RATCH-Australia Corporation

Decommissioning and Rehabilitation Plan
Collector Wind Farm ("CWF")

Version 1.2

March 2012

Document control:
Document: Collector Wind Farm Decommissioning and Rehabilitation Plan
Date: January 2012
Prepared by: Anthony Yeates
Reviewed by: Terry Johannesen

Revision History:

Version	Revision Date	Comments	Approved
1.1	31 Jan 2012	Final Draft	David Smith
1.2	6 March 2012	Amended	David Smith

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1. Statutory, Policy and Planning Context

CWF has been declared a Major Project under Part 3A of the EP&A Act and will be subject to determination by the Minister for Planning. It has also been declared critical infrastructure under Section 75C of the Act, being a renewable energy project with a peak generating capacity greater than 30MW.

Draft NSW Planning Guidelines for Wind Farms (the "Draft Guidelines") were released in December 2011. Section 1.3 (f) of the Draft Guidelines relates to decommissioning, and sets out two specific requirements:

- The proponent/wind farm owner rather than the "host" landowner must retain responsibility for decommissioning. CWF is fully compliant with this requirement, which is addressed below in Section 3
- Applicants to include a Decommissioning and Rehabilitation Plan in their environmental assessment report, as detailed in Appendix A. CWF is fully compliant, this plan has been developed to satisfy this requirement.

2. Introduction

The proposed Collector Wind Farm ("CWF") involves the construction, operation and decommissioning of a wind farm comprising up to 68 wind turbines and associated electrical and civil infrastructure. The associated infrastructure includes access roads, underground cabling, control building, substation, equipment for connection to the transmission grid, and wind monitoring masts. During the construction phase, additional components would include a construction compound (including site offices and storage areas) and potentially an on-site concrete batching plant.

CWF will be located within the Upper Lachlan Shire approximately 55km north-east of Canberra and 35km south-west of Goulburn, situated in the NSW Southern Tablelands along the Cullerin Range.

The project site falls within the NSW Government's Renewable Energy Precinct No. 4 – ACT/NSW Boarder Region. The project site is bounded to the north by the Hume Highway and to the south by Collector Road.

The proposed layout of the CWF is shown in Figure 1.

2.1. CWF Proponent

The Proponent of CWF is Transfield Services Wind Farm Developments Pty Ltd, a company wholly owned by RATCH-Australia Corporation Limited. For the purposes of this decommissioning plan, the Proponent will be referred to as "RATCH-Australia".

2.2. Main components of the constructed wind farm

Main elements of the wind farm will include:

- Roads and access tracks
- Crane hardstands and construction lay down areas
- Bridges and fords over waterways
- Underground and overhead electrical cabling
- Turbine, step up transformer and substation footings
- Wind turbine generators (including the tower, nacelle and blades)
- Step up transformers and substation
- Site Office / Control Room / Storage compound and car park

- Possible viewing facility

The decommissioning and or site rehabilitation associated with each of these elements is discussed in Section 5 of this plan.

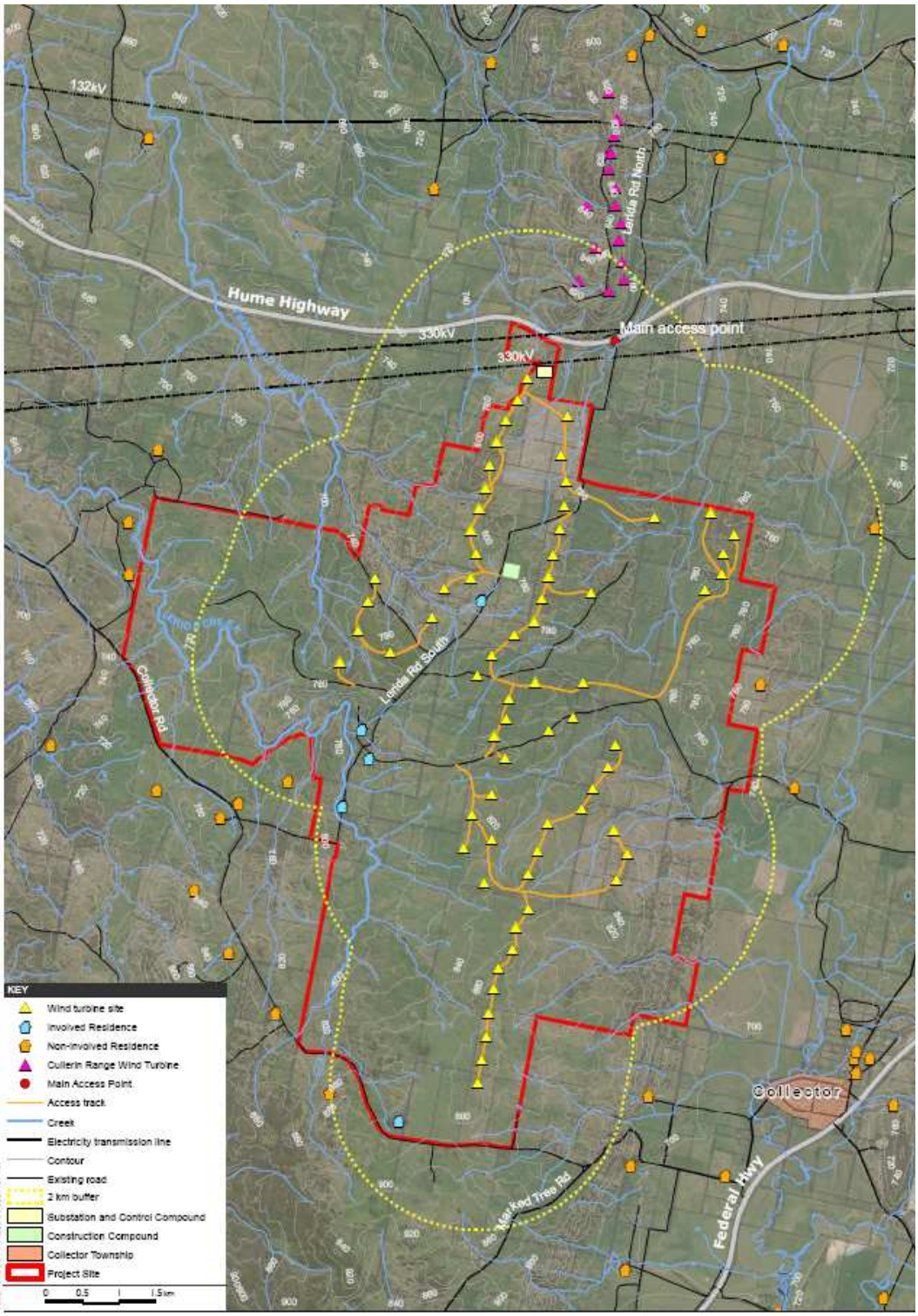

Figure 1 - Proposed layout of CWF

2.3. Expected operational life of the wind farm

It is anticipated the operational life of CWF will be 20 to 25 years after the completion of construction. During this initial period, the wind farm may be repowered or refurbished, extending for an additional period of 20 to 25 years.

