WIND ENERGY FACILITY AND ASSOCIATED INFRASTRUCTURE

ISSUES AND RESPONSE REPORT: I&APs & STAKEHOLDERS

Scoping Phase: Comments Received on Draft Scoping Report *(with updated responses in Italics)*

No.	Issue	Raised by	Response
		Energy Supply	
1	When will the project be established and what percentage of energy would be available to local consumption?	Peter Van Wyk, Prismatica Diamonds (PTY) Ltd Lutzville (reply form), 28 August 2007	The first phase of the project should be commissioned by 2010. The facility will feed into the national grid and no direct connection would be made from the Wind Energy Facility to the local grid.
2	Level of contribution towards energy supply?	Martin Albertus DEAT Offices of Cape Winelands District Municipality (reply form)	
3	As Manager of "Green Energy" for the City of Cape Town I am responsible for developing a "green market" for green certificates. It would be pleased to be advised whether Eskom are intending to sell green certificates from the wind farm and if so, whether a price has been established.	Brian Jones, Head: Green Energy/City of Cape Town, 16 August 2007 (comments by e-mail)	Eskom will be assessing different opportunities for alternate supplemental funding for projects. Green certificate prices are market driven in the international context and any certificate generated by a renewables plant will be subject to that market. In addition to this, Eskom is investigating the CDM potential of this project.
4	What is Eskom's intentions are regarding the Green Electricity to be generated by the 100MW wind farm. Do they intend to create and sell TREC's?	Brian Jones, Head: Green Energy/City of Cape Town, 13 September 2007 (comments by fax)	
		Aviation Airspace	
5	How will the project affect aviation and airspace?	Lizell Stroh, South African Aviation Authority (reply form), 22 August 2007	The requirements of the CAA, both from a technical and operational point-of-view, will be adhered to in order to reduce the potential for impact on aviation.

No.	Issue	Raised by	Response
Environmental concerns and impacts to biodiversity on site			
6	Impact on biodiversity and footprint of proposed area, given the scope of proposed activity.	Martin Albertus DEAT Offices of Cape Winelands District Municipality (reply form), 23 August 2007	It is estimated that the facility would require a broader area of 25km^2, within which all infrastructure would be accommodated with the necessary spacing requirements. The site will be required to be cleared for turbine foundations, access roads, substations etc. It is acknowledged that the area does not rehabilitate quickly, and so disturbance during construction must be limited. Issues regarding rehabilitation will be addressed in further detail in the flora specialist study. *Refer to Appendix G for the specialist vegetation assessment and Appendix S for the Environmental Management Plan (EMP) detailing rehabilitation measures.*
7	CapeNature's involvement will relate specifically to the biodiversity and ecological aspects of the proposed development activities on the receiving environment. CapeNature expects that a precautionary and risk-averse approach be adopted towards those projects which may result in substantial detrimental impacts on biodiversity and ecosystems, and especially the irreversible loss of habitat and ecological functioning in threatened ecosystems as identified by the National Spatial Biodiversity Assessment of systematic biodiversity plans. (CapeNature provided guidance regarding the addressing of ecological issues and EIA process procedures that should be focussed on).	Samantha Ralston, Cape Nature Scientific Services, 11 September 2007 (comments by fax)	In order to assess the significance of biodiversity impacts, detailed flora, fauna and wetland impact assessment specialist studies are to be undertaken as part of the EIA Phase. *Refer to Appendices G, H and J respectively for flora, fauna and wetland impact assessment specialist studies.*

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8	Construction aligned to season: The construction should possibly be done during the winter months-suspected lowest wind velocities and durations (to be confirmed), best potential for recovery of plants.	Paul A Herselman – CIT Sustainable Resource Management: Landcare – Vredendal, 14 September 2007 (comments by fax)	The construction phase would be undertaken over all seasons, as the timeframe for construction will be approximately 12 months for 50 turbines. Where possible, construction activities requiring civils works should be aligned to season as suggested.
9	Protection of construction areas against wind erosion: The sites for the erection of the towers will have to be cleared of vegetation and should be surrounded by shadecloth fences during this time, e.g. 1.2m high surrounds.	Paul A Herselman – CIT Sustainable Resource Management: Landcare – Vredendal, 14 September 2007 (comments by fax)	Comment noted. This suggestion will be included into the EMP for Construction. *Refer to Appendix S for the draft EMP.*
10	Protection of linking trenches against wind erosion: By allowing the minimum of time to lapse between opening and closing the trenches, and by damping the area down on a regular basis until well-recovered thereafter, the necessity of protection may be avoided.	Paul A Herselman – CIT Sustainable Resource Management: Landcare – Vredendal, 14 September 2007 (comments by fax)	Comment noted. This suggestion will be included into the EMP for Construction. *Refer to Appendix S for the draft EMP.*
11	Stockpiling of Soil: Any stockpiles need to be protected against wind erosion – surrounded by shadecloth fences or damped down on a regular basis (water would make the inner bio-diversity more sustainable).	Paul A Herselman – CIT Sustainable Resource Management: Landcare – Vredendal, 14 September 2007 (comments by fax)	Comment noted. This suggestion will be included into the EMP for Construction. *Refer to Appendix S for the draft EMP.*
12	Seeding: Some areas would need to be reseeded and kept fenced off for some time after the towers are up (and possibly watered).	Paul A Herselman – CIT Sustainable Resource Management: Landcare – Vredendal, 14 September 2007 (comments by fax)	Comment noted. This suggestion will be included into the EMP for Construction. Rehabilitation efforts are considered essential to the project. *Refer to Appendix G for the specialist vegetation assessment and Appendix S for the Environmental Management Plan (EMP) detailing rehabilitation measures.*

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13	Regular visits/maintenance: Rather than have numerous access roads on the site it needs to be investigated whether the placement on site, in a secure facility, or the bringing to site on a trailer, of a 'quad bike' type of vehicle to move around between the towers would not be preferable to an ldv (the resultant damage of a slow, well-guided 'quad' is much less than that caused by a ldv, even when carrying two persons).	Paul A Herselman – CIT Sustainable Resource Management: Landcare – Vredendal, 14 September 2007 (comments by fax)	The access roads between turbines constructed during the construction phase will remain intact and maintained for movement between towers during maintenance.
14	Initial construction and maintenance roads on site: The impact of all vehicles on the surface can be greatly reduced by the use of temporary ground covers for the areas to be driven on (e.g. 'Fleximesh, a Maccaferri product, distributes the weight of vehicles and results in less damage. There are undoubtedly similar products on the market).	Paul A Herselman – CIT Sustainable Resource Management: Landcare – Vredendal, 14 September 2007 (comments by fax)	Comment noted. Where possible this will be investigated as part of the construction process.
15	Botanical consultant: The Department of Agriculture – Landcare would prefer to see a botanical consultant with experience of the area assisting the applicant from the start of the operation to ensure the best possible rehabilitation (fast and complete). The consultant should give regular reports which should be made available to the group. His/her initial report and recommendations should be included as part of the EMP.	Paul A Herselman – CIT Sustainable Resource Management: Landcare – Vredendal, 14 September 2007 (comments by fax)	A botanical consultant is part of the EIA specialist team (his CV is included in Appendix A of the Scoping Report). He is familiar with the West Coast area as well as appropriate rehabilitation methods. His recommendations will be included within the EMP. *Refer to Appendix G for the specialist vegetation assessment and Appendix S for the Environmental Management Plan (EMP).*
16	Fencing: It is assumed that the entire area would be fenced. If the area is to be used for grazing by animals, it is highly recommended	Paul A Herselman – CIT Sustainable Resource Management: Landcare –	The entire site would be fenced. The use of the area for grazing post-construction is yet to be determined.

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	that unstable, disturbed areas are fenced.	Vredendal, 14 September 2007 (comments by fax)	
17	Will the facility would straddle both sides of the Skaapvlei road. Does Eskom have clarity on the specific area/footprint for the project?	Kobus Kritzenger, Cape Nature, Scoping Public Meeting, 22 August 2007	Eskom has not yet concluded on the site design and layout (i.e. micro-siting of turbines etc). This is highly dependant on harnessing the best wind resource in the area. The turbines might need to be installed on both sides of the road. This information will become available as this phase of the project progresses. *Refer to Chapter 5 of the EIA Report for details of the wind energy facility site layout.*
		Visual Impact	
18	Visual impact on environment and acceptability for relevant I&APs.	Martin Albertus DEAT Offices of Cape Winelands District Municipality (reply form), 23 August 2007	A detailed visual impact assessment will be undertaken as part of the EIA Phase specialist studies in order to assess the significance of visual impacts. *Refer to Appendix M for the visual impact assessment.*
19	Are the turbines always painted white?	Annali van der Westhuizen, Matzikama Local Municipality, Scoping Public Meeting, Lutzville, 22 August 2007	Worldwide, the choice of the off-white colour (RAL 90/10) seems to be the most pleasing on the eye under all conditions. Experiments with multiple schemes and types of camouflage have not been effective as seasonal changes in the environment occur. The visual impact assessment will, however, consider the use of white as a standard colour for this facility. *Alternative colour schemes (i.e. painting the turbines sky-blue, grey or darker shades of white) are not permissible as the CAA's Marking of Obstacles expressly states, "Wind turbines shall be painted bright white to provide the maximum daytime conspicuousness". Failure to adhere to the prescribed colour specifications will result in the fitting of supplementary daytime lighting to the wind turbines,*

No.	Issue	Raised by	Response
			once again aggravating the visual impact.
	Transportation, access and traffic		
20	Concern about the number of trucks that would have to pass his home. He requested that Eskom consider tarring the Skaapvlei Road as it seems from the information presented that thousands of trucks would have to use the road over the construction period. He urged Eskom to calculate the volume and type of heavy vehicle traffic anticipated for the project as well as the durability of the road to be used as the haul road. He estimated a 1000 cement trucks during the foundation-pouring phase of the project alone. He requested that a specific study on traffic volumes for the construction stage be undertaken and the results include in the environmental impact assessment phase. He suggested that the study focus on the greater impact of the additional traffic on the road for all seasons. His specific concerns relate to volume and type of traffic, how the road will be affected, the state of the road once construction is completed, dust and mud associated with heavy traffic on the road.	Mr Smook, resident on the Skaapvlei Road, Scoping Public Meeting, Lutzville, 22 August 2007	The use of the Skaapvlei road during the construction phase of the project is acknowledged and considered a real concern by Eskom. The Eskom engineering team will be tasked with investigating the road durability and the required number of heavy vehicle movements on the Skaapvlei Road. Eskom's investigations will determine what is required for the road to be suitable for the heavy vehicle traffic during construction. Eskom will then be in a position to understand what needs to be undertaken with regards to the haul road. The recommendations by the road engineers and experts will be discussed with the affected municipality and a way forward will be established to implement the long-term solution for the road. *Refer to Appendix Q for the specialist transportation study.*
21	Mining activities in the area are already underway and the Skaapvlei Road is used for heavy vehicles by the mines too – that is other groups are also looking to make use of this road as a haul road. It is important to consider testing the durability of the road and suggests that Skaapvlei Road should be tarred.	Annali van der Westhuizen, Matzikama Local Municipality, Scoping Public Meeting, Lutzville, 22 August 2007	

