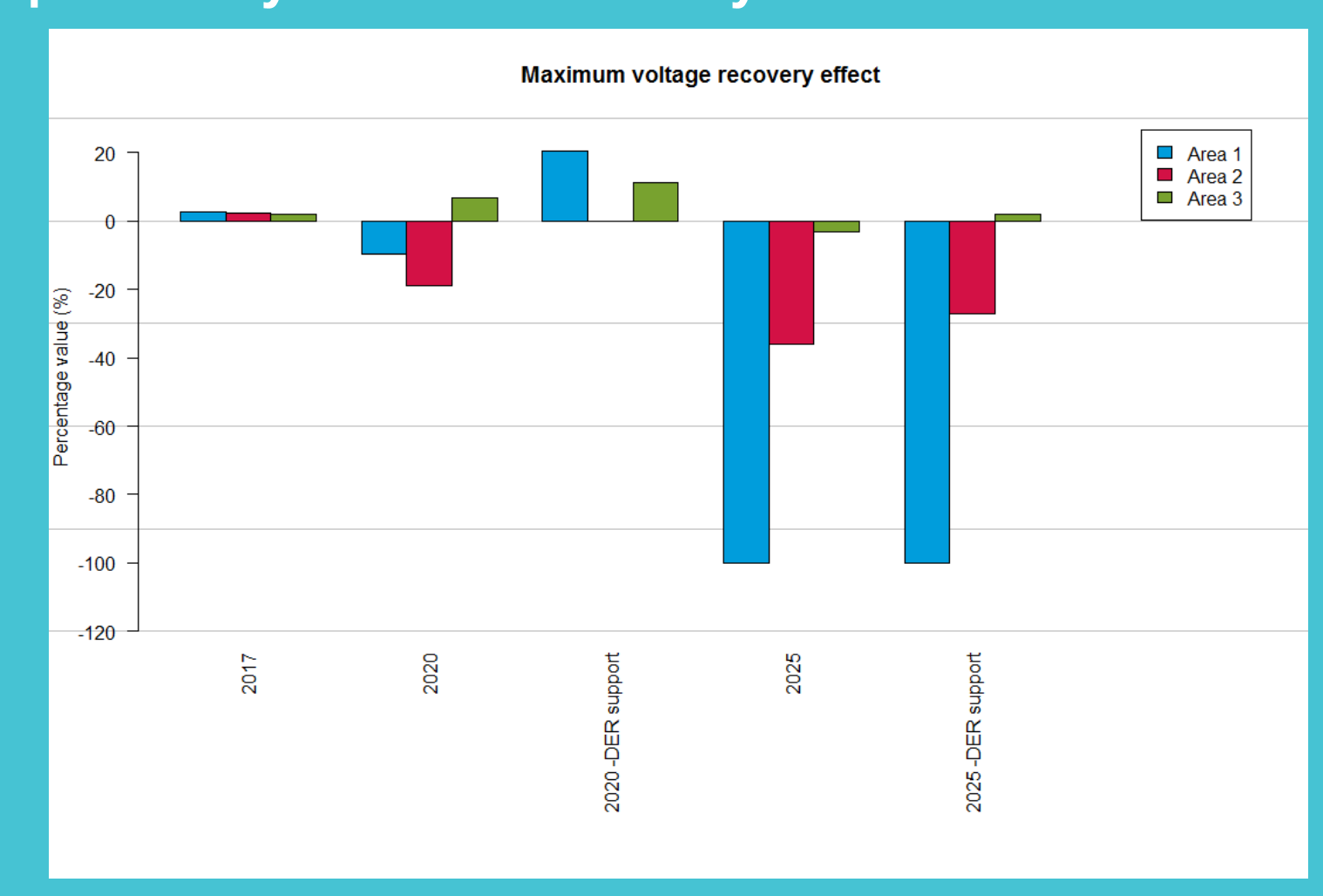
- Regional distribution of synchronous generation becomes more uneven in the next decade
- Some regions are likely to have low or zero synchronous generation



