ENERGY SYSTEMS AFRICA

LUVSIDE

Make every kW Greener

Introduction

Energy systems Africa was established in 2016, started with energy efficiencies before moving onto renewable energy. We became one of the first bank funded renewable energy projects with our Power Purchase Agreements with Makro.

Luvside is a leading developer and supplier of small-scale wind turbines. Their mission is to bring autonomous and sustainable energy to organizations and people in remote landscapes, windy regions and coastal areas.

As the sole distributors of Luvside wind turbines in the African continent ESA aims to be Africa's preferred sustainability partner across the commercial and residential sectors, bringing German ingenuity to the local market.

Together, we can offer you the best solution to achieve your decarbonization goals, reduce your operational costs, and enhance your social and environmental impact.

Considerations

Environmental impact: Wind energy significantly reduces carbon emissions, helping combat climate change.

Renewable resources: Unlike fossil fuels wind energy ensure sustainability and is an inexhaustible energy supply.

Cost savings: Over time, green energy solutions often lead to a reduction in costs.

Energy independence: By diversifying energy sources and relying on renewables this will reduce the dependency on energy providers using coal and diesel fuels.

Corporate responsibility: Embracing green energy aligns with corporate responsibility, enhancing brand image and meeting the growing demand for substantiality.

Resilience to energy price volatility: Green energy systems protect the business from price fluctuations associated with traditional energy sources, providing stability for business and consumers.

LS HuraKan 8.0

Horizontal axis wind power turbine

Highlights

Nominal Power	8 kW at 11 m/s
Annual yield	~ 12.000 kWh
Rotor diameter	6.0 m
Hub height	12.0 m

The LS HuraKan 8.0 turbine with horizontal axis is not slowed down or switched off at high wind speeds, but continues to run at full load in the most attractive wind phase.

LS Helix 3.0

Vertical wind power turbine

Highlights

Nominal Power	3 kW at 16 m/s
Annual yield	~ 2.500 kWh
Diameter	2.2 m
Height	4.0 m

The LS Helix 3.0 wind turbines impress with their high energy efficiency. Equipped with vibration decoupling, no structure-borne noise is transmitted and enables roof mounting.

LS Double Helix 1.0

Vertical wind power turbine

Highlights

Nominal Power	1 kW at 15 m/s
Annual yield	~ 1.000 kWh
Diameter	1.4 m
Height	3.0 m

The slim silhouette of the LS Double Helix 1.0 blends into its surroundings in a minimalist manner. With its low weight, it can be installed on a mast or on a robust roof.

LS Double Helix 0.5 Marina

Vertical wind power turbine

Highlights

Nominal Power	500 W at 16 m/s
Annual yield	~ 300 kWh
Diameter	1.4 m
Height	1.0 m

Suitable for maritime applications, but also for flat roofs of garages and houses. The off-grid LS Double Helix 0.5 Marina charges 48 V batteries with absolute silence.

Hurakan 8.0

Output Power

- Nominal Power 8.0 kW at 11m/s
- Start-up wind speed 3 m/s (11 km/h)
- Max wind speed before destruction 50 m/s (180 km/h)
- Requires Mast and Foundation

Turbine Dimension

- Diameter 6 m
- Height 15-25 m
- Speed of Rotation 260 rpm
- Material Glassfiber plastic (GRP)