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22	Supports the tarring of the road. This could be done in co-operation with other companies also making use/planning to make use of the road.	Mr. Reynders, West Coast District Municipality, Scoping Public Meeting, Lutzville, 22 August 2007	The use of the Skaapvlei road during the construction phase of the project is acknowledged and considered a real concern by Eskom. The Eskom engineering team will be tasked with investigating the road durability and the required number of heavy vehicle movements on the Skaapvlei Road. Eskom's investigations will determine what is required for the road to be suitable for the heavy vehicle traffic during construction. Eskom will then be in a position to understand what needs to be undertaken with regards to the haul road. The recommendations by the road engineers and experts will be discussed with the affected municipality and a way forward will be established to implement the long-term solution for the road. *Refer to Appendix Q for the specialist transportation study.*
23	Made used the Skaapvlei Road for the past 23 years for work purposes and agrees that the road will not be able to take the increased traffic. He advised that the road would be required to be upgraded, especially the road surface which is not stable.	Mr. Pedro Huysmen, diamond mining contractor, Scoping Public Meeting, Lutzville, 22 August 2007	
24	The current road is fairly narrow and has several tight bends – which may not make the road suitable for the abnormal truck loads if not upgraded.	Mr. Kobus Kritzenger, Cape Nature, Scoping Public Meeting, Lutzville, 22 August 2007	
25	It may be necessary to consider tarring the Skaapvlei road. This road is also used by tourists, and enquired if the road would be able to accommodate tourist traffic too.	Mr. Timlyn, Namakwa Sands, Scoping Public Meeting, Lutzville, 22 August 2007	

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26	It appears that an accurate assessment of the significance of such impacts on the transport infrastructure and in particular the road network will only be possible once the assessment stage has been completed. Thus it is suggested that the assessment include a detailed Transport Impact Assessment (TIA) prepared by a qualified Traffic Engineer. As it is envisaged to construct the project in two phases it is also suggested that a detailed TIA be prepared by a qualified Traffic Engineer for each phase.	Sandra Strydom, Western Cape Department of Transport and Public Works – Roads Infrastructure, 14 September 2007 (comments by fax)	The study undertaken during the scoping phase was undertaken by a traffic engineer. This work will be supplemented through the EIA Phase, and recommendations and mitigation measures prescribed within the EMP. The study will also be taken forward by the transport contractor for the project. This contractor will undertake a detailed assessment of the routes proposed to be utilised by heavy and abnormally sized loads to assess the condition of the pavement. In addition to this, discussions between Eskom, the Municipality, and the Western Cape Department of Transport and Public Works – Roads Infrastructure regarding this issue would be ongoing. *Refer to Appendix Q for the specialist transportation study.*
27	The EIA shall incorporate a plan that details a proposed route that abnormal loads shall follow together with a management plan that will deal with the affected road network pavement and road infrastructure. The requisite improvements to the road infrastructure shall comply with the requirements of this Branch.	Sandra Strydom, Western Cape Department of Transport and Public Works – Roads Infrastructure, 14 September 2007 (comments by fax)	
28	Access roads: A traffic study and study of access roads would be of great importance, as well as the method and route and method of transport of the sections of the towers/blades, some which are very large (includes the routes from the harbours or site of construction to the Skaapvlei).	Paul A Herselman – CIT Sustainable Resource Management: Landcare – Vredendal, 14 September 2007 (comments by fax)	
29	This Branch is in agreement with the specialist Infrastructure and Transport Assessment scoping report that proposes that the local access road (DR 2225) be formalized to an asphalt surface. This suggestion is motivated in respect of the impacts that the aforementioned	Sandra Strydom, Western Cape Department of Transport and Public Works – Roads Infrastructure, 14 September 2007 (comments by fax)	The Eskom engineering team will be tasked with investigating the road durability and the required number of heavy vehicle movements on the Skaapvlei Road. Eskom will then be in a position to understand what needs to be undertaken with regards to the haul road, and be able to assess the need for the road to be surfaced.

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	report states that abnormal and construction traffic will have on the gravel pavement /surface of the local access road (DR 2225).		
30	Applications for wayleaves and servitudes within the road reserve for the powerlines have to be submitted to this Branch for the necessary approvals.	Sandra Strydom, Western Cape Department of Transport and Public Works – Roads Infrastructure, 14 September 2007 (comments by fax)	Comment noted. This will be undertaken outside of, but possibly in parallel to the EIA process.
31	Plans for any new access points on the proclaimed road network must be submitted to this Branch for approval.	Sandra Strydom, Western Cape Department of Transport and Public Works – Roads Infrastructure, 14 September 2007 (comments by fax)	Comment noted. This will be undertaken outside of the EIA process.
32	Should consider the impacts the proposed Wind Energy Facility will have on the forward planning programme of the Municipalities especially in regard to the Integrated Transport Plan.	Sandra Strydom, Western Cape Department of Transport and Public Works – Roads Infrastructure, 14 September 2007 (comments by fax)	Comment noted. This will be undertaken outside of the EIA process.
33	Will the turbines be installed closer than 95 m to the Skaapvlei Road. There is a building restriction on the Skaapvlei Road. In the case of a divisional road, according to Act 24 of 1994, any structure built should be 95 m away from the road.	Mr. Erasmus, Department of Transport & Public Works, Stakeholder Meeting 23 August 2007, Cape Town	The preliminary layout will take into account where the wind resource could be best harnessed. The proximity to the road, however, will be taken into account. The installation of the substation will also be considered carefully.
34	Eskom must consider distances for access points to the site. A minimum distance of 600 metres is required between access points off the divisional road.	Mr. Erasmus, Department of Transport & Public Works, Stakeholder Meeting 23 August 2007, Cape Town	Comment noted. The access to the wind energy facility could, however, not be considered as a road, but as a property access.

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	Landuse and Planning		
35	Zoning Departures: The applicant would need to comply with Municipal legislation by applying for the required zoning departures on the property.	Paul A Herselman – CIT Sustainable Resource Management: Landcare – Vredendal, 14 September 2007 (comments by fax)	Comment noted. This will be undertaken outside of the EIA process.
36	Comments about land use and jurisdictions be forwarded to their municipality soon in order that it could be discussed at Council level.	Annali van der Westhuizen, Matzikama Local Municipality, Scoping Public Meeting, Lutzville, 22 August 2007	Comment noted. This will be undertaken outside of the EIA process.
37	Where will the substation be built? Will it be on the portion of the site under the Matzikama LM, or the portion of the site under the WCDM?	Annali van der Westhuizen, Matzikama Local Municipality, Scoping Public Meeting, Lutzville, 22 August 2007	The position for the substation would be determined together with the turbine micro-siting exercise. The substation needs to be optimally located in relation to the turbines. *Refer to Chapter 5 of the EIA Report for details of the wind energy facility site layout.*
38	In terms of the integrated development planning for the District Municipality, some clarity must be sought regarding the roles of the Local Municipality and the District Municipality, especially with regards to roads.	Ms. N. Plaatjies, West Coast District Municipality, Scoping Public Meeting, Lutzville, 22 August 2007	Eskom would welcome the opportunity to engage with the relevant authorities. A maintenance agreement for roads could be considered between Eskom and the municipalities. This would be considered and discussed outside of the EIA process.

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39	Would the turbines/towers would be fenced off and would there be any restrictions for cattle to graze?	Mr. F. de Waal, landowner, Scoping Public Meeting, Lutzville, 22 August 2007	A normal fence will be erected for control purposes especially while construction is underway. No decision has been taken at this time regarding the end-use of the facility, and that the success for rehabilitation of disturbed areas needs to be considered. However, the substation will definitely be fenced off for safety and security reasons. No gazing would be permissible within the substation high-voltage yard. Each turbine is secure, and would not require any fencing around a single turbine unit. Grazing rights during construction and post-construction are required to be considered by Eskom.
40	It will be impossible to have sheep graze in the area during the construction phase, which would extend over a few seasons. Grazing will be difficult during rehabilitation. Mr de Waal's sheep are free-range, and are rotated between camps. Without grazing rights for the affected property, his grazing would be impacted.	Mr. F. de Waal, landowner, Scoping Public Meeting, Lutzville, 22 August 2007	

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41	I am the landowner of portion 617 and of portion 615 of Olifants River Settlement, each with their own title deed. Although only portion 617 is affected as described in the Draft Environmental Scoping Report, these two portions must be seen as one unit. I am currently investigating and researching the idea to develop this land or to have it developed and the proposed Wind Energy Facility on one portion will affect both. Having these 135 meter (90 meter hub plus 45 meter rotor blade) giant windmills on the property will certainly be an aesthetic problem for development. The view will be altered. Bringing in wildlife will be influenced. Designing tranquil trails to escape industrialism will be a major issue. I can carry on and on and feel in a social impact way, that this will no longer present a viable proposition. I am therefore against these windmills, not to mention the overhead powerlines feeding electricity into the network, on the property or for that matter, near or close to this property.	Nakkie Pienaar, Landowner Olifantsriver Settlement portions 615 & 617, 16 August 2007 (letter by e-mail)	Comment noted.

No.	Issue	Raised by	Response
	Construction phase and pollution control		
42	Can the concrete be batched/prepared on the site. This may assist in reducing excessive heavy vehicles on the roads.	Mr. Klazen, Saclawa, Scoping Public Meeting, Lutzville, 22 August 2007	On-site batching is not preferred as it can potentially result in localised pollution of the site. With on-site batching, the raw materials would still be required to be brought to site – which would still result in haulage along the road. In addition, water would also be required to be brought to site to batch the cement.
43	Storage of heavy machinery during construction: The heavy machinery needs to be stored in the maintenance area every night in order that the diesel and oil which will leak from these units will be 'captured' by the soil on top of an impermeable lining and not fall on 'unprotected' sand. This soil, as well as the lining, needs to be removed and properly disposed of at closure, as part of the rehabilitation process.	Paul A Herselman – CIT Sustainable Resource Management: Landcare – Vredendal, 14 September 2007 (comments by fax)	The EMP for the construction and operation of the facility will address pollution control and waste management. Waste will be required to be disposed of appropriately in line with local and national requirements. *Refer to Appendix S for the draft EMP.*
	Noise		
44	What are the anticipated levels of noise during construction as well as the noise levels of the turbines. How this would compare to ambient noise levels?	Mr. Reynders, West Coast District Municipality, Scoping Public Meeting, Lutzville, 22 August 2007	At the Klipheuwel site noise measurements were taken before and after installation and that no considerable increase was noticed. The noise from the facility will be assessed in detail through a specialist study in the EIA. While the sound of the blades can be heard when standing in close proximity to one of the turbines, this sound is not readily audible some distance away from the turbine. *Refer to Appendix P for the Noise Impact Assessment.*
	Tourism		
45	Local Relationship Information Committee: This project is viewed as having potential in the long-term from an eco-tourism point of view. It may be worthwhile initiating a group of people to	Paul A Herselman – CIT Sustainable Resource Management: Landcare – Vredendal, 14 September	Through this project, the Eskom Development Foundation will be investigating opportunities to contribute to the local community. This aspect will also be covered in the social impact assessment and the tourism impact assessment,

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	assist in monitoring the development and rehabilitation of the site with a view to exploring the potential of eco-tourism of the site e.g. organised group visits, etc.	2007 (comments by fax)	and recommendations relating to such issues will be made for consideration by Eskom. *Refer to Appendices O and N respectively for the Social Impact Assessment and the Tourism Impact Assessment.*
46	The Wind Energy Project is an excellent idea and it would provide a good financial injection into the Koekenaap Area. I would like to establish local accommodation and a Bush Pub and make it available for use by the project staff. Would Eskom be interested in such accommodation and how many units would be needed?	Petro Jacobus Huysamen, Farmer on Skaapvlei Road, Koekenaap, 11 September 2007 (comments by fax)	Comment noted.
		Community benefits	
47	Labour-intensive construction methods could be considered by Eskom during construction where possible. This will assist in creating a community-partnership with Eskom.	Lewellen Rhoode, Regional Director of Department of Transport and Public Works, Scoping Public Meeting, Lutzville, 22 August 2007	The execution of the project will include what makes best sense for the success of the project and community involvement, where possible.
48	Request for clarity on the intended spin-offs for the community and how this could be incorporated in the Municipality's Integrated Development Planning.	Ms. N. Plaatjies, West Coast District Municipality, Scoping Public Meeting, Lutzville, 22 August 2007	The project will not require large numbers of labourers for construction. However, there is the potential for long-term employment opportunities as a result of the facility. Through this project, the Eskom Development Foundation will be investigating opportunities to contribute to the local community. This aspect will also be covered in the social impact assessment and recommendations relating to such issues will be made for consideration by Eskom. There are few people required for the installation of the facility. Indirect spin-offs are anticipated, specifically from the tourism sector. This will be the biggest wind energy facility in Africa, and from numbers recorded at the Klipheuwel facility, there is interest in viewing/visiting

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			such a facility (recorded 4 000 people have officially visited the Klipheuwel demonstration facility near Cape Town).
	Technical considerations		
49	Chapter 3 in the DSR briefly refers to the Klipheuwel facility, and it mentions a 90% availability, and an "energy utilisation factor" of 16%. Does the 90% availability mean that the three generators were available to run 90% of the time, only depending on the wind being in the design speed range, or if not, then what does it mean? And what does the "energy utilisation factor" of 16% mean? That this was the actual time during the test operational period during which they were actually producing electricity which could be fed into the national grid? It can't surely refer to the average demand from the three wind generator units, in view of all the problems that the Western Cape has experienced, with peak demand across the country rising on some occasions to nearly 96% of gross generating capacity in South Africa?	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 17 August 2007	90% is availability of plant to generate i.e. ready and waiting. "Energy utilisation factor" or EUF is the percentage of actual generation compared to the total possible installed generation annually.
50	The other point which is missing is any reference to the performance of the two types of wind generator, viz two with gearbox drive to the generator, the third one being a direct drive unit. I would have thought that this was a very important point to comment on, particularly from the point of view of mechanical noise.	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 17 August 2007	Eskom's experience is that the gearboxless system was noisier due to the magneto-struction in the filter and transformation equipment (converter switching/ harmonics).
51	Is there any reason why a summary of Eskom's experience in the running of the Klipheuwel facility has been omitted from the DSR, when it	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National	There is no particular reason why the technical performance of the Klipheuwel demonstration facility has not been discussed in great detail in this environmental

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	is so obviously an important point to the more technically minded I&APs? For example, is it not considerably more silent, without the noise from meshing gears, no matter how well helically designed they are? Can an appendix describing the operational experience with the Klipheuwel generating facility be added to the FSR? And comparisons in the performance of the direct and gearbox drive generating units?	Association for Clean Air – (comments by e-mail) 17 August 2007	report. Lessons learnt from this research facility are continuously drawn upon in both technical and environmental issues, and will be extensively utilised in the design and future operation of the new proposed Wind Energy Facility. The best performing unit at Klipheuwel was the V47. Eskom experienced numerous issues with the gearboxless system - the technology is not stable yet. The V66 performed the best under light wind conditions.
52	What is the voltage per unit?	Mr. Visagie, Eskom, Scoping Public Meeting, Lutzville, 22 August 2007	The turbines will operate within approximately 33 kV.
		Stakeholder support	
53	The WCDM view this project as a good initiative for the West Coast.	Ms. N. Plaatjies, West Coast District Municipality, Scoping Public Meeting, Lutzville, 22 August 2007	Comment noted.
		EIA and PIP Process	
54	What mechanisms were used to inform and involve communities and people in general towards an inclusive public participation process?	Ms. N. Plaatjies, West Coast District Municipality, Scoping Public Meeting, Lutzville, 22 August 2007	Mechanisms used in engaging and informing local communities and interested and affected parties of the project were inclusive and extensive, and included: a database of district and local stakeholders is in place, media namely; the local newspapers and Radio Namakwaland were approached, visits throughout area were undertaken and communities consulted, the required process for information dissemination for public participation processes was followed – including advertisements, background information documents, letters, posters, focus group meetings and one-on-one discussions.

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Detailed comments received on the entire Draft Scoping Report by Mr R Mike Longden-Thurgood. His comments cover the entire DSR and its Appendices.			
55	Page ix, 1st column: mention is made of "micro-siting". When Eskom is dealing with 100 wind towers about 80 metres high with rotor blades 45 metres long mounted on 15 metre square thick concrete bases covering about 25 square kilometres, to refer to "micro-siting" would appear to be somewhat inappropriate.	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	The use of the term "micro-siting" is an international convention with regards to wind energy facilities. It refers to the process of specifically determining the position of each turbine based on the wind resource and topographical constraints. The use of the word "micro-siting" must also be seen in the context of the regional or "macro…" siting of the Wind Energy Facility.
56	Page X, Conclusion and the way forward: The start of the first para is "No environmental *fatal flaws* were identified - - -". (*My italics*). People get so used to the terminology of the anti-this and that brigade that their most highly favoured but inappropriate and meaningless terminology risks becoming incorporated into professional reports. I would suggest that some other more suitable phrase is used to replace "fatal flaws".	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	Comment noted. The phrase "fatal flaw" is used in this report as this concept is generally understood by the public and the environmental authorities.
57	Page xv, Definitions - Betz limit: this was quite new to me. I found the explanation fascinating and totally unexpected. For anyone else who's interested, look up this url: http://www.windturbine-analysis.netfirms.com/intro-betz.htm	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	Comment noted.
58	Page xvi, Definition of "Endemic": I assume that *endemic* is not necessarily synonymous with *indigenous*. This point should be made clear, in particular if there's a very special aspect relating to the presence of some non-	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by	Endemic and indigenous are indeed discrete terms. However, should a species be considered endemic (i.e. a species that grows in a particular area (is endemic to that region) and has a restricted distribution), it would be indigenous.

No.	Issue	Raised by	Response
	indigenous endemic species, eg if for some reason it needs to be protected.	e-mail) 26 August 2007	
59	Page 2, 2nd paragraph: this refers to studies to determine areas in South Africa with the highest wind speeds. In view of the fact that wind turbines operate optimally over a wind speed range, was determining where the *highest* wind speeds occur really relevant? Surely what is required is not finding out where the highest wind speeds occur but where there's the *greatest incidence of wind within the required velocity range*? That is the first criterion to be achieved. If the highest wind speeds also occur at such locations, that's not necessarily a bonus if they exceed the maximum for the optimum wind speed range. Perhaps the report on wind speeds clarifies this anomaly. But I suggest that the wording of this paragraph should be more appropriately worded to accord with the wind speed requirements.	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	The comment is relevant and accurate to the studies undertaken. The studies aimed to identify areas with sustained wind speeds within a particular threshold or within a velocity range. An amendment to the report has been made.
60	Page 7, Section 1.5 Objectives of the Scoping Phase: The second para says that "In accordance with the EIA Regulations, the main purpose of the Scoping Phase is to focus the environmental assessment in order to ensure that *only potential significant issues* - - - are examined in the EIA phase". This appears to me to be a reinterpretation of the EIA Regulations, April 2006. Clause 28(e) says "subject to the application to scoping by identifying - (i) issues that will be relevant for	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	The Scoping Phase identifies and evaluates all potential issues pertaining to the proposed activity. Through the scoping process (which includes the scoping public involvement process) those issues of significance which require further investigation through more detailed studies are identified and flagged for detailed examination in the EIA phase.

No.	Issue	Raised by	Response
	consideration of the application". The public participation process could be thwarted if the phrase that I have highlighted in the DSR statement is left as it is. The object of public participation in the scoping phase is for *all issues and concerns to be identified*. It is then from those issues and concerns that the significant ones are selected for further studies, after due and careful consideration. I would suggest the word "only" be removed. I presume that, in the preparation of the FSR, somewhere in it all issues and concerns raised at the public meetings will be listed, with comments against those which have not been selected for further studies, explaining why they haven't been selected. This gives individuals in the public domain who raised specific issues and concerns which have not been selected for further studies, the opportunity to add further comment when responding to this DSR, if they so wish to take it, so that cogent arguments can be provided in the FSR why such issues and concerns haven't been selected for further studies.		
61	Page 10, Section 2.1 Strategic Electricity Planning in South Africa: Quote from the first para: "Electricity, by nature, cannot be stored and therefore must be used as it is generated". This statement is too brief to set the true scenario. We all know that electricity can be "stored" in chemical form, typical of the	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	The comment relating to the statement that electricity in significant quantities cannot be readily or inexpensively stored is acknowledged.

No.	Issue	Raised by	Response
	batteries used in motor vehicles, which can be recharged. It is not the supposed impossibility of storing electricity which is the criterion here, but that there's no mechanism to store from tens to thousands of megawatts to keep the base load supply going continuously for many hours - the scale would be far too large and impossibly expensive. Hence, of course, arises the continual misunderstanding from those people who are highly enthusiastic about the renewables, being unable to appreciate that to supply thousands of megawatts to a city complex with home, retail, commercial and industrial infrastructure, the base load needs to be provided from a generating source which operates continuously. As a final comment, if some high storage capacity system was ever to be invented in the future, wind generation facilities would require at least 50% more generators in order to keep the storage system fully charged whilst at the same time supporting the base load. That is 50% more of what is already a huge footprint for such a facility, which could actually be accommodated over the total site area of ~37 square km.		
62	Page 17, first para: Quote - "It is believed that" *[the introduction of renewable energy sources]* "is necessary to ensure that measures to reduce energy consumption and increase the supply of clean renewable energy can be taken as soon as possible".	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	Eskom's Integrated Strategic Electricity Planning (ISEP) process provides strategic projections of supply-side and demand-side options to be implemented to deal with the energy management issues and meet long-term load forecasts. It provides the framework for Eskom to investigate a wide range of new supply-side and demand-

No.	Issue	Raised by	Response
	This is giving preference to the wrong philosophy on electrical energy supplies. Only about 10% of South Africa's supply from the renewables is provided for in the DME's white paper on Energy Policy. This is a tacit acknowledgement that using wind and solar doesn't provide the bright energy future for South Africa that a lot of people would like to believe, particularly in the minds of those people who are opposed to nuclear power. One of the most important ways to actually *reduce* power requirements would be by introducing a national policy for the installation of solar water heaters for people's homes, and the introduction of new technology insulation measures in new home and commercial build. But the forecasts for energy consumption in South Africa are quite unequivocally based on there being an annual increase, hence the need for the projected additional 20 000 MW generating capacity by year 2020, including 10 000 MW of energy from the renewables, the remainder from nuclear. What in fact needs to be reduced is *the energy which is currently being produced by the coal fired power stations*, and I am not certain whether the energy predictions include the reduction in the component which is produced by coal - and also gas, which is "clean" only in a rather fantasy way because any carbon containing fuel produces carbon dioxide when it is combusted.		side technologies, with a view to optimising investments and returns. The most recent ISEP plan (ISEP9a) was approved early in 2004 and provides economically and environmentally acceptable options for flexible and timely decision making. The focus has been to provide a robust plan, taking into account Eskom's and the shareholder's objectives. Eskom has entered into a demand-side management programme (DSM) in order to defer the commissioning of new plant. Eskom's DSM programme aims to provide lower cost alternatives to generation system expansion by focusing on the usage of electricity. Consumers are incentivised to use electricity more efficiently and at times of the day outside of Eskom's peak periods. This is a joint initiative between the DME, the National Electricity Regulator (NER) and Eskom and it aims to save 4 255 MW of generation capacity over a 25-year period. The most attractive supply-side option remains the return to service of the three mothballed power stations, Camden, Komati and Grootvlei, which were placed in reserve storage during the period of high excess capacity on the Eskom system. The project to return Camden Power Station to service is currently underway with the first two units planned to come on line towards the latter part of 2005. Thereafter Eskom continues to investigate a variety of options, including conventional pulverised fuel plants, pumped storage schemes, gas-fired plants, nuclear plants (PBMR), greenfield fluidised bed combustion technologies, renewable energy technologies (mainly wind and solar projects) as well as import options. Internationally there is increasing pressure on countries to increase their share of renewable energy due to concerns

No.	Issue	Raised by	Response
	In view of global warming, all carbon burning energy sources need to be eliminated from the energy scenario as soon as is it practicable to do so. Thus, energy consumption in South Africa with its predicted economic expansion is most definitely not going to be reduced, although the *rate at which its consumption increases* can be mitigated by the introduction of alternate measures to save heat, such as solar water heaters and the design of new homes and offices with measures designed to conserve heat during the winter months. In the case of the Western Cape, construction times for OCGT power stations and wind generator facilities are far shorter than the construction time for nuclear power stations. Therefore it makes sense to make use of these technologies. The sentence I have quoted above is a misinterpretation of the intentions of South Africa's energy consumption criteria. It needs to be reworded to reflect the correct situation.		such as climate change and exploitation of resources. South Africa emits almost half of Africa's greenhouse gas emissions and Eskom contributes half of that. The South African government has developed national response strategies for both climate change and renewable energy. The white paper on Energy for the Republic of South Africa (The Energy Policy) recognises that Renewable Energy applications have specific characteristics which should be taken into account. The Energy Policy is *"based on the understanding that renewables are energy sources in their own right, and are not limited to small-scale and remote applications, and have significant medium and long term commercial potential."* In order to meet the long-term goal of a sustainable renewable energy industry, the South African Government has set the following 10-year target for renewable energy: *"10 000 GWh (0.8 Mtoe) renewable energy contribution to final energy consumption by 2013, to be produced mainly from biomass, wind, solar and small-scale hydro. The renewable energy is to be utilised for power generation and non-electric technologies such as solar water heating and bio-fuels. This is approximately 4% (1667 MW) of the estimated electricity demand (41539 MW) by 2013."* At present no sector or company specific targets have been put in place. However, government is currently finalising proposals which will in all likelihood impose renewable energy obligations or targets on Eskom. There are several pilot studies that are ongoing to determine the suitable technologies for solar heat and other energy efficiency programmes.

No.	Issue	Raised by	Response
63	Page 18, fifth arrowed comment: Quote - "To introduce the wind energy industry to the public and thereby increase support for and interest in alternative renewable energy sources". As Savannah Environmental (Pty) Ltd are based in Sunninghill in Gauteng, this explains why they will be unfamiliar with numerous letters to the Cape Town press relating to the renewables. The issue of the renewables, here, has been recognised, even if for no other reason than due to the proximity of the two Koeberg pressurised water reactors.	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	This section (section 2.2.2) is a summary of the content of the WC DEA&DP Strategic Initiative document. The objectives listed are taken directly from the DEA&DP Strategic Initiative document, and are objectives of the Western Cape provincial Government. The location of the EIA consultant's offices, therefore, has no bearing on this statement. It should be noted that there are still many persons in the public domain who are less informed of renewables projects than others, and so this statement is still very relevant. In addition, from the perspective of this EIA - this project is considered to be of national interest, and the context of this statement is meant to be broader than to that of the Western Cape only.
64	Page 20, Recommended Urban Focus**:** The second para states that in Denmark "wind energy policy has shifted - - - to emphasising urban and industrial locations as 'first preference' for wind developments". It is mentioned elsewhere in the DSR that software is available to optimise the locations of wind generator towers in relation to wind parameters, presumably in relation to large-number wind generator sites. However, in rural and industrial areas, the proximity of large structures and buildings can dramatically alter wind parameters, with both lensing and dispersion phenomena occurring. The Betz limit may be very difficult to use for optimising purposes in such areas. Have any such large numbers of wind generator installations been	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	The roughness of a terrain drastically influences the wind and production of a facility. Computational fluid dynamics are used to calculate this. Eskom would certainly prefer an open terrain but there are some examples of wind farms internationally that are close to obstacles with obvious loss in production. Eskom Research and Development has done intensive studies to optimise renewable technologies.

No.	Issue	Raised by	Response
	completed and their efficiency compared with that from open site facilities?		
65	Pages 20/21, Recommended Disturbed Landscape Focus: This refers to "focussing on existing disturbed landscapes" for the installation of wind facilities "and, in particular, those rural landscapes that have already been 'vertically compromised' by the location of, for example, transmission powerlines, railway lines and all telecommunication towers". Existing transmission lines and a railway could be greatly advantageous for a large wind generator site, such as this current one. Presumably there is an overhead transmission line to Vredendal, and there's a railway, so there are two essential requirements for a large wind generator facility. The site needs to be assessed that the *three* levels of visual compromise remain acceptable, namely vertical, linear and horizontal.	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	This section (section 2.2.2) is a summary of the requirements of the WC DEA&DP Strategic Initiative document. The vertically disturbed landscape is specifically listed here, but is considered together with the linear developments such as roads. These are listed and used in the mapping exercise which is detailed in Chapter 4.
66	Page 21, Landscape Assessment - Subjective/Qualitative: Is *qualitative* in this title being used as being synonymous with *objective*? Quoting - "The role of public participation in perceptual based studies to determine landscape character and sensitivity to wind turbines has been highly questionable in overseas experiences". Is this comment being provided with no further explanation? It's rather sweeping, and for this reason it would be helpful for interpretation if some evidence was provided to demonstrate the claim.	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	This section (section 2.2.2) is a summary of the requirements of the WC DEA&DP Strategic Initiative document. This section is intended to provide a summary of the content of the DEA&DP document. The DEA&DP document provides detailed explanations as to the research conducted in drafting the Strategic Initiative document. The complete document is available on the Cape Gateway website (www.capegateway.gov.za)

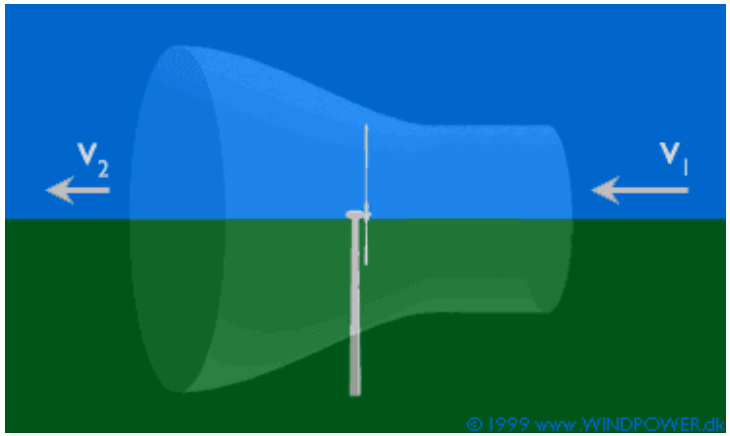
No.	Issue	Raised by	Response
	Is there an authoritative overseas report which demonstrates the claim? If this is a pitfall to avoid with other EIA processes, it would be useful to know about it, not to keep it a secret matter with the specialists. However, any proposed change would require the EIA Regulations to be amended before implementation could be applied.		
67	Chapter 3 Wind energy as a power generation option Quoting from the second para: "Renewable energy is considered a 'clean source of energy' with the potential to contribute greatly to a more ecologically, socially and economically sustainable future". Where the phrase "is considered" is concerned, is this a quote, or is it the personal viewpoint of the writer? Nuclear power is also a clean source of energy, despite the perceived problems with the storage of highly radioactive irradiated fuel elements. It is erroneous to equate wind generating exclusively with a miniscule carbon dioxide emission in comparison with any other power source, in view of the fact that all the work from ore mining through manufacture to final installation involves the use of carbon dioxide emitting power sources simply because there are insufficient renewable and nuclear power stations around the world to provide all the power requirements. When both wind and nuclear are actually generating, then the	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	Comment noted. An amendment to the report has been made, as suggested.

No.	Issue	Raised by	Response
	comment *is* true - for both power sources - but the important point is that neither the one power source nor the other is a less sustainable one. This EIA process is intended to deal with an alternate *renewable* power source. It is not intended to be a propaganda medium for the renewables, and this impression needs to be avoided, certainly in the draft and final EIRs. Therefore the above sentence I suggest could with advantage be altered to "Renewable energy is considered to be one of the 'clean sources of energy', with the potential - - -", etc.		
68	Section 3.2 Investigations into Wind Energy for South Africa I have already raised in an earlier e-mail the point about what I consider to be an anomaly in the references to wind energy having a 90% availability and an energy utilisation factor of 16%. What these figures refer to needs to be properly defined. I suspect that the 90% refers to a wind generator downtime of 10%, but why was the apparent energy utilisation factor so low? Was this in fact purely a matter of wind availability over the required minimum and maximum velocities at the Klipheuwel site? This makes nonsense of the capital expenditure vs generating factor for a wind facility, compared with the normal utilisation for a typical PWR nuclear power plant which often exceeds 80% and higher, as has been	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	The wind turbine utilisation factor is low due the availability of wind resource. This is an average number over the year. Internationally the energy utilisation of windfarms are somewhere between 15% and 30%. Klipheuwel performs at 16% to 18%. The anticipated west coast facility will be 20% to 25%. According to the international standards the utilisation factor of 26% is within the acceptable range of the other wind turbine installation utilisation factor. An important factor here to remember is that although utilisation is low the fuel is free, will not run out and is clean. The running cost of the wind energy facility is minimal, hence the down time of the plant due to maintenance will be minimised. The wind turbine power plant availability is dependent on the wind resource availability.

No.	Issue	Raised by	Response
	experienced for the Koeberg PWRs. (I strictly refer to reactor availability, not to downtime through contingencies which bear no relation to the nuclear plants). Are there any reasons why a summary of the operational experience of the Klipheuwel wind facility can't be added as an Appendix to the FSR, and be retained in the draft and final EIRs? I am sure that it would be most useful and instructive.		
69	Page 27 - Wind rose diagrams: to help the many people to interpret a wind rose, it should be mentioned that the wind direction is conventionally indicated from the *periphery towards the centre of the graph*, not what is often mistakenly assumed to be from the *centre outwards*. This note should be added to the description in the para immediately above the wind roses.	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	Comment noted. An amendment to the report has been made, as suggested.
70	P.28. 3rd para: Quote: "Wind turbines typically need to be spaced ~2 to 3" rotor diameters - D - "apart, and 5 to 7 x D where a turbine is behind another. This is required to minimise the induced wake effect the turbines might have on each other. Considering a turbine - whose rotors are ~90 metres diameter, each turbine would be separated by ~180 to 300 metres. The erection of turbines in parallel rows one behind another would require a distance between rows of 500 to 700 metres". I mention later in more detail that the	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	The wind turbine supplier will be required to optimise the wind turbine layout to harness most of the wind resource. The optimisation will include the spacing of individual turbines as well as turbine rows. *Refer to Chapter 5 of the EIA Report for details of the wind energy facility site layout.*

No.	Issue	Raised by	Response
	presumably greater distance apart of the rows is for construction access purposes. I note in Fig. 4.7 that, in adjacent longitudinal rows, the towers are staggered at about 45 degrees. There are seen to be no less than *three rows*, along any one of which the towers could be regarded as being located behind each other in relation to the wind direction. So the description of one wind turbine being behind another one is rather ambiguous. Same paragraph, 3rd line from the btm: We have a reference to "micro-siting". I refer to my earlier comments about using the word "micro" in the context of a huge macro site. There's absolutely nothing micro about a wind generator facility. Locating the positioning of adjacent towers to within +/- 1 metre would be absolutely of no operational consequence. To deal with accuracies down to one micron is more relevant as a micro requirement.		
71	Section 3.3 What is a wind turbine and how does it work? Mention needs to be made why the gearbox type of wind generator is the only one which is described, when there is the direct drive type with considerably fewer moving parts to absorb energy. One such type was installed at the Klipheuwel site. What has been the operational experience with it? Presumably pretty good if the Klipheuwel site has achieved ~90 % overall availability with all three wind turbines. A brief mention in passing could also be made of the	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	The wind industry refers to the term micro-siting as the detailed final positioning in a wind farm layout to maximise production. It is agreed that this is not to µm scale. Eskom makes use of the industry standard terms. A wind turbine works the opposite of a fan. Instead of using electricity to make wind, a turbine uses wind to make electricity. The wind turns the blades, which spin a shaft, which connects to a generator and makes electricity. The gearbox type depends on the make and the supplier. The wind turbine supplier will be required to choose the correct gearbox for the wind turbine to suit the conditions on site.

No.	Issue	Raised by	Response
	vertical rotating rigid sail type of generator. (I note in Part 2 that other types have been briefly discussed, but not the vertical sail type which doesn't have to be either feathered or yawed to the wind direction).		
72	Page 30, diagram at top of the page: "Airfoil" needs to be replaced by "Aerofoil". Sorry, but "airfoil" must be some made up word. If someone else has used it, say in some foreign report, I suggest that a possible - most likely - translation error should not be repeated in these EIA reports. Please refer to an English technical dictionary.	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	Comment noted. An amendment to the report has been made, as suggested.
73	Section 3.3.2. Operating characteristics of a wind turbine: an essential feature which hasn't been described is that, presumably, the wind generator must rotate at a constant rotational speed in order to maintain the frequency to be equal to, and in phase with, that of the national grid, namely 50 cycles per second. Also that the differential feathering capability of the rotor blades - *the aerofoil surfaces* of the rotating blades - is used to adjust the power take-off at a constant rotational speed, in an analogous manner in which the mass steam flow to a steam turbine is adjusted to accommodate different power requirements, with the turbine maintaining a constant rotational speed.	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	Most mainstream wind turbines are not constant speed devices with the variation in frequency being absorbed by the slip of the asynchronous generator ("induction generator"). Typical rotor speeds are in the range of 15 to 25 rpm. The wind turbine will need to conform the national system frequency of 50 Hz and other Distribution network conditions.

No.	Issue	Raised by	Response
74	Section 3.3.3 Understanding the Betz limit: Is this following comment really correct?: "If the blades were 100% efficient, a wind turbine would not work because the air, having given up all its energy, would entirely stop". We have to be very, very careful here, and it will require an aerodynamicist to advise. I don't believe the statement is correct because the wind would be losing its energy as it *traversed the aerofoil section*. Therefore it most definitely would be losing energy to the aerofoil blade, from some maximum amount at its leading edge to near zero at its trailing edge. Therefore there would be a *net positive force* on the aerofoil surface to provide the power to rotate it. However, at what speed it would rotate I have no idea. When any body or mass loses energy, that loss of energy has to be emitted or be absorbed in some other form, which can be by mechanical movement, or the emission of heat, light or sound, or a combination of these effects. Quantum mechanics would no doubt have us believe that there's some gravitational effect as well. One obviously can't invent a situation which disregards the first law of thermodynamics - you can't lose energy from a system into nothing. Therefore if 100% of the wind energy was to be absorbed, that energy has to become manifest in some other demonstrable way.	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	The more kinetic energy a wind turbine pulls out of the wind, the more the wind will be slowed down as it leaves the left side of the turbine in the picture below. In reality, a wind turbine will deflect the wind, even before the wind reaches the rotor plane. This means that we will never be able to capture all of the energy in the wind using a wind turbine.  If we tried to extract all the energy from the wind, the air would move away with the speed zero, i.e. the air could not leave the turbine. In that case we would not extract any energy at all, since all of the air would obviously also be prevented from entering the rotor of the turbine. In the other extreme case, the wind could pass though our tube above without being hindered at all. In this case we would likewise not have extracted any energy from the wind. We can therefore assume that there must be some way of

No.	Issue	Raised by	Response
	The Benz theory states that the wind loses some 67% of its speed and, therefore, energy as it *approaches* the aerofoil surface. Understanding the physics of this is not entirely obvious, except that, when the three rotor aerofoils are rotating, presumably they present a partial blank wall effect to the wind, deflecting it, which is thus bound to lose speed, and therefore energy, as this occurs. Although it's obvious with hindsight, none-the-less to regard a rotating three bladed aerofoil system, as we have with a wind generator rotor, acting as a partially penetrable solid wall is an unusual concept. Palpably there can be little or no wind inhibition if the rotor aerofoil blades are static and, theoretically, no absorption of energy occurs whilst the blades are fully feathered. As soon as feathering is reduced, the blades absorb energy and start rotating. At the theoretical 100% energy absorption limit, an equilibrium rotational speed will surely be reached. What comes out of this discussion is the fact that the operation of a wind generator is not a simple process, but involves a number of quite complex physical concepts. If follows from the Benz effect that a propeller aircraft flying through air compresses the air in front of the propeller, thus making it more effective as a driving force because of the increased mass flow of air through the rotating propeller, than if the Benz effect was absent.		braking the wind which is in between these two extremes, and is more efficient in converting the energy in the wind to useful mechanical energy. It turns out that there is a surprisingly simple answer to this: An ideal wind turbine would slow down the wind by 2/3 of its original speed. To understand why, we have to use the fundamental physical law for the aerodynamics of wind turbines: ***Betz' Law:*** Betz' law says that you can only convert less than 16/27 (or 59%) of the kinetic energy in the wind to mechanical energy using a wind turbine. Betz' law was first formulated by the German Physicist Albert Betz in 1919. His book "Wind-Energie" published in 1926 gives a good account of the knowledge of wind energy and wind turbines at that moment. Reference: www.windpower.org (Danish Windpower Manufacturers Web Site)

No.	Issue	Raised by	Response
	The same effect most probably occurs with the very large front fan blades on a turbo jet engine on an aircraft once it is moving through the air. This will obviously enhance the acceleration at the point of, and after, take off, and as the aircraft speed continues to increase due to the continued rate of increase of the mass flow of air through the engine, which continues through a considerable distance as the altitude increases, to some point at which equilibrium is reached. Which is all very instructive and interesting where flying is concerned, but can be disregarded as having any relevance for wind generators! A last thought: don't get confused with a wind generator *impellor type* rotor and an aircraft *propelling* propeller.		

No.	Issue	Raised by	Response
75	P.59, last para: Quote - "The commercial variability of a wind energy facility is already put at risk by the variability in wind resource at any given location, as well as the high capital cost of generating equipment. Placement of the facility at a location outside that of the most optimal production would further *hamper the roll-out of renewable technology facilities* in South Africa by Eskom and/or other parties". [My emphasis]. This statement is clearly acknowledging the fact that wind energy, although very acceptable in principle, in practice it doesn't provide the stability of electrical generating capacity which would be considered to be satisfactory, or provide an economic return on one's investment, in comparison with the more conventional types of central generating power stations. No wonder why the British government, as an example, has to make wind generated electricity economical to users by paying the wind generating operators a subsidy in order to keep the costs of the wind generated supplies down to the level at which central generating power stations are providing it - and that includes the nuclear power stations. The footnote on this page is especially significant, giving the estimated generating availability per year to be as low as about 26%. This should be evidence enough to demonstrate that wind power alone cannot provide the essential constant base load required by a highly	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	Comment noted. Eskom fully understands the limitations of renewables and their place in its energy mix of the future. Wind will always be additive and non-despatchable.

No.	Issue	Raised by	Response
	commercially and industrially developed country such as South Africa is. The question which those people who are overly enthusiastic about the renewables should ask themselves is**:** where does the base load come from when the renewables are not providing any generating capacity? My comments are certainly not being made as arguments against the use of wind generation, but that its limitations must be understood and appreciated, so that its use is adopted on a pragmatic basis.		
76	P.60, Fig.4.9: This figure shows the preferred area for wind generator development in the north west region, north of Papendorp and up to at least 20 km north of the Klein Gourat River, with five levels of acceptability ranging from highly restricted to highly preferred. P.61, 2nd arrowed comment: I am completely at a loss why a band of land, both north and south of the Klein Gourat River and inland between ~5 and 20 km from the coast, has been designated as being *highly preferred* - the reason being, apparently, because it is anticipated that a transmission line will be approved for construction somewhere near to the band - when it is commented further on that "*the area to the immediate north and south of the Klein Gourat River - - - was not considered feasible due to the proximity to the Klein Gourat River, land availability, poor access, as well as the distance from the existing transmission grid*",	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	The area illustrated as being "highly preferred" received this score due to the proximity of the proposed Oranjemund-Juno transmission line (awaiting authorisation from DEAT). This is detailed on page 45 of the DSR. In terms of the requirements of the methodology stipulated by DEA&DP, planned activities are also required to be included in the assessment. This line was therefore considered. It is not feasible for the wind energy facility to link into this Transmission line, as the planned Oranjemund-Juno transmission line is a 400 kV line, and the line from the Wind Energy Facility would be a 132 kV distribution line.

No.	Issue	Raised by	Response
	and that "*the construction of a power line to connect to the [existing] grid will also have an impact on the environment*". The question here is where does the new grid line awaiting approval from the DEAT fall into the picture? It would be very helpful for its track to be added to Fig.4.9. This area cannot simultaneously be designated as *highly preferred,* and then be declared as *non-preferred* because of other environmental impacts. I would suggest that it would be wise to eliminate these inconsistencies for the FSR.		
77	In view of what is happening in other parts of the world where land based wind generator towers are becoming an environmental abomination, why has an offshore installation not been considered as an alternate site? A great advantage of an offshore installation is, surely, that there is no land topography to have any impacts on the wind profile. Is the slope of the seafloor too steep for an installation about 1 km offshore, leading to too great a depth of water? Obviously for an 80 metres high tower above high tide level, it requires additional height to accommodate installation on the seafloor. Also, providing they are far enough out from the shoreline, they become pretty well visually unobtrusive, particularly if the towers are painted a lightish grey/blue to blend in with the horizon.	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	The ocean floor off the west coast falls off steeply. Wind turbine technology currently founds in depths up to 20m to 30m. Even at these depths the turbine cost doubles. It is thus not considered a feasible option for this project.

No.	Issue	Raised by	Response
78	Fig.6.1: it would be helpful to add a distance scale to this figure, as it goes down well below Cape Town. It would also be helpful if the relevant municipality names were added to the main map rather than on the local area one alongside, on which the lettering is so small that even magnification hardly helps with legibility.	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	Comment noted. An amendment to the report has been made, as suggested.
79	Fig.6.5: There are 8 areas of different vegetation types indicated on the map. Although only two of them are affected by the proposed site, it would surely be of interest to provide a colour key legend for all eight areas, rather than just name three of them. Unless they are fully detailed in the relevant appendix.	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	A comment to clarify this has been added to the specialist report. As the vegetation in the study area and the surrounds is composed of only two types, the vegetation specialist does not believe it is necessary to further contextualise the site by naming all other unrelated vegetation types shown on the map (which are indicated purely by virtue of the shape of the map).
80	Page 100, last para up from the btm, last sentence, quote: "Through research, the viability of a wind energy facility has been established, and Eskom propose that up to 200 MW can be realised from the facility on the West Coast". This reads far more positively than the reality, which is that the derived efficiency of electrical generation at maximum output is only 26%, as has already been mentioned in this document. For a cost per complete wind generator tower of R20 million at 2 MW output, ie R10 million per MW, for 26% efficiency this cost actually works out that about R15 million will have been spent on doing nothing, ie for a no generation situation. Unfortunately, this sort of economy is found to be acceptable for wind energy because	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	Comment noted. Eskom understands the technology in both the economic and natural environment in South Africa. It must be borne in mind that this project is in support of the Government's initiative in introducing a mix of renewable electricity generating technologies into South Africa. As above, it must be further noted that Eskom understands that this technology would be additive and non-dispatchable.

No.	Issue	Raised by	Response
	of the emotive effect of using this energy source as a non-carbon dioxide emitting source. In industry and commerce, such an inefficient economy would be disastrous, since it would represent a situation where bad judgement had resulted in the investment in plant which was only being used for about 26% of its output during the normal working hours of manufacturing time. Therefore in order to charge an economical price for wind generated electricity, compared to that from central power stations, the price per unit of the wind generated electricity has to be subsidised, as it is in Britain, for example. These unpleasant economic facts cannot be hidden once the facility is up and running, and Eskom hopes to be making a profit selling the electricity. Unfortunately, herein lies the in-built disadvantage of using this particular energy source. Although we don't argue against having wind generated electricity on these grounds, it is wise to bear this pragmatic view in mind.		
81	Page 102: In the table, btm line "Other variables", am I to understand that, in the case of a non-variable pitch bladed rotor, the rotational speed is controlled by yawing instead of the rotor blade feathering type, with the rotor facing directly into the wind all the time? What detector mechanism is used to determine the angle of yaw, and how rapidly does it respond? How does this power control system	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	Yaw type speed control is not very common due to the slow response and inaccuracies of the scheme – it is still used on small turbines. Modern mainstream wind turbines all employ pitch control as it is the most efficient.

No.	Issue	Raised by	Response
	compare in effectiveness with the blade feathering type of rotor?		
82	Fig.7.1: This figure shows the various possible routes for road transport from the Cape Town docks and Saldanha Bay. The figure has been positioned in the middle of the section which deals with railway lines, which seems to be a rather strange location as the road transport section is way down the next page. May I suggest that this figure be more appropriately positioned - the existing page boundaries wouldn't appear to compromise such a repositioning.	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	Comment noted. An amendment to the report has been made, as suggested.
83	Fig.7.2: There's a thin very light grey line running up from the btm of the figure to the Juno Substation with small black dots along it, which then goes off to the NW which, I presume, is the existing transmission power line. May I suggest that this is better highlighted and indicated as the Existing transmission line in the legend.	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	This line does represent the existing Transmission line network, and is detailed as such in the figure legend.
84	Section 7.1.2 Establishment of Access Roads to the Site: Apart perhaps for short lengths from existing well tarmacced roads, there is no mention of what quality roads to and within the site will be constructed. Will these be gravel roads with adequate foundation layers? (Note: gravel roads are mentioned later).	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	Comment noted. An amendment to the report has been made, as suggested.

No.	Issue	Raised by	Response
85	P.112, 2nd para from top: here we have mention again of distances between rows and distance apart of the towers along the rows. I have already referred above to the apparent inconsistency between the distance apart of rows and towers, and that there are, in fact, more rows (even though they are considerably shorter) than the longitudinal ones, and how the apparent spacing inconsistency is explained in these circumstances. Or perhaps is the wider distance apart of the longitudinal rows intended to better accommodate the access roads and storage of all the large wind generator components, plus the installation plant and equipment? If this is indeed the case, it could with advantage be clarified at the earlier mention about distances. The question boils down to: other considerations being taken into account, what is the optimum distance apart of the towers? It has in fact already been given: from 180 to 300 metres (*qv* Page 28, 3rd para above).	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	The wind turbine supplier will be required to optimise the wind turbine layout to harness most of the wind resource. The optimisation will include the spacing of individual turbines as well as turbine rows.
86	Section 7.2 Project operation phase: I had read of rotors falling off and blades breaking. Can bearings lock, or blade feathering or rotor yawing mechanisms fail? Because direct manpower observational surveillance will be kept to a minimum, will it be intended to install surveillance monitors on a selection of cowlings so that the whole site can be remotely visually monitored?		The SCADA system to be employed (as per industry standard) will monitor all vital statistics real time per turbine. Although catastrophic failures have occurred the industry has an impeccable safety history. There plant will be controlled remotely via GPRS/wireless technology. There will be regular visual inspection on site, which will be done by few employees.

No.	Issue	Raised by	Response
87	Chapter 8 Scoping issues associated with the wind energy facility on the West Coast One of the issues associated with the site is its decommissioning after the anticipated 20 year lifetime of the wind generators. What the lifetime implies should be explained. For example, electrical generators themselves do not wear out, but it's their bearings and gearbox systems which wear. The rotor blades may possibly show signs of fatigue cracks, and their design may improve over the next 20 years. These can be replaced. If the towers are steel, serious signs of corrosion may become apparent, limiting their useful lifetime. However, many of these problems, and undoubtedly others, may arise over 20 years: why is it being assumed, now, that perhaps wind generation will fall out of favour in 20 years time? Or if the installation has to be scrapped for good reasons, eg too high maintenance costs, why does the site have to be decommissioned? If it has been determined that experience with wind power demonstrates that it should remain a power option, why can't the site be repopulated with new wind generators? Why go for another site, which will require all the necessary infrastructure, eg roads, power transmission lines to the grid, thick concrete foundations, and the floral devastation of yet another area? And it will have to be purchased. Decommissioning certainly needs to be mentioned, but it should be mentioned in the	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	Decommissioning of a facility is required to be considered. The level of maintenance through the life of the plant would affect and determine the actual date of required decommissioning. In addition, this plant does lend itself to upgrade and limit the need for a new site for a facility of the same/similar nature. Eskom also has extensive experience on the extension of both economic and technical life of various plant.

No.	Issue	Raised by	Response
	right context. To suggest that in 20 years time the site will require to be decommissioned because that is the design life of the wind generators which will be installed and, once decommissioned, no more will be constructed on that site, is quite the wrong philosophy to adopt. The "revert to greenfields" syndrome can become a manifestation of an unacceptable mindset, just as it is for some, *but not all,* of those sites on which nuclear reactors have been constructed which, by all acceptable standards, really are the best sites for them. "Go: find new sites" is an unacceptable philosophy in such cases. So with this current site for the major wind generator facility: who can predict, now, that in 20 years time it will have been determined *not* to have been the best site to have selected? By referring so positively to decommissioning at this early stage is nothing less than making such an assumption. For reasons which aren't apparent, now, possibly it *may indeed* turn out not to have been an ideal site on which to re-establish new wind turbines, but we are many years from being able to reach such a conclusion, now. My arguments are that, when referring to decommissioning, the following aspects need to be considered: a) adopt a much more pragmatic approach b) explain why has decommissioning been introduced into this EIA process		

No.	Issue	Raised by	Response
	c) justify on what basis it may need to be given consideration in the future Taking the consideration for the location for wind generators to the opposite extreme, it would be quite unacceptable to install thousands of them across the Cape Flats, even if the wind régime was determined to be optimal. This would be on the grounds of the sheer environmental insult to the region. Just consider these criteria, which are listed on P.117, second para: "Environmental issues specific to the operation of a wind energy facility include visual impacts; noise produced by the spinning rotor blades; avian/bat mortality resulting from collisions with blades; mortality, injury and disturbance to other species; and light and illumination issues". These demonstrate some of the more emotive considerations which are commonly associated with wind generators.		
88	P.121, Table 8.1, top item, "Soil erosion": In the column *Potential significance*, it is stated to be *low, negative*. In the column " 'No go areas' " is the following comment: "Unvegitated and largely unvegitated Aeolian dunes represent a high erosion risk and should be avoided for the siting of infrastructure wherever possible. Alternatively, strict mitigation will be required on site to address erosion concerns". It has already been stated that a lot of disturbance during the construction phase is anticipated, which will presumably mean the	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	Comment noted. The management of soil disturbance and methods for the appropriate control of erosion of the local soils will be included within the EMP. *Refer to Appendix Q for the draft EMP.*

No.	Issue	Raised by	Response
	destruction of the flora species and leave areas of bare soil. Could this possibly result in local areas of mini-Aeolian dunes being formed with the very characteristics which this clause is suggesting should be avoided? Perhaps this needs further consideration on how the situation should be managed. If necessary perhaps a soil binder solution could be sprayed on to the ground.		
89	P.124, Table 8.1, top item: Under *Nature of Impact* it says: "A grid pattern of roads not following a particular contour (eg 100m contour) may result in roads being too steep to accommodate abnormally loaded vehicles getting to the turbine sites. To achieve smooth 'flat' gradients may require significant cut and fill earthworks". In view of this comment, I suggest that the draft EIR has a contour map of the site area added, including the approach route from outside it, at whatever contour gradients are considered to be appropriate - at 5 metre increments? This could perhaps be added as another consultant's task, possibly to be carried out under supervision by a team of university or technical college students from an appropriate faculty.	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	Comment noted. This level of detail would be available only at quite an advanced stage of the design process. The EIA informs this design process. The EMP would guide the construction process, providing specifications to be met in order to undertake construction activities in the least environmentally destructive way. *Refer to Appendix Q for the draft EMP.*

No.	Issue	Raised by	Response
90	As a general comment, I do not like the term "abnormal" being applied to vehicles which are specially designed to take very heavy loads, and which are not, therefore, at all abnormal under these circumstances. They are only abnormal from the point of view of width and/or length when used on existing public roads. Obviously the layout of the roads on the site must take the width and turning characteristics of these large vehicles into account. P.125, Table 8.1, btm comment: This refers to impacting the existing gravel road to Skaapvlei by "abnormal" wheel loads. This will obviously require considerable examination, especially wheel loadings, in relation to what the existing gravel road would be capable of dealing with.	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	An abnormal load in this context of this report refers to either length or load of the vehicle.
91	Pp.127 - 128, Table 8.1: There are some clauses here on noise and social impacts, and their *Potential significance* which is stated as "Cannot be determined at this stage". What parameters and data are currently missing which don't permit their potential significances to be determined, and at what stage in the construction of the facility is it anticipated that they can be determined?	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	Baseline data was not seen as adequate to make an assessment of significance at the Scoping stage. The assessment of significance will be determined in the EIA Phase. *Refer to Appendices G – Q for the specialist studies undertaken within the EIA Phase.*
92	P.132, Table 8.1 at btm, Visual impact: The *Potential significance* column for this item says "Structures would be easily and comfortable *[sic]* visible and would constitute a high visual prominence, potentially resulting in a high visual impact (negative) within the 0 - 25 km zone".	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	The sentence should read "Structures would be easily and comfortably visible and would constitute a high visual prominence, potentially resulting in a high visual impact (negative) within the 0 - 25 km zone".

No.	Issue	Raised by	Response
	The first part of this sentence obviously doesn't make any sense. It needs to be reworded. I also suggest substituting "impact" for "prominence".		
93	P.134, Table 8.1, Impacts on birds: So as not to get caught unawares by some excessively hardminded environmentalist, it might be useful to approach the Provincial DEADP to find out in detail exactly what bird strike concerns were raised by some local individual at or near Darling, who apparently complained about bird strikes iro the Darling National Wind Generating Facility, as it is referred to. Whether it was only partly for this reason or not, the EIA process was held up for at least two years. Although I was an I&AP for this project, I was never appraised of the specific concerns, even though I enquired, and I only read about them in the press. Obviously Eskom will have knowledge of any such concerns iro their Klipheuwel wind generator site, if any were ever raised.	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	Eskom are unable to comment on the Darling Wind Facility. Eskom are unaware of any turbines constructed as yet at the Darling facility. An avian monitoring report was compiled for the Klipheuwel site, and was utilised in the drafting of the Avifauna specialist study for the Scoping Report. *Refer to Appendix I for the Avifauna Impact Assessment.*
94	P.136, Table 8.1 Weathering: Reference is made to the sandblasting of paint off metal structures. It would need some investigation to ascertain an average maximum height to which sand grains are likely to be elevated in winds of maximum strength. Certainly along a beachfront road at Blaauwberg they don't rise very high above the road surface - 1 metre at most. I believe that there are special soft protective coverings which withstand sand erosion, which could be put round the first five metres height round the towers.	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 26 August 2007	The migration of sand grains in strong winds is referred to as saltation (a “bouncing” movement of sand grains over the surface under high energy wind storms). There have been detailed saltation studies in the Alexandria coastal dunefield (Illenberger and Berkinshaw) in Algoa Bay, which is an aeolian setting with potentially similar sand grain fractions to those at the wind farm site. There are ways to monitor the potential height selected grain sizes will be transported by the wind. A realistic dataset for the area and the various weather systems experienced in the area would be required to be obtained over a 12 month period.

No.	Issue	Raised by	Response
	Are there rocks close to the beach which will typically give rise to a very fine seaspray mist in high winds, which would be highly corrosive? Such a seaspray mist is often seen at certain times of the year in strong winds along the seafront road from Blaauwberg to Bloubergstrand, and further up the coast to Melkbosstrand. It has been mentioned in the DSR that the nearest wind generator towers will be located about 2 km from the sea, well within the range of these mist particles.		Results from such testing could determine the relative ease to offset this potential problem.
95	Appendix C - DEAT an DEADP correspondence and meeting minutes: Two points of interest: a) that both Norway and India (manufacturers?) are interested in the possibility of establishing wind energy sites in South Africa; b) that Eskom seemingly consider that a 100 wind generator site would be the greatest number on a single Eskom site. Since the present project will have an area of 25 square km, and environmental and tourism issues become paramount concerns, presumably the DEADP in their recommendations for wind energy sites will consider some relevant maximum area, which would also dictate the maximum number of wind generators on any one site, and how far apart such sites will require to be distanced. Does the DEADP make any recommendations for offshore wind generator developments?	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 1 September 2007	DEA&DP have offered support for Eskom to consider the construction of a larger facility on a single site, rather than several smaller facilities along the coastline. Furthermore many international players have IPP aspirations that will come into fruition once the economics make sense.

No.	Issue	Raised by	Response
96	At the top of page 3 of the minutes of the joint meeting with Authorities held on April 2, 2007, the first arrowed clause is: "Report 5 details the regional methodology developed" *[for siting wind energy facilities]* "and outlines the criteria which should be dealt with as a precursor to an EIA process". May I suggest that Report 5 - presumably prepared by the WCPG's DEADP - be added to the FSR as an appendix. Because further wind energy facilities are likely to be initiated, both by Eskom and other independent utilities, it would be very useful and informative for I&APs to have the text available. The summary given further down the page is not a satisfactory substitute for the actual report.	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 1 September 2007	The WC DEA&DP report consists of 7 volumes. This report is fully referenced in the DSR. The DEA&DP report is available on the Cape Gateway website (www.capegateway.gov.za)
97	On the same page, the third arrowed clause from the top states: "Support for this strategic initiative was expressed by international *stakeholders* consulted as part of the process" *[my highlight].* I don't want to belabour this point, but do we have assurances that international consultants were selected who had no possible financial interests in establishing wind energy facilities on South Africa? That is the unfortunate implication of using the word *stakeholder*.	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 1 September 2007	Comment noted. However it must be noted that in context this refers to the support for the Western Cape Guideline Document on Wind Energy Facilities.

No.	Issue	Raised by	Response
98	P.4, first arrowed comment: "A wind facility cannot utilise all the energy in the wind. A theoretical efficiency of 60% can be achieved. A typical efficiency of 44% is unexpected. When combined, an efficiency of approximately 25% can be expected". If I hadn't read up the Benz theory of extracting energy from the wind, I wouldn't have understood this sentence at all. In fact, its composition makes it confusing. It can't be changed now because the document is the minutes of a meeting. I can only hope that it was explained to all those who attended the meeting in a way that made the concept easy to understand. I commented on the Benz effect in the first part of my comments, particularly pointing out that if all the wind energy is absorbed across the rotor blades, so that the wind velocity at the furthest edge of the blades is zero, there would still be a net positive rotating force on the blades. But I didn't emphasise the point that, for future meetings much nearer to the proposed facility at which members of the local population will obviously attend, future documents need to spell out exactly what the energy absorption of wind energy entails, so it can be understood.	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 1 September 2007	Comment noted. It should be noted that Betz's Law merely states that the wind cannot be stationary behind the turbine – the theoretical maximum of slowing of the wind is 69%. Modern 3 bladed turbines have mechanical conversion efficiencies of about 40% to 45%. So at best the conversion from wind to electrical energy will be somewhere in the early 20%.
99	Page 4, Section 3.2, 4th arrowed clause: Quote "Eskom estimate that there is the potential for approximately 500 MW from wind energy facilities along the west coast". I wonder	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air –	Comment noted, but to have turbines all along the coastline is not recommended from a technical and environmental perspective. The potential in the wind is considered to be enormous.

No.	Issue	Raised by	Response
	whether the true significance of this statement has been really appreciated? When the length of the west coast is considered - I guess to be between 1000 to 1200 km from Cape Point to the Namibian border, but subject to correction, of course - that there are only enough sites near to the coast with an adequate wind spectrum for generating about 500 MW. This should be a very sobering thought for those people who are overly enthusiastic about wind power. The current facility will absorb about 2/5ths of the potential total! It really is quite staggering, but no doubt environmental and access considerations have a substantial bearing on dictating the limitation of suitable sites. I return to my theme: what's the status of offshore wind generator towers?	(comments by e-mail) 1 September 2007	However for Eskom's purposes and planning, Eskom estimate to utilise about 500 MW on the West Coast based on availability of land (including environmental issues), access to that land, and existing grid infrastructure in close proximity to get the energy out.
100	Appendix D - Public information control sheet: whenever this data sheet was prepared, there were apparently 149 registered I&APs, for which no list has been provided in this DSR. I presume that it will be added to the FSR.	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 1 September 2007	The I&APs and stakeholders registered on the project database are listed in Appendix E.
101	Appendix E - Stakeholder database: This appendix could be conveniently split into Part a) for stakeholders, and Part B for I&APs	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 1 September 2007	The database provides an indication of which body and/or organisation each registered individual represents.

No.	Issue	Raised by	Response
102	Appendix J - Issues and response report: Issue 82 - the awkward question: "Does the plant not tangle itself up on its cables when it has to turn into the wind?". The response is: "This is not an issue as it is computer controlled. The nacelle can turn 3-4 times in a direction before in needs to "unwind". As I see the situation, if the wind persisted in continuously precessing in the same rotational direction then, in order to unwind the eletrical cables running down through the horizontal bearing, before rotating the nacelle the rotor blades would have to be feathered back to zero energy absorption from the wind, and only then can the nacelle be rotated back 3 to 4 times before the rotor can be restarted. Please confirm. I assume that the electrical cables run more or less freely down the centre of the slightly tapering cylindrical tower. Issue 103 - Has solar energy been considered for this area? The response is**:** "Heat is required for energy generation with solar. This heat is affected by the windy conditions. Eskom have submitted an EIA for a pilot concentrating power plant - - - and are awaiting a decision". Any system which uses huge arrays of heat absorbing panels in the open through which water flows, being heated by the direct absorption of infrared radiation from the sun, would certainly be subject to unacceptable heat losses through convection by strong winds	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 1 September 2007	Issue 82 – Correct the cables allow for 3 to 4 rotations in a direction before an unwind is required. Fortunately the wind doesn't always blow and thus from an operational perspective this does not become troublesome. Issue 103 – Eskom is certainly aware of all the technologies currently commercial and in development in concentrating solar power generation and PV. Best practice internationally is to avoid windy areas for any of the concentrating solar technologies due to aiming and loss issues. Of all these technologies mentioned above and others, the central receiver type offers the highest efficiency and most opportunity for localisation, hence its recommendation for Upington.

No.	Issue	Raised by	Response
	blowing on the panels. However, that is only one type of solar technology, and the response seems to be confined to just this one. It wouldn't apply to a solar reflector, from which the infra red radiation is reflected by a suitable and very large following parabolic mirror through a transparent non-infrared absorbing panel on to an enclosed boiler. Nor would the heat loss constraint apply in the case of direct electrical conversion technology using broad spectrum photoelectric panels. Although I wouldn't suggest that the explanation as given requires an extensive addition, but through reserving the response to one solar power technology, when the other two are well enough established - although maybe not yet for high output electricity generation - this could give an erroneous impression that there wasn't an awareness of the other two technologies.		
103	Appendix O - Geomorphological scoping study: Page 34, Section 7, we come back to the recommendation not to site the structures on Aeolian sand dune areas. However, I reiterate my point that where the earthworks have been carried out, if the soil character is the same as where the Aeolian sand dunes are, the difference now being that it is no longer vegetated, mini-Aeolian sand dunes could arise, which might spread, rather than be suppressed from spreading by some mechanism. The question here is**:** could the situation be initiated which it is recommended should be avoided?	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 1 September 2007	Comment noted. The management of soil disturbance and methods for the appropriate control of erosion of the local soils will be included within the EMP. If there was no likelihood of a situation occurring it may not have been included in the report. Recommended measures to avoid, mitigate or offset this aspect will be provided in the specialist study in the EIA Phase. *Refer to Appendix J for the Geomorphology and Surface Processes Specialist Report.* *Refer to Appendix S for the draft EMP.*

No.	Issue	Raised by	Response
104	Appendix P - Geological and erosion scoping report, Section 2.1 Topographical Environment, Sub-section 2.1.4 Recommendations, second paragraph: this states that "The site-specific topographical environment is poorly mapped - - - and needs to be established/confirmed during an on site investigation - - -. It is more important to identify and understand the various marine terrace levels - - - so that the platforms upon which the proposed wind energy infrastructure is earmarked can be properly understood and that correct planning decisions are made with regards the underlying geological/engineering environment". The terms of reference for this study do not appear to indicate that any such investigation should be implemented if the scoping study data were found to be deficient, with on site investigative work being required. Has valuable time been lost through missing this point? A number of other investigations are recommended in this report which need to be carried out in order to provide additional essential information which isn't available from other sources. This is the scoping phase, and perhaps a precedent may have been set in having specialist scoping reports provided at this stage, rather than leaving them until they are prepared as complete investigative reports for the draft EIR. I am not privy to the terms of reference for this EIA process. It is to be presumed that the	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 1 September 2007	This study has identified/highlighted aspects which are required to be considered within the detailed geotechnical study to be undertaken by Eskom prior to construction. The data required to establish site specific ground conditions will be confirmed during a detailed geotechnical investigation (to be undertaken by Eskom) upon completion of the EIA investigation (prior to construction). The site-specific ground conditions will require appropriate founding solutions to counter any geotechnical constraints identified during the investigation. These solutions are of an engineering nature and will be dictated to by appropriate budgetary constraints and not specifically environmental concerns. Additional investigations recommended in the report include a detailed engineering geological (geotechnical) investigation to confirm the geological conditions (with reference to the prevailing topographical land facet, ground conditions with reference to founding solutions), hydrological environments (with reference to wetland concerns) and the presence of potentially suitable construction material (with specific reference to road building material availability). There are, however, no red flags or significant environmental reasons why the wind farm should not be established in the study area based on the geological environment. The geotechnical investigation, therefore, is merely a forum to confirm the prevailing ground conditions and to implement appropriate foundation design according to the site specific parameters. Specialist report findings will be released for public comment during the detailed EIR phase of the EIA

No.	Issue	Raised by	Response
	additional investigative work will be authorised. Section 5 Conclusion: The first paragraph says that "The specialist report covering the geological and soil environment occurring within the study area has been compiled based on published literature and personal observations - - - during a brief site assessment - - -. The numerous recommendations made in this report should be confirmed during more detailed engineering geological investigations, which should be commissioned by the proponent upon completion of the EIA process" [my highlight]. Just a point here to note because, of course, the additional studies would need to be started as soon as possible after *approval of the FSR* has been received, so that all the information is available for *inclusion in the final EIR* for its submission to the DEAT.		investigation. The geotechnical findings will, however, only form part of this EIR should this study take place prior to completion of the EIA phase. *The geotechnical study is still to be undertaken by Eskom.*
105	Appendix Q - Groundwater scoping study: It would be helpful if some of the terms given in Tables 1 & 2 were better spelt out. EIA processes are public participation processes, and documents should be made as understandable as possible for a wide spectrum of I&AP participants. The acronyms EC, ROL and TDS, for example, are obviously going to be familiar to specialists, but not necessarily to everyone. A number of elements and cations are also included, which may elude the understanding of a lot of people. For example, [NO2] and [NO3] explained as nitrite and nitrate ions in a glossary would very likely be more familiar; F may be	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 1 September 2007	Comment noted. An amendment to the report has been made, as suggested.

No.	Issue	Raised by	Response
	unfamiliar as the international notation for fluorine.		
106	Appendix R - Noise impact scoping assessment, Section 2 Study area: This mentions the total area of the site for installing the wind generator towers as 37.6 sq.km, whereas it is only intended to select 25 sq.km for their installation, in rows 500 metres apart. As yet it hasn't been indicated on which part of the site they will be installed, but someone is going to get an erroneous impression that all 37.6 sq.km will have wind towers on it. Once 100 have been installed and operated for a number of years would be the time to find out if the local population would wish to see another 50 installed on the remaining area. This ambiguity about the area on which the wind generators will be constructed needs to be clarified. Table 2 - Acceptable rating levels for noise in districts: I find it to be rather surprising that the recommended levels of acceptable continuous noise in residential districts actually *increases* from rural to urban districts, ie from low to high density habitation. A note should be added to explain the philosophy behind this unexpected recommendation. In the case of non-residential districts, the order of increasing continuous noise levels from low order industry to heavy industry is, of course, not unexpected. Table 5 - Categories of community/group response: There is no mention of the *quality* of	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 1 September 2007	At the time of preparing the noise scoping report the number of wind turbines, the manufacturer, the turbine type, the electrical capacity, their placement, plus other factors were not available. The best estimate of a worst-case scenario was presented including highlighting potential noise aspects - such as low-frequency noise - that would require attention once all relevant data was/will be available. Some of the specific comments/queries raised are specifically addressed in the scoping report. Measurement and assessment procedures are conducted in accordance with S.A. National Standards procedures that are in line with World Health Organisation recommendations. A Standard, besides recommending best practice, also requires to be practical. The query regarding "acceptable rating levels of noise": The levels of noise in a rural area, exposed to little man-made noise, are generally much lower than in an urban district containing many people and with associated road traffic noise. It would be contrary to the principle of protecting the environment to base the assessment of noise from a proposed activity in a quiet rural area on levels of noise typically found in a city centre. On the other hand it would be impractical and economically not viable to impose the same low levels of noise typically found in a rural district (hence acceptable to such an environment) to a similar development in an urban (city centre) district - notwithstanding the desire for a quiet, peaceful urban environment.

No.	Issue	Raised by	Response
	the noise, which individuals most commonly *subjectively* gauge by frequency. Very low frequency noise can sometimes be far more intolerable that higher frequency noise. Some mention needs to be made of noise quality - unless it is dealt with later in this report. (Note: in Section 8.3 - Low frequency sound content, it states that "No standardised test and measurement procedure is yet available for the assessment of low frequency noise". SANS 10103 apparently contains a procedure for measuring low frequency noise, but which is only suitable for indoor application). Section 6 - Existing ambient sound levels: Quoting "The equivalent continuous A-weighted sound pressure level, - - - simultaneously with the octave band equivalent sound pressure levels, were measured using a Larson Davis type 824 precision integrating sound level meter mounted in a tripod with the microphone positioned 1.4 metres above ground and at least 1.5 metres from any large sound reflecting surface. *The microphone was fitted with a windshield*" [my italics]. I am not familiar with this equipment. I assume that the windshield is intended to suppress wind noise arising form the interaction of the wind with the microphone and its stand. The windshield looks like the black ~120 mm diameter spherical object placed over the microphone seen in subsequent photographs. A very low density polystyrene foam?		*Refer to Appendix P for the Noise Impact Assessment.*

No.	Issue	Raised by	Response
	What effect does the wind shield have on the intensity of the ambient noise detected by the microphone? Is it significant or not? I note that the noise has been "A-weighted" over a frequency spectrum from 31.5 to 8000 Hz. Section 8.4 - Assessment of low frequency noise impact: from experience with the Klipheuwel facility, it has been deduced that low frequency noise doesn't reach any resonant frequency with the materials of construction of building. However, all this work is related to the conduction of sound in air. The same considerations don't apply when the sound is conducted through the ground. Has any work been carried out on this aspect? Section 11 - Recommendations should give consideration to investigating low frequency sound transmitted through the ground. The glossary of terms is very useful.		
107	Appendix S - Tourism scoping report: I have no substantive comment. It is interesting that the facility is considered to be of potential interest in attracting tourists to an area which, currently, isn't real tourist territory. The present limit of tourist concern is up to the Orange River. African and Asian tourists are perhaps more likely to be attracted to it, because international tourists from Europe and the USA will be all too familiar with wind generating facilities in their own countries.	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 1 September 2007	Comment noted.

No.	Issue	Raised by	Response
108	Appendix U - Visual assessment scoping report: Section 6 Conclusion/Recommendation: Mention is made in the first para that "photo simulations of critical viewpoints should be undertaken - - - to aid the visualization of the envisaged visual impact". I presume that this refers to using genuine photos and imposing on them views of the wind towers. Unless it would be far too expensive to prepare, could consideration be given to preparing the sort of feature which is available on Google Earth where one can view at an angle, but to add for the wind generator facility a feature to be able to move down to ground level, say from 50 km from the site up to the boundary fence. For the future proposed tourist facility at the site this would be a very entertaining and instructive view scene. Even possibly starting with the Google earth view of the area and moving in onto the scene. For such a purpose, the cost may justify the effort.	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 1 September 2007	Comment noted. The photo simulations have as their primary purpose the illustration of the potential visual impact of the wind energy facility from specifically identified sensitive visual receptors. It is also intended to give an indication of the visual significance of alteration to the landscape over varying distances. The results of these visualisations are for the inclusion in the Visual Impact Assessment report where it will be supplemented with a discussion specifically aimed at determining the visual impact. The creation of a promotional/educational video or for entertainment purposes falls outside of the scope of work of the visual impact assessment. The entertainment and instructive value of dynamic fly-through models, as made popular by Google Earth, is however noted and could well be considered by Eskom as part of their educational programme on wind energy generation. *Refer to Appendix M for the Visual Impact Assessment.*
109	Appendix W - Social scoping report: Section 1.4 Project description: There shouldn't be any false hopes about supply in the minds of the local inhabitants. Thus where it is mentioned that "The new wind energy facility therefore has the potential (*when the wind resource is at its optimum* - my italics) to meet the energy requirements of approximately 20 000 first world and 100 000 rural households, respectively", the clause in parenthesis should	Mr R Mike Longden-Thurgood, Institution of Nuclear Engineers & National Association for Clean Air – (comments by e-mail) 1 September 2007	Comments noted. Points for clarification: 100MW can supply 20 000 homes assuming average consumption of 5kW per house. 26% utilisation means that you will only have enough to do that 26% of the year. The reference to the number of homes are alternatives, and not intended to be accumulative. South Africa's oceans offshore fall off very quickly to great depths in excess of 100m. In the UK and Denmark the coastline sea is less than 20m deep. Even under such conditions the cost of the turbine application doubles. The

No.	Issue	Raised by	Response
	include the estimated optimum resource only being expected to be available for about 6/7, ie 26% availability. The wording rather suggests that the 20 000 first world and 100 000 rural households are *accumulative*. Is this intended to be the case, or are they in fact intended to describe *alternates*? If it's the former, "and" should be replaced by "plus", but if it's the latter, it should be replaced by "or". P.10 3rd line down, word correction: For "countries" change to "country's" P.10 last para, 8th line down: quote - "Although Eskom has line-strengthening plans in place to help secure electricity for the Western Cape, there are a range of other options that may be preferable, including diversifying the supply mix and broadening the energy generation options". I am not sure whether a personal opinion has crept in here, or if it reflects a comment made in the energy white paper (which I haven't yet seen). Other than when offline for maintenance, or the occasional unanticipated problem, central generating stations are generating continuously, which is essential for supplying the base load. Obviously alternate generating capacity can contribute to this base load, *so long as they are able to generate*. For example, wind generation is dependent on the wind velocity spectrum falling within minimum and maximum limits. Solar systems are obviously entirely dependent on receiving radiation from the sun.		project cost cannot be justified at this time.

No.	Issue	Raised by	Response
	Although very expensive to run, an OCGT plant can be run continuously, although the intention of the OCGT power stations at Atlantis and Mossel Bay is to provide capacity during peak periods, generally arising in the early to mid evenings, with an estimated normal operating time of about five hours per day. With only a 26% availability, wind generation capacity at the time it's most wanted cannot be relied upon. And even in a permanently cloudless sky, solar generation has its obvious limitations on availability. Therefore although there's an advantage in having other generating options available, they cannot be claimed to be *preferable* to, say, an OCGT plant nor, eventually, to the broad nuclear power programme. A clear advantage of wind and OCGT units is their relatively short installation time from start to commissioning. P.10 last para, last sentence: In relation to the total requirements for electrical generating capacity for South Africa by 2013, this has been estimated to be about 41 500 MW. By 2020, the Western Cape alone is likely to require at least 6 000 to 7 000 MW, possibly more. I would suggest replacing the word "high" with "moderately significant". The white paper is only estimating a contribution from the renewables of about 10% by 2020, which at best is only moderately significant. P.12 Cumulative Impact Issues: I am a little		

No.	Issue	Raised by	Response
	surprised that there is no mention in this section of the preferred installation of wind generator facilities offshore in those countries with a substantial seaboard. In Britain, in fact, the opponents of land based wind generators have gone so far as to refer to them as an environmental insult and abomination, partly the result of a wrong decision to have adjoining wind facilities too close together. South Africa, as Britain, has a long coastline, along which appropriate lengths for offshore installation surely could be identified. The level sea also provides advantages that there are nothing like land masses present, which deflect, attenuate, and absorb wind power. P.13 Landscape assessment - Subjective/qualitative: The comment is made that "the role and value of public participation in perceptual based studies to determine landscape character and sensitivity to wind turbines has been highly questionable in overseas experience". Although I am not challenging this conclusion, there is no expansion to indicate in what way such public participation has been brought into question - excepting the NIMBY syndrome. When the judgement of "professional practitioners at the local level" is referred to whom, from local communities, are judged to be professional practitioners? What qualifications do they have, or does this mean people who are considered to be		

No.	Issue	Raised by	Response
	community leaders, with some status? Would a qualitative assessment technique be considered to be unsatisfactory if it was accompanied by the Google Earth type of presentation to which I have already referred? Without such a visual aid, it will be very difficult for many people to form any sensible visual judgement when many probably haven't even seen any large wind turbines. This is the typical situation in which the NIMBY syndrome is likely to rear its head.		