- Repowering: involves the removal and replacement of the generation equipment within the wind farm with newer, more efficient or more advanced generation equipmet, extending its life by 20 to 25 years

- Refurbishment: involves undertaking a major overhaul of the existing generation equipment, replacing worn or degraded components with new components, extending its life by approximately 10 to 15 years

2.4. Consultation with landowners regarding decommissioning

Discussions have been held with each of the host landowners regarding decommissioning. It has become apparent during this consultation process that landowners may prefer some elements of the wind farm to remain after decommissioning. This includes roads and access ways, bridges or fords built over water courses, fencing, and trees or other planted foliage.

It is recognised that host landowner decommissioning requirements may change over time, or if ownership of the land changes during operation of the wind farm. As such, notwithstanding the current desire of the host landowners to retain some elements of the constructed wind farm after decommissioning, RATCH-Australia has accepted the full responsibility for decommissioning all elements of the wind farm in accordance with this plan. Consultation would be re-undertaken during the future detailed planning phase of the decommissioning, to understand landowners' requirements at that time.

3. Decommissioning and rehabilitation obligations

RATCH-Australia, as proponent of CWF, recognises and accepts the responsibility to retain the obligation for wind farm decommissioning. Land lease documents between RATCH-Australia and host landowners explicitly allocate this obligation to RATCH-Australia.

The relevant clause from the land lease documents is shown below (RATCH-Australia is "the Lessee"):

> *19.2 Removal of Lessee's Property*
>
> *Within twelve (12) months after the expiry of the Term or sooner termination of this Lease, during which period the Lessee shall pay to the Lessor the Annual Charge, the Lessee shall:*
> *(a) give back the Leased Area (excluding the Wind Turbine Generators and the Electrical Plant and any other of the Lessee's Property which shall remain the property of the Lessee) to the Lessor;*
> *(b) remove all signs and advertisements;*
> *(c) remove from the Land all permanent buildings, fences and other structures and Accessways constructed by the Lessee thereon (other than any Permanent Foundations situated below ground, and*

underground cables, none of which the Lessee shall be required to remove);
(d) leave a minimum of 300mm of soil above all underground structures which the Lessee is not required pursuant to the clause above to remove and grade and contour the surface consistent with surrounding areas;
(e) restore and revegetate the surface of the Land, so far as is reasonably practicable, to its condition as at the commencement of the Lease, including by sowing grass or pasture seed on the surface on those parts of the Land referred to in this clause in consultation with the Lessor; and
(f) repair any damage caused by the activities listed in this clause 19.2.

4. Public consultation prior to decommissioning

Public consultation will be undertaken well in advance of the commencement of the decommissioning of the wind farm.

They key objectives of the consultative process:

- ensure the local community and stakeholders are provided with appropriate information about the planned decommissioning,
- allow the understanding of community concerns or issues,
- allow the amendment of plans to accommodate community or stakeholder feedback where possible
- ensure local authorities are informed about the proposal
- ensures an open forum for communication between many diverse stakeholders to resolve any issues or concerns

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

- Timing and phasing of the works to minimise impacts on agricultural and farming activities (i.e. avoidance of breeding or harvest periods)
- Management of traffic on Lerida Rd South and other access tracks to minimise traffic impacts
- Coordination of employment and contractor involvement in decommissioning, to ensure local area participation is maximised
- Coordination of logistical issues for decommissioning, to ensure adequate availability of contractor accommodation, food, fuel, entertainment etc

The Proponent will establish a Community Consultative Committee (“CCC”) which will remain active until the conclusion of the decommissioning phase. The CCC will be available to guide and inform the Proponent on matters of interest to the community, and will provide an additional forum for communication between stakeholders.

5. Description of main decommissioning and rehabilitation activities

5.1. Roads and access tracks

Roads and access tracks will be constructed using a suitable gravel road base, and will not be tarred or covered with asphalt. Roads and access tracks are likely to be retained after rehabilitation of the site, at the discretion of host landowners.

Should remediation of the roads and access tracks be required, gravel will be removed from access roads and transported to a pre-approved disposal location. Disposal may include reuse as land fill on site if required, or at an offsite location.

All drainage structures, including culverts, end sections, stone outlet protection, etc., will be removed and reused where possible, or disposed of accordingly.

Any cleared areas of roads or drainage 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 de-compacted or aerated as appropriate, dressed with appropriate topsoil, and seeded or planted with appropriate grasses or foliage to reintegrate it with the surrounding environment.

5.2. Crane hardstands and construction lay down areas

Crane hardstands will be constructed using a suitable gravel road base and will not be tarred or covered with asphalt. Construction laydown areas may be constructed in a similar manner, or may simply be large flat, cleared areas set aside in well drained parts of the site.

Remediation of these areas would be as for nearby roads and access tracks, and may be retained at the discretion of the host landowners.

5.3. Bridges and fords over waterways

Roads will be designed in such a manner as to avoid the need to cross water courses, so it is unlikely major rehabilitation will be required. Any bridges or fords constructed are likely to be retained after rehabilitation of the site, at the discretion of host landowners.

In the event bridges or fords need to be removed, they will be completely dismantled or destroyed, and all materials taken away for re-use or recycling where possible. Culverts and other specific infrastructure will be removed as carefully as possible to allow for their reclamation and re-use. Where removed materials cannot be recycled or reused, they will be disposed of in an approved landfill site.

Slopes will be re-graded as close as possible to their former natural grade, and where there has been some disturbance to the water course bed, it will be rehabilitated using stones or material closely replicating the surrounding terrain.

5.4. Underground and overhead electrical cabling

Cabling will be laid at various depths but will likely be buried at depths of at least 1m.

Cabling and conduits will not be recovered during decommissioning, and will be completely deactivated and abandoned. The cables and conduits contain no materials known to be harmful to the environment, and the process of digging up and removing the underground cabling is considered to have a greater impact on the surrounding environment than leaving them in place.

Underground cabling will be laid beneath or adjacent to the internal roads and access tracks wherever possible to connect the turbines with the substation. Unless requested by the landowner, removal or remediation of roads and access tracks will not be undertaken. As such, leaving the cabling in place is unlikely to have any impact on the current use of the land.

Should removal of the cabling and conduits be required for any reason, they will be dug up in a manner that results in minimal impact on the surrounds. Any disturbed 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 de-compacted or aerated as appropriate, dressed with appropriate topsoil, and seeded or planted with appropriate grasses or foliage to reintegrate it with the surrounding environment.

Only a small amount of overhead cabling or transmission lines are anticipated to be used. All overhead cabling and transmission lines will be completely dismantled, removed and recycled where possible. The supporting poles will be removed and the holes filled in with compatible sub-grade material and revegetated as required. In areas where environmental damage from complete removal may outweigh the benefits, the poles will be sawed flush with the surrounding grade.

5.5. Footings

Each wind turbine tower would be erected on a concrete and steel footing. Footings would be of either a gravity or rock-anchor type, depending on the geotechnical conditions at each wind turbine site. Gravity footings require approximately 450m^3 of steel reinforced concrete to be poured to a depth of approximately 2.5m. Rock anchor footings utilise a series of tensioned steel cables (or tendons) installed into competent rock to a depth of approximately 20m below ground. A combination of both these footing types may be used, depending on the specific geology at each wind turbine site.

Given the significant amount of disturbance likely caused on site if the footings were to be excavated and removed, it is preferred the footings be left largely intact below the ground. Once all protruding cabling, conduit and structure is removed, the footings would be 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 appropriate topsoil, and seeded or planted with appropriate grasses or foliage to reintegrate it with the surrounding environment.