Generator

- Rated Output power 8 kW
- Rated Output Voltage 400 VAC
- Rated Speed 260 rpm

Year	System Cost	Wind saving	Maintenance	Taxation	Annual Cash Flow	Cumulative Cash Flow
0	-R648 339,26	R0,00	R0,00	R0,00	-R648 339,26	-R648 339,26
1	R0,00	R36 000,00	-R1 000,00	R209 364,50	R244 364,50	-R403 974,76
2	R0,00	R41 400,00	-R1 050,00	-R10 894,50	R51 244,50	-R352 730,26
3	R0,00	R47 610,00	-R1 102,50	-R12 557,03	R59 064,53	-R293 665,74
4	R0,00	R54 751,50	-R1 157,63	-R14 470,35	R68 064,22	-R225 601,51
5	R0,00	R62 964,23	-R1 215,51	-R16 672,15	R78 420,87	-R147 180,64
6	R0,00	R72 408,86	-R1 276,28	-R19 205,80	R90 338,37	-R56 842,27
7	R0,00	R83 270,19	-R1 340,10	-R22 121,12	R104 051,22	R47 208,95
8	R0,00	R95 760,72	-R1 407,10	-R25 475,48	R119 829,09	R167 038,04
9	R0,00	R110 124,82	-R1 477,46	-R29 334,79	R137 982,16	R305 020,20
10	R0,00	R126 643,55	-R1 551,33	-R33 774,90	R158 867,12	R463 887,31
11	R0,00	R145 640,08	-R1 628,89	-R38 883,02	R182 894,20	R646 781,52
12	R0,00	R167 486,09	-R1 710,34	-R44 759,45	R210 535,20	R857 316,72
13	R0,00	R192 609,00	-R1 795,86	-R51 519,55	R242 332,70	R1 099 649,42
14	R0,00	R221 500,35	-R1 885,65	-R59 295,97	R278 910,68	R1 378 560,09
15	R0,00	R254 725,41	-R1 979,93	-R68 241,28	R320 986,75	R1 699 546,85
16	R0,00	R292 934,22	-R2 078,93	-R78 530,93	R369 386,22	R2 068 933,07
17	R0,00	R336 874,35	-R2 182,87	-R90 366,70	R425 058,18	R2 493 991,24
18	R0,00	R387 405,50	-R2 292,02	-R103 980,64	R489 094,13	R2 983 085,37
19	R0,00	R445 516,33	-R2 406,62	-R119 639,62	R562 749,33	R3 545 834,70
20	R0,00	R512 343,78	-R2 526,95	-R137 650,54	R647 467,37	R4 193 302,08
21	R0,00	R589 195,35	-R2 653,30	-R158 366,35	R744 908,40	R4 938 210,48
22	R0,00	R677 574,65	-R2 785,96	-R182 192,95	R856 981,63	R5 795 192,11
23	R0,00	R779 210,85	-R2 925,26	-R209 597,11	R985 882,69	R6 781 074,80
24	R0,00	R896 092,47	-R3 071,52	-R241 115,66	R1 134 136,60	R7 915 211,40
25	R0,00	R1 030 506,34	-R3 225,10	-R277 365,94	R1 304 647,18	R9 219 858,58
26	R0,00	R1 185 082,29	-R3 386,35	-R319 057,90	R1 500 753,84	R10 720 612,43
27	R0,00	R1 362 844,64	-R3 555,67	-R367 008,02	R1 726 296,99	R12 446 909,41
28	R0,00	R1 567 271,33	-R3 733,46	-R422 155,23	R1 985 693,10	R14 432 602,52
29	R0,00	R1 802 362,03	-R3 920,13	-R485 579,31	R2 284 021,22	R16 716 623,74
30	R0,00	R2 072 716,34	-R4 116,14	-R558 522,06	R2 627 122,26	R19 343 746,00
Tariff R3/kWh; 15% Annual increase; Average Annual wind speed of 6m/s						

