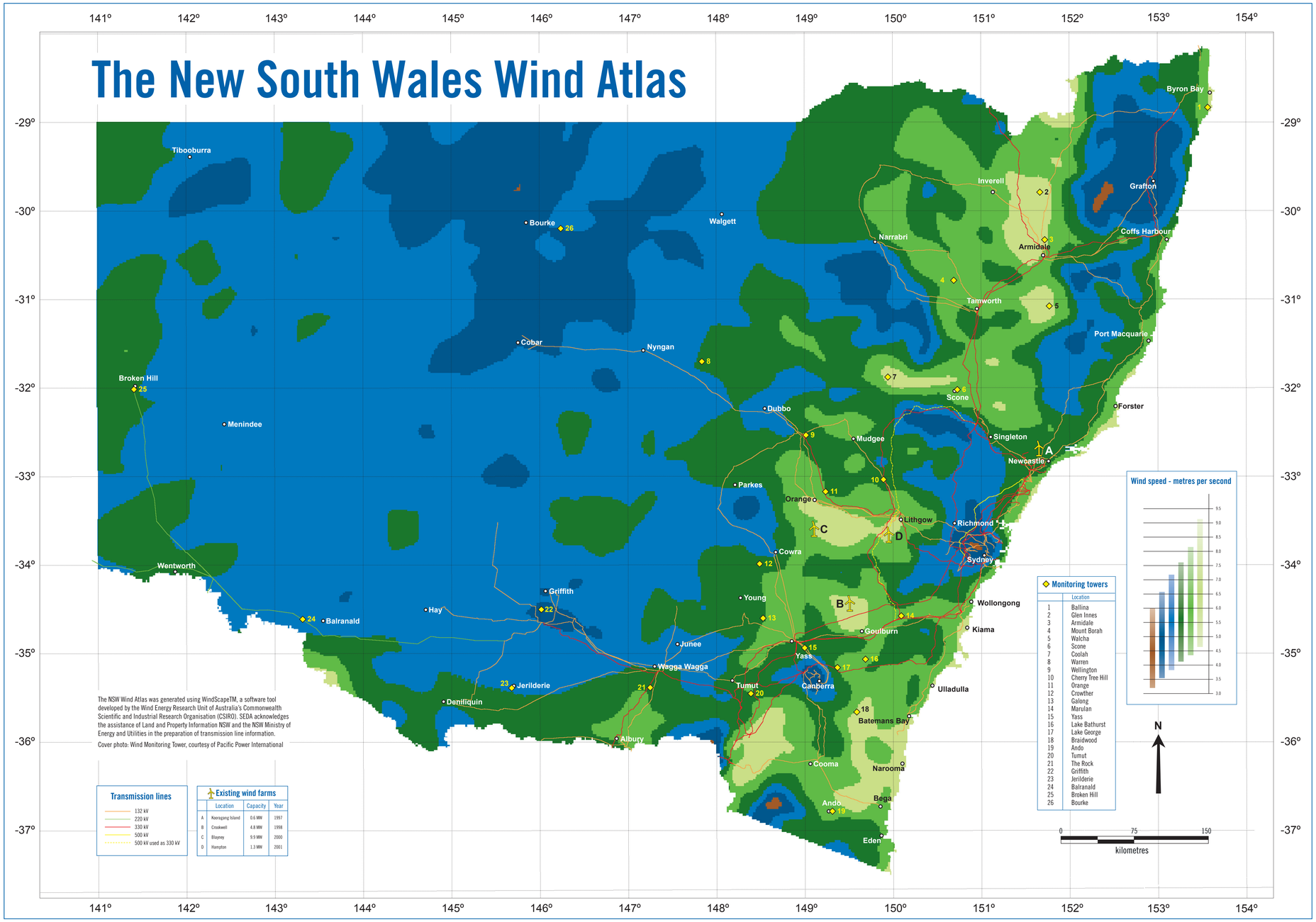
The New South Wales Wind Atlas



The NSW Wind Atlas was generated using WindScapeTM, a software tool developed by the Wind Energy Research Unit of Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO). SEDA acknowledges the assistance of Land and Property Information NSW and the NSW Ministry of Energy and Utilities in the preparation of transmission line information.