5.6. Wind turbine generators (including the tower, nacelle and blades)

<u>Deactivation of turbines and “make safe”</u>

The first step in decommissioning of the wind turbine generators will be to ensure they are fully deactivated from the surrounding electrical infrastructure, are locked down and made safe.

Standard manufacturer processes for lockdown and make safe, as described in operations manuals will be followed. Where the turbines are being dismantled for resale, procedures for deactivation and make safe will be documented by the manufacturer or purchaser representatives if required.

<u>Removal of all liquids and other turbine consumables</u>

Prior to equipment disassembly, liquid waste management specialists will be deployed to drain all operating fluids (lubricants, oils, greases, coolants, etc.) and remove any consumables from the wind turbines.

Liquid waste and any stored fluids would be recycled as much as possible, and if not possible, disposed of at an approved waste facility. The handling, storage, transportation and disposal of any liquid waste and/or other hazardous materials will

be conducted in accordance with the project's Hazardous Waste Management Plan, Best Management Practices and regulatory compliance.

Disassembly of blades, nacelle and tower

At present, it is considered likely that the wind turbines will have significant resale value when decommissioned. As such, the process of dismantling the blades, towers and nacelle will be undertaken with care and precision to ensure their resale value is retained. Disassembly of the blades, nacelle and tower will broadly be the reverse of their original assembly. Disassembly will involve dismantling of the various components, which will be lowered by crane for transportation to on-site storage areas or off-site.

Each turbine blade will be lowered whole, and the nacelle will be dismantled and lowered according to manufacturer's specifications. The tower will be separated into three segments (as per its construction) and taken away.

Reuse or recycling of the tower and nacelle

Wind turbine towers and nacelles are typically made up of high quality metallic and alloy materials, as well as a limited amount of plastics and composite materials. It is anticipated that the towers and nacelles will have significant resale value in the second hand market when the wind farm is decommissioned.

If no resale options exist, the towers and nacelles would be recycled as scrap metal. Ferrous and non-ferrous materials and the various alloys utilised would be separated and sold as scrap. Recycling of scrap metal is widespread throughout Australia and globally covering all type of metal commonly used in construction and industry. It is anticipated that all of the metallic components of the towers and nacelles would be sold and recycled with none ending up in landfill.

Any plastics or composites that could not be reused or recycled would be gathered and would be crushed and compacted and disposed of in an authorised landfill.

Recycling or disposal of turbine blades

Wind turbine blades are typically made up of a range of strong and lightweight plastic, polymer and composite materials such as glass fibre or carbon fibre, plastic polymers such as polyester or epoxy, sandwich core materials such as PVC or PET. The nature of the materials and their fabrication makes it difficult to recycle the blades, and because of the rigorous safety and performance requirements for the blades, it is unlikely they will be able to be re-used in separation from the entire wind turbine.

Recycling of the material used in wind turbine blades currently involves pulverisation of the blades into a fine powder, for use as a composite in cement manufacture. As the global wind industry continues to grow, and as increasing numbers of older wind farms require repowering or decommissioning, other commercial options for recycling of wind turbine blades are expected to become available.

If no feasible recycling options are identified or available for the wind turbine blades at the time of decommissioning, the blades would be crushed and compacted and disposed of in an authorised landfill.

5.7. Step up transformers and substation

Depending on the ultimate turbine selection, step up transformers may or may not be required. Step up transformers comprise a small concrete footing laid to a depth of up to 1m, and an electrical transformer housed inside a protective structure.

The process for decommissioning the electrical transformers would be similar to the wind turbines, without the requirement for use of a crane for disassembly. After deactivation and make safe, and removal of all liquids and consumables, the transformers would be carefully dismantled and transported off-site for resale.

Step up transformer footings will be left largely intact below the ground. Once all protruding cabling, conduit and structures are removed, the concrete footings 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 appropriate topsoil, and seeded or planted with appropriate grasses or foliage to reintegrate it with the surrounding environment.

The substation and associated footings will be disassembled and removed from site in the same way as for the step up transformers. It is likely some infrastructure within the substation compound will be the property of Transgrid or another network service provider and as such the responsibility for decommissioning this infrastructure will remain with the relevant owner.

5.8. Site Office / Control Room / Storage Compound and car park

A number of existing buildings and farm facilities exist on-site and it is proposed to utilise one of these to house the site office and control room. Some renovation or restoration work may be required to make the selected building fit-for-purpose, but this will enhance its usefulness after completion of wind farm operations. It is likely these buildings will be retained on site once wind farm decommissioning is completed.

If the site buildings are to be demolished and removed, this demolition will be undertaken in accordance with standard demolition practices. Footings for any demolished site buildings would be left in place and rehabilitated in accordance with the principles set out for the turbine foundations (Section **Error! Reference source not found.**).

5.9. Viewing facility

No viewing facility is proposed for CWF.

In the event a viewing facility is subsequently constructed, it would be removed and the area rehabilitated in accordance with the practices and principles set out above.

5.10. Ongoing site monitoring and rehabilitation

The primary objective of any rehabilitation activities is to reintegrate the grade and grass/foliage of any disturbed terrain with the surrounding area. It is possible initial grade restoration efforts in some areas will be ineffective, with erosion or other topographic impacts occurring on rehabilitated land. Similarly, it is possible initial re-seeding or re-grassing efforts, or foliage planting activities may be unsuccessful, with seeds, grass or foliage failing to provide appropriate coverage.

To ensure the rehabilitation of the site is successful for the long term, ongoing site monitoring will be undertaken for a period of up to 2 years. It is likely such site

monitoring will be undertaken by the host landowners. Remedial works will be undertaken to ensure any unsuccessful initial site rehabilitation activities are appropriately rectified.

Remediation activities may include:

- spreading of additional subgrade material, backfill or topsoil
- works to restore drainage to areas when ponding or puddling is occurring, or to prevent excessive stormwater runoff from causing erosion
- aeration or fertilisation of soil to promote growth or grasses or foliage
- replanting of any dead trees or foliage, or reseeding of any dead grasses

6. Timeframe for decommissioning activities

It is anticipated major onsite decommissioning activities would be completed within a period of nine to twelve months, with ongoing site monitoring and rehabilitation activities continuing for up to two years beyond this time.

Figure 2 below sets out the indicative decommissioning schedule.