Details

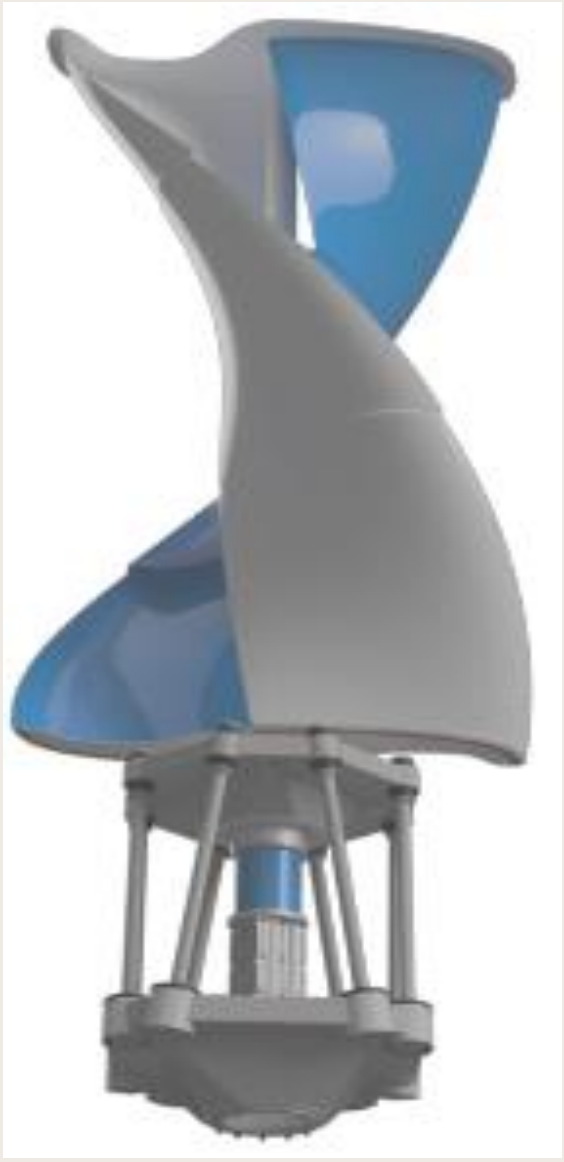
Financial Considerations

- Turbine Cost R648 339,26
- Internal rate of return 23%
- Payback 6 years

Factors

- Annual Production 12 000kWh
- Initial tariff R3,0/kWh
- Average Annual windspeed 6m/s
- Tariff annual increase 15%

Helix 3.0



Output Power

- Nominal Power 3.0 kW at 15.85m/s
- Start-up wind speed 4 m/s (14 km/h)
- Max wind speed before destruction 50 m/s (180 km/h)
- May require Mast and Foundation

Turbine Dimension

- Diameter 2,2 m
- Height 4 m
- Speed of Rotation 100 – 140 rpm
- Material Glassfiber plastic (GRP)

