Čibuk 1 Wind Farm, Dolovo, Serbia

Environmental and Social Impact Assessment
Non-Technical Summary

ATKINS

Plan Design Enable

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Contents

1. Introduction

Overview

The Wind Energy Balkan Group (WEBG), Belgrade (Vetroelektrane Balkana d.o.o., Beograd) and Continental Wind Partners (CWP), (together called "WEBG" in this document) are proposing to develop the Čibuk 1 wind farm at a site to the north east of Belgrade (the "Project"). The Project is part of a long-term plan to develop wind power in the area.

WEBG is committed to demonstrate that it is working to international best practice standards, over and above basic legal compliance. In line with this desire for quality and openness, this Non-Technical Summary (NTS) presents the key findings of the Environmental and Social Impact Assessment (ESIA) for the Project. This NTS describes the environmental and social changes that may occur due to the planned development of the Čibuk 1 wind farm. The NTS considers both the construction and operation of the wind farm, the overhead power line connection to the national grid and the development of transformer buildings and access roads.

Three International Financial Institutions, namely European Bank for Reconstruction and Development (EBRD), International Finance Corporation (IFC) and Overseas Private Investment Corporation (OPIC) are considering the provision of financial support to the Project. The ESIA has therefore been undertaken in compliance with the high standards required by these organisations and is in line with their Guidelines and Policies. In addition, the ESIA also addresses Serbian legislative requirements relating to environmental impacts assessment and environmental protection, and the information presented in the ESIA was used to support the preparation of nationally required Environmental Impact Assessment (which has been approved by the Serbian authorities in November 2012). The scope of the ESIA was agreed originally with the EBRD and Serbian regulatory authorities.

The original ESIA for the Project was completed in 2012. The implementation of the Project was delayed whilst WEGB finalised the design and obtained the necessary permits for the development. The ESIA and the NTS were updated in October 2014. The main issues considered in the update are the potential cumulative impact of the Čibuk 1 and other windfarms that are being considered for the area, the access roads to be used during construction and the operational management of the windfarm.

The purpose of this NTS is to give information to everyone that may be interested in the Project.

Site Location

The site of the proposed wind farm is about 30 km to the north east of Belgrade in the municipality of Kovin, Autonomous Province of Vojvodina. The location of the wind farm site is shown in Figure 1, and the proposed layout is shown in Figure 2, below.

The site is set on a slightly elevated position within generally flat to gently undulating surroundings. The land is in agricultural use and is intensively farmed. The local area is sparsely populated, with the nearest village, Deliblato is about 1.3 km to the northeast of the windfarm boundary. The small town of Dolovo is about 2 km to the south west. There are no houses within the boundary of the windfarm. The main road access to the site will be from the E70 via the village of Vladimirovac (to the north of the site). This route will be used during construction and provides good connection to the River Danube port at Pančevo.

The proposed wind farm is about 1.3 km from the Deliblato Sands Important Bird Area (IBA). The Deliblato Sands are also designated as a Special Nature Reserve (SNR) and are part of Serbia's "Tentative List" for inclusion in UNESCO's list of World Heritage Sites.

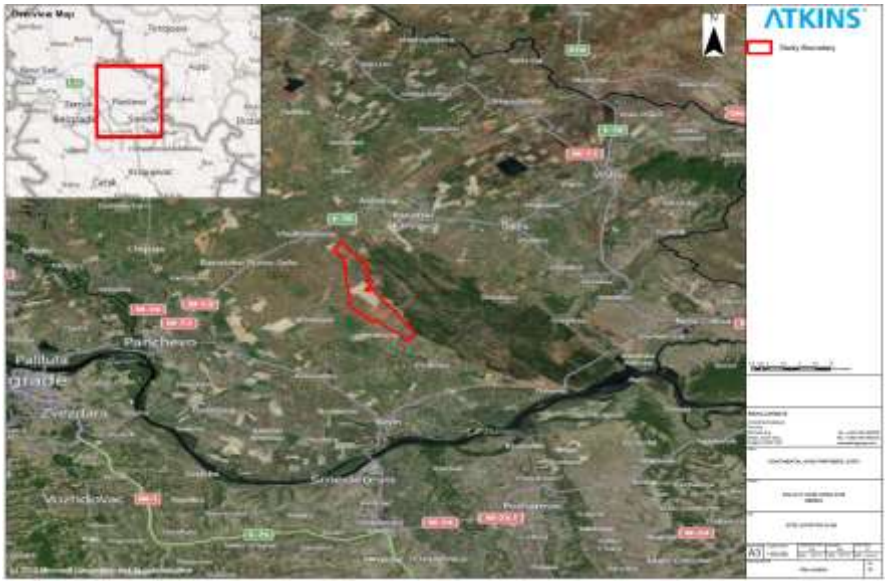

Figure 1 – Site Location

Project Description

The Čibuk 1 wind farm will include the construction of 57 wind turbines, access roads and energy infrastructure. General Electric (GE) are likely to be the supplier of wind turbines and they will also be responsible for the construction of the windfarm. Each turbine will be able to produce up to 2.78 MW of electrical power, giving the wind farm a maximum generating capacity of 158.46 MW. The total maximum height of each wind turbine will be no more than 180m including the tower and the blade radius. Each turbine will have 3 blades with a maximum rotor diameter of 120m.

The windfarm includes the following infrastructure:

- each turbine will require a piled foundation of reinforced concrete;
- underground, medium voltage electric power cables connecting the turbines with a transformer station
- transformer station (medium/ high voltage), located within the boundary of the wind farm
- about 10 km-long high-voltage power line (400kV) connecting the transformer station and the overhead power line (400kV) at Bavanište.
- service and access roads (approximately 50 km of roads will be either constructed or upgraded).

The total site covers approximately 37 km^2 or 3,700 hectares, the boundary of which is illustrated in Figure 1.

Need for the Development

The proposed wind farm is needed because it will:

- provide a valuable source of renewable energy for use within Serbia to support infrastructure development and the national building programme;
- strengthen Serbia's energy sector by helping to diversify its energy sources (proving to be of great importance after the floods in May 2014);
- reduce the need for Serbia to import energy from neighbouring countries;
- reduce the country's reliance on fossil fuel combustion;
- help Serbia achieve its 2020 targets (27% of total consumption needs to come from renewable energy sources by 2020);
- confirm Serbia as a developing state with a commitment to reduce its Greenhouse Gas emissions, displacing about 275,000 tonnes of carbon dioxide per year that would normally be emitted if the same amount of electricity was produced from a coal fired power station;
- provide local jobs and improvements, specifically during the construction programme.

2. Description of the Wind Farm

Layout of the Wind Farm

The location of the turbines has been designed to maximise generation capacity and to minimise the impact on the local environment (see Figure 2). The turbines will be connected to the transformer within the site boundary by underground power cables. The external connection from the transformer to the grid connection will be by overhead high voltage power lines.

Figure 2 – Wind Farm Layout

The Wind Turbines

The wind turbines consist of a hollow steel tower with a nacelle to which the fibreglass rotor with three blades are attached (see Figure 3). The nacelle houses the generator, gearbox and control systems. The transformer will be in the base of the tower.