### Voltage and Frequency Dependency

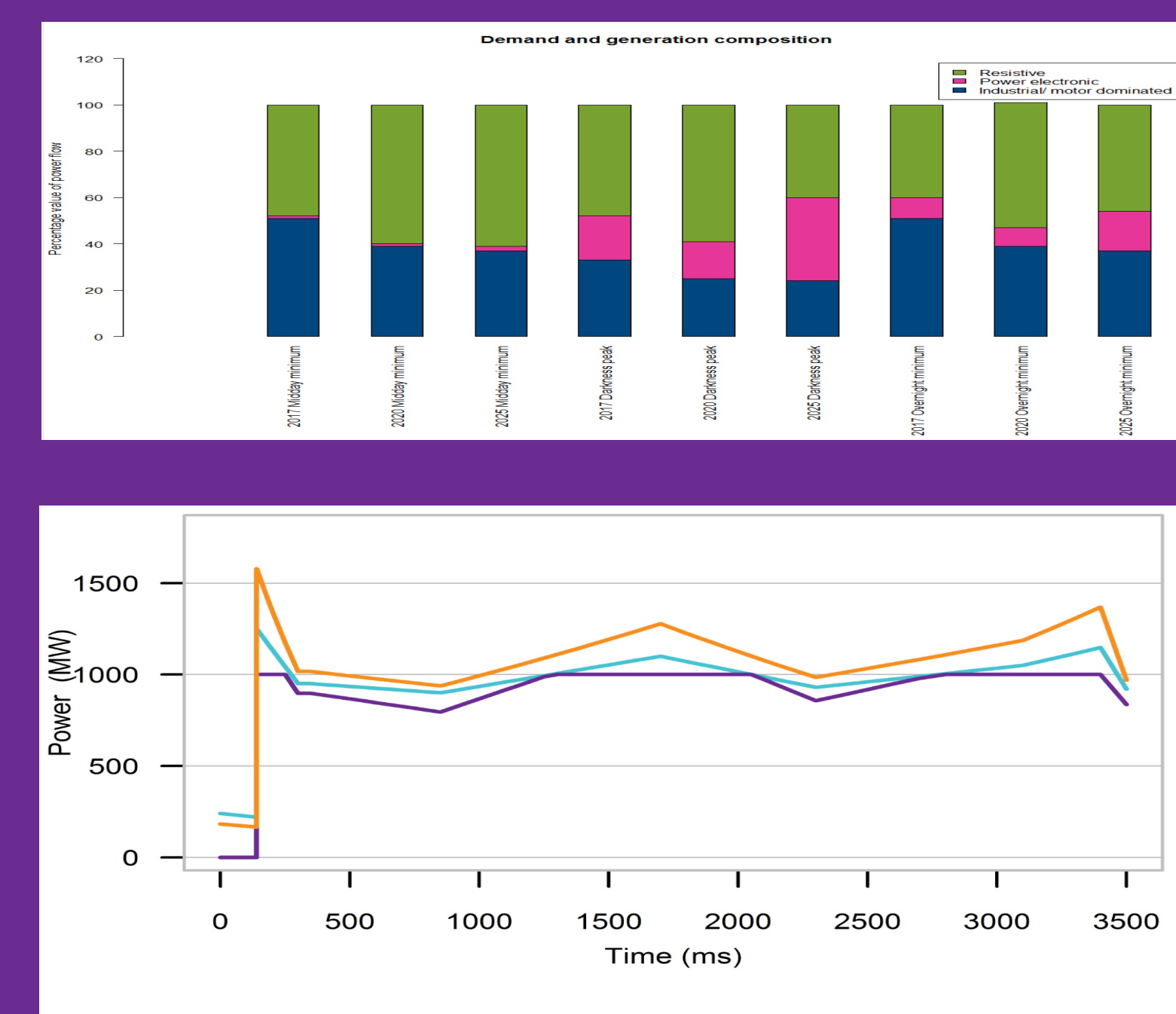
#### Trends

- Regional Active Power Losses have greater impact than National losses in Frequency containment in the future
- Whole system dynamic voltage support positively assists recovery



