

# Case Study

## Snowtown Wind Farm

### Project Facts

<b>Location:</b>	140 km north of Adelaide, South Australia
<b>Project Size:</b>	98.7 MW with a capacity factor of over 40%
<b>Project Timing:</b>	2002 – site development started 2004 – approval for 130 turbines 2007-2008 - Stage1 construction (47 turbines) 2010-2011 – Stage 2 to be constructed
<b>Project Participants:</b>	<ul style="list-style-type: none"> <li>• Owner: Trust Power (New Zealand-based)</li> <li>• Developer: Wind Prospect (Adelaide-based)</li> <li>• Wind turbine supplier and head contractor: Suzlon (India-based)</li> <li>• Electrical contractor: Downer Engineering (Sydney-based)</li> </ul>



### Project Development

The Snowtown Wind Farm was developed in a similar manner to most wind farms. The development was completed in four stages:

- **Site Selection** - Wind Prospect selected the site for Trust Power on the basis that it had all the required characteristics: wind that blows hard and often, close to transmission powerlines and unlikely to cause any 'visual amenity' objections.
- **Site Development** - Requires a lease with the landowners, measurement of the wind resource by erecting 10 m masts for 12 months, grid connection design and costs.
- **Site Approval** – Site planning approval requires assessments of ecology, Aboriginal heritage, aviation lighting requirements, noise and community objections. Culminates in the development of an Environmental Impact Statement (EIS). Also need to finalise a Power Purchase Agreement, a Power Generation Licence and a Transmission Connection Agreement.
- **Construction** – Suzlon won the Engineering, Procurement and Construction (EPC) contract to supply turbines and manage the entire construction.

### Project Challenges

- **Project Delay** - The project was delayed for three years between getting approval in 2004 and the start of construction in 2007. This delay was due to a South Australian State Government moratorium on the development of more wind farms whilst it assessed the impacts of increased wind energy generation on the stability of the power grid.
- **Aboriginal Heritage** – The site was assessed for both anthropological heritage concerned with dreamtime stories and sites of importance and archaeological heritage concerned with the presence of artefacts.
- **Community Engagement** – Community concerns and expectations were carefully managed from project inception into ongoing operations. The construction phase is particularly disruptive for landholders and issues such as gates being left open and fences not being repaired can cause major problems and were managed very carefully.
- **Site Layout** – there were many issues to consider when finalising the layout of the site. In addition to heritage and landholder considerations, the site was designed to optimise the economic returns through consideration of soil types, topography, access routes, construction sequence and environmental impacts. Detailed wind maps were also developed to ensure the turbines were constructed in the spots showing the greatest wind resource.

#### Project Facts

*The Suzlon S88 wind turbines have a rotor diameter of 88 m and tower height of 80 m.*

*Construction of Stage1 involved 350 escorted truck journeys from Adelaide, the use of km of high tension cables for anchor footings, 5000 cubic metres of concrete, 8000 tonnes of steel for towers, 27 km of underground cable and 18 km of overhead 33kV power line, with 11 landholders agreeing to have turbines on their land.*

#### How Much Energy Does a Wind Farm Capture?

*On average a 98.7MW wind farm with a capacity factor of 40% produces 39.5 MWh of electrical power every hour.*

*An average household uses 6500 kWh of electrical energy per year, so the Snowtown Wind Farm provides enough energy for 53 000 homes each year.*

*The project will save 345 000 tonnes of greenhouse gas emissions annually.*

# Case Study

## Career Opportunities

The following roles were filled by people in their 20s for the Snowtown Wind Farm:

- **Development Officer** – driving the development activity, managing design and ecological consultants, providing input to the EIS.
- **Development Engineer** – designing the wind farm payout, access points and construction sequence.
- **Wind Engineers** – responsible for installation and monitoring of wind masts and analysis of associated data.
- **Construction Engineers and Technicians** – working on the foundations, construction and installation of the towers, turbine installation and commissioning, crane operations.
- **Consultant Engineers and Scientists** – civil design, ecologists, archaeologists.
- **Electrical Engineers and Technicians** – working on transmission lines.
- **Maintenance Technicians** – six full-time electrical and mechanical technicians manage the ongoing operations.

Each of these people now has the opportunity to work on wind farms anywhere in the world.

### A Global Career

*The Construction Project Manager working for Wind Prospect on the Snowtown Wind Farm started his career on Tasmanian wind projects. Following the completion of Stage 1, he has worked on projects in Scotland and Brazil.*

*In 2010, he plans to come back to Snowtown to manage Stage 2 of the project*

### The Best Bit

*“Seeing the positive impact on the whole community, including the opening of a new business in the town and both farm labourers and local aboriginals being employed on the project and then being able to then work on other wind farm projects”*

*Andrew Dickson, Wind Prospect*

### Aboriginal Heritage



*Three Aboriginal groups were consulted to ensure that there were no issues with the site. Each completed its surveys and many Aboriginal artefacts were found.*

*As a result the wind farm was redesigned, with part of the site being excluded and some of the turbines moved from the initial layout design*

### Community Engagement



*The Snowtown Community Engagement program was particularly challenging because of the long time frame from project inception in 2002 to commissioning in 2008.*

*Extra effort was made to involve the local community, including job opportunities and the launch event which featured a street party in the town of Snowtown.*

### Power Line Design



*The initial power line route were changed after stakeholder concerns about safety.*

*The final design had to balance many complex issues, including ensuring that native vegetation was not disturbed, costs were minimised, construction crews were not delayed and stakeholder expectations were managed.*

### The Greatest Challenge

*“Having to facilitate the communications between the Aboriginal heritage monitors and the construction workers. It was like they were from different worlds”*

*Andrew Dickson, Wind Prospect*

### Wind Farms of the Future

*There will be bigger turbines, bigger wind farms and more geographic diversity.*

*A major constraint for the Snowtown Wind Farm was the maximum blade length that could be transported by road.*

### Further Information

[www.trustpower.co.nz](http://www.trustpower.co.nz)

STELR Career Profiles

STELR Student Handbook

# Case Study Questions

## Snowtown Wind Farm

1. What are the key criteria for a good wind farm site? Why is each of these important?
2. Draw a flow chart to show the process required to set up and run a wind farm.
3. Explain all the factors that are considered in finalising the design of a wind farm. What conflicts might arise from these different factors?
4. When thinking about ecology, heritage, community and engineering issues, what might be discovered in the approval stage that could mean that a wind farm will not be approved?
5. What community benefits can be generated by a regional wind farm project such as the Snowtown Wind Farm? What negative community impacts might occur?
6. Show that the calculations of the electrical energy produced per hour and of the number of households that can have electrical energy in the box on the bottom right of the first page are correct.