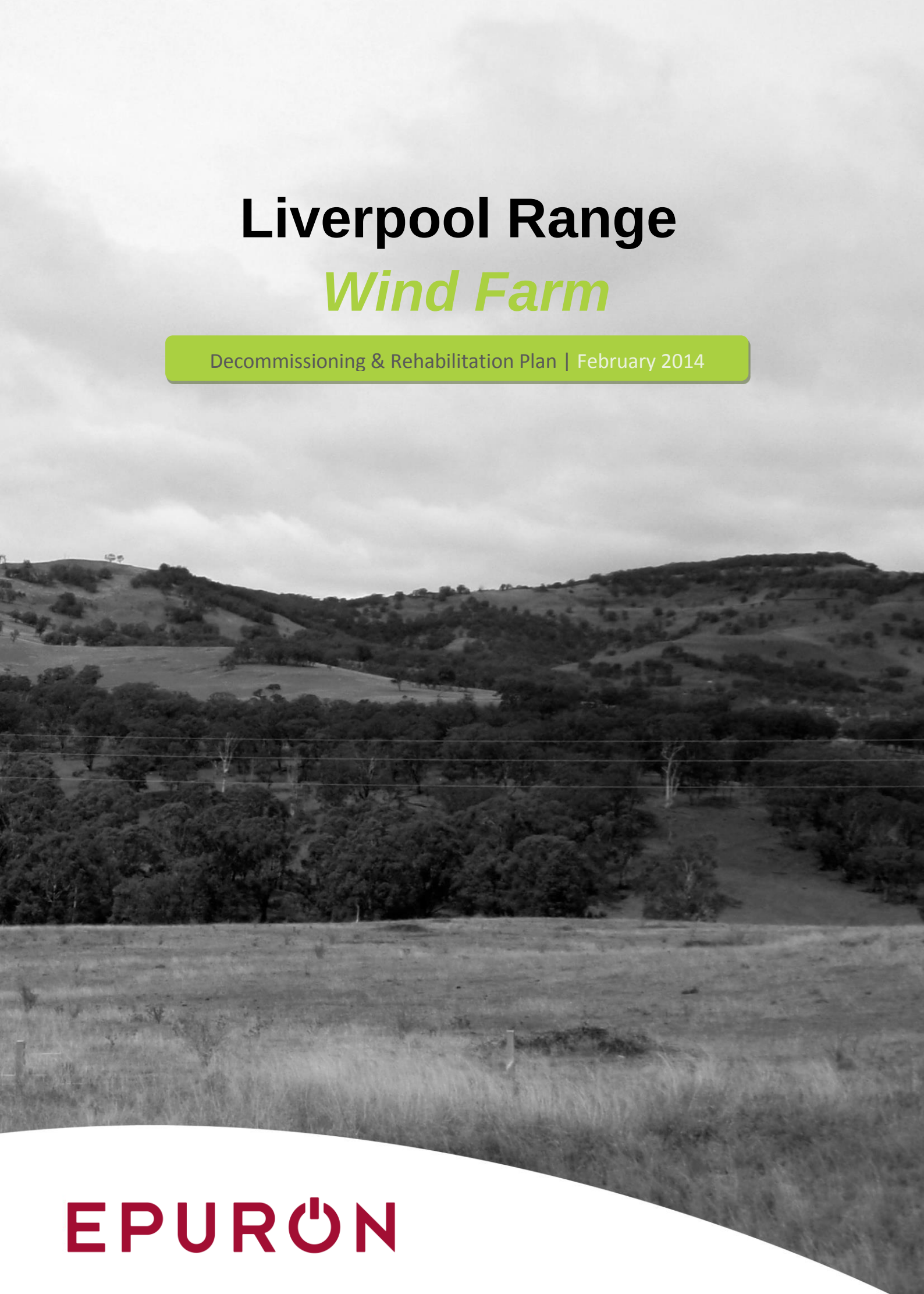
Liverpool Range

Wind Farm

Decommissioning & Rehabilitation Plan | February 2014



EPURON

Liverpool Range

Wind Farm

Decommissioning & Rehabilitation Plan | February 2014

Prepared By:

Epuron Pty Ltd
Level 11, 75 Miller Street
North Sydney NSW 2060
AUSTRALIA
02 8456 7400
www.epuron.com.au

Table of Contents

Figures

1 Introduction

Development of the Liverpool Range Wind Farm involves the construction, operation and decommissioning of a 288 turbine wind farm and its associated infrastructure. This plan sets out the decommissioning and rehabilitation works required at the end of the wind farms 30 year operating life and land Lease term.

