

structures have been designed and constructed to harmonize with desirable or acceptable characteristics of the surrounding environment.

1.10 Cultural Resources

Archaeological sites and historic properties are not present in the area, hence no impact is envisaged. Moreover Acciona has:

1. Contributed to rebuild/renovate local temple in the village(s);
2. Provided clear access to a temple situated at one of the locations at the project site that was previously designated for a turbine. The location of the turbine was changed to accommodate this requirement of the local people at Anaburu;

Periodic monitoring of this significant cultural resource in the vicinity of development projects may help curtail potential looting/vandalism and erosion impacts. If impacts are recognized early, additional actions shall be taken before the resource is damaged.

1.11 Planned strategy

Acciona Wind Energy Pvt. Ltd. incorporates policies and Best Management Practices (BMPs) that establish mitigation requirements for all projects and will continue to do so. These programmatic policies and BMPs are designed to ensure that potential impacts associated with wind energy development would be kept to a minimum.

As part of the strategy to help weaker sections of the community including tribals in the vicinity to access project benefits about 50% of the indirect employment (through contractors) is local labour.

The project does not restrict grazing of animals belonging to the local people, or their access through the site for other purposes.

Project contractors have been instructed to comply with all statutory requirements as part of the contract. This includes minimum wages as per norms of the Minimum Wages Act, to make no discrimination between employing men and women, and not to employ child labour. They have been asked to prefer employment for local labour and the results are seen in the people employed. For future, this will be made part of the contract agreement wherever possible.

1.12 Conclusion

Acciona Wind Energy Pvt. Ltd. is committed to, and has demonstrated, continual innovations leading to greater protection of the environment and wildlife. Unlike fossil fuel power plants and other industrial processes, wind energy power plants do not release any harmful emissions that contribute to acid rain, global warming, mercury poisoning or other environmental effects that threaten wildlife.

The wind power industry will transform the social and economic fabric of rural life besides being an environment-friendly industry providing unhindered power supply to villagers.

The project areas fall under Jagalur reserve forest area of Jagalur taluka and Anaburu Reserve forest of Davanagere district of Karnataka State. The forest types of study mainly comprise Southern tropical dry mixed deciduous type.

On the basis of literature survey, from Red data books of Indian plants, detailed list rare and Endangered plant genera of Karnataka particularly with reference to Davanagere and Chitradurga of Karnataka reveals that there are no endangered, threatened, rare plant species observed or recorded and the plant species in the area recorded are quite commonly present in dry deciduous forest type.

As per Ministry of Environment and forests and Forest department of Government of Karnataka state notifications reveals that there are no Protected areas (biospheres, tiger reserves, elephant reserves, national parks, wildlife sanctuaries, conservation reserves and community reserves) in 10-km radius from project area.

Flora and fauna studies were conducted during study period to assess the existing biological resources in and around existing wind power mill. *Tectona grandis*, *Tamarindus indica*, *Acacia sp*, *Acacia nilotica*, *Delonix regia*, *Parthenium hysterophorus*, *Cassia occidentalis*, *Calotropis procera* are predominant when compared to tree shrub and herb, populations.

Both project sites extensively use underground cabling to further reduce possibility of collision with towers/lines within the boundaries with a single line taking off to the sub-station.

Afforestation has been completed by the forest department on compensatory land handed over to the Forest Department in lieu of the use of forest land for the project. Necessary report confirming the same has been obtained from the forest ranger with photographs; Necessary medicinal plantations, boundary markings, painting of red bands on blades and other conditions have been complied. Land to be transferred to the Forest Department in lieu of additional forest land (4,94ha) that had to be used during Implementation (for realignment of lines/road due to difficult site conditions at Anaburu) has already been identified and the entire transfer process is expected to be completed by June 2010.

1.9 Visual Resources

- Turbine arrays and the turbine design have been integrated with the surrounding landscape. To accomplish this integration, several elements of design are incorporated.
- Acciona Wind Energy Pvt. Ltd. has provided visual order and unity among clusters of turbines (visual units) to avoid visual disruptions and perceived "disorder, disarray, or clutter".
- Acciona Wind Energy Pvt. Ltd. has used non-reflective paints and coatings to reduce reflection and glare. Turbines, visible ancillary structures, and other equipment have been painted before or immediately after installation.
- The site design has been integrated with the surrounding landscape.
- To the extent practicable, Acciona Wind Energy Pvt. Ltd. has avoided placing substations or large operations buildings on high land features and along "skylines" that are visible from nearby sensitive view points. The presence of these structures has been concealed or made less conspicuous. Conspicuous

The day and night time noise level at the project areas are observed to be well within the prescribed limit. Recent technological improvements have reduced mechanical noise from wind turbines.

1.4 Water Resources

Small amounts of water are used to clean wind turbine rotor blades in arid climates (where rainfall does not keep the blades clean). The purpose of blade cleaning is to eliminate dust and insect buildup, which otherwise deforms the shape of the airfoil and degrades performance.

Most of the physico-chemical, heavy metals and bacteriological parameters values of ground and surface water resources within 10-km radius of the study area are found to be within permissible limits. The overall quality considerations as far as water quality in the study area indicate absence of any external polluting sources like industries and represent uncontaminated conditions.

➤ Water-harvesting at project sites

The project will examine the feasibility of undertaking water harvesting measures at the project sites from all aspects, including discussion with the local offices of the forest department.

1.5 Electromagnetic Interference (EMI)

The Anaburu and Arasinagundi wind farms are not located near an airport or military airfield.

1.6 Geologic Resources and Seismic Setting

It has been observed that the texture of soil is mostly sandy loam in the study area. The common color of the soil ranged from light brownish to reddish. NPK values are medium to less in most of the locations.

The wind farms come under seismic zone - II as per IS 1893 (Part-I): 2002 classification hence the site is a stable zone and has very less potential for earthquakes. In addition, other geologic hazards do not exist, such as the potential for landslides and rock falls. The potential for volcanic activity does not exist as well, although this is less widespread.

1.7 Hazardous Materials and Waste Management Impacts

Acciona Wind Energy Pvt. Ltd. has developed a waste management plan identifying the waste streams that are expected to be generated at the site and addressing hazardous waste determination procedures, waste storage locations, waste-specific management and disposal requirements, inspection procedures, and waste minimization procedures. This plan would address all solid and liquid waste that would be generated at the site.

1.8 Ecological Resources

M/s. Acciona Wind Energy Pvt. Ltd. has installed wind farms at Anaburu and Arasinagundi Villages, Jagalur Taluk, Davanagere district, Karnataka State, India.

The wind farm at Anaburu has an installed capacity of 16.5 MW with ten wind turbines each with a capacity of 1.65 MW whereas the wind farm at Arasinagundi has an installed capacity of 13.2 MW with eight wind turbines each with a capacity of 1.65 MW.

For the Arasinagundi wind farm the land acquired is 10.94 ha of the Arasinagundi S.F. of Jagalur Taluk, Davanagere District, Karnataka State. The site is leased forest land. In addition there is a small piece of land for substation leased from KPTCL.

For the Anaburu wind farm the land acquired is 21,708 ha of the Anaburu S.F. of Jagalur Taluk, Davanagere District, Karnataka State, and additional land of 4.94-ha is being acquired. The site is leased forest land.

The project did not involve acquisition of any private land for its development and as such there are no land losers in the project area. The forest and revenue land (for compensatory afforestation) allotted to the project for its development was used mainly for animal grazing by locals. Since the project has not restricted the movement of animals in the project area, the cattle of the local population continue to graze in the area. Thus the project does not adversely impact the local population including Scheduled Tribes (ST) and Scheduled Castes (SC) people of the area.

The project has been planned to minimize Electromagnetic Interference (EMI) (e.g., impacts to radar, microwave, television, and radio transmissions). Potential interference with public safety communication systems (e.g., radio traffic related to emergency activities) has been avoided.

1.1 Land Use

- Wind project is planned to mitigate/minimize impacts to other land uses;
- To plan for efficient land use, necessary infrastructure requirements have been consolidated whenever possible, and current transmission and market access are used; and
- Restoration plans have been developed to ensure that all temporary use areas are restored.

1.2 Air Quality

All the parameters, Total Suspended Particulate Matter (TSPM), Respirable Particulate Matter (RPM), Sulphur dioxide (SO₂), Oxides of Nitrogen (NO_x), Carbonmonoxide (CO) were observed to be within the specified limits applicable to rural and residential zone. Operating wind turbines do not produce direct emissions. There could be some minor VOC emissions during routine changes of lubricating and cooling fluids and greases. The other operations would generate fugitive dust from road travel, vehicular exhaust, and brush clearing in addition to the tailpipe emissions associated with vehicle travel. However, all these activities are limited in extent and duration and have no appreciable air quality impact.

1.3 Noise Impacts