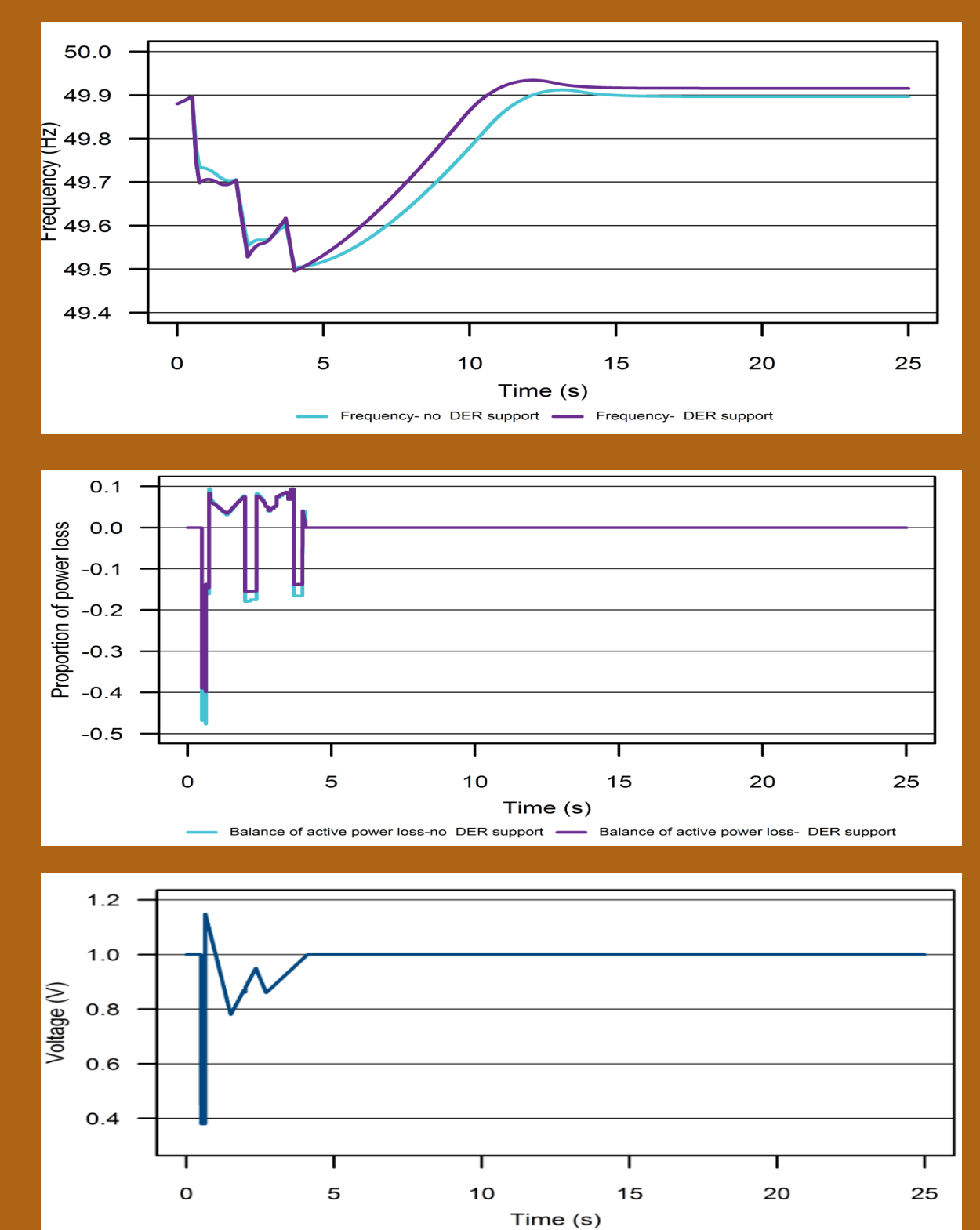
#### Changing Generation and Demand Mix

- Regional Generation and Demand behaviours drive different combined voltage against frequency effects



#### Reduction in Synchronous Generation

- Regional Frequency and Voltage recovery takes longer and is more oscillatory



If you would like more information or are interested in collaborating, please contact us: [sof@nationalgrid.com](mailto:sof@nationalgrid.com)