In December 2011 Draft NSW Planning Guidelines for Wind Farms (Guidelines) were released. Sections 1.3(f) of the Guidelines address the following decommissioning and rehabilitation requirements for wind farms at the end of their operational life;

- The proponent/wind farm owner rather than the "host" landowner must retain responsibility for decommissioning, and
- The proponent to include a Decommissioning and Rehabilitation Plan in their environmental assessment report.

The Proponent is committed to fulfilling the wind farm decommissioning and rehabilitation obligations specified in the Guidelines. This plan has been developed so these obligations can be satisfied for the Liverpool Range Wind Farm and forms part of the project's Environmental Assessment.

1.1 Project Description

The proposed 288 turbine Liverpool Range Wind Farm is located to the east of Coolah and north west of Cassilis, New South Wales. The site is approximately 325 km north west of Sydney in the New England Tablelands and is located on freehold land and leasehold land within and adjacent to agricultural areas, predominantly use for grazing sheep and cattle.

The site has been selected for its exposed windy ridges, cleared grazing land and proximity to the national electricity grid. The majority of the land in the region is currently used for commercial agriculture (sheep and cattle grazing) purposes and has been cleared and grazed over many decades.

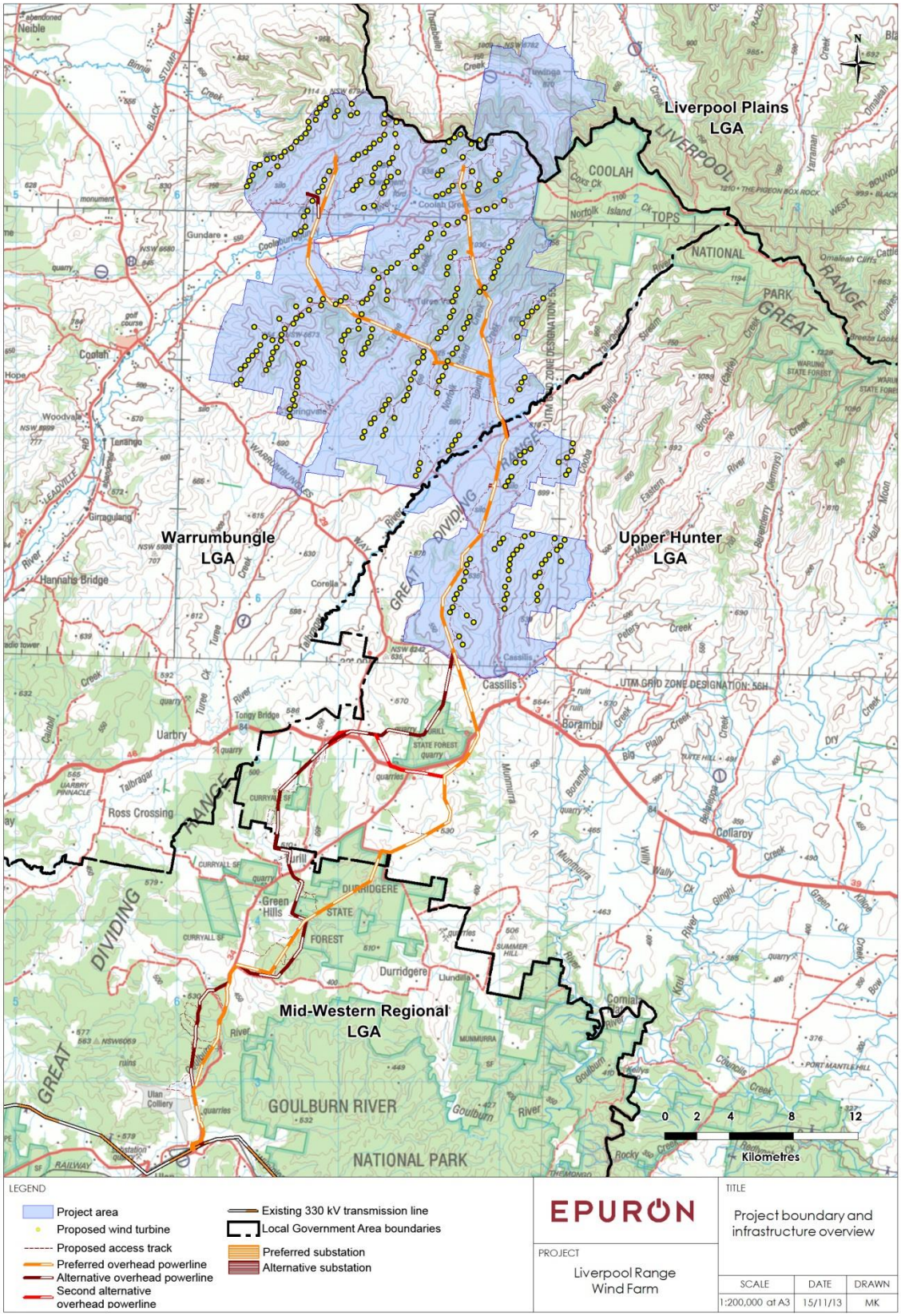
The wind farm is partly located in Warrumbungle Shire Council, Upper Hunter Shire Council and Liverpool Range Shire Council and its immediate surrounds as being within Zone 1(a) Rural, RU1 and RU2 rural zones. The power line is situated in the Mid Western Regional Council. The development is being assessed by the NSW Department of Planning and Infrastructure as a Major Project under Part 3A of the EPA Act 1979.

