Base Load Power Hub (BLPH)

DAVIT CRANE
MOTOR DATA SHEETS AND LOAD LIST

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ROSETTI MARINO

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None

1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

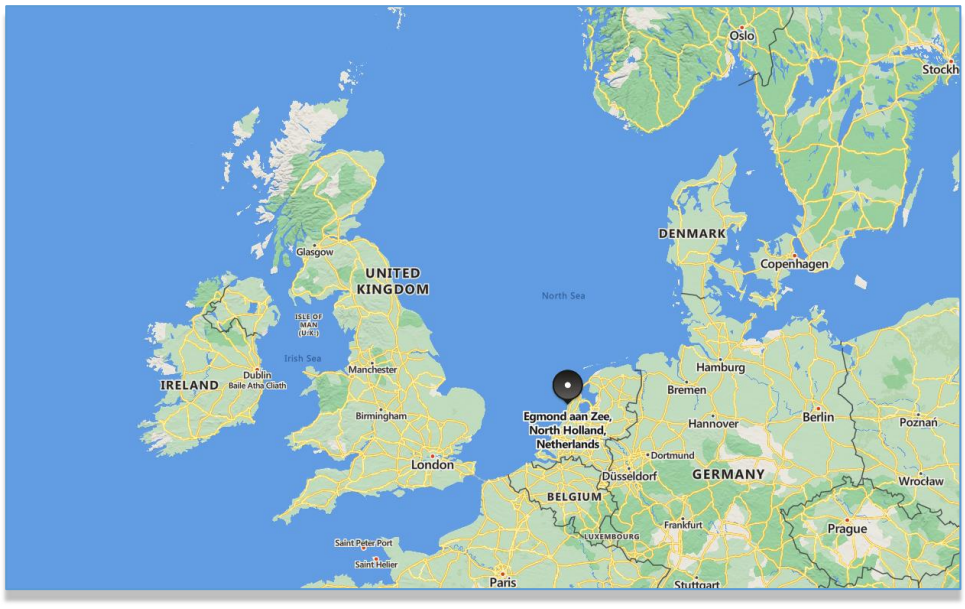


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map



Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

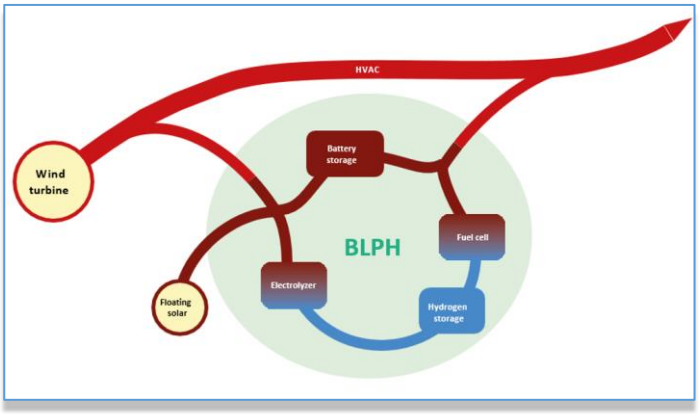


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

2 DOCUMENT SCOPE

Motor data sheets and load supply

2.1 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project

Table 1 - Definitions and Abbreviations

3 MOTOR DATA SHEETS AND LOAD LIST

3.1 ELECTRICAL LOAD LIST

FEEDING LINE	Load	Rated Power [kW]	cos φ	Load Type	Utilization factor (ku)	Utilized power [kW] (kW*ku)
400Vac / 50 Hz / 3 Phases + neutral	Hoisting motor	14,0	0,84	S3 60%	0,8	11,20
	Rotation motor	3,90	0,86	S3 60%	0,5	1,80
	Trolley motor	1,45	0,84	S3 60%	0,5	0,73
	auxiliaries	1,50	0,95		0,7	1,05
	Total	20,85				14,78

Table 2 - Electrical Load List

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3.2 MOTORS DATA SHEET

BA-BM Enhanced power (EP)

BA - BM Enhanced Power (EP) series- Intermittent duty S3 60%

The BA and BM brake motors are available in the EP 'Enhanced Power' version. These motors can supply the indicated power in the tables below only in intermittent duty (S3 60%), they cannot work in continuous duty (S1). Even the motors of the BAH series are available in the EP version, starting from size 80.
The brake assembly of the BA, BM, BAH motors in the EP version remains the same as that used on the corresponding type of motor for continuous duty (BAX, BMX, BAHX series).