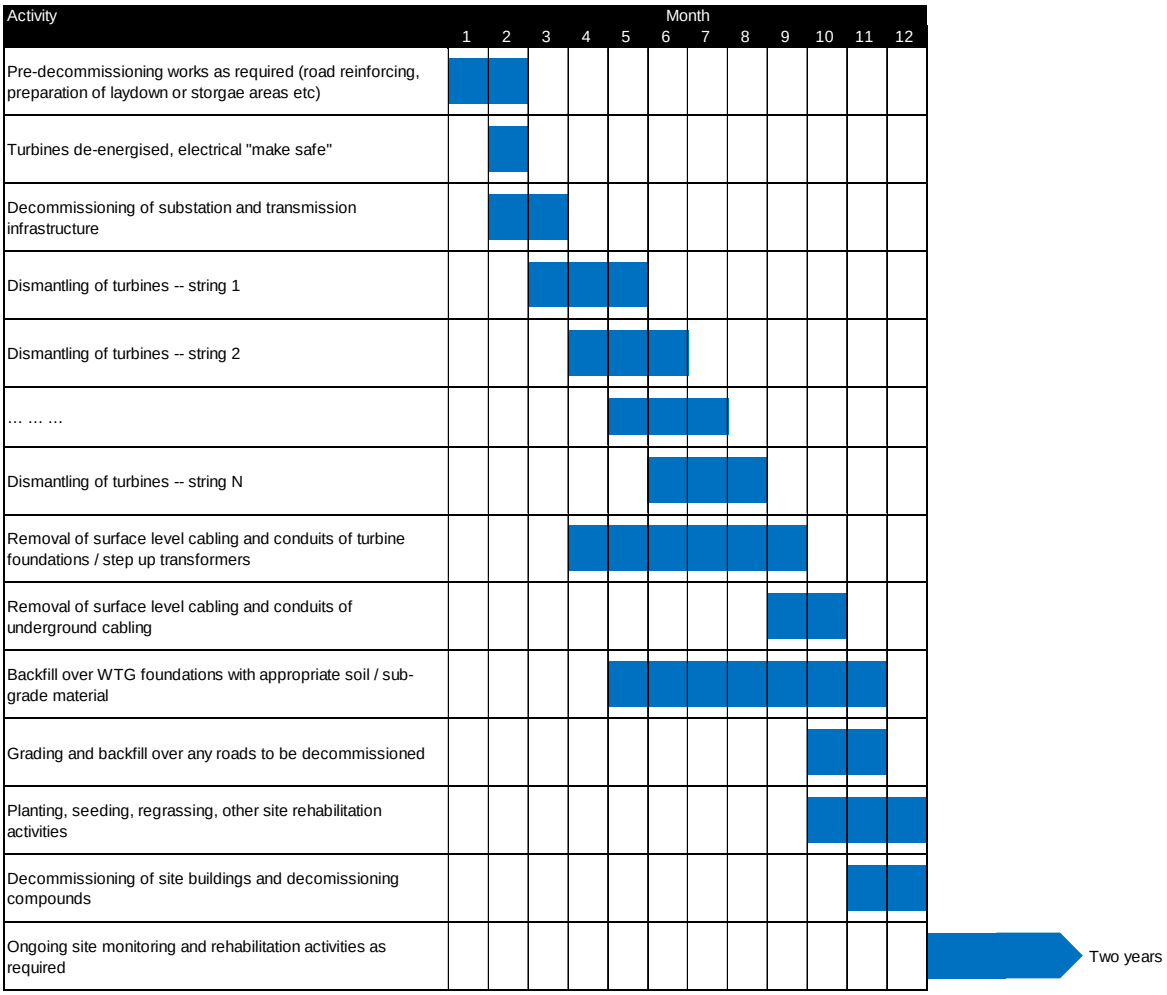

Figure 2 – Decommissioning Schedule

7. Transport of the dismantled turbines

A detailed Traffic and Transport Assessment was undertaken for the project and is included as Appendix H of the Environmental Assessment Report. This section of the Decommissioning and Rehabilitation Plan draws on the results and conclusions of this study.

7.1. Access for trucks and cranes required for decommissioning

As identified in the Traffic and Transport Assessment, the external access point to and from site is via the Hume Highway / Lerida Road South intersection. This is a give way intersection with priority to through traffic on the Hume Highway, and would be upgraded during the construction process to facilitate the movement of large trucks. Once onsite, the existing project roads and access tracks would be utilised by vehicles and equipment required for decommissioning.

7.2. Transport routes for dismantled components

At present, it is considered likely the wind turbines will have a material resale value when decommissioned. As such, the process of dismantling the blades, towers and nacelle will be undertaken with care and precision to ensure their resale value is retained.

The decommissioned wind turbines may be sold as second hand equipment, recyclable or scrap material. The exact transport route of the components will be determined by the location of the purchaser and the suitability of the transport corridor from the wind farm site. Given the proximity of the project to the Hume Highway, access to the national road network should facilitate transport to any destination within Australia.

If the decommissioned turbines or components require shipping then a route similar to the original delivery is most likely depending on the road conditions and road use patterns at that time. The expected delivery route for shipped equipment is shown below in Figure 3.

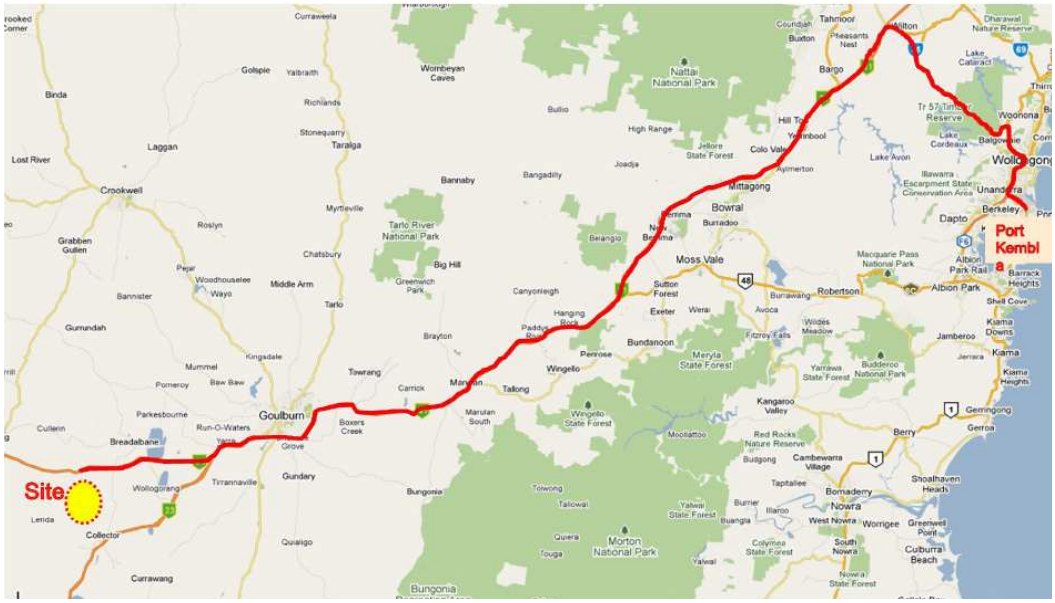

Figure 3 - current proposed transport route from Port Kembla to Collector wind farm

7.3. Temporary storage areas

Should temporary storage areas be required on site, these would be located in close proximity to main site roads to facilitate easy transport to their eventual destination.

The location of the temporary storage areas would be determined at the time of decommissioning in consultation with the applicable land owner. It is likely temporary storage areas would use the same locations as the laydown areas used during construction, as identified in Figure 1.

8. Cost estimate and funding for decommissioning

8.1. Current cost estimate

The proponent engaged Sinclair Knight Merz in January 2012 to estimate the indicative costs of decommissioning. Sinclair Knight Merz undertook a bottom up Order Of Magnitude ("OOM") analysis based on units of work and current unit rates. SKM also made appropriate allowances for income from scrap sales of decommissioned materials.

SKM estimate the total costs for decommissioning of CWF in accordance with this Decommissioning Plan in today's dollars (Q1 2012) to be approximately $25.5 million. This equates to approximately $375,000 per turbine.

The detailed OOM cost estimate provided by SKM is included as Appendix 1 to this Decommissioning Plan.

8.2. Funding for Decommissioning

RATCH-Australia analysis shows that the resale value of second hand turbines exceeds the estimated costs for decommissioning, so funding for decommissioning of CWF in accordance with this plan is secured through the resale value of the used turbines.