The primary components of the wind farm include;

- 288 wind turbines including nacelles, towers and blades
- Foundations and civil structures
- Access roads and watercourse crossings
- Hard stands and lay down areas
- Underground cabling and overhead powerlines
- Substations and associated electrical equipment
- Operations and maintenance facilities
- Storage areas and car parks
- Wind monitoring masts and communications equipment

The proposed layout of the Liverpool Range Wind Farm is shown in Figure 1-1 below.

Figure 1-1 Site layout overview for the proposed Liverpool Range Wind Farm



LEGEND

- Project area
- Proposed wind turbine
- Proposed access track
- Preferred overhead powerline
- Alternative overhead powerline
- Second alternative overhead powerline
- Existing 330 kV transmission line
- Local Government Area boundaries
- Preferred substation
- Alternative substation

EPURON

PROJECT: Liverpool Range Wind Farm

TITLE: Project boundary and infrastructure overview

SCALE	DATE	DRAWN
1:200,000 at A3	15/11/13	MK

2 Decommissioning and Rehabilitation

2.1 Decommissioning Commitment

The expected commercial life of the Liverpool Range Wind Farm will be up to 30 years once commissioned and placed into operational service at the end of the construction phase. At the end of the operational life the wind farm will be decommissioned and removed from service in accordance with this plan or the wind farm may be refurbished and repowered for a further 30 years. The option to refurbish and repower the wind farm is subject to a decision by the Proponent at the time and is influenced by future market conditions.

Consistent with the Guidelines the Proponent is committed to its obligation to decommission and rehabilitate the Liverpool Range Wind Farm site at the end of its operational life and Lease term. The Lease agreements between the Proponent and the wind farm landowners set out the terms requiring the Proponent to undertake decommissioning and rehabilitation the site.

An extract of the relevant clauses from the Lease Agreement is shown below;

- *Clause 11.1 Removal of Wind Farm Operator's Property and remediation*

  (a) Unless the Landowner and the Wind Farm Operator have entered into a further lease of the Land, the Wind Farm Operator must, where practicable by the Actual Termination Date and in any event within one year of decommissioning of the Wind Farm:

  (i) remove all the Wind Farm Operator's Property from the Land; and

  (ii) return the Land, as far as practicable, to its condition before the commencement of Construction Activities on the Land (insofar as the change in condition of the Land since that time is attributable to the Wind Farm or the use of the Land by the Wind Farm Operator), subject to clause 11.2.

2.2 Decommissioning Funding

Decommissioning the wind farm at the end of its commercial life is the Proponents obligation and cost. It would involve reinstating similar access road arrangements to construction, and would require access for large cranes and transport vehicles to dismantle and remove the turbines and other equipment. All underground foundations, cable trenches and other infrastructure would remain in situ and all above ground infrastructure would be removed unless requested to remain by the landowner. The decommissioning period is likely to be significantly shorter at around 12-18 months and with significantly fewer truck movements than the construction phase.

It should be noted, based on current market data, that the sale value of recovered turbine materials and other equipment is predicted to exceed the costs of their dismantling and site rehabilitation. In today's terms it is estimated the decommissioning works will cost in the order of $103-115 million while the sale value of recovered equipment and materials is around $123-138 million. Should this positive cost / sale balance tip negatively in the future the Proponent has agreed to ensure an appropriate financial instrument is put in place to ensure the works can be funded. A bank account is the financial instrument to the used.

The decommission works cost estimate has been based on the advice of a turbine supplier with experience in Australia and an industry wide accepted value for the construction of wind farms and extrapolated across the site. It is estimated that the cost of building a wind farm is approximately $2 million per MW installed and this includes the cost of the turbine unit, transformers, shipping from the manufacturer to the site, erection and commissioning as well as the associated civil and electrical works to connect to the electricity grid. As a percentage of the $2 million per MW estimate, the cost of transport from port to site and erection amount to 8% of the total. As the same processes used in construction will be used in decommission (i.e. use of cranes, electrical decommissioning and supervision), it has been assumed that this method will provide a good estimation of the costs. This leads to a total estimated decommissioning cost in the region of $103-115 million or approximately $380,000 per turbine. This estimate is on par with other wind farm developments that have recently been approved in New South Wales.

Current sale prices of refurbished wind turbines vary significantly due to in improvement in technology in recent years and name plate capacity increasing. A list of currently available refurbished wind turbines can be seen in Attachment

1. The sale prices range between 105,000€ - 295,000€ for turbines with a much lower rated output than those proposed for the Yass Valley Wind Farm.

2.3 Host Landowners and Decommissioning

Landowner's contracts contain clauses relating to the decommissioning of the wind farm. An extract of the relevant clauses from the Lease Agreement is shown below;

- *Clause 11.5 Decommissioning and Remediation Fund*

  (a) At any time, but no earlier than five years before the Terminating Date, the Wind Farm Operator will arrange for the creation of a fund (Decommissioning and Remediation Fund) into which the Wind Farm Operator must deposit funds which will, when combined with interest earned, be sufficient at the Terminating Date to cover the Wind Farm Operator's likely costs of complying with its decommissioning and remediation obligations under clause 11.1 and 11.2. The fund shall be maintained by a mutually agreed escrow agent in accordance with the terms and conditions of an escrow agreement between the escrow agent, Landowner and Wind Farm Operator until such time that the obligations under clause 11.5(c) have been satisfied. If the Wind Farm Operator has not completed its decommissioning and remediation obligations under clause 11.1 and 11.2 within 12 months of the Actual Termination Date, the Landowner may give notice of the breach, and if the Wind Farm Operator does not rectify the breach within 60 days:

  (i) control of the Decommissioning and Remediation Fund shall be immediately given to the Landowner; and

  (ii) the Landowner may apply the Decommissioning and Remediation Fund or an appropriate part of it toward remedying that breach.

3 Stakeholder Consultation

3.1 Wind Farm Landowners

As part of the overall wind farm consultation process the Proponent discusses decommissioning and rehabilitation requirements with the host wind farm landowners during agreement negotiations. The requirements of the parties in this regard are documented in the Lease Agreement but fundamentally place the obligation for decommissioning to be the responsibility of the Proponent.

While the Proponent has committed to decommission the consultation process indicates that most wind farm landowners may prefer some components of the wind farm infrastructure to remain on their land after the decommissioning process. The retention of these improvements is seen by the landowners to enhance their ongoing farming practises and potentially includes infrastructure such as;

- access roads and watercourse crossings
- fencing, sheds and storage facilities
- planted vegetation

The Proponent recognises that the wind farm landowners views may change over time regarding decommissioning requirements or if land ownership changes. Accordingly, keeping in mind the current desire of the wind farm landowners to retain some components of the wind farm after decommissioning, the Proponent accepts the responsibility for decommissioning all components of the wind farm in line with this plan. Consultation with the wind farm landowners would be revisited prior to the decommissioning phase, to make sure their requirements at that time are incorporated into the plan.

3.2 Community

Consultation with the community regarding decommissioning will be undertaken well in advance of the commencement of the wind farm decommissioning works.

They key objectives of the consultative process will be to:

- Ensure the local community and stakeholders are appropriately informed about the planned decommissioning works in advance,
- Seek feedback from the community and local authorities regarding any concerns regarding the decommissioning works,
- Consider and incorporate any feedback from the community and local authorities, where possible, into the decommissioning plan.

Key issues to be addressed during the community consultation will include:

- Program and staging of the planned decommissioning works necessary to minimise impacts on farming activities and the community,
- Management of traffic and transport matters on the wind farm access roads,
- Maximise local employment opportunities to ensure local participation in the works where possible,
- Coordination of logistics to ensure adequate availability of contractor supplies, accommodation and local services.

The Proponent has established a Community Consultation Committee for the project which will remain active until completion of the decommissioning phase. The CCC's role will be to provide information to the community and to inform the Proponent of their feedback. The CCC provides an alternate forum for consultation between stakeholders.

4 Planned Scope of Works

The Proponent will engage appropriate contractors and specialists to undertake the wind farm decommissioning and rehabilitation works once the wind farm has reached the end of its commercial life. Manufacturer equipment manuals and procedures, where available, will be utilised to guide decommissioning and dismantling activity. The decommissioning works are expected to be completed in around 12-18 months from commencement.

The current plan is to sell recovered equipment and material wherever possible to fund the works. As such it is expected the decommissioning process will be carried out with due care and accuracy to ensure the resale value of all recovered equipment and materials are preserved.

4.1 Wind Turbines

At the end of their commercial life turbines will be shut down and removed from active service and physically disconnected from the electrical infrastructure in order to make safe before the dismantling process commences. Once safe and ready for dismantling all liquids will be drained and contained (oils, grease, lubricants and coolants, etc.) and any other consumable or disposable items will be removed where necessary. Captured wastes and materials will be recycled or reused wherever practicable to do so, and if not practicable, disposed of at an appropriate waste facility. Any handling, storage and disposal of waste material will be carried out in accordance with the project's Waste Management Plan.

Dismantling of the turbine blades, nacelle and tower will be generally carried out in the reverse sequence to their original assembly during construction. Dismantling will involve disassembly of the various components, which will be lowered by crane and transported to a storage / laydown area before removal from site for sale to market.

It is expected that all waste metallic components would be recovered and sold or recycled with no material going to waste. Any other non-metallic waste materials such as plastics, composites or civil material that could not be feasible reused or recycled would be recovered and crushed or compacted and disposed of in an appropriate waste facility.

4.2 Electrical Transformers

Selection of the preferred wind turbine model will ultimately reveal the type, size and location of the turbine electrical transformers. Some turbines require the transformers to be mounted inside the turbine tower while others are mounted externally on a concrete foundation and inside a weatherproof housing. To decommission the transformers they must be shut down, removed from service and made safe. To dismantle the transformers they must first be allowed to cool before removing and containing all liquids (oil) prior to transporting off-site for resale. Transformer foundations will remain in situ below the ground while all exposed cabling, conduit and housings are removed. The concrete foundations would be covered with a layer of compatible sub-grade material and would be graded to preserve the slope of the surrounding area. The ground will be dressed with compatible topsoil, and planted with appropriate grasses or foliage to reintegrate it with the surrounding environment.

Some electrical transformers, substations and grid connection equipment on the wind farm site may be owned and operated by the network operator, currently Transgrid. The responsibility for decommissioning this equipment remains with the network owner / operator and their processes and procedures would apply to their equipment.

4.3 Underground Electrical Cabling and Overhead Powerlines

Underground electrical cables may be installed at varying depths, depending on the rating and type of cable conductor used, but will likely be installed at depths of at least 1m. Underground electrical cabling will not be removed during decommissioning and will be deactivated and left in situ. The cables contain no materials considered harmful to the environment and the process of digging them up and removing them is often considered to have a far greater impact on the environment than leaving them in situ. Many of the underground cabling will be installed under the wind farm access roads and leaving the cabling in place is unlikely to have any impact on future farming practises, particularly if the access roads remain in place after decommissioning. Should underground electrical cabling need to be removed, they will be removed in such a way to minimise impact on the surrounding area as much as possible. Any disturbed areas would be backfilled with compatible sub-grade material and would be graded to preserve the slope of the surrounding area. The ground will be dressed with compatible topsoil and planted with foliage to reintegrate it with the surrounding environment.

All overhead electrical cabling and powerlines will be dismantled, removed and materials reused or sold where possible. The powerline poles will be removed and the holes filled in with compatible sub-grade material and revegetated. In locations where potential environmental damage from complete extraction of the powerline pole may outweigh the benefits, the pole will be cut off at ground level.

4.4 Access Roads

Wind farm landowners are likely to seek the retention of access roads at the time of decommissioning as they provide a benefit to their ongoing farming practises. In the event decommissioning of the access roads is required, the gravel topping and sub layers will be removed and transported to an appropriate disposal location. Disposal may include reuse as land fill on site if required, or at an offsite location. All associated access road infrastructure including drainage structures, culverts and crossings will be removed and reused where possible, or disposed of at an appropriate offsite location. Cleared areas would be backfilled with clean, compatible sub-grade material and would be graded to preserve the slope of the surrounding area. The ground will be remediated as appropriate and dressed with compatible topsoil and planted with grasses or foliage to reintegrate it with the surrounding environment.

4.5 Foundations

The wind farm may comprise a mix of both gravity type and rock anchor type foundations for installation of the wind turbines. Determining which type of foundation will be used is finalised during the pre-construction phase depending on the specific geology existing at each wind turbine site. A gravity foundation is essentially a large block of reinforced concrete installed 2-3m below the surface while a rock anchor foundation drills deep into the ground and fixes steel cables into the rock about 20-25m underground. Regardless of the underground foundation used it will not be removed during decommissioning as the disturbance is not necessary and the underground foundation is considered to cause no harm by remaining in situ. All protruding electrical cabling, conduit and other structures are removed and the foundations are covered with a layer of compatible sub-grade material and graded to preserve the slope of the surrounding area. The ground will be dressed with compatible topsoil and with grasses or foliage to reintegrate it with the surrounding environment.

4.6 Hardstands and Laydown Areas

Hardstand areas are generally constructed in a similar manner to access roads but may have an increased level of compactness for crane lifts. Laydown and storage areas are also constructed in a similar manner to access roads and are often large flat areas of well drained land set aside for storage purposes. Remediation of these areas would be the same as for access roads but it is likely some areas may also be retained by the wind farm landowners for future farming use.

4.7 Operation and Maintenance Facilities

During the operations of a wind farm a number of buildings and structures are required to accommodate offices, amenities, storage, control room and general maintenance facilities including car parks. This can be achieved by refurbishing existing structures or constructing purpose built facilities. It is expected these buildings and structures will be retained on site by the landowner once wind farm decommissioning is completed. If the buildings are to be demolished and removed, this would be undertaken in accordance with standard demolition practices for buildings of this nature.

5 Rehabilitation Monitoring

The planned rehabilitation activities are designed to reintegrate any disturbed area with the surrounding land and existing vegetation to a condition similar to that existing prior to construction. It is possible initial rehabilitation works may be ineffective in some areas due to erosion, farming intrusion or topographical effects impacting the rehabilitated area. Similarly, it is possible initial reseeding, re-grassing or vegetative replanting activities may be unsuccessful due to inappropriate coverage or weather effects. To ensure the rehabilitation program is successful in the longer term, periodical site monitoring will be undertaken for up to 2 years following decommissioning. It is likely the monitoring will be undertaken by the host landowners in the first instance and any remediation works carried out by the Proponent as required. Rehabilitation remediation works may include;

- Application of additional water to newly planted vegetation
- Remedy of poor drainage areas where runoff is insufficient or to prevent erosion
- Aeration or fertilisation of topsoil to enhance vegetation growth
- Replanting of any dead vegetation
- Applying additional backfill material or topsoil
- Fencing to keep farming practises and livestock away from rehabilitated areas until established

6 Updating the Plan

Consistent with the Guidelines, the Proponent accepts the requirement to update the Decommissioning and Rehabilitation Plan every 5 years. The Proponent will update this plan during the first year of commercial operations and every 5 years thereafter. In updating the plan during the first year of operations the Proponent will take into account as built wind farm infrastructure, any changed landowner ownership and any regulatory or approval conditions relevant to the future decommissioning process. A copy of the updated plan will be made available for public viewing.

Attachment 1 – Refurbished Wind Turbine for Sale

List of currently available Second hand WIND TURBINE

Issued/ up-dated: February 2013

Repowering Solutions

List´s ser. No.	Offer´s reference no.	Title / Technical Data	Price, Scope of Deliveries (SoD) and other commercial and delivering conditions
			[RE]MANUFACTURED WTG USED WTG UNUSED WTG
		If you want to have more details or a detailed offer and photos,	
		Preliminary note:	
	2013/0001	**LAGERWAY 18/80KW** Manufacturer: Lagerway Power: 80kW Year of production: 2000 Unit: Several units Rotor: 18 Tower height: 30 General condition: Remanufactured Notes: We can supply this turbine Limited at 60kW for Italian Market	Price: -- Scope of deliveries: a) Nacelle, b) Rotor, c) Tower, d) New full power converter, e) New panel control, f) New generator Status: Remanufactured with 2 year warranty Location: Spain Delivery: Has to be negotiated Payment: Has to be negotiated Available: Immediately
	2013/0002	**NORDTANK** Manufacturer: NORDTANK 300 Power: 300KW Year of production: 1996 Unit: 30 Rotor: 28 Tower height: 30 General condition: Remanufactured We can supply this turbine Limited at 200kW for Italian or 250kW for North Ireland markets	Price: -- Scope of deliveries: a) Nacelle, b) Rotor, c) Tower, d) New full power converter, e) New panel control, f) New generator Status: Remanufactured with 2 year warranty Location: Spain Delivery: Has to be negotiated Payment: Has to be negotiated Available: Immediately
	2013/0003	**VESTAS** Manufacturer: VESTAS V27 Power: 225KW Year of production: 1999 Unit: 3 Rotor: 27 Tower height: 30 General condition: Remanufactured	Price: -- Scope of deliveries: a) Nacelle, b) Rotor, c) Tower Status: Remanufactured with 2 year warranty Location: Spain Delivery: Has to be negotiated Payment: Has to be negotiated Available: Immediately
	2013/0004	**NORDEX N54** Manufacturer: NORDEX Power: 1000 Year of production: 2000 Unit: 17 Rotor: 54 Tower height: 60 General condition: Good condition	Price: 105.000,00 € Scope of deliveries: a) Nacelle, b) Rotor, c) Tower, d) Control cabinet, e) Trafo Dismantling: Not including Status: Used Location: Germany Delivery: Has to be negotiated Payment: Has to be negotiated Available: Immediately
	2013/0005	**NEG MICON** Manufacturer: NEG MICON Power: 1000 Year of production: 2000 Unit: 12 Rotor: 60 Tower height: 70 General condition: Good condition	Price: 150.000,00 € Scope of deliveries: a) Nacelle, b) Rotor, c) Tower, d) Control cabinet, e) Trafo