Cover photo: Wind Monitoring Tower, courtesy of Pacific Power International

Transmission lines

- 132 kV
- 220 kV
- 330 kV
- 500 kV
- 500 kV used as 330 kV

Existing wind farms

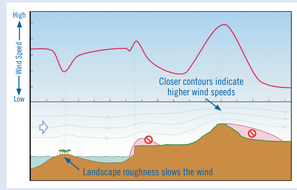
	Location	Capacity	Year
A	Kooragang Island	0.6 MW	1997
B	Crookwell	4.8 MW	1998
C	Blayney	9.9 MW	2000
D	Hampton	1.3 MW	2001

Monitoring towers

	Location
1	Ballina
2	Glen Innes
3	Armidale
4	Mount Borah
5	Walcha
6	Scone
7	Coolah
8	Warren
9	Wellington
10	Cherry Tree Hill
11	Orange
12	Crowther
13	Galong
14	Marulan
15	Yass
16	Lake Bathurst
17	Lake George
18	Braidwood
19	Ando
20	Tumut
21	The Rock
22	Griffith
23	Jerilderie
24	Balranald
25	Broken Hill
26	Bourke

Wind speed - metres per second

How does landscape affect the wind?



In NSW, landscape strongly influences the viability of a wind farm. In Figure 1, the red line represents the energy potential for wind blowing off the sea on to the land. While the rough land surface and vegetation will slow the wind down, hills and ridges can serve to concentrate and speed the wind up. There are also "no-go" zones near cliffs and behind steep hills where turbulence prevents wind energy development.

Figure 1

Figure 2 shows a series of wind maps covering the same area, but at different scales. At 8km and even 3km resolution we can only see the effect of larger landscape features. A dramatic change is seen when the wind is displayed at a resolution of 100m (computed with the WindScape™ system). The warmest colours indicate the best wind speeds. The right hand panels show that good wind sites exist in areas that appear to have only modest resources when modelled at 3km or 8km resolution. Some inland sites in NSW have wind speeds comparable to coastal sites of southern Australia. More information on higher resolution data such as shown in this figure is available through SEDA WindBusiness.

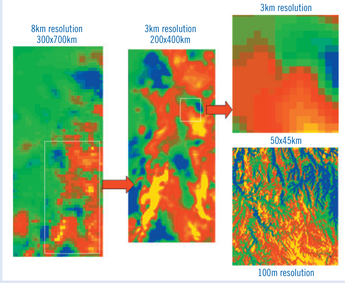
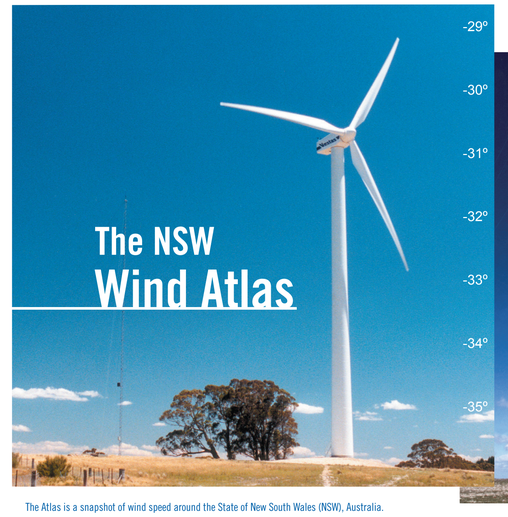


Figure 2

Solutions for the future SEDA
A NSW Government Initiative



The NSW Wind Atlas

The Atlas is a snapshot of wind speed around the State of New South Wales (NSW), Australia.
It was produced for all with a local interest in wind power, including developers, government, the electricity industry, landowners and the broader community.

How was this Atlas created?