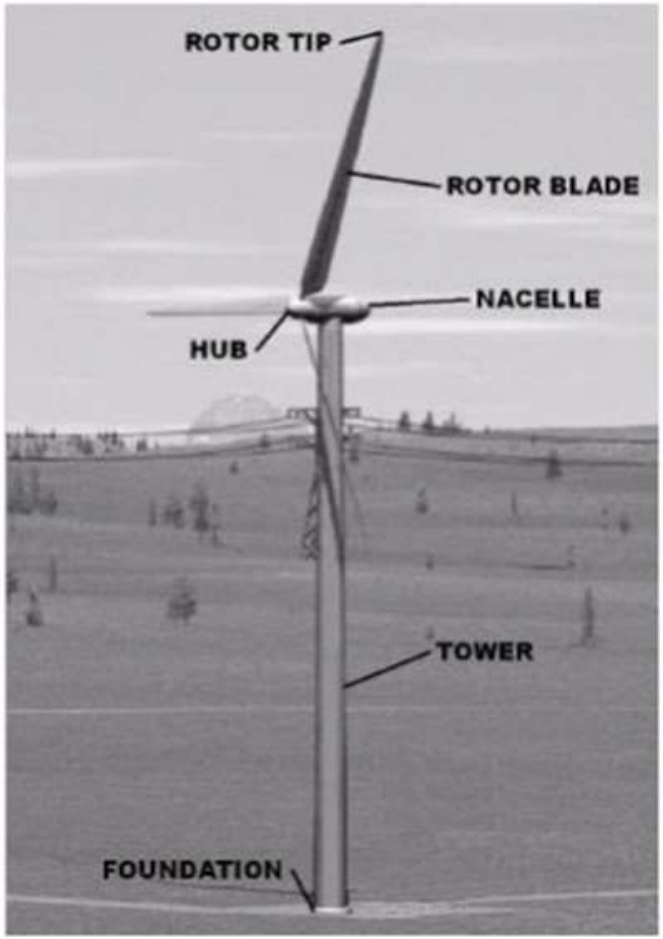

Figure 3 - Generic Wind Turbine Structure (adapted from IFC Guidance Documentation)

The technical characteristics of the turbines used for the basis of the assessment are:

- Tower Height at Hub –140 m (maximum); GE: 110 m
- Total Height – 210 m (maximum); GE: up to 180 m
- Rotor Diameter – 126 m (maximum); GE: 120 m
- Turbine Output – GE: 2.78 MW
- Total Number of Turbines – 57

Each turbine will be bolted to a concrete base measuring 19m in diameter and 3m thick. The base will be supported by 25 concrete piles, each pile will be 16m deep and 0.6m in diameter. During construction, a work area will be provided to accommodate the crane and turbine components. These work areas will be of compacted, broken stone and will be removed once construction is finished.

Ancillary Plant

The following support infrastructure will be constructed:

- A network of access roads that connect all the wind turbines.
- An underground electrical network with a medium voltage of 35 kV which will connect the turbines with the substation.
- A 35/400kV (Kilovolt) 2 X 90 MVA (Megavolt Amperes) substation.
- Management /Control building, housing the metering and control equipment, telecommunications equipment, and some control station accommodation for personnel, and a site compound for the temporary storage of material and equipment supplies.
- Telecommunications cabling across the site will be required to relay data from the turbines to the control centre; this uses electric cable trenching and roadways as far as possible.

Operations

The operational life-time of the wind farm is expected to be about 25 years; this is a typical working life of a wind turbine blade. After 25 years the windfarm will either be decommissioned or redeveloped.

The five basic steps of electricity production and distribution from wind power are (also see Figure 4):

- wind turbine blades are turned by the power of the wind;
- the blades turn a rotating generator in the nacelle which converts wind energy to electricity;
- a transformer in the base of the turbine tower increases the electricity voltage for transmission to the substation by underground cables;
- the substation increases voltage for transmission over long distances;
- the electricity is transferred to the grid and distributed.

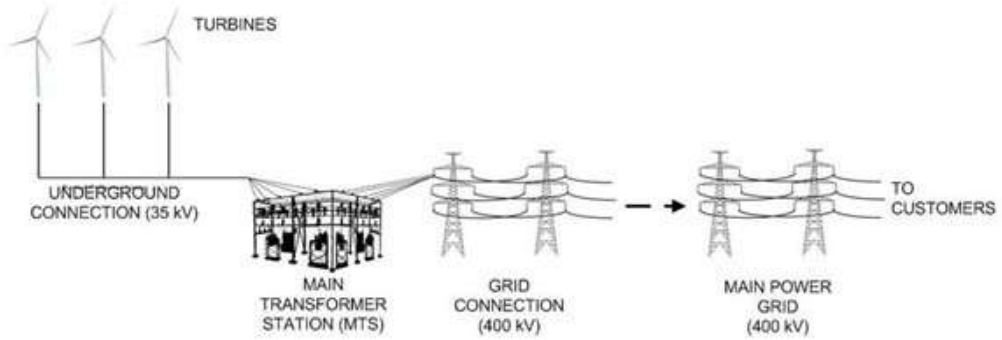

Figure 4 - Energy Production & Distribution Schematic

When the wind reaches and maintains constant speeds of over 3 m/s, the turbine rotor starts rotating (in a clockwise direction) and drives the gearbox that converts the mechanical energy into electrical energy through an electrical generator. At a constant wind speed of 3 m/s each turbine will generate about 20 kW. At 6 m/s, the output is about 600 kW but then rises sharply to the maximum power output at 12 m/s, where the turbine will generate about 3,000 kW. At wind speeds above 25 m/s, the turbine blades are stopped (by rotating the blades on the hub; called "feathering" the blades) for safety reasons and to prevent excessive wear and tear on the mechanisms. Most of the electricity produced by the wind farm will be transferred to the grid but a small amount of electricity will be used by the on-site control facilities.

Operational control of the wind farm is likely to be through a fully automated system, managed from a remotely located control centre. There will be permanent operations personnel on site, as well as some maintenance, monitoring staff, and there may be a security presence.

Maintenance will be undertaken on a scheduled basis, in line with manufacturer's recommendations and requirements identified by the company technical staff.

Grid Connections

A new 400 kV overhead line will be constructed to connect the wind farm transformer station with the existing 400 kV transmission line. The routing of the power line is illustrated in Figure 5, below.

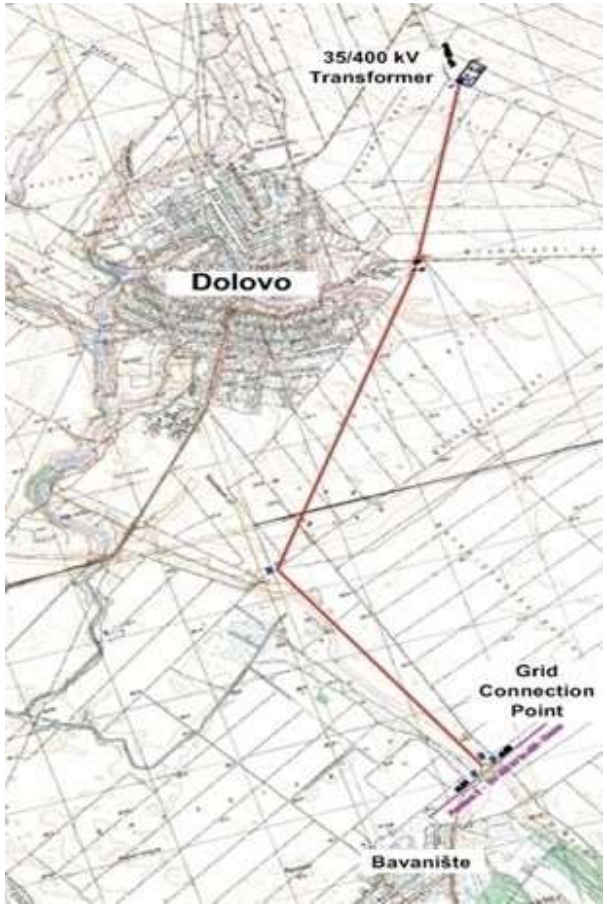

Figure 5 – Grid Connection Route

International Best Practice

IFC Environmental, Health, and Safety (EHS) Guidelines are technical reference documents that describe Good International Industry Practice. These Guidelines describe the performance levels that are generally considered to be achievable in new facilities by existing technology at reasonable costs (often also referred to as Best Available Techniques or "BAT"). In addition, when the IFC invests in a project, it is important that the developers confirm that the design and performance of their project conforms to the relevant IFC Guidelines.

The IFC EHS Guidelines for windfarms describes the environmental issues specific to the operation of wind energy projects and facilities as:

- Visual impact;
- Noise;
- Impact on species like birds and bats;
- Light and illumination;
- Habitat alteration;
- Water quality.

The design, operation and management of the Čibuk wind farm has been assessed within the ESIA against national and international good practice standards, and is considered to be compliant with Serbian requirements and consistent with the IFC HSE Guidelines for Windfarms. The development of appropriate management systems will ensure that BAT compliance is achieved throughout the project lifecycle.

Project Alternatives

Project alternatives, including a "do nothing" option were considered during the ESIA. The "do nothing" option was rejected, as there is a great need for power generation projects to aid Serbia's development and energy security. Renewable energy sources are preferred as these have the added benefit of reducing the carbon footprint of energy generation in Serbia.

An alternative potential site at Bela Crkva site was rejected due to the proximity of important bird sites in relation to the IBA and SNR and additional alternative sites at Popadije and Cestobrodice were rejected due to ground conditions and adverse wind measurements which were not deemed adequate for the operation of the turbines.

3. Development of the Wind Farm

Construction Programme

Construction of the wind farm is planned to start during the Q2/Q3 2015 and be completed 18-21 months thereafter. Installation of wind turbines is expected to start in Q3 of 2015. Since construction will be carried out in phases, the site will be able to deliver electricity to the grid before all turbines have been installed. It is expected that the construction of the overhead power line will start in Q2/Q3 of 2015 and that wind farm will begin to generate electricity in the autumn/winter of 2016.

The Project will be built and operated by WEBG, and will be staffed by people with previous experience in wind farm development. The windfarm will be developed and operated in accordance with national regulation and International Best Practice.

To ensure good levels of control, WEBG will develop a health, safety and environmental management system to manage the development and operation of the Project. Furthermore, all environmental, health & safety and social requirements will be imposed upon all the contractors and sub-contractors working on the Project.

It should be noted that the development and operation of the wind farm will be closely monitored by the IFIs investing in the Project. The application of IFC EHS Guidelines and the EBRD's Environment and Social Policy will ensure that the potential environmental and social impacts of the project are understood, minimised and managed. The Environmental and Social Impact Assessment and the Environmental and Social Action Plan (ESAP) and intended to help WEBG meet these objectives. Progress against the ESAP will be monitored by the Lenders.

Construction Activities

The wind turbines and electrical equipment will be manufactured off-site in the EU (e.g. the GE turbines will be manufactured in Germany) and delivered to site on large road vehicles. Construction activities will include:

- preparation of the site area for development (including the removal and storage of top soils);
- importing fill material and site levelling;

- utilities and services connections to site;
- preparation of a construction compound / laydown area (for the temporary storage of turbine parts and the erection of a concrete batch plant);
- construction of site roads and construction pads;
- foundation piling / excavations and concrete footings pours;
- erection of building frames and cladding;
- installation of turbines (using two large, travelling cranes);
- reinstatement of land around the turbine bases;
- ancillary plant erection;
- building fitting-out; and
- wind farm commissioning.

The construction lay-down area will be within the boundary of the wind farm, close to the transformer station (see Figure 7). The compound will be used for the storage and assembly of plant components during construction. Construction workers will not live on site, but welfare facilities will be provided for day-time use. The construction workforce will be accommodated locally.

Once construction has been completed, the land within the windfarm will be returned to agricultural use.

Access Roads and Transportation Route

Items to be transported to site during construction of the wind farm include the main turbine components, ancillary plant, temporary buildings and aggregate and materials for the substantial concrete turbine foundations, as well as fill material for roads and construction pads. The transport of these components and materials will be split in to four phases:

1. Transport of wind turbine components by ship to the port of Pančevo (where they will be stored temporarily).
2. Use of the main road network to transport these components from the port to the site as well as the delivery of other large scale equipment and bulk construction materials from the local area.
3. Local transport from the main roads through local, minor roads to the site access point.
4. Transport from local roads at the site boundary to all areas within the site on presently unimproved roads and tracks.

See Figure 6.

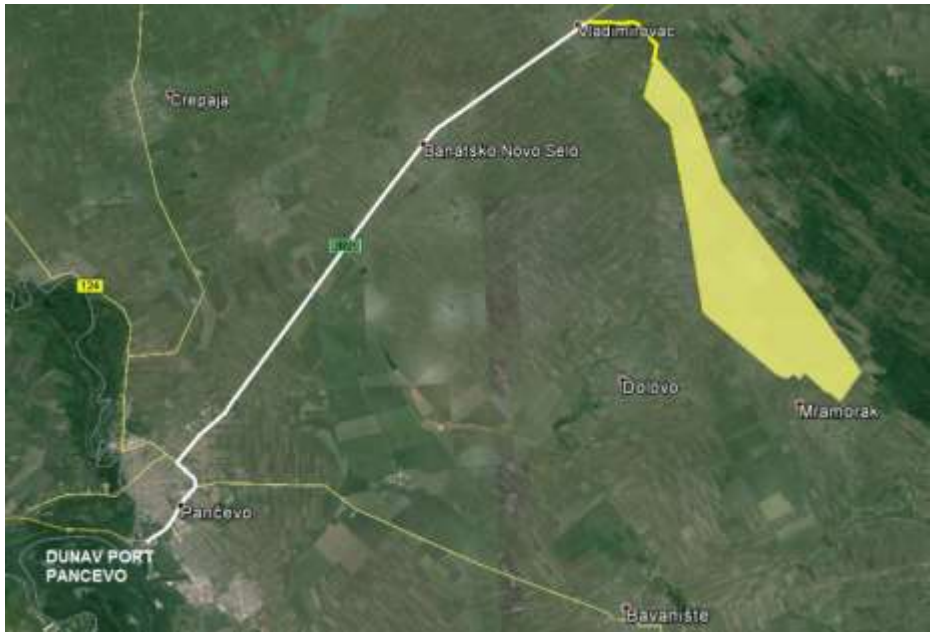

Figure 6: Route of Site Access to the Project Area

The regional road E70 will be used for the connection to the port at Pančevo. The delivery vehicles will then use local roads and pass along the edge of Vladimirovac village (see Figure 7). The local asphalt and non-asphalt roads will be upgraded by WEGB to ensure that they are wide enough and strong enough to take the weight of the delivery vehicles. The vehicles that will deliver the wind turbines are large; up to 60 metres long and up to 140t in weight.

In order to minimise disruption to local residents and other road users, the main turbine components will be delivered at night. The hours of operation will be discussed with highways representatives from the local authorities, the police, and local residents but could be between 1am and 5am.

The delivery vehicles will be offloaded at the lay-down during the night. Erection of the towers and turbines will only take place during daylight hours.

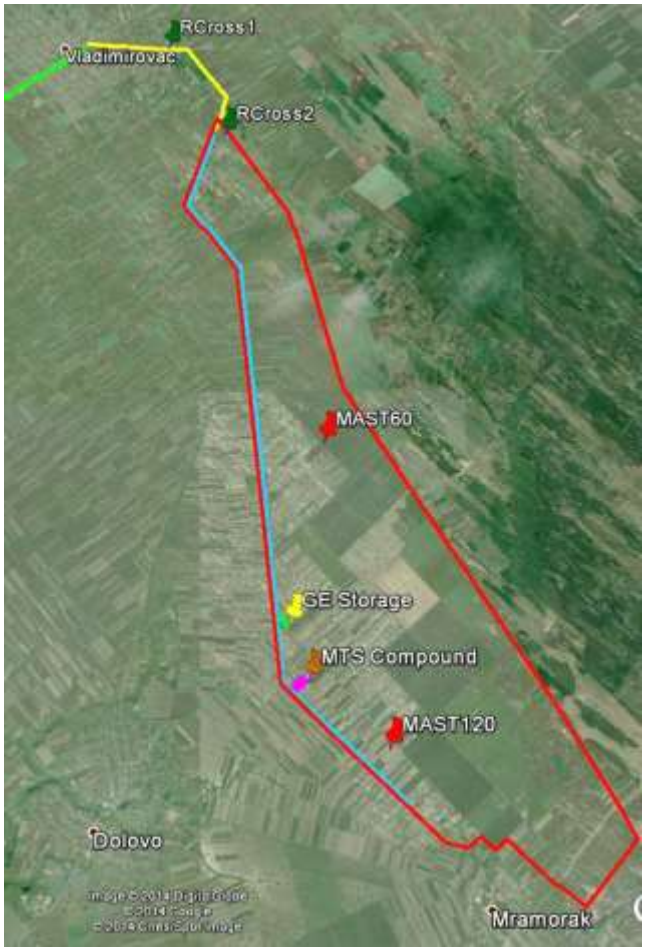

Figure 7: Local Site Access and Lay-down Area

Closure & Decommissioning

The operational life of a wind farm is typically 20 to 25 years. Towards the end of the operational life of the wind farm a decision will be made as to whether the site will be redeveloped so that wind energy production can continue, or to decommission the wind farm and close the site altogether. Redevelopment may involve the overhaul and refitting of the turbines or the total replacement of the turbines.

In the event that the wind farm will be closed, the operator will produce a decommissioning plan that will be approved by the local authorities before decommissioning commences. The decommissioning of the wind farm will start as soon as the operation ceases and approval has been obtained. The decommissioning stage will take an estimated 1.5 to 2 years and will involve the dismantling and removal of the constituent parts of the wind farm and rehabilitation in the affected areas.

Compliance with Serbian Environmental Law

The initial approvals were obtained in 2009 when the Municipality of Kovin confirmed the Detailed Regulation Plan of the Čibuk 1 Wind Farm Infrastructure System ('the Plan'). The Plan incorporated all the requirements of the competent authorities and organizations and was officially approved by the Municipality of Kovin in December 2010. Where applicable, the requirements of 'the Plan' have been incorporated into the assessment of impact as well as the associated management, mitigation and monitoring measures.

In November 2011, the Provincial Secretariat for Urbanism, Construction and Environment, determined that an Environmental Impact Assessment Study must be undertaken associated with the wind farm development. The original ESIA was completed in compliance with the requirements of national regulation. The local EIA was completed and approved by the Provincial Secretariat for Urbanism, Construction and Environment in November 2012.

Serbian Law on Environmental Impact Assessment (Article 28) requires that if the construction work has not started within 2 years, the Developer should apply for the EIA update procedure with the competent authority. The EIA Consent Decision for Čibuk was issued on 8th November 2012 meaning that 2 years period will end in November 2014, while WEGB plans to commence the construction around March 2015.

In September 2014, WEGB consulted with the Provincial Secretariat of Environment to confirm the need to update the EIA Study. WEGB was informed by the Secretariat that in their view, as long as there had been no changes or deviations to the project design, then the Authority is very unlikely to require an amendment of the EIA. In respect to the Čibuk Project, the authority clearly expressed the view that given that no changes to the project have been made since the EIA was approved, they will not require the EIA update.

4. The Existing Environment

Physical Environment

Geology

The site is located in the southern part of the Neogene Panonnian basin – a wide plain spreading over the Central Europe bounded by the Carpathian Mountains, the Alps and the Dinaric Alps. The Panonnian basin is a deep tectonic depression with regional faults.

The site is located on Quaternary eolian (wind-borne) deposits of upper Pleistocene age consisting of loess, sandy loess and sand. The total thickness of Quaternary deposits is approximately 100 metres; overlying a thick Neogene complex consisting mostly of clay, sandy and marl layers.

Some unconfined aquifers may occur in the upper 12m of layers of the ground (loess deposits), with groundwater present in the lower layers (underlying eolian sands). The main aquifer is in the deep (100-150m depth) geological (neogene) formations which supply the majority of the area's groundwater supply.

Climate

The area surrounding the wind farm site is a moderate continental climate with variable seasons, and higher temperatures in the autumn than the spring. Monthly mean temperatures range from 21.4°C (July, the hottest month) to -1.7°C (January, the coldest month). The average annual rainfall is 608 mm.

The strongest winds blow from the south-east during winter. During the warmer seasons the wind blows from the south-west and although slightly weaker is still strong. According to the wind speed analysis, in January 2012, the mean wind speed at 120 m was approximately 7.2 m/s; and in December 2012, it was 7.95 m/s.

Landscape

The region is characterised by a gentling rolling landscape, dominated by large, open arable fields, pastures and limited deciduous woodland areas.

The wind farm site comprises large areas of intensively managed arable monoculture, mainly maize and sunflowers. A number of narrow dirt roads cross the site, providing access for agricultural vehicles.

To the east of the proposed wind farm is the Deliblato Sands, an area of sand, steppe, forest and wetland vegetation covering an area of 380 km^2. The dunes of yellow and grey sand with maximum elevations of around 200 metres above sea level extend from the south-east to north-west. The Sands are surrounded by the cultivated steppe of the Panonnian plain.

The area around the site has low population levels although there are a number of small settlements including Dolovo, Mramorak and Vladimirovac. The villages are in most cases serviced with at least one convenience store and school as well as religious buildings and community buildings.

There are no designated landscapes in the wind farm site or in the area immediately surrounding the site.

The local authorities hope to further develop the Deliblato Sands as a tourist attraction.

Ecology

Habitats

The site of the proposed wind farm development comprises intensively managed, arable farmland with limited semi-natural habitats present; these include unmanaged field boundaries and road and rail verges often containing areas of semi-natural grassland, and areas of scrub and woodland.

No water bodies or water courses were identified during a survey of the site, although ditches and small valleys at the margins of the site are likely to hold water during the winter and periods of heavy rain.

Some areas of semi-natural steppe grassland typical of that which would have historically covered much of the Panonnian Plain, are present immediately adjacent to the eastern boundary of the site, and remnants appear on the site along roads or the old railway line to the north of the site.

There are small, isolated patches of woodland and scrub on the site. Woodland is generally young and below 5m in height. The dominant species are generally false acacia (Robinia psudoacacia), with common elm (Ulmus campestris), cherry plum (Prunus cerasifera) and wild cherry (Prunus avium) also present. Scrub generally consists of common hawthorn (Crataegus monogyna), with common dog rose (Rosa canina) and wild privet (Ligustrum vulgare) also present.

Field survey of the power line route has been undertaken and habitats present (and associated species) are the same or very similar to those identified within the wind

farm site. Habitats are predominantly intensive arable farmland with associated grassland and scrub.

Designated sites

The proposed wind farm is 1.3 km away from the Deliblato Sands Special Nature Reserve (SNR) and the Deliblato Sands Important Bird Area (IBA). Deliblato Sands SNR extends over an area of 35,000 hectares and is an UNESCO Biosphere Reserve, and is on Serbia's tentative list for consideration as a UNESCO World Heritage Site. A UNESCO world heritage site is a place that is listed by UNESCO as being of special cultural or physical significance.

WEBG have agreed with the Serbian Institute for Nature Protection that the turbines will be located at a minimum distance of 1 km from the border of the Important Bid Area (IBA)/SNR.

Bara Kraljevac (the Bog of Kraljevac) lies 7km to the south of the wind farm site and is in the process of being awarded protected status due to its geomorphological and hydrological characteristics as well as habitats of rare species.

Birds

Windfarms may impact on ornithological interests in three main ways:

- loss of habitat, due to the construction of turbine bases and tracks;
- displacement of birds as a result of disturbance;
- potential mortality through collision.

The arable farmland habitat which dominates the site has already reduced significantly the suitability of the site for many species of bird which can be found in natural or semi-natural habitats in the local area. For example, the long term use of insecticides has reduced the insect population and therefore has reduced the food potential of the area for birds (and bats). However, the site supports species which have adapted to agricultural intensification, species which remain in the small areas of semi-natural habitat around the site, as well as species which may use the site sporadically for feeding, or roosting.

Bird surveys were undertaken on the wind farm area and in a 1km buffer zone around the site, identifying the bird species present at and around site. Some bird species of high nature conservation value were identified at the site (common quail, turtle dove, crested and sky larks, corn bunting) and those of moderate to high conservation value were common buzzard, saker falcon, hobby, common kestrel, grey partridge.

No frequent flight patterns were identified through the wind farm site as a result of the ESIA survey work. The Čibuk windfarm is therefore expected to have a very limited impact on birds. The surveys were extended in scope and duration until July 2012, and further results are reported in the Updated ESIA (October 2014).

Bats

A total of 16 confirmed species of bat were recorded at the site during survey work between 2009 and 2011. A further 5 species are considered likely to be present within the study area, but these could not be confirmed.

No bat roosts were identified within the boundary of the planned wind farm. Habitats of potential value to roosting bats such as buildings and mature trees are almost entirely absent from within the site boundary. A number of positively identified bat roosts have been found in the area surrounding the proposed wind farm.

Various other monitoring techniques were used to establish bat activity over the site; these established the presence of bats and identified that the wind farm site was generally of low to moderate value for the identified species.

Other Fauna

Due to the large proportion of arable farmland present, species considered most likely to be present within the site are small seed eating rodents that are well adapted to cultivated areas, such as species of hamsters, voles, mice and shrews.

Brown hare (Lepus europaeus) and evidence of burrowing by either common mole (Talpa europea) or lesser mole rat (Nannospalax leucodon), was observed adjacent to the site.

Carnivorous mammals thought likely to be present within the site are: red fox (Vulpes vulpes), weasel (Mustela nivalis), stoat (Mustela erminea), and badger (Meles meles). It was considered that habitats within the site would be sub-optimal for the souslik or ground-squirrel (Spermophilus citellus).

The arable farmland habitat which dominates the site is not especially suitable for many species of reptile, however, green lizard (Lacerta agilis) was abundant during the survey, and it was considered that habitats present within the site are suitable to support populations of common wall lizard (Lacerta viridis), sand lizard (Anguinus fragilis), and slow worm (Anguis fragilis).

Other species possibly present in wooded areas around the periphery of the site include smooth snake (Coronella austriaca) and Aesculapian snake (Elaphe longissima).

Lack of permanent water habitats indicated that the site is unlikely to support a diverse range of amphibian species, however, there is the potential for some amphibian species, including: common tree frog (Xyla arborea), green toad (Bufo viridis), and common toad (Bufo bufo).

The insect fauna at the site is considered to be limited due to a poor diversity of habitats, as well as the structure of the habitats themselves (intensive arable habitats are dominant).

Human Geography

Socio-Economic Environment

The Project is located about 30 km to the north east of Belgrade, on the territory of the Kovin Municipality in the northern Serbian Province of Vojvodina. It covers an area of about 37 km^2 between several small local communities – Mramorak to the south (located on the territory of the Kovin Municipality), Dolovo to the south west (located on the territory of Pančevo City) and Vladimirovac to the north (located on the territory of the Alibunar Municipality). Devojački bunar, territorially belonging to Alibunar Municipality1 is a small weekend home settlement to the north east of the Project site, on the edge of the Deliblato Sands Special Nature Reserve. An overhead line connecting the wind farm with an existing transmission line extends to the local community Bavanište to the south (located on the territory of Kovin Municipality).

According to the data from the 2011 official census in Serbia, Kovin Municipality has a population of 33,725, Pančevo City has a population of 122,252 while Alibunar Municipality has a population of 19,780.

The official language spoken in the Project area is Serbian. Citizens of Vojvodina have the right to demand communication with authorities in 6 official languages – Serbian, Hungarian, Slovak, Romanian, Ruthenian and Croatian. The project area within the Vojvodina province will benefit from development, in particular in terms of infrastructure, development and opportunities for business. Information regarding employment by sectors suggests that approximately one quarter of the population in all three municipalities is self-employed, as entrepreneurs. The rest are employed by other legal entities. Of these, the majority are employed in manufacturing or services such as education, health and social work. Employment in agriculture is also quite important, more so for the population of Alibunar Municipality (14.3%) and Kovin Municipality (10%) and less for Pančevo City (4.3%). A relatively small percentage of employees are engaged in the construction sector – 2.3% in Kovin, 3% in Pančevo and 0.7% in Alibunar. At the end of 2013, the average net monthly salary in Kovin Municipality was 344 EUR, in Pančevo City 368 EUR, and in Alibunar Municipality 231 EUR.

The electricity, gas supply and telecommunications networks are developed in each village; however there is no sewage network and no wastewater treatment is undertaken. Drinking water is supplied by local groundwater wells, whose capacity is insufficient during periods of increased water consumption.

Life expectancy in all three municipalities is just over 70 years. There are two hospitals in the region, one in Pančevo and one in Vršac with a combined capacity of 950 beds. Each municipality has a primary health care centre, while each local community surrounding the Project site has one small health clinic and one pharmacy.

Land Acquisition

The Project site covers 3,700 ha (37 km^2) of agricultural land. Land required for the development has been purchased by WEBG or is subject to permanent access rights (easements). Access to land that has been purchased by WEBG has been released back to the previous owners (at no charge) giving them the right to continue to use (or sub-let) these plots for a period of 99 years, or until decommissioning of the wind farm.

In addition, 22 ha of government owned land has been purchased from the municipality of Kovin for the construction of 19 wind turbines. The land for the construction of overhead power lines (OHL) pylons has been acquired through easement contracts with the land owners.

During the transport and installation of the turbines, some privately owned land or government owned land will be temporarily disturbed in order to gain access to the construction plots. All land users will be compensated for crops and any other damage.

[1] Local community Banatski Karlovac.

Archaeology and Cultural Heritage

Initial analysis completed in October 2012 by the Institute for Protection of Cultural Monuments at Pančevo, indicated that there is some trace evidence of settlements from the Bronze Age and the Medieval period in the area of the wind farm site.

The Institute concluded that the "Potes Velika Njiva" archaeological site (to the north-east of Mramorak village) may contain individual archaeological finds from the Bronze Age. This site has been given the status of a "preliminary protected" archaeological locality. There are also records of sporadic chance finds from the late medieval period in the area of local roads (Mramorak to Dolovo, Dolovo to Vladimirovac).

The Institute has required that the ground below four OHL pylon bases must be the subject of preliminary excavations before major works begin. This has been completed. In addition, the Institute has requested that the excavation of all foundations must be supervised and a "chance finds" procedure implemented. The "chance finds" procedure will be form part of the Construction Environmental Management Plan.

In August and September 2013, WEBG, in cooperation with the Institute for Protection of Cultural Monuments, completed the preliminary excavations in four places identified by the Institute (OHL pylons number 10, 23, 24 and 25). Small movable objects were identified which were recorded and removed and in October 2013, WEBG has fulfilled the condition for the start of construction.

Transport

A transport survey was completed by GE Energy (a potential supplier of the major equipment) to determine what facilities and routes would be available.

The port of Pančevo on the River Danube will be used for the transfer of wind turbine components from ship to road. The GE report identified that the port was "relatively small but fully capable of accepting and handling all the turbines being proposed for the Dolovo project", although the existing port cranes will need to be augmented by mobile cranes with a high lifting capacity.

The turbine blades and components will be transported along the E-70. The E-70 is part of the national road network but is not classed as a major road. It has a single lane and runs north east from Pančevo to Vladimirovac, situated on the north western edge of the project site. The results of the GE survey indicate that the transport route provides appropriate transport conditions for the wind turbine components.

At the village of Vladimirovac the wind farm components and all other plant and materials associated with the project will move from the main road network onto local roads. In cooperation with GE and the local community of Vladimirovac, WEBG have confirmed which local road will be used to transfer large items from the E-70 to the Project site. For the most part, the local road is asphalt but will still require some road improvement works. About 750m of new road will have to be built. The selected option goes through the village of Vladimirovac which is why WEBG will have to work with local community to ensure all safety measures during transport.

In addition, at the request of the local mayor, WEGB will also construct 5km of new road that will link Vladimirovac to the recreational area within the Deliblato Sands. It is hoped that the improved access will help the development of the local tourist industry.

Noise

Noise levels in the surrounding area have been assessed and noise sensitive receptors identified. Background noise environment is characterised by natural noise sources, typical of a rural location and are considered to be low.

5. Impact Assessment

Impact Assessment Process

The impact assessment considered the condition of the existing environment (the 'baseline' conditions), the impact of the environment that would occur from the construction and operation of the wind farm, how these impacts could be reduced (or mitigated) and the residual impact after the mitigations have been implemented. The baseline condition was determined using information obtained during research and surveys undertaken by WEBG or from other publicly available sources. In order to provide a robust analysis, the environmental and social assessments were undertaken on a sensible, "worst case" design. For example, although the wind farm design is likely to be based on a 2.78 MW turbine, the impact analysis has assumed a worst case of 3.2 MW turbines.

The mitigation measures suggested by the ESIA will reduce any potential negative impact associated with the proposed Project.

These mitigation measures include changes to the wind farm design or management measures to avoid or minimise impact. Once the management and

mitigation measures are applied to a potential project issues, the resulting impact is termed the 'Residual Impact'. The Residual Impact is summarised as a simple graduated scale from positive benefits to negative impacts as follows:

Significantly Adverse
Moderate Adverse
Minor Adverse
Negligible Adverse
No change
Negligible Beneficial
Minor Beneficial
Moderate Beneficial
Substantial Beneficial

Where the summary of the impact is variable, such as where the impact is variable over a number of individual receptors, this can be expressed as a band of potential impacts. For example, a band of impacts may include:

- No change
- Negligible Adverse
- Minor Adverse
- Moderate Adverse

Rather than list each of the potential impact levels, the residual impact will be expressed as 'No Change – Moderate Adverse', where the impacts include those presented in the text (in this case 'No Change – Moderate Adverse) as well as those in between on the impact scale (in this case 'Negligible Adverse and Minor Adverse').

In the summary table, where there is range of impacts, these type of impacts are illustrated with an asterisk (*). 'The highest 'Adverse' or 'Beneficial' rating is shown in these cases in Table 1.

Residual Impact Ratings for Each Aspect

The following table provides the residual impact rating following the implementation of the mitigation measures which have been recommended in the ESIA.

The summary is divided into the three phases of the project;

- Construction (CP);
- Operations (OP); and
- Decommissioning (DP).

The residual impact ratings for this phase are shown in Table 1.

Table 1: Residual Impacts of the Čibuk Windfarm Development

Issue	Sub-issue	CP	OP	DP
Ecology & Nature Conservation	Habitats			
	Birds	*	*	*
	Bats			
Landscape and Visual	All Landscape and Visual Aspects	*	*	
Traffic and Transport	All Traffic and Transport Aspects			
Noise	All Noise Aspects			
Socio-Economic	Impacts on Land Use			
	Employment and Procurement Opportunities			
	Impacts on Livelihoods		*	
	Community Health, Safety and Security	*		
	Revenue generation for Local Government/Municipality (Local Competitiveness)		*	
	Revenue generation for Local Government/ Municipality (Available revenue)		*	
	Impacts on Infrastructure (Improvements)			
	Impacts on Infrastructure (Damages)			
Site Health and Safety	All Site Health and Safety Aspects	*	*	*
Emissions to Ground and Water	All Emissions to Ground and Water Aspects			
Archaeology and Cultural Heritage	All Archaeology and Cultural Heritage Aspects	*		
Air Emissions	All Air Emissions Aspects	*		
Electric and magnetic Fields	All Electric and magnetic Fields Aspects			
Electromagnetic Interference	All Electromagnetic Interference Aspects			

6. Summary of Construction Phase Impacts and Control Measures

Ecology and Nature Conservation

Loss of arable farmland habitat and marginal habitats such as grassland and scrub is expected at the site.

Disturbance of mammals, reptiles and breeding birds is expected during vegetation clearance and other construction activities. Vegetation clearance should be confined to activities areas and clearance should be scheduled around the breeding times of the indigenous birdlife.

Construction should be scheduled during times when artificial light is not required (i.e. outside of dusk and dawn). This will minimise noise, vibration and light disturbance for roosting, commuting and foraging bats.

Landscape and Visual Impact

Impact on land cover to construct the new access points and tracks between turbines, electricity pylons, construction compound and material storage facilities is expected. Vegetation clearance must be limited to the areas where it is necessary. Suitable tree protection should also be provided through protective fencing and ground protection surfacing to limit the impact of remaining trees.

There will be a landscape and visual impact on surrounding land users due to the change in land use and development activities. It is recommended that bespoke mitigation planting at strategic sites is undertaken, both within and outside the development area, to create thickets of vegetation in keeping with the landscape current character and perform targeted screening of potential visual impacts. The proposed development is to be constructed approximately 1km away from populated areas, which in itself will minimise impact.

Land use alteration and increase in vehicular movement during construction should be addressed with the rehabilitation of the impacted areas to original use following development. Impacts associated with vehicular movement will be short-term during construction activities.

Traffic and Transport

An increase in heavy vehicles which transport construction equipment, as well as vehicles required for the construction of the development is expected during the construction phase. The following mitigation measures are recommended:

- Use of designated managed traffic routes only;
- Restricting delivery hours to reduce noise nuisance; avoid heavy truck movements in the day light hours;
- Considering whether deliveries should be scheduled to avoid peak times to reduce congestion;
- Heavy construction traffic will be subject to a traffic management plan, as necessary.

It must be noted that the traffic study conducted indicated that there will not be a significant impact.

Noise

Noise levels are expected to increase due to traffic movement and construction activities. The implementation of ‘Best Practice’ to manage noise emissions (e.g. undertaking turbine assembly and pouring concrete during day light hours only) is recommended along with defining access routes to the site which ensure the least number of properties are impacted by heavy traffic.

Socio-Economic Impacts

Land Use

It is expected that the development will result in a minor reduction of land availability for agriculture and land accessibility will be affected due to increased vehicular movement during construction.

The following measures are recommended:

- Minimise the amount of land occupied during construction;
- Position the turbines near edges of land plots to optimize land use;
- Upon the completion of construction activities, fully reinstate the land so that it can be used for its former purpose;
- Develop and implement a traffic management plan;

- Provide timely information to users of land of when access to their land might be more difficult (e.g. scheduled access track upgrades); and
- Establish and implement a community grievance mechanism.

Employment and Procurement Opportunities

Creation of employment opportunities directly and indirectly associated with the development is expected.

About 400 people will be employed during construction, most of which will be either local (about 20%) or national staff (about 50%). To manage this, the following is proposed;

- Put in place transparent and fair recruitment procedures;
- Ensure that all non-employee workers are engaged in line with both national legislation and applicable international (International Labour Organisation) standards and recommendations;
- Provide a grievance mechanism for workers should they consider that they have been treated unfairly; and
- Implement a training programme for the local workforce to enable them to take advantage of the opportunity.

In order to ensure the promotion of indirect employment which are expected through the projects supply chain and the spending of employees within the local area, it is recommended that goods and services are procured locally wherever it is possible.

It is further recommended to continue to provide timely and transparent information regarding employment opportunities related to the Project. This will eliminate any unfounded expectation of employment possibilities.

Impacts on Livelihoods

Economic displacement could occur for people who are using the land plots which have been or will be acquired for the project, but who are not owners of land, and whose crops may be affected by construction. Also, people who are using the land plots which will be crossed during construction may be disrupted. The following mitigation measures are recommended:

- Minimise the amount of land occupied / disrupted during construction;
- Upon the completion of construction activities, fully reinstate the land not permanently occupied;
- Provide timely information to users of land of when construction is planned to begin and how lost crops and damages will be compensated;
- Compensate all users of land for lost crops and any other damages at full replacement value, in accordance with the Serbian Law on Planning and Construction and IFI policies;
- Fully reinstate the land after disruption; and
- Establish and implement a grievance mechanism.

A number of positive impacts are expected. These are:

- Increased incomes for farmers who sold their land to WEBG (during 2012 and 2013) and received compensation with which they bought replacement land.
- Improvements for local economies as a result of employment and increased incomes for farmers.
- Increased value of land in the Project area.

Community Health, Safety and Security

An influx of workers could impact on local community health, safety and security. It is recommended that contractors are encouraged to hire local people wherever possible. The Project workforce must abide by a strict code of conduct to ensure good behaviour and discourage trespassing. The increase in traffic could result in more accidents and reduced quality of life during the construction period. This should be addressed providing information to residents affected by the increase in vehicles of proposed movements as well as co-operation between the project and the local health and safety facilities (i.e. hospitals and police).

Impacts on Infrastructure

Damage to road surfaces during the transportation of heavy material could occur. It is recommend to prepare roads for heavy transport before construction and to restore the roads to adequate requirements for the proposed movements. These improvements could impact road users; however this is expected to cause very little disruption to locals.

2 Only one family sold their land in January 2011.

Positive impacts of the operation are expected in the form of improved access to the agricultural plots as a result of the road upgrading and widening.

Site Health and Safety

Industrial accidents associated with the construction of the wind farm could result in serious injury or death, particularly associated with falls from height or electrocution. It is essential that an appropriate health and safety management system be implemented by WEGB.

Accidents associated with construction traffic, both on and off site associated with both workers and members of the public could be a risk. In order to limit the possibility of incidents the implementation of a traffic management plan is required. This includes ensuring vehicles are driven within speed limits and with care on public roads, as well as on site.

There is risk to the public and also workers associated with unauthorised site access. This potential impact can be reduced by the erecting appropriate signage and ensuring appropriate site security.

Emissions to Ground and Water

Accidental release of fuels, oils, chemicals, hazardous materials, etc., to the ground, groundwater and/ or surface water could occur. In order to manage such incidents all these materials should be stored in a specialist store. In addition, a materials handling procedures and a spillage procedure should be implemented and enforced to minimise risk to ground and water.

Similarly, potential risks to ground water have been identified concerning waste water. In addition to the spillage response procedure waste water management systems should be situated away from open water, and appropriate containment both primary and secondary should be in place. This should include management of domestic waste waters and vehicle washing.

Increased sediment load in water ways as a result of direct water runoff is a potential risk. This may occur particularly as a result of earth moving during construction and will result in a negative impact on the water system. To manage this predicted impact it is recommended excavations are minimised during construction, that open ground faces are minimised and temporary drainage grooves and sedimentation ponds for surface runoff collection are constructed.

The production of concrete for the construction of the turbine bases and piles will consume water. The current plan is to position the concrete batch plant at the construction compound. Water will be provided from the municipal system at Dolovo. There is sufficient capacity within this system to supply the needs of the village and the construction of the wind farm. It is not yet known if the water will be transferred to the batch plant by road tanker of temporary pipeline.

Archaeology and Cultural Heritage

There are no registered archaeological or cultural heritage sites within the Project area. After the detailed analysis of the terrain for the wind farm and corresponding overhead power line, performed by the Institute for Protection of Cultural Monuments (in 2012), they identified a number of areas in which they would like to establish oversight during construction to ensure that there are no items of archaeological and/ or cultural interest. WEBG, in cooperation with the Institute for Protection of Cultural Monuments, has completed preliminary excavations in four locations where OHL pylons will be located and in October 2013 the Institute issued a document stating that all conditions have been met for construction to being. If findings are discovered during construction activities all works will be immediately halted until those findings are safely conserved in accordance with the Serbian Law on Cultural Heritage.

Air Emissions

Air quality could be impacted by dust emissions during construction and ground works, as well as emission from generators and vehicles.

The following control measures should be put in place to manage to potential impacts:

- Water spraying roads and stockpiles of dusty materials;
- Covering vehicles carrying dusty materials on leaving the site to prevent materials being blown from the vehicles;
- Speed limits on unmade surfaces on site to limit dust; and
- Assurance that all engines operate to national standards and are fully maintained, particularly to prevent the release of black smoke.

7. Summary of Operational Phase Impacts and Control Measures

The residual impact ratings for this phase are shown in Table 1.

Ecology

The construction of wind farms can result in the disturbance or displacement of some birds (often called the "barrier effect"); i.e. choosing to go around a windfarm rather than through it. It is considered that some species, such as geese, are particularly sensitive to this. It is important to note that the survey work undertaken as part of the ESIA did not record any clear flight lines through the Čibuk wind farm. There may still be some displacement of sensitive species as a result of the Čibuk Project but there is plentiful agricultural land in the surrounding area that can provide alternative habitat.

In addition, the ESIA concluded that the individual turbines are not expected to have a significant detrimental impact on bird populations. A Collision Risk Assessment (August 2012), indicated that there is a low risk of birds colliding with moving turbine blades or turbine towers. The Serbian Institute of Environmental Protection has instructed WEBG to paint the tip of all the turbines blades in red (about 15% of the blade length) to further mitigate this potential impact.

The construction and operation of the turbines could also lead to collisions by bats. However, as with birds, no evidence for flight patterns which could lead to collisions was identified during the surveys.

Due to the levels of concern over these impacts, it is recommended that a post-construction monitoring plan be put in place to confirm these potential impacts. Should the impacts be larger than expected, then mitigation measures will be considered and agreed with the authorities (and the Lenders).

Landscape and Visual

The operation of the wind farm will impact on the local vegetation, land cover and landscape character. There may be impact on views of the landscape from distance, potential visual impact in villages, hamlets and vehicle travellers and potential visual impact on those working in the area. Potential views of turbines from the Deliblato Sands site would in all likelihood comprise of the upper sections of a limited number of turbines only, dependent on viewer's position within the area. Associated with the project, there is also limited potential for visual impact as a result of the power line and pylons.

The site is comprised of large agricultural fields with open, undefined boundaries and therefore the proposals will not result in the loss of any significant landscape features or vegetation of particular value for its contribution to the wider landscape. It is proposed that mitigation planting be applied, which should comprise of native plant species which are representative of the local landscape character. Upon completion of construction, land use should revert back to agricultural use where ever possible.

The potential visual impact from villages, hamlets and vehicle travellers are to be mitigated by careful planting at strategic sites both within and outside the development area. The objective being to create dense vegetation that will provide targeted screening of potential visual impacts. Turbines should be a colour which is unobtrusive, such as a neutral matt colour (pale grey) to blend with the muted colours of the surrounding landscape and predominant sky colours and excessive use of corporate logos, lettering and motifs should be avoided.

Shadow Flicker

Shadow flicker is caused where the light from the sun passes through the blades of a moving turbine. It may become a problem for those people who live near, or have a specific orientation to, the wind farm.

Serbian regulations state that the distance from the turbines to the nearest residential properties must be greater than 500m. This is considered to be the maximum area over which shadow flicker is experienced. However, international to best practice, states that the minimum distance from the turbine to a residential property must be at least ten times the rotor diameter to ensure shadow flicker is eliminated. This ESIA has used this best practice figure, i.e. 1,260m.

The ESIA has identified that there is one residential property to the north of Mramorak that is within 1,260m of a turbine (at 1,038m). It is considered that the due to the angles of the sun, the orientation to the sun and the presence of matures trees around the property that is extremely unlikely that the residents of this property will be affected.

Traffic and Transport

Increased vehicular movement during maintenance times and operators utilising the roads is expected. The impact is not expected to be significant. Designated

managed traffic routes will only be utilised and a traffic management plan should be enforced.

Noise

Noise emissions are expected to increase from the wind farm operation, however these are expected to remain below permitted levels. The maximum predicted noise level during the night being 41.3 dBA against a limit of 45 dBA. The maximum predicted noise level during the day being 49.3 dBA against a limit of 55 dBA.

It is also noted that the IFC guidelines require that the noise generated by the turbines must not result in a maximum increase in background levels of 3 dB at the nearest residential property. The modelling has suggested that this may be an issue at some locations during the night. The ESAP contains a requirement to monitor levels and to take remedial action (e.g. by modifying turbine speeds) should the noise levels cause significant complaint.

Socio-Economic

Impacts on land use

For the duration of the operation the land available for agriculture will be reduced. This cannot be mitigated; however compensation for privately owned land has already been undertaken. The operation activities should be confined to areas needed for the safe operation of wind farms and easy access for repairs and maintenance, in order to avoid further reduction in available land.

Employment and Procurement Opportunities

The wind farm is expected to create direct and indirect employment opportunities in the following forms:

- about 30 individuals (a few local and international, but mostly national) will be contracted by WEBG during the operational phase of the project;
- the project's supply chain; and
- use of businesses by employees in local communities.

To manage these opportunities, transparent and fair recruitment should be put in place (recruitment policy) and goods and services should be procured locally wherever possible.

Revenue Generation for the Local Government/Community

A number of positive impacts are expected and these are listed below.

- Increased revenue for Kovin Municipality and local community Mramorak;
- Enhanced tourism opportunities for local communities; and
- WEBGs presence in the Municipality Kovin is attracting foreign and domestic investments in the municipality and the wider area.

To ensure the continuation of the beneficial impacts WEBG must make all payments in a timely and transparent manner. As of January 2013, WEBG supports related initiatives from local communities through the internal Social Investment Programme (SIP). Prior to this, WEBG has supported local community initiatives in an ad hoc manner and without annual budget set aside for SIP. WEBG continues to support and lobby for investments within the project area.

Impacts on Infrastructure

The impact on infrastructure is a positive one as a consequence of improved transport routes to the agricultural plots due to road and maintenance by WEBG. It is essential that maintenance is carried out on a regular basis.

Site Health and Safety

The management measures discussed in construction phase should be continued during the operational phase.

Electric and Magnetic Fields

There is a perception that electric and magnetic fields could cause health impacts, however, evidence suggests that this is only possible with very high exposure levels. In order to ensure peace of mind the location of the electric and magnetic sources are not situated adjacent to public residences.

Electromagnetic Interference

Windfarms have a small potential for disruption of aviation radar and radio systems as well as public telecommunications. However, the Čibuk windfarm is situated away from the main airport and flight paths, and the design (including material selection) has been done to minimise disruption. In the responses from local telecommunication operators, they are clearly of the opinion that there will be no

disruption following the construction of the Čibuk wind farm; they approve the construction of the wind farm.

Emissions to Ground and Water

All of the control measures used during construction will also apply during operation.

A borehole will be constructed to provide water during site operation. However, the quantities that will be used are very small and will not have a detrimental impact on ground water supplies.