Wind farms that are 10 to 15 years old are often repowered or reconditioned to improve their operational performance, with the used turbines that are replaced available to be purchased from their owners. There is an active secondary market for the sale of used wind turbines and supporting generation hardware. RATCH-Australia analysis (presented in Appendix 2) shows that the resale value of used, commercial scale wind turbines comparable to those that are proposed for CWF is approximately $450,000 per turbine. This analysis is based on the sale price sought for 16 consignments of used turbines available in January 2012, with a size of greater than 500kW and a hub height of at least 50m.

It is noted that the turbines currently available for sale on the second hand market are considerably smaller and less sophisticated than the turbines proposed for CWF. They are also considerably older and thus built using less advanced technology, with most having been commissioned more than 10 years ago. It is likely that the resale value of the turbines of the type that are proposed for the Collector Wind Farm on the second hand market is likely to be greater than the $450,000 estimated.

It is noted that SKM's OOM analysis of the costs for decommissioning concluded decommissioning would cost approximately $350,000 per turbine. Based on the analysis of resale values, RATCH-Australia conclude that the resale value of the second hand turbines safely exceeds the decommissioning costs

9. Commitment to Update the Decommissioning and Rehabilitation Plan

It is noted in the Draft Guidelines that conditions of consent for a windfarm will generally require that the Decommissioning and Rehabilitation Plan must be updated every 5 years. RATCH-Australia accepts this requirement, and undertakes to update this plan at the commencement of operations and every 5 years thereafter.

In updating the plan, RATCH-Australia will take into account all changes to laws, guidelines and regulations relevant at that time, and will work with the appropriate consent authorities to ensure that this plan satisfies all of the condition of consent requirements and any other requirements.

An update of this plan will include an update of the estimated costs for decommissioning and resale value of the turbines as outlined in sections 8.1 and 8.2. If, at this time, analysis shows that the resale value (or scrap value) of the turbines is unlikely to cover the costs of decommissioning, RATCH-Australia commits to establishing a dedicated decommissioning reserve to cover decommissioning costs. This reserve would be established out of operating cashflows, with an appropriate percentage of cash generated by the wind farm directed into this reserve over a period of several years, until the reserve was fully cash funded.

Appendix 1: Cost estimate for Decommissioning provided by SKM

Sinclair Knight Merz
Cnr of Cordelia and Russell Street
South Brisbane QLD 4101 Australia
PO Box 3848
South Brisbane QLD 4101 Australia

Tel: +61 7 3026 7100
Fax: +61 7 3026 7300
Web: www.globalskm.com

Anthony Yeates
Ratch Australia Corporation Limited
Level 13, 111 Pacific Highway
North Sydney
NSW
2060

06 March 2012

Sinclair Knight Merz 05 03 12.docx
QH10392

Dear Anthony,

We are pleased to provide you with an order of magnitude estimate for the decommissioning of the Collector windfarm.

Our estimate is based on the following:

- 68 WTGs
- Located in Collector near Goulburn in southern NSW.
- Availability of competent labour resources local to the site, therefore no provision for accommodation or travel costs
- Availability of cranes of sufficient capacity local to the site
- Good access to site which is adjacent to Hume Highway, so no transport difficulties
- Turbines approximately 85 metres in height to the nacelle
- Foundations and roads will not be removed. Foundations will be covered to a depth of 300 mm
- Underground cable conduits and culverts will remain in place
- We have also applied industry practice norms for the following:
  - ❖ Contractor's support facilities
  - ❖ Mobilisation and demobilisation
  - ❖ Owner's costs
  - ❖ Fees/bonds/guarantees
  - ❖ Insurances

We have made appropriate allowances for income for scrap, based on discussions with local merchants and our internal database.

Assumptions:

- Excludes Cultural Heritage allowances
- Excludes Human Resources allowances
- Excludes Socio-economic allowances
- Excludes post closure maintenance and monitoring
- Removal of superstructure includes for structure up to 300mm below ground level (included in the 280 tonne allowance for each WTG)
- Excludes allowance for the removal of fuels lubricants and the like from equipment
- Excludes removal of any asbestos and lead etc.
- All roads, access tracks, bridges, culverts to remain
- All hardstands, laydown areas to remain
- All underground cabling to remain
- All foundations to remain (as mentioned above)
- Storage compound, carpark to remain
- All services to remain
- Estimate is conceptual/OOM ± 50%
- WTG weight assumed at 280t ea
- Estimate is current 1st quarter 2012

Please do not hesitate to contact me with any queries.

Yours sincerely

Brian Eagers

Phone: +61 07 3026 7598
Fax: +61 07 3026 7444
E-mail: beagers@globalskm.com

			Project: Collector Windfarm					**Take-off / Estimate Sheet**		Date :	6/03/2012	
	no of units	no of members per unit	length	width	height	total	ref	description	unit	quan	rate	amount
							Clean-up Costs					
								no allowance for clean up (operational contamination)	n/a			
							Decommissioning/demolition					
								Roads and Access Tracks				
								All roads and crossings left in place	km	42.00	-	-
	1	1	42.00	1.00	1.00	42.00		per email				
						-						
						-						
						42.00						
								Crane Hardstands and Construction Laydown Areas				
								All roads and crossings (hardstands) left in place	n/a	-	-	-
						-						
						-						
						-						
						-						
								Bridges and Fords over Waterways (culverts)				
								All bridges and fords left in place	n/a	-	-	-
						-						
						-						
						-						
						-						
								Underground and Overhead Electrical Cabling				

			Project: Collector Windfarm					**Take-off / Estimate Sheet**		Date :	6/03/2012	
	no of units	no of members per unit	length	width	height	total	ref	description	unit	quan	rate	amount
								All underground cabling left in place	n/a	-	-	-
						-						
						-						
						-						
						-						
								dismantle and remove all overhead cabling	m	250.00	10.00	2,500.00
	1	1	250.00	1.00	1.00	250.00		11 Kv lines allow 2 km				
						-						
						-						
						250.00						
								Turbine Step-up Transformer and Substation Foundations				
								All foundations left in place	n/a	-	-	-
						-		Assumed all fdns are 300 mm below ground level				
						-						
						-						
						-						
								Wind Turbine Generators (Including tower, nacelle and blades)				
								Dismantle complete WTG and load for cart away	tonne	19,040.00	600.00	11,424,000.00
	68	1	280.00	1.00	1.00	19,040.00						
						-						
						-						
						19,040.00						
								Allow cranes and support to lower turbines to ground	item	1.00	7,352,800.00	7,352,800.00
	1	1	1.00	1.00	1.00	1.00		see crane calc				
						-						
						-						
						1.00						
								Allow to cart away to scrap	tonne	19,040.00	16.00	304,640.00