The NSW Wind Atlas was created with WindScape™, a regional wind resource mapping tool produced by the CSIRO Wind Energy Research Unit. WindScape™ uses data and modelling from global – and continental – scale climate models, as well as fine-scale calculations for wind speed near large individual landscape features such as ranges and large plains. More information on the Wind Energy Research Unit and their wind resource assessment tools is available online at http://www.clw.csiro.au/products/windenergy/

How to use this Atlas

The NSW Wind Atlas models average annual wind speed across the State. The wind speeds shown are modelled at a height of 65m above the ground, which is close to the height of modern wind turbines.

The wind speed colours shown on the Atlas are accurate to a resolution of 8km. While the Atlas gives a general impression of the NSW wind resource, it does not incorporate the effects of local landscape features smaller than 8km in size, like small hills and ridges. Consequently, the Atlas cannot be used as the sole means for siting a wind farm.

The legend shows a series of colour bars to represent different levels of wind speed. The centre of each bar indicates the modelled average annual wind speed, while the ends of each bar show possible wind speeds within that colour area due to the effects of local landscape on wind speed.

Hampton Wind Park (right) is a two-hour drive from Sydney, past the Blue Mountains. Power from two 660kW wind turbines enhances the quality of supply in the surrounding electricity grid.

Printed on 100% recycled paper

Hampton Wind Park

Selecting a wind farm site

A windy area is not the only element of a successful wind farm. Any wind developer must consider a range of issues, including:

- results of around 12 months of wind monitoring in the exact area
- requirements for development approval
- nearby natural habitats, important plant or animal species, environmental impact assessment
- the cost of connecting to the electricity transmission network near the site (poles and wires)
- compatibility with the existing land use
- the preferences of the nearby community
- how very large wind farm components would be transported to the site

The NSW Wind Energy Handbook covers all the issues relevant to wind farming in this State. It is produced by SEDA and may be ordered by calling the Energy Smart Information Centre on 1300 138 638, at a cost of $33.

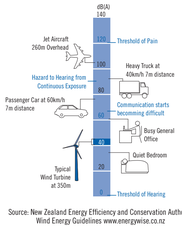
SEDA WindBusiness
A NSW Government Initiative

SEDA's WindBusiness unit offers a range of information and services to assist in the development of wind power in NSW. These include:

- **NSW Wind Synopsis:** a guide to wind resources in NSW, incorporating detailed info on wind regimes, transmission networks and environmental considerations.
- **Regional Wind Reports:** Very high (100m) resolution wind maps and map information overlays, each covering an area of 50km by 50km.
- **Wind Data Licences:** Wind data from SEDA's network of monitoring sites is available for use in site prospecting and project design.

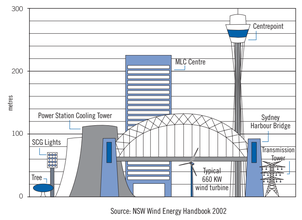
To contact WindBusiness: Tel: +61 2 9249 6100, Email: windbusiness@seda.nsw.gov.au

Relative sound levels



Source: New Zealand Energy Efficiency and Conservation Authority Wind Energy Guidelines www.energywise.co.nz

How big is a wind turbine?



Source: NSW Wind Energy Handbook 2002

Who is SEDA?

The Sustainable Energy Development Authority is a New South Wales Government agency set up to reduce the level of greenhouse gas emissions in this state. All of SEDA's programs are designed to transform the marketplace for sustainable energy technologies and services. We invest our resources in the development and use of energy efficiency, renewable energy and low emission technologies.

SEDA has been actively involved in progressing wind power development in NSW since 1996. SEDA contributed to the development of the existing wind farms in NSW and works closely with the wind industry, local councils, and other stakeholders to remove barriers to the development of wind power in the State.

Phone: +61 2 9249 6100 **Facsimile:** +61 2 9299 1519 **Web:** www.seda.nsw.gov.au **Email:** seda@seda.nsw.gov.au