8. Summary of Decommissioning Impacts and Control Measures

The residual impact ratings for this phase are shown in Table 1.

Noise

A noise impact is expected due to decommissioning activities of the infrastructure as well as the potential increase in traffic brought about by these activities. It is recommended that 'Best Practice' is implemented during this time as well as access routes being clearly defined in order to ensure that the minimum number of sites are impacted by the increase in road users.

Traffic and Transport

An increase in traffic due to the movement of heavy vehicles for the decommissioning activities is expected. The mitigation measure which is recommended is that a traffic management is put in place and site access be arranged to avoid built up areas or areas where traffic may cause nuisance or disruption. It's further recommended that delivery hours be restricted so that noise nuisance is reduced and heavy truck movements are avoided during night hours, and it should be considered to carry out deliveries around peak times to reduce congestion.

Socio-Economic

Land Use

A reduction in land available for agriculture due to the decommissioning activities is expected and it is recommended that upon the completion of decommissioning, the impacted land is fully reinstated.

Employment and Procurement Opportunities

The dismantling of the turbines, disposal of materials and reinstatement of land will generate some direct and indirect employment opportunities a part of those opportunities will be available for local people. These impacts should be addressed continuously as discussed in the Construction Phase.

Impacts on Livelihoods

People, who are using the land plots which may be crossed during dismantling and transport of the turbines and site clearance, may be economically displaced if their crops are affected. Restoration of private ownership over land on which turbines were constructed should also be addressed in the decommissioning planning phase. Owners of land and/or their descendants will have the possibility to regain full ownership of land after decommissioning of the turbines for a fee of 1 EUR (about 62 ha). This provision is already included in the lease contracts signed between WEBG and the owner and registered with the courts.

Site Health and Safety

The health and safety impacts and risks during decommissioning are similar to those during construction. The management measures discussed in construction phase should also be continued during the decommissioning phase.

Ecology and Nature Conservation

Habitat loss and disturbance to wildlife may occur and resurveying of the site is recommended.

It is predicted that the birds in the region will be impacted by disturbance by the deconstruction activities, in similar way as during construction. It is recommended that vegetation clearance be timed as to avoid the breeding season.

Bats are predicted to be impacted by noise, vibration and light as during construction, while roosting, commuting and/or foraging. It is recommended that

deconstruction work be avoided between dusk and dawn and that artificial lighting is restricted to required areas only.

Landscape and Visual Impact

Impacts of decommissioning are anticipated to be of a similar magnitude and severity as those experienced during construction. The mitigation measures recommended are anticipated to be similar to those undertaken during construction. Judicious vegetation clearance should be carried out to ensure only limited vegetation is cleared to facilitate access and operations during decommissioning. Where machinery access is required in the vicinity of existing vegetation, suitable protection should be provided through protective fencing and ground protection surfacing. Land cover should be stripped and stored during the decommissioning operations and subsequently reinstated (cultivated and graded) and returned to a condition suitable for agricultural use upon completion.

9. Cumulative Impacts

At the beginning of September 2014, it was a matter of public knowledge that seven wind farm schemes were being considered within a 30km radius of the Čibuk wind farm. The approximate locations of these Projects are shown in Figure 8. These schemes were in different stages of development, from early planning (preparation of spatial plans) but only one (Plandište) was under construction. The likelihood that the Bela Anta and the Alibunar 1 windfarms would be constructed before 2020 is low to very low.

Of the remaining 5 windfarm developments, only two EIA Reports and two Non-Technical Summaries were available in the public domain. Of these, only the EIA for Kovačica windfarm used the same methodology to assess the impact of on bird populations and the data was not placed in the public domain.

None of the EIAs considered landscape impacts or provided a construction programme.

As a consequence of the extremely limited availability of data, only a qualitative assessment of cumulative impact could be completed.

Figure 8: Windfarms planned within a 30km radius

Birds and bats

The Čibuk bird survey undertaken from 2009 to 2011 indicated that the main migration route for birds in the area is from the Deliblato Sands towards the Danube River valley. It can be seen from Figure 8 that this migration route to the east and south of the Čibuk site, is currently free of proposed wind farm development.

None of the EIAs in the public domain identified a significant impact on migratory birds. Each concluded that the region comprises intensively cultivated monoculture of agricultural fields and does not include any large or obvious landscape features that could be used as navigational aids by migrating birds.

It is possible that the Čibuk windfarm will lead to some displacement of bird feeding locations. However, the distances between the potential windfarms are thought to be sufficient to provide sufficient arable land for feeding for over-wintering birds. Given that the habitat within the region represents a uniform cultivated land, the effects of habitat loss for birds at one wind farm site are not considered significant, as they will have the use of abundant alternative habitat in the wider area.

Bird and bat surveys for the Čibuk 2 and Bela Anta wind farms are yet to be undertaken. However, information on bird and bat monitoring in the areas of Alibunar and Kovačica wind farms indicate that there was no evidence the sites are along the route of any habitually used migration pathway for any birds including migratory raptors, wild fowl, water fowl and storks. In respect to sensitive raptor species, two EIAs (Alibunar and Kovačica) mention that Saker falcon was observed in the area but both conclude that no nests or evidence of actual breeding was recorded and that the potential impact is considered low. No bat roosts were identified within any of the sites (Čibuk, Alibunar, Kovačica) and no evidence of the use of the sites as migration flyway for bats was found. Given the distance between the Čibuk site and the Alibunar and Kovačica site (more than 10km) it is not likely that any in-combination effects will arise as a result of construction of all developments even for species potentially migrating through the region.

Landscape

The introduction of the Čibuk wind farm on its own has been assessed to have a minor to moderate adverse effect on the landscape character. The turbines are likely to become the dominant feature and a key characteristic of the landscape within the local area (Mramorak, Dolovo, and Vladimirovac).

If all seven developments were to be constructed (although this is considered extremely unlikely), wind turbines would become a characteristic feature of landscape in the South Banat Region: wrapping around west, north and east of the Deliblato Sands. This would be a significant cumulative change to the character of landscape assessed to be uniform and ordinary.

Socio-economic impacts

Planned wind farm developments cover the area of South Banat region, one of the economically least developed areas of Vojvodina province. Although the individual contribution of a single wind farm may not represent a significant socio-economic effect, the cumulative effect of all developments is likely to represent a significant positive change in respect to local economy, infrastructure and tourism opportunities in the communities of Alibunar, Kovačica, Kovin, Plandište and Vršac.

The construction of wind farms is expected to create both direct and indirect employment opportunities. For instance, approximately 400 workers are required for construction of a wind farm of the Čibuk size. In addition, materials needed for civil works and infrastructure improvements will be procured in the local municipalities creating opportunities for local contractors. Construction of wind farms will require the upgrading and widening of access roads which will have a beneficial impact on infrastructure in the area. At the operational phase, presence of two or more wind farms may support the growth of local industry for service and maintenance.

Municipal budgets are likely be increased as a results of agreements between the wind farm operators and local municipalities (e.g. profit sharing agreements or similar) and social investment programmes. Operation of wind farms could also have an effect on increased tourism opportunities, especially in the communities close to the Deliblato Sands. It is difficult to assess whether wind farms alone will be enough of a stimulus to trigger tourism in the area but being the first wind farms to be constructed in Serbia, they may attract visitors to the area to see them.

10. Contact Information

Further information on the Project, as well as electronic copies of environmental impact assessments can be obtained by contacting WEGB: Mr Slobodan Perovic. (Telephone: +381 (60) 6440078; email: slobodan.perovic@continentalwind.com).

Hard copies of the full ESIA documentation, Non-Technical Summary and Stakeholder Engagement Plan, in English will be held at the Continental Wind Serbia d.o.o. office in Belgrade. The office address is Continental Wind Serbia, Resavska 23, IV floor, Belgrade 11000; Serbia.

It is expected that the full ESIA, the NTS and SEP in the Serbian language will be available at the Mayor's office in Dolovo.

Information about the Grievance Mechanism and other project related information will be available on a dedicated page of the WEGB website (www.wpc.rs) that will include a link to the grievance redress form. Such information will also be publicised to affected communities through contextually appropriate avenues including the distribution of leaflets, on information boards within the community.

WEGB is open for all your queries and comments. Our procedures grant that all matters will be analysed and proper answers returned. We will redirect your query to the appropriate and proper body if the matter is out of our competence.

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