List of currently available
Second hand WIND TURBINE
Issued/ up-dated: February 2013

Repowering Solutions

List´s ser. No.	Offer´s reference no.	Title / Technical Data	Price, Scope of Deliveries (SoD) and other commercial and delivering conditions
			Dismantling: Not including Status: Used Location: Germany Delivery: Has to be negotiated Payment: Has to be negotiated Available: Immediately
	2013/0006	**NORDEX N60** Manufacturer: NORDEX Power: 1300 Year of production: 1999 Unit: 37 Rotor: 60 Tower height: 69 General condition: Good condition	Price: 160.000,00 € Scope of deliveries: a) Nacelle b) Rotor c) Tower d) Control cabinet e) Trafo Status: Not including Location: Germany Delivery: Has to be negotiated Payment: Has to be negotiated Available: Immediately
	2013/0007	**VESTAS V66** Manufacturer: VESTAS V 66 Power: 1650 Year of production: 1999-2001 Unit: 30 Rotor: 66 Tower height: 70M General condition: Good condition	Price: 295.000,00 € Scope of deliveries: a) Nacelle b) Rotor c) Tower d) Control cabinet e) Trafo Dismantling Excluded Status: Used Location: Germany Delivery: Has to be negotiated Payment: Has to be negotiated Available: Immediately
	2013/0008	**VESTAS** Manufacturer: VESTAS V47 Power: 660 Year of production: 2000 Unit: 9 Rotor: 47 Tower height: 65 General condition: Good condition	Price: 157.000,00 € Scope of deliveries: a) Nacelle b) Rotor c) Tower d) Control cabinet e) Rotor Dismantling Exclusive Status: Used Location: Germany Delivery: Has to be negotiated Payment: Has to be negotiated Available: Immediately
	2013/0009	**VESTAS** Manufacturer: VESTAS V52 - CLASS I Power: 850 Year of production: 2010 Unit: 4 Rotor: 52 Tower height: 65 General condition: Unused - The turbines have not been installed, we think we can buy these turbines at a significant discount.	Price: please give us your price Scope of deliveries: a) Nacelle b) Rotor c) Tower d) Control cabinet Dismantling Including Status: Unused Location: Italy Delivery: Has to be negotiated Payment: Has to be negotiated Available: Immediately
	2013/0010	**VESTAS** Manufacturer: VESTAS V90 - CLASS I Power: 3000 Year of production: 2010 Unit: 6 Rotor: 90 Tower height: 80	Price: please give us your price Scope of deliveries: a) Nacelle b) Rotor c) Tower d) Control cabinet

List of currently available
Second hand WIND TURBINE
Issued/ up-dated: February 2013

Repowering Solutions

List´s ser. No.	Offer´s reference no.	Title / Technical Data		Price, Scope of Deliveries (SoD) and other commercial and delivering conditions	
		General condition:	Unused - The turbines have not been installed, we think we can buy these turbines at a significant discount.	Dismantling Status: Location: Delivery: Payment: Available:	Including Unused Spain Has to be negotiated Has to be negotiated Immediately
	2013/0011	**VESTAS**			
		Manufacturer: Power: Year of production: Unit: Rotor: Tower height:	VESTAS V90 - CLASS III 2000 2010 7 90 80	Price: Scope of deliveries:	please give us your price a) Nacelle b) Rotor c) Tower d) Control cabinet
		General condition:	Unused - The turbines have not been installed, we think we can buy these turbines at a significant discount.	Dismantling Status: Location: Delivery: Payment: Available:	Including Unused Spain Has to be negotiated Has to be negotiated Immediately
	2013/0012	**VESTAS**			
		Manufacturer: Power: Year of production: Unit: Rotor: Tower height:	VESTAS V80 - CLASS I 2000 2010 6 80 80	Price: Scope of deliveries:	please give us your price a) Nacelle b) Rotor c) Tower d) Control cabinet
		General condition:	Unused - The turbines have not been installed, we think we can buy these turbines at a significant discount.	Dismantling Status: Location: Delivery: Payment: Available:	Including Unused Spain Has to be negotiated Has to be negotiated Immediately