			Project: Collector Windfarm					**Take-off / Estimate Sheet**		Date :	6/03/2012	
	no of units	no of members per unit	length	width	height	total	ref	description	unit	quan	rate	amount
	68	1	280.00	1.00	1.00	19,040.00						
						-		allow 40.0 m3/ truck&trailer (7.85 x 30% = 2.355 t/m3 vol scrap steel)				
						-		say $5.00 /km (1500/trip)				
						19,040.00						
								Allow to dispose of in landfill	m3	33,660.00	18.00	605,880.00
	68	3	55.00	3.00	1.00	33,660.00						
						-		say structure 300kg / m3 ? (sg approx 1500/m3)				
						-		$60.00/tonne				
						33,660.00						
								Step-up Transformers and sub-stations				
								Site Office / Control Room / Storage Compound and Carpark				
								Refurb site office to residence	m2	200.00	500.00	100,000.00
	1	1	200.00	1.00	1.00	200.00	say 200 m2					
						-						
						-						
						200.00						
								Dismantle and remove control Room	item	1.00	15,000.00	15,000.00
	1	1	1.00	1.00	1.00	1.00						
						-		say Demountable 6.0 x 2.4 m				
						-						
						1.00						
								Storage Compound and Carpark left in place	n/a	-	-	-
						-						
						-						
						-						
						-						
								Dismantle and remove transformers	n/a	-		-
		1	1.00	1.00	1.00	-		(included with WTG weight)				
						-						
						-						
						-						

			Project: Collector Windfarm					**Take-off / Estimate Sheet**		Date :	6/03/2012	
	no of units	no of members per unit	length	width	height	total	ref	description	unit	quan	rate	amount
								Dismantle and remove sub-stations	n/a	-		-
		1	1.00	1.00	1.00	-		(included with WTG weight)				
						-						
						-						
						-						
								Switchyard				
								Dismantle and remove switch yard and cart away	m2	600.00	600.00	360,000.00
	1	1	20.00	30.00	1.00	600.00		(20.0 x 30.0 m allow say 1.0 t / m2)				
						-						
						-						
						600.00						
								Fences, Gates and Entrance				
								Remove complete all fencing and gates	n/a	-		-
						-						
						-						
						-						
						-						
								Allow to dispose of all fencing and gates in landfill (local)	n/a	-		-
						-						
						-						
						-						
						-						
							Contamination					
								dispose / treat contaminated material as in approved dump areas/landfills	n/a			
							Rehabilitation					
								Allow to rip and seed areas of dismantled structures	m2	6,800.00	5.00	34,000.00
	68	1	100.00	1.00	1.00	6,800.00	say 100m2 / WGT					
						-		Large areas $13500/ha				

			Project: Collector Windfarm					**Take-off / Estimate Sheet**		Date :	6/03/2012	
	no of units	no of members per unit	length	width	height	total	ref	description	unit	quan	rate	amount
						-		allow small areas say $50000/ha				
						6,800.00						
								Allow 300mm topsoil to dismantled areas	m2	6,800.00	19.50	132,600.00
	68	1	100.00	1.00	1.00	6,800.00	say 100m2 / WGT	say 65/m3				
						-						
						-						
						6,800.00						
							Post Closure Monitoring / Maintenance					
								Monitoring and maintenance to rehabilitated areas				
								Redo rip and seed areas	m2	1,360.00	10.00	13,600.00
	68	1	100.00	1.00	0.20	1,360.00	allow 20% of orig area	(re-establish for small works say 10/m2)				
						-						
						-						
						1,360.00						
								Allow monitoring of rehabilitated areas	hrs	240.00	130.00	31,200.00
	2	12	10.00	1.00	1.00	240.00		(allow 1 trip / mth for two years)				
						-						
						-						
						240.00						
												20,376,220.00
							Indirects					
								Contractors support facilities	3%			611,286.60
								Allow temporary facilities, utilities and services required by the EPCM contractors and Owners team during the plant closure and post closure monitoring phases.(temporary on site facilities, operating costs, roads, power, water, effluent provided for the use of the contractor and others)				

			Project: Collector Windfarm					**Take-off / Estimate Sheet**		Date :	6/03/2012	
	no of units	no of members per unit	length	width	height	total	ref	description	unit	quan	rate	amount
								Mob and demob	5%			1,018,811.00
								Allow mobilisation and demobilisation of the EPCM contractors and Owners team during the plant closure and post closure monitoring phases.				
								Closure management	8%			1,630,097.60
								Allow for engineering design of closure activities, procurement of subcontract services, supervision of subcontractors and the overall management of the closure program. (home office costs for off site engineering and procurement and site office cost which covers closure management on site.				
								Owners costs	3%			611,286.60
								Allow for costs incurred during the period prior to physical closure for team members, test work and the development of a detailed decommissioning plan.				
								Also Owners engineering and administration staff during the physical closure period including salaries, benefits, travel and accommodation, office rental and running costs.				
								Allow for rates during closure and post monitoring periods.				
								Allow for external consultants, legal, enviromental, HR, community, financial, outplacement fees and the like.				
								Fees bonds garantees	1.50%			1,018,811.00
								Allow Government fees, bonds, garantees, licenses, approvals and the like required for closure operations.				
								Insurances	1%			203,762.20
								Allow for insurances during the plant closure, for motor vehicles, public and professional liability.				

			Project: Collector Windfarm					**Take-off / Estimate Sheet**		Date :	6/03/2012	
	no of units	no of members per unit	length	width	height	total	ref	description	unit	quan	rate	amount
								Total Estimated Value				25,470,275.00

			Project: Collector Windfarm					**Take-off / Estimate Sheet**		Date :	6/03/2012	
	no of units	no of members per unit	length	width	height	total	ref	description	unit	quan	rate	amount
							Cranes - Calculation for WTG's					
								68 WTG's				
								5.0 days each with relocate (total 340 days)				
								Mobilise assemble dismantle demobilise 300 t and 25 t franna	item	1.00	70,000.00	70,000.00
	1	1	1.00	1.00	1.00	1.00		all equip and labour to prepare for demolition				
						-						
						-						
						1.00						
								300 t crawler 40 m fixed fly	hr	3,400.00	1,100.00	3,740,000.00
	1	340	10.00	1.00	1.00	3,400.00						
						-						
						-						
						3,400.00						
								25 t franna	hr	3,400.00	300.00	1,020,000.00
	1	340	10.00	1.00	1.00	3,400.00						
						-						
						-						
						3,400.00						
								trucks support/counterweights	hr	6,800.00	120.00	816,000.00
	2	340	10.00	1.00	1.00	6,800.00						
						-						
						-						
						6,800.00						
								riggers	hr	8,160.00	80.00	652,800.00
	2	340	12.00	1.00	1.00	8,160.00	10 hr + 2 hrs travel / day					
						-						
						-						
						8,160.00						
								Per diem	days	2,380.00	80.00	190,400.00

	7	340	1.00	1.00	1.00	2,380.00							
						-							
						-							
						2,380.00							
								Travel time	hrs	4,760.00	80.00	380,800.00	
	7	340	2.00	1.00	1.00	4,760.00							
						-							
						-							
						4,760.00							
								Accommodation	days	2,380.00	160.00	380,800.00	
	7	340	1.00	1.00	1.00	2,380.00							
						-							
						-							
						2,380.00							
								travel	km	68,000.00	1.50	102,000.00	
	2	340	100.00	1.00	1.00	68,000.00							
						-							
						-							
						68,000.00							
								total				7,352,800.00	

