Numerical wind atlas data at 5 km resolution have been used to map the wind resources of the Wind Atlas for South Africa (WASA) domain in great detail: mean wind speed, mean wind power density, elevation and ruggedness index for every 250 metres over an area of 350,000 square kilometres.

The wind-climatological inputs to the wind resource mapping are wind atlas data sets derived from mesoscale modelling using the Karlsruhe Atmospheric Mesoscale Model (KAMM). The topographical inputs to the microscale modelling are 20-m digital height contours from 1:50,000 South African topographical maps and vector-format land surface roughness maps based on the USGS Global Land Cover Characteristics database (GLCC). A transformation table was used to relate land cover to roughness length.

The detailed resource map has been verified at ten mast locations where high-quality wind measurements are available. Overall, the resource map seems to underestimate the wind resources by about 12%; half of this bias is due to the wind-climatological inputs, the other half is related to the topographical descriptions. However, the exact discrepancy is not critical for most of the intended applications.

The detailed wind resource estimates are designed for national and provincial planning and strategic environmental impact assessment for wind power in South Africa and the results have therefore been made available in common GIS formats. The database of results is in the public domain and can be downloaded from the WASA web site. An updated version of the database will be available in the spring of 2014.