Case Studies: Shutdown on Demand

5 WIND FARMS IN EUROPE

MARCH 2014

These data have been collected for BirdLife International *"Guidance for turbine shutdown on demand for the migratory soaring birds in the Red Sea Flyway"*

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In the scope of the elaboration of DTBird® Shutdown on demand proposal for BirdLife International *"Guidance for turbine shutdown on demand for migratory soaring birds in the Red Sea Flyway"* DTBird® was required to provide case studies. This document includes the data collected and provided on March 2014.

DTBird® Stop Control performance data of 5 wind farms in Europe are presented. Name and wind farm location are not provided to keep data confidentiality.

TABLE 1.
GENERAL FEATURES OF THE WIND FARM, SERVICE PERIOD STUDIED, MAIN TARGET SPECIES/GROUPS, ENVIRONMENTAL CONDITIONS, DTBIRD DETECTION MODULE (DETECTION DISTANCE CONFIGURATION), DTBIRD DISSUASION MODULE STATE (INSTALLED, ENABLED/DISABLED), AND COLLISION DETECTABILITY.

WIND FARMS LOCATED IN EUROPE	WTG FEATURES	SERVICE PERIOD	MAIN TARGET SPECIES/GROUPS	ENVIRONMENTAL CONDITIONS	DETECTION MODULE (DETECTION DISTANCE CONFIGURATION)	DISSUASION MODULE	COLLISION DETECTABILITY*
EUROPE 1	**Tower height**: 55-80 m. **Blades length**: 35-55 m. **Nominal Power**: 0,80-2,3 MW	2013 Whole year	Big size eagles	Altitude: 0-100 m. Temp: -10 to 25 ºC. Wind speed: Up to 140 km/h. Topography: Nearly flat.	300 m	Disabled, for experimental purposes.	99,5
EUROPE 2		2013 Whole year	Migratory flocks and raptors	Altitude: 100-500 m. Temp: -5 to 40 ºC. Wind speed: Up to 120 km/h. Topography: Hilly.	300 m	Enabled	98,4
EUROPE 3		2013 Whole year	Migratory flocks	Altitude: 100-500 m. Temp: -5 to 40 ºC. Wind speed: Up to 120 km/h. Topography: Hilly.	300 m	Not installed	99,7
EUROPE 4		2013 - 2014 Less than 1 year	Small size raptors	Altitude: 100-500 m. Temp: -5 to 40 ºC. Wind speed: Up to 120 km/h. Topography: Hilly.	150 m	Enabled	98,9
EUROPE 5		2013 - 2014 Less than 1 year	Big size shoring birds, migratory flocks and raptors	Altitude: 2000 m. Temp: -30 to 30 ºC. Wind speed: Up to 120 km/h. Topography: Mountainous.	300 m	Enabled	99,8

* % of detected flights where a Potential Collision has been discarded by the review of video recordings. No Determined collisions are automatically communicated by email to the wind farm staff in charge of in situ carcasses searches, for potential collision confirmation.

TABLE 2.
WIND FARM IDENTIFICATION; STOP PROTOCOL; STOPS (NUMBER AND LENGTH) DUE TO MAIN TARGET SPECIES, OTHER SPECIES AND NO IDENTIFIED BIRDS, AND STOP ERRORS; TOTAL STOPS; AND % OF ENERGY LOSS.

WIND FARMS LOCATED IN EUROPE	STOP PROTOCOL	MAIN TARGET SPECIES			OTHER SPECIES AND NO IDENTIFIED BIRDS			NO BIRD STOPS (ERROR)		TOTAL STOPS**	% ENERGY LOSS FOR 2.500 EQUIVALENT HOURS OF OPERATION/YEAR/WTG
		FLIGTHS/WTG/YEAR	STOPS**		FLIGTHS/WTG/YEAR	STOPS**		STOPS**			
			Nº STOPS/WTG/YEAR	TOTAL LENGTH STOPS/WTG/YEAR (HOURS)		Nº STOPS/WTG/YEAR	TOTAL LENGTH STOPS/WTG/YEAR (HOURS)	Nº STOPS/WTG/YEAR	TOTAL LENGTH STOPS/WTG/YEAR (HOURS)	TOTAL LENGTH STOPS/WTG/YEAR (HOURS)	
EUROPE 1	Flights: 1) in Collision Route, and/or 2) in Collision Risk Area: 150-200 m for big size eagles.	384	27	1,7	249	6	0,3	11	0,7	**2,7**	**0,054**
EUROPE 2	Flights: 1) in Collision Route, and/or 2) in Collision Risk Area: 150 m to WTG.	1.575	285	16,9	659	33	1,9	28	1,6	**20,5**	**0,410**
EUROPE 3	Flights: 1) in Collision Route, and/or 2) in Collision Risk Area: 150 m to WTG.	0,2	0,0	0,0	42	0,0	0,0	1	0,1	**0,1**	**0,001**
EUROPE 4	Flights: 1) in Collision Route, and/or 2) in Collision Risk Area: 50 m for small size raptors, 100 m for medium size raptors, 150-300 m for big size raptors and migratory flocks.	181	8	0,5	79	2	0,1	23	1,2	**1,7**	**0,004**
EUROPE 5	Flights: 1) in Collision Route, and/or 2) in Collision Risk Area: 150 m for migratory flocks.	60	1	0,1	162	3	0,2	9	0,4	**0,6**	**0,009**

** Stop data presented have been calculated per year and per WTG. A slight underestimation is possible in wind farms Europe 4 and Europe 5, as the Service period does not include a whole year of service. In 2 wind farms real stops are performed (Stop recorded by DTBird© system and actual Stop of WTG rotor), and in 3 wind farms virtual stops are performed (Stop recorded by DTBird© system, without actual Stop of WTG rotor, for testing or demonstrative purposes).

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DTBird® Worldwide Presence

44 DTBird® units are operating in 12 wind farms distributed in 8 countries:

- France
- Greece
- Italy
- Norway
- Poland
- Spain
- Switzerland
- US (Montana)

Currently 9 DTBird® units are being installed in France and Norway.

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