Appendix 2: RAC analysis of used turbines currently for sale in secondary market

RATCH-Australia Corporation

Analysis of used turbines available for sale

February 2012

Exchange Rate: 1 AUD = Euro 0.79

Exchange Rate: 1 AUD = 1.05 USD

Ref	Broker	Turbine	Size kW	Tower metres	Qty	Unit Price	Currency	Equivalent price AUD
1	MWPS	Bonus 1000	1,000	70	1	240,000	Euros	303,797
2	MWPS	Enercon E40	600	65	2	210,000	Euros	265,823
3	MWPS	Enercon E44	600	65	1	205,000	Euros	259,494
4	MWPS	Enercon E40	500	78	2	260,000	Euros	329,114
5	MWPS	Enercon E40	500	65	3	180,000	Euros	227,848
6	MWPS	GE 1.5SLE	1,500	77	6	1,100,000	USD	1,047,619
7	MWPS	GE 1.5S	1,500	70	4	350,000	Euros	443,038
8	MWPS	Mitsubishi MWT1000	1,000	69	15	720,000	USD	685,714
9	MWPS	NEG Micon NM92	2,750	70	1	1,085,000	Euros	1,373,418
10	MWPS	Vestas V42 & V44	600	53	2	165,000	Euros	208,861
11	Repowering Solutions	Enercon E44	600	65	3	175,000	Euros	221,519
12	Repowering Solutions	Vestas V66	1,650	70	5	335,000	Euros	424,051
13	Repowering Solutions	Enercon E44	600	65	8	175,000	Euros	221,519
14	Repowering Solutions	Vestas V47	660	65	9	157,000	Euros	198,734
15	WTMP	NEG Micon NM52/900	900	50	3	250,000	Euros	316,456
16	WTMP	GE1.5S	1,500	80	6	300,000	Euros	379,747
					Weighted avg price per unit		**AUD**	**452,744**
					Rounded avg price per unit		**AUD**	**450,000**

Sort by Manufacturer

Sort by Price

Sort by kW

Currently Available Second Hand Wind Turbines

Click manufacturer name to see website advert

as of 1st January 2012

Click on price to convert to your currency

Manufacturer	Model	Qty	Rated Power kW	Frequency	Year	Tower	Rotor	Location	Available	Comments	Currency	Price per Unit
Bonus	1000	1	1000	50 Hz	2001	70m	54m	Germany	Immediately	Very good condition	EUR €	240000
Enercon	E40	2	600	50 Hz	1999	65m	44m	Germany	Summer 2011	maintained by Enercon, price excl. dismantle	EUR €	210000
Enercon	E44	1	600	50 Hz	1999	65m	44m	Germany	immediately	dismantle, maintained by Enercon	EUR €	205000
Enercon	E40	2	500	50 Hz	2002	78m	44m	Germany	Summer 2011	maintained by Enercon, price excl. dismantle	EUR €	260000
Enercon	E40	3	500	50 Hz	1997	65m	44m	Germany	Summer 2011	incl. 10kV transformer, one unit with new nacelle, maintained by Enercon	EUR €	180000
General Electric	1.5 SLE	6	1500	60 Hz	2006 - 2009	80m	77m	USA	immediately	As new, never in operation	USD $	1100000
General Electric	1.5S	4	1500	50Hz	2003	64m	70m	Germany	immediately	transformer with 30 kV, 2 machines got new gearbox	EUR €	350000
GoldWind	750	80	750	50 Hz	2010	48.5m	50	China	immediately	Warranty options available - full turnkey solution	EUR €	288000
Mitsubishi	MWT1000	15	1000	60 Hz	2009/2010	69m	59m	USA	immediately	operation before, 1-2 years warranty left	USD $	720000
Mitsubishi	MWT-500	18	500	50 Hz	1998	40m	41m	Southern Europe	immediately	spare parts, in need of minor work, price excl.		SOLD
NEG Micon	NM92	1	2750	50 Hz	2007	70m	92m	Netherlands	immediately	Very good condition, price excl. dismantling	EUR €	1085000
Vestas	V52	1	850	50Hz	2001	65m	52	Germany	Summer 2011	In mint condition, price incl. transformer, excl. dismantle	EUR €	SOLD
Vestas	V47	1	660	50 Hz	2001	N/A	47m	Italy	immediately	Installed, Never been In Operation. Can be seen 'As	EUR €	SOLD
Vestas	V42	1	600	50Hz	1999	50m	42	Germany	Summer 2011	In mint condition, price incl. transformer, excl. dismantle	EUR €	SOLD
Vestas	V44	1	600	50Hz	1996	40m	44m	Sweden	immediately	New gearbox 2003 New generator 2004	EUR €	SOLD
Vestas	V42 & V44	2	600	50 Hz	1995 - 1996	53m & 63m	42m & 44m	Germany	Spring 2011	Good condition, Incl. transformer, price excl. dismantle	EUR €	165000
WindMaster	750EG	4	750	50Hz	1998	48m	44m	UK	immediately	priced to sell quick, special auction price, one unit only	EUR €	SOLD

List of currently available Second hand WIND TURBINE

Issued/ up-dated: December 2011

Repowering Solutions

List´s ser. No.	Offer´s reference no.	Title / Technical Data	Price, Scope of Deliveries (SoD) and other commercial and delivering conditions

If you want to have more details or a detailed offer and photos, than send us your request and refer with your enquiry to the below mentioned offer's reference-no.

Preliminary note:
We can offer to you with our experienced engineers also engineering services concerning development of wind farms:
a) Wind Resource Assesment & Site Design
b) Site classification & turbine procurement
c) Post-construction analysis,
d) Due diligence
e) Engineering auditing & inspections
f) Renovated works for wind turbines
If you have other specific need, than send us please your enquiry and we will work on it to find suitable equipment for you and provide you an offer.

1.	REF2342	**LAGERWAY 18/80KW** Manufacturer: Lagerway Power: 80kW Year of production: 2000 Unit: 3 Rotor: 18 Tower height: 30 General condition: Good condition	Price: 58.400,00 € Scope of deliveries: a) Nacelle, b) Rotor, c) Tower, d) Control cabinet Status: Renovated with 2 year warranty Location: Holland Delivery: Has to be negotiated Payment: Has to be negotiated Available: Immediately
3.	REF4002	**JACOBS** Manufacturer: JACOBS Power: 500KW Year of production: 1996 Unit: 6 Rotor: 41 Tower height: 50 General condition: Good condition	Price: 55.000,00 € Scope of deliveries: a) Nacelle, b) Rotor, c) Tower, d) Control cabinet, e) Trafo Dismantling: Including Status: Used Location: Germany Delivery: Has to be negotiated Payment: Has to be negotiated Available: Immediately
5.	REF4020	**NORDEX N54** Manufacturer: NORDEX Power: 1000 Year of production: 2000 Unit: 15 Rotor: 54 Tower height: 60 General condition: Good condition	Price: 122.500,00 € Scope of deliveries: a) Nacelle, b) Rotor, c) Tower, d) Control cabinet, e) Trafo Dismantling: Including Status: Used Location: Germany Delivery: Has to be negotiated Payment: Has to be negotiated Available: Immediately
6.	REF4021	**NEG MICON 1500** Manufacturer: NEG MICON Power: 1500 Year of production: 2000 Unit: 2 Rotor: 67 Tower height: 64 General condition: Good condition	Price: please give us your price Scope of deliveries: a) Nacelle, b) Rotor, c) Tower, d) Control cabinet, e) Trafo Dismantling: Including Status: Used Location: Germany Delivery: Has to be negotiated

List of currently available
Second hand WIND TURBINE
Issued/ up-dated: December 2011

