Methodology for refining the New England Renewable Energy Zone geographic area

In 2018, the NSW Government undertook initial geospatial mapping analysis investigation of the New England region to identify a nominal boundary for the New England Renewable Energy Zone (REZ). The underlying approach and assumptions for the original analysis is described in the *NSW Government Submission on AEMO's Integrated System Plan (March 2018), Appendices A and B*.

This initial analysis was undertaken in six key stages as summarised below:

1. Consultation with a range of NSW Government stakeholders from relevant agencies to identify key boundary considerations and source relevant data. 25 data layers were identified and collected.
2. 13 data layers were selected to create heatmaps of modelled land use considerations, technical constraints and optimal wind and solar resource locations. Each of these layers was broken down into sublayers, with the respective sublayers ranked to reflect the unique opportunities and constraints relevant to each data layer.
3. These sublayers were then combined using 50-metre wide cells to create heatmaps for wind and solar resource potential, land uses and key constraints.
4. Modelling was then run to identify the mean score for each 50-metre cell across all 13 data layers.
5. In addition to the above resource potential and technical feasibility layers, 12 further model layers were included to enable qualitative factors to be incorporated, such as economic feasibility, heritage, land tenure and other compatible energy generation such as bioenergy.
6. The potential New England REZ boundary was then identified based on balanced consideration of the quality of the energy resource, economic considerations, investor and community support and considerations of environmental, heritage and land-use constraints.

EnergyCo NSW has since refined the REZ geographic boundary based on updated analysis and feedback from key stakeholders, including consultation and ground truthing with the New England Regional Reference Group.

These refinements seek to incorporate updated inputs on resource potential and constraints, balance impacts on existing agricultural and environmental land uses, ensure reasonable connection distances to transmission infrastructure and maintain flexibility of project location with high quality and diverse wind, solar and pumped hydro resources.

All 25 existing data layers were revisited in August 2021 and updates were made, where appropriate. This included refinements to the scoring of sublayers, the incorporation of updated data, and developer responses to EnergyCo's New England REZ Registration of Interest (ROI) process.

Project locations identified through the ROI were considered as a reasonable indication of some of the more prospective energy resources with a likelihood of being developed within the REZ geographic area. This data was used to inform the consideration of potential amendments to the REZ boundary to capture areas with greater prospects for wind and solar projects in the near term, while other areas were acknowledged as having particularly strong wind or solar potential that could be potentially developed in the future.

Census data and dwelling numbers were also used to inform the consideration of the likely population within the REZ and areas of higher population density.

Refining the New England REZ area

This review process led to the following key refinements to the New England REZ boundary:

1. The north western boundary to the west of Glen Innes was extended north towards the Kings Plains National Park to capture the strong wind resources in this area, as well as a potential Pumped Hydro Energy Storage (PHES) site. The north eastern corner of the boundary was brought in by approximately 30km to reflect the low potential for solar and wind generation in this area and to avoid National Parks to the east. The new boundary follows the contour of the national park as a natural boundary, whilst still capturing areas of potential solar, wind and pumped hydro potential.
2. While strong measures already exist to protect National Parks, the southern half of the eastern boundary was reduced to minimise perceived interactions with a number of National Parks to the east and recognise that these areas are not proposed to be subject to wind and solar generation. This has resulted in a relatively smooth eastern boundary that traverses the edges of national parks and the extent of prospective wind and solar potential. .
3. The southern boundary was extended approximately 40km further south to capture the strong wind resource and pumped hydro potential in this area. This extension to the southern boundary also captured additional projects that responded to the ROI.
4. The western boundary was brought in due to the distance from existing transmission assets, low level of commercial interest in this area and to avoid agriculture land present in the region.

The refined boundary for the New England REZ geographic area seeks to deliver a balanced and optimal outcome, considering the likely technical and economic feasibility issues for renewable energy and storage project developments, network infrastructure considerations, land use constraints and stakeholder views.

Data layers

The tables below detail the data layers used for identifying the New England REZ boundary.

Data layer	Original source	Changes relative to 2018 analysis
Heatmap analysis layer		
Solar PV resource	DIGS, Geological Survey of NSW	No change from prior version
Wind resource (speed)	DIGS, Geological Survey of NSW	No change from prior version
Site slope	Geoscience Australia DEM_S_1s	No change from prior version
Site aspect	Geoscience Australia DEM_S_1s	No change from prior version
Site elevation	Geoscience Australia STRM 1s	No change from prior version
Parcel size	NSW Spatial Service	Version updated with latest dataset
Land use	Australian Bureau of Agricultural and Resource Economics, Catchment Scale Land Use of Australia 2014	Version updated with information from NSW Department of Planning, Industry and Environment
Land cover	NSW Department of Planning and Environment	Replaced dataset with updated dataset and sublayers
Protected areas	Collaborative Australian Protected Area Database 2020 and NPWS 2021	Version updated with latest dataset

Prohibited areas	Geoscience Australia	No change from prior version
Site elevation	Geoscience Australia DEM_S_1s	Version updated with latest dataset
Land use zoning	NSW Department of Planning and Environment	Version updated with latest dataset
Biophysical Strategy Agricultural Land (BSAL)	NSW Department of Planning and Environment	Version updated with latest dataset
Biodiversity	NSW Office of Environment and Heritage	No change from prior version
Solar PV resource	DIGS, Geological Survey of NSW	No change from prior version
Wind resource (speed)	DIGS, Geological Survey of NSW	No change from prior version
Site slope	Geoscience Australia DEM_S_1s	No change from prior version
Site aspect	Geoscience Australia DEM_S_1s	No change from prior version
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Biodiversity	NSW Office of Environment and Heritage	No change from prior version
View layer		
Soil/Erosion area	NSW Department of Planning and Environment	No change from prior version
Geology	Geoscience Australia	No change from prior version
Easement	NSW Department of Planning and Environment	Version updated with latest dataset
Watercourse corridor	NSW Department of Planning and Environment	Version updated with latest dataset

Local Government Area	NSW Department of Planning and Environment	Version updated with latest dataset
NSW Electorates	NSW Department of Planning and Environment	Version updated with latest dataset
Bioenergy	DIGS, Geological Survey of NSW	No change from prior version
Transmission corridors and capacity	NSW Department of Planning and Environment	Version updated (see additional data layer below)
Common Ground mining data - Mining Tenure	NSW Department of Planning and Environment	No change from prior version
Heritage	NSW Department of Planning and Environment	Version updated with latest dataset
Other planned energy developments	NSW Department of Planning and Environment	Version updated with latest dataset
Land tenure details Crown/private	NSW Department of Planning and Environment	Version updated with latest dataset

Additional 2021 data layer	**Source**
Heatmap analysis layer	
Registration of Interest projects	Results of Registration of Interest process for New England REZ, EnergyCo NSW
Population and housing density	Australian Bureau of Statistics, Census 2016

Note: all references to the Department of Planning and Environment in the original source data now refer to the Department of Planning, Industry and Environment