Methodology for refining the South West Renewable Energy Zone geographic area

In 2018, the NSW Government undertook an initial geospatial mapping analysis investigation of the South West region to identify a nominal boundary for the South West Renewable Energy Zone (REZ). The underlying approach and assumptions for the original analysis are 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 South West REZ boundary was then identified based on a balanced consideration of the quality of the energy resource, economic considerations, investor and community support and considerations of environmental, heritage and land-use constraints.

Refining the South West area before the ROI

The Energy Corporation of NSW (EnergyCo) has since refined the REZ geographic boundary based on updated analysis and feedback from key stakeholders, including consultation and ground truthing with the South West Regional Reference Group (RRG).

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

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. All 25 existing data layers were revisited in September 2021 and updates were made where appropriate ahead of the registration of interest (ROI) process. This included refinements to the scoring of the sublayer and the incorporation of updated data.

This review process led to the following initial refinements to the South West REZ boundary:

1. The western boundary has been extended towards Buronga to encompass strong wind resource potential in this region and proximal access to the nearby project EnergyConnect.

2. The eastern and northern boundaries have been retracted to balance interactions with existing land uses, including irrigated cropping, agricultural lands, and Mungo National Park. These initial refinements also sought to provide a balance between the maintenance of reasonable connection distances to planned transmission infrastructure and opportunities to unlock new energy generation in areas with strong resource potential.

Refining the South West REZ area after the ROI

Following a review of the submissions received during the ROI, the geographical area has been further refined from the map published in the 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.

EnergyCo has undertaken further consultation with local stakeholders through the South West RRG and ensured their feedback on the updated geographical area has been appropriately captured.

This review process led to the following refinements to the South West REZ boundary:

1. The northern boundary has been further retracted in response to limited generator interest in this region during the ROI process and the challenges presented by connection distances to Project EnergyConnect. In addition to ensuring reasonable connection distances to planned transmission infrastructure, this change is designed to provide greater certainty around potential interactions with existing agricultural, cultural and environmental values in this area.
2. The eastern boundary has been further retracted and refined in places to balance interactions with existing agricultural land uses, including irrigated cropping, and ensure reasonable connection distances to planned transmission infrastructure.
3. The south-eastern boundary has been retracted to follow the contours of Yanco Creek and Kidman Way as clear delineable lines that seek to minimise the need to traverse individual properties or landholdings, whilst still capturing areas with strong solar and wind potential.

The refined boundary for the South West 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 South West 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 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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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

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 South West REZ, EnergyCo
Population and housing density	Australian Bureau of Statistics, Census 2016