List´s ser. No.	Offer´s reference no.	Title / Technical Data	Price, Scope of Deliveries (SoD) and other commercial and delivering conditions
			Payment: Has to be negotiated Available: Immediately
7.	REF4023	**ENERCON E44** Manufacturer: ENERCON Power: 600 Year of production: 2000 Unit: 3 Rotor: 44 Tower height: 65 General condition: Good condition	Price: 175.000,00 € Scope of deliveries: a) Nacelle, b) Rotor, c) Tower, d) Control cabinet, e) Trafo Status: Used Location: Germany Delivery: Has to be negotiated Payment: Has to be negotiated Available: Immediately
8.	REF4007	**VESTAS V66** Manufacturer: VESTAS V 66 Power: 1650 Year of production: 1999-2001 Unit: 5 Rotor: 66 Tower height: 70M General condition: Good condition	Price: 335.000,00 € 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
9.	REF4024	**VESTAS** Manufacturer: VESTAS V25 Power: 200 Year of production: 1998 Unit: 2 Rotor: 25 Tower height: 30 General condition: Good condition	Price: 65.000,00 € Scope of deliveries: a) Nacelle, b) Rotor, c) Tower, d) Control cabinet Status: Used Location: Denmark Delivery: Has to be negotiated Payment: Has to be negotiated Available: Immediately
11	REF2353	**ENERCON E44** Manufacturer: ENERCON Power: 600 Year of production: 2000 Unit: 8 Rotor: 44 Tower height: 65 General condition: Good condition	Price: 175.000,00 € Scope of deliveries: a) Nacelle, b) Rotor, c) Tower, d) Control cabinet, e) Rotor Status: Used Location: GERMANY Delivery: Has to be negotiated Payment: Has to be negotiated Available: Immediately
14	REF4026	**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: SPAIN Delivery: Has to be negotiated Payment: Has to be negotiated Available: Immediately

List of currently available
Second hand WIND TURBINE
Issued/ up-dated: December 2011

Repowering Solutions

List´s ser. No.	Offer´s reference no.	Title / Technical Data	Price, Scope of Deliveries (SoD) and other commercial and delivering conditions
16	REF4012	**DANWIN** Manufacturer: DANWIND Power: 180 Year of production: 1988 Unit: 2 Rotor: 23 Tower height: 30 General condition: Good condition	Price: 26.000,00 € Scope of deliveries: a) Nacelle b) Rotor c) Tower d) Control cabinet e) Rotor Dismantling: Exclusive Status: Used Location: DENMARK Delivery: Has to be negotiated Payment: Has to be negotiated Available: Immediately
17	REF4013	**WINDWORD W2320** Manufacturer: WINDWORD Power: 160 Year of production: 1988 Unit: 7 Rotor: 23 Tower height: 30 General condition: Good condition	Price: 25.000,00 € Scope of deliveries: a) Nacelle b) Rotor c) Tower d) Control cabinet e) Rotor Dismantling: Exclusive Status: Used Location: DENMARK Delivery: Has to be negotiated Payment: Has to be negotiated Available: Immediately
18	REF4014	**BONUS** Manufacturer: BONUS Power: 150 Year of production: 1988 Unit: 3 Rotor: 23 Tower height: 30 General condition: Good condition	Price: 34.900,00 € Scope of deliveries: a) Nacelle b) Rotor c) Tower d) Control cabinet e) Rotor Dismantling: Exclusive Status: Used Location: DENMARK Delivery: Has to be negotiated Payment: Has to be negotiated Available: Immediately

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Onshore Type: Onshore
Transformer: Any
Location: All locations

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Date	Manufacturer	Model	Firm	Power	Rotor Diameter	Quantity	Price	Country
08/12/11	**Neg Micon**	NM92/2750	Bettink Service & Onderh...	2750	92	1	on request	Netherlands
01/03/12	**Neg Micon**	NM80/2750	CSULB	2750	80	2	on request	India
22/01/12	**Neg Micon**	NM92/2750	Blue Planet Wind	2750	92	2	on request	Belgium
15/11/11	**Mitsubishi**	MWT-95	mericle remodeling	2400	95	1	on request	USA
26/12/11	**STX Windpower**	STX 72	STX Windpower BV	2000	70	3	on request	Netherlands
04/11/11	**Enercon**	E66/1800	EUROPEAN Energy Online S...	1800	66	2	on request	Germany
11/01/12	**Enercon**	E66/1800	East Wind Brokers	1800	66	2	on request	Germany
22/11/11	**Vestas**	V66/1750	East Wind Brokers	1750	66	3	on request	Denmark
01/03/12	**Vestas**	V66/1750	CSULB	1750	66	8	on request	India
22/01/12	**Vestas**	V66/1650	Green-ener-tech aps	1650	66	5	on request	Denmark
31/12/11	**Vestas**	V66/1650	EUROPEAN Energy Online S...	1650	66	3	on request	Germany
19/01/12	**Neg Micon**	NM82/1500	EUROPEAN Energy Online S...	1500	82	1	on request	Germany
02/11/11	**GE Energy**	1.5s	dutchwind	1500	71	6	300,000 EUR	Germany
19/01/12	**Neg Micon**	NM64/1500	EUROPEAN Energy Online S...	1500	64	1	on request	Germany
28/02/12	**Repower**	MD70	Wind Nielsen GmbH	1500	70	1	on request	Germany
11/01/12	**GE Energy**	1.5sl	East Wind Brokers	1500	77	5	on request	Germany
23/02/12	**Other**	1200Watt Super Liberty II	Caspe Viento y Solar	1200	180	10	899 EUR	Spain
03/01/12	**Nordex**	N54/1000	Blue Planet Wind	1000	54	1	65,000 EUR	Luxembourg
11/01/12	**Neg Micon**	NM60/1000	East Wind Brokers	1000	60	1	on request	Germany
11/12/11	**Other**	Polaris 1MW	E2SOL LLC	1000	62	5	on request	USA

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GE Energy 1.5s offer by dutchwind

PREVIOUS AD NEXT AD

Created	08/09/10
Last Modified	02/11/11
Manufacturer	**GE Energy**
Model	**1.5s**
TURBINE	
Power, kW	1500
Rotor Diameter (m)	71
Hub height (m)	80
Quantity	6
Onshore Type	
Transformer	included
Year of construction	2000
When available	Q2 2011
Location	Germany
	PRICE: 300,000 EUR

0

ALL ADS OF THIS COMPANY

DUTCHWIND

NO LOGO

Country	
Contact Person	maurik
Phone	0031630170106

DUTCHWIND TEAM

maurik
Phone: 0031630170106

Spoken Languages:

Neg Micon NM52/900 offer by Green-ener-tech

PREVIOUS AD NEXT AD

Created	03/01/11
Last Modified	25/01/12
Manufacturer	**Neg Micon**
Model	**NM52/900**
TURBINE	
Power, kW	900
Rotor Diameter (m)	52
Hub height (m)	50
Quantity	3
Onshore Type	
Transformer	To be negotiated
Year of construction	2000
When available	Neg Micon NM 52 in good condition, 3 pcs in total 100 other turbines in stock
Location	Denmark
Additional information	Many others turbines in stock
	PRICE: 250,000 EUR

0

NO LOGO

ALL ADS OF THIS COMPANY

GREEN-ENER-TECH

Country	
Contact Person	Carsten Sorensen
Phone	004540447701
Fax	004598930717
Website	www.green-ener-tech.dk

GREEN-ENER-TECH TEAM

Carsten Sorensen
Phone: 004540447701
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Spoken Languages: