

Methodology for refining the Central-West Orana Renewable Energy Zone geographic area

In 2018, the NSW Government undertook initial geospatial mapping analysis investigation of the Central-West Orana (CWO) region to identify a nominal boundary for the CWO 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 CWO 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 CWO Regional Reference Group and REZ Technical and Commercial Steering 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 February 2021 and updates were made, where appropriate. This included refinements to the scoring of sublayers, the incorporation of updated data, identification of connection distances from TransGrid's identified 'study corridor' for the CWO REZ Transmission Line Project and developer responses to EnergyCo's CWO REZ Registration of Interest (ROI) process.

Project locations identified through the ROI were considered as a reasonable indication of 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 and proximal connection distances to transmission assets.

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 CWO REZ area

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

1. The northern boundary from north-west to north-east was retracted southward. This retraction reflects a relatively low level of current commercial interest in this area and long connection distances to the transmission assets. Given these commercial factors, this area was reduced to provide a balanced consideration of other factors including existing agricultural land use and biodiversity constraints.
2. The eastern boundary was extended slightly to capture more of the favourable wind resource in this area, while considering land use constraints, and to provide an appropriate connection distance from transmission assets and proposed substations.
3. The southern boundary was moved southward to capture an area of favourable wind resource, while considering land use constraints and population densities in this area and maintaining appropriate connection proximity to transmission assets.
4. The entire REZ boundary was refined to follow cadastral boundaries, avoid bisecting individual lots and follow existing Local Government Area and conservation area boundaries, where logical.

The refined boundary for the CWO 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 CWO 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
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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 Central-West Orana REZ, EnergyCo NSW
Distance to proposed CWO REZ Transmission	TransGrid
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

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