



Wind Energy Integration in Australia

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TABLE 1: Life cycle of Wind Farm Facilities – Identification of understanding of issues

		Planning	Construction	Commissioning	Operation	End of Life
Technical	<i>Wind Farm</i>	<ul style="list-style-type: none"> •Site assessment •Wind farm design •Technical specifications 	<ul style="list-style-type: none"> •Build to specification 	<ul style="list-style-type: none"> •Testing of compliance 	<ul style="list-style-type: none"> •Operation to specification •Participation in market 	<ul style="list-style-type: none"> •Disconnection & disposal of equipment
	<i>Power System</i>	<ul style="list-style-type: none"> •Security assessment •Network augmentation 	<ul style="list-style-type: none"> •Build network augmentation to specification 	<ul style="list-style-type: none"> •Testing of network augmentation •Confirmation security assessment 	<ul style="list-style-type: none"> •Maintain power system security 	<ul style="list-style-type: none"> •Disconnection & disposal of equipment
Contractual	<i>Wind Farm</i>	<ul style="list-style-type: none"> •Development approval •Land agreements 	<ul style="list-style-type: none"> •Build to specification 	<ul style="list-style-type: none"> •Registration •License (some states) 	<ul style="list-style-type: none"> •National Electricity Law & Rules •Commercial Laws 	<ul style="list-style-type: none"> •Decommissioning agreement (NSP)
Financial	<i>Wind Farm</i>	<ul style="list-style-type: none"> •Business Plan •Capital Raising 	<ul style="list-style-type: none"> •Wind farm •Network augmentation 	<ul style="list-style-type: none"> •Commissioning •Registration and licensing fees 	<ul style="list-style-type: none"> •Sale of electricity & green certificates •minus costs 	<ul style="list-style-type: none"> •Decommissioning costs

Understood but still in progress

- **Planning of power system: Technical**
 - Streamlining network augmentation
 - Change of security & reliability assessment methods
- **Planning of wind farm: Contractual**
 - Standardize development approvals
- **Commission power system: Technical**
 - Change of security & reliability assessment methods
- **Commission wind farm: Contractual**
 - Change registration categories
- **Operation of wind farms: Financial**
 - Review pricing and costs for electricity & related services
 - ‘Green certificate’ system to replace MRET

Not yet fully understood

- **Operation of wind farms: Technical**
 - Forecast reliability
 - Electricity market participation
- **Operation of power system: Technical**
 - Security & Reliability assessment
 - Aggregated wind farm behavior
- **Operation of wind farms: Contractual**
 - Inappropriate electricity rules including market rules

Understood and implemented

- Documented and tested methods for technical and financial planning of wind farms
- Construction and network augmentation is well something
- Commissioning of wind farms is well documented
- Costs for commissioning, registration and licensing of wind farms are established
- All end of life processes are well documented in decommissioning agreements and best practice guidelines

Sources: Australian Electricity Market Commission (www.aemc.gov.au), National Electricity Market Management Company Ltd (www.nemmco.com.au), Electricity Supply Industry Planning Council of South Australia (www.esipc.sa.gov.au), Australian Wind Energy Association (www.auswind.org), Ministerial Council for Energy (www.mce.gov.au)