Motor type	Power (kW) S3 60%	In(A) 400V 50Hz	cos φ	Ta (Nm)	rpm	BA Max Brake torque (Nm)	BM Brake torque (Nm)
2 pole							
56 B2	0.16	0.49	0.80	0.58	2650	-	2
63 A2	0.24	0.72	0.80	0.85	2700	-	5
63 B2	0.30	0.85	0.85	1.09	2630	-	5
63 C2	0.50	1.33	0.89	1.85	2580	-	5
71 A2	0.50	1.21	0.85	1.73	2760	14	5
71 B2	0.70	1.68	0.86	2.42	2760	14	5
71 C2	0.92	2.15	0.85	3.16	2765	14	5
80 A2	0.92	2.01	0.90	3.20	2730	18	10
80 B2	1.35	2.97	0.90	4.74	2720	18	10
80 C2	1.80	3.85	0.86	6.23	2759	18	10
90 SA2	1.80	4.03	0.88	6.27	2740	38	20
90 LA2	2.70	5.67	0.90	9.38	2750	38	20
100 LA2	3.60	7.47	0.86	12.19	2820	50	40
112 MB2	4.88	10.13	0.87	16.29	2860	80	60
112 MC2	6.60	13.06	0.88	21.96	2870	80	60
132 SA2	6.90	13.35	0.90	23.12	2850	150	100
132 SB2	9.00	17.19	0.89	29.95	2870	150	100
132 MA2	11.00	20.77	0.89	36.22	2900	150	100
132 MB2	13.20	24.42	0.93	43.92	2870	150	100
160 MA2	13.40	23.66	0.93	43.97	2910	190	150
160 MB2	18.30	32.68	0.93	60.26	2900	190	150
160 LA2	22.60	40.36	0.93	74.17	2910	190	150
180 LA2	28.60	51.08	0.93	93.5	2920	300	250
200 LA2	39.00	70.41	0.92	128.0	2910	300	250
200 LB2	48.10	85.08	0.92	157.6	2915	300	250

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BA - BM Enhanced Power (EP) series- Intermittent duty S3 60%

BA-BM Enhanced power (EP)

Motor type	Power (kW) S3 60%	In(A) 400V 50Hz	cos φ	Tn (Nm)	rpm	BA Max Brake torque (Nm)	BM Brake torque (Nm)
4 pole							
63 A4	0.15	0.60	0.80	1.30	1100	-	5
63 B4	0.23	0.78	0.73	1.65	1300	-	5
63 C4	0.26	0.81	0.89	1.92	1310	-	5
63 D4	0.37	1.24	0.85	2.96	1180	-	5
71 A4	0.33	0.94	0.81	2.33	1330	14	5
71 B4	0.5	1.37	0.79	3.48	1320	14	5
71 C4	0.7	1.97	0.82	5.29	1290	14	5
71 D4	0.8	2.22	0.80	5.86	1325	14	5
80 A4	0.7	1.96	0.80	5.13	1330	18	10
80 B4	0.98	2.55	0.79	6.97	1335	18	10
80 C4	1.20	3.04	0.78	8.37	1365	18	10
80 D4	1.30	3.50	0.73	9.09	1365	18	10
90 SA4	1.45	3.33	0.84	10.22	1355	38	20
90 LA4	1.95	4.43	0.86	13.90	1340	38	20
90 LB4	2.30	5.27	0.83	16.15	1360	38	20
90 LC4	2.70	6.34	0.82	19.10	1350	38	20
100 LA4	2.90	6.29	0.86	20.21	1370	50	40
100 LB4	3.90	8.30	0.86	26.99	1380	50	40
112 MB4	4.80	9.96	0.86	32.86	1395	80	60
112 MC4	6.60	13.68	0.85	45.02	1400	80	60
132 SB4	7.10	14.54	0.85	48.09	1410	150	100
132 MA4	9.80	19.60	0.86	66.61	1405	150	100
132 MB4	12.0	23.73	0.87	81.27	1410	150	100
132 MC4	14.0	28.34	0.84	94.15	1420	150	100
160 MA4	12.0	24.29	0.84	79.30	1445	190	150
160 MB4	14.0	27.68	0.85	93.2	1435	190	150
160 LA4	19.5	38.11	0.85	129.8	1435	190	150
180 LA4	24.0	46.89	0.86	158.6	1445	300	250
180 LB4	28.6	55.89	0.85	189.0	1445	300	250
200 LB4	39.0	74.47	0.86	259.5	1435	300	250
225 S4	48.1	88.82	0.86	313.5	1465	600	400
225 M4	58.5	108.0	0.87	381.3	1465	600	400
250 M4	70.4	122.9	0.89	455.8	1475	700	-
280 S4	97.5	176.2	0.86	628.3	1482	1000	-
280 M4	117.0	216.0	0.86	754.9	1480	1000	-

1. Motor characteristic values reported in the tables refer to intermittent duty (S3 60%), voltage 3~400V/50 Hz, ambient temperature max. 40 °C, altitude up to 1000 m. above sea level operating conditions. These motors are not included in the scope of the regulation (EU) 2019/1781 s then and they are exempt from efficiency requirements of the regulation.
2. MGM keeps the data provided as up-to-date and correct as possible. Since the products are subject to changes and improvements, the data indicated cannot be considered binding. The data indicated must also be understood as being general in nature. For specific applications, please contact the MGM staff.
3. For BA Enhanced Power (EP) motors the maximum brake torque values indicated on the chart refer to AC brake. DC brake on BA series is available on request only.
4. The maximum brake torque for BAK 132 motors series is 120 Nm.

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