Generator

- Rated Output power 3 kW
- Rated Output Voltage 400 VAC
- Rated Speed 90 rpm

Year	System Cost	Wind saving	Maintenance	Taxation	Annual Cash Flow	Cumulative Cash Flow
0	-R350 049,77	R0,00	R0,00	R0,00	-R350 049,77	-R350 049,77
1	R0,00	R8 250,00	-R1 000,00	R116 184,30	R123 434,30	-R226 615,48
2	R0,00	R9 487,50	-R1 050,00	-R2 278,13	R6 159,38	-R220 456,10
3	R0,00	R10 910,63	-R1 102,50	-R2 648,19	R7 159,93	-R213 296,17
4	R0,00	R12 547,22	-R1 157,63	-R3 075,19	R8 314,40	-R204 981,77
5	R0,00	R14 429,30	-R1 215,51	-R3 567,72	R9 646,07	-R195 335,70
6	R0,00	R16 593,70	-R1 276,28	-R4 135,70	R11 181,71	-R184 153,98
7	R0,00	R19 082,75	-R1 340,10	-R4 790,52	R12 952,14	-R171 201,84
8	R0,00	R21 945,16	-R1 407,10	-R5 545,28	R14 992,79	-R156 209,06
9	R0,00	R25 236,94	-R1 477,46	-R6 415,06	R17 344,42	-R138 864,63
10	R0,00	R29 022,48	-R1 551,33	-R7 417,21	R20 053,94	-R118 810,69
11	R0,00	R33 375,85	-R1 628,89	-R8 571,68	R23 175,28	-R95 635,42
12	R0,00	R38 382,23	-R1 710,34	-R9 901,41	R26 770,48	-R68 864,94
13	R0,00	R44 139,56	-R1 795,86	-R11 432,80	R30 910,91	-R37 954,03
14	R0,00	R50 760,50	-R1 885,65	-R13 196,21	R35 678,64	-R2 275,39
15	R0,00	R58 374,57	-R1 979,93	-R15 226,55	R41 168,09	R38 892,70
16	R0,00	R67 130,76	-R2 078,93	-R17 563,99	R47 487,84	R86 380,53
17	R0,00	R77 200,37	-R2 182,87	-R20 254,72	R54 762,77	R141 143,31
18	R0,00	R88 780,43	-R2 292,02	-R23 351,87	R63 136,54	R204 279,85
19	R0,00	R102 097,49	-R2 406,62	-R26 916,54	R72 774,34	R277 054,18
20	R0,00	R117 412,12	-R2 526,95	-R31 018,99	R83 866,17	R360 920,35
21	R0,00	R135 023,93	-R2 653,30	-R35 740,07	R96 630,56	R457 550,92
22	R0,00	R155 277,52	-R2 785,96	-R41 172,72	R111 318,84	R568 869,76
23	R0,00	R178 569,15	-R2 925,26	-R47 423,85	R128 220,04	R697 089,80
24	R0,00	R205 354,52	-R3 071,52	-R54 616,41	R147 666,59	R844 756,39
25	R0,00	R236 157,70	-R3 225,10	-R62 891,80	R170 040,80	R1 014 797,19
26	R0,00	R271 581,36	-R3 386,35	-R72 412,65	R195 782,35	R1 210 579,54
27	R0,00	R312 318,56	-R3 555,67	-R83 365,98	R225 396,91	R1 435 976,45
28	R0,00	R359 166,35	-R3 733,46	-R95 966,88	R259 466,01	R1 695 442,46
29	R0,00	R413 041,30	-R3 920,13	-R110 462,72	R298 658,45	R1 994 100,92
30	R0,00	R474 997,49	-R4 116,14	-R127 137,97	R343 743,39	R2 337 844,31
Tariff R3/kWh; 15% Annual increase; Average Annual wind speed of 6m/s						

Details

Financial Considerations

- Turbine Cost R350 049,77
- Internal rate of return 12%
- Payback 14 years

Factors

- Annual Production 2 750kWh
- Initial tariff R3,0/kWh
- Average Annual windspeed 6m/s
- Tariff annual increase 15%

Helix 1.0

Output Power

- Nominal Power 1.0 kW at 15m/s
- Start-up wind speed 3 m/s (14 km/h)
- Max wind speed before destruction 50 m/s (180 km/h)
- May require Mast and Foundation

Turbine Dimension

- Diameter 1,4 m
- Height 3 m
- Speed of Rotation 100 – 140 rpm
- Material Glassfiber plastic (GRP)

Generator

- Rated Output power 1 kW
- Rated Output Voltage 400 VAC
- Rated Speed 90 rpm

Year	System Cost	Wind saving	Maintenance	Taxation	Annual Cash Flow	Cumulative Cash Flow
0	-R313 092,57	R0,00	R0,00	R0,00	-R313 092,57	-R313 092,57
1	R0,00	R3 750,00	-R1 000,00	R104 926,24	R107 676,24	-R205 416,33
2	R0,00	R4 312,50	-R1 050,00	-R880,88	R2 381,63	-R203 034,71
3	R0,00	R4 959,38	-R1 102,50	-R1 041,36	R2 815,52	-R200 219,19
4	R0,00	R5 703,28	-R1 157,63	-R1 227,33	R3 318,33	-R196 900,86
5	R0,00	R6 558,77	-R1 215,51	-R1 442,68	R3 900,59	-R193 000,27
6	R0,00	R7 542,59	-R1 276,28	-R1 691,90	R4 574,40	-R188 425,87
7	R0,00	R8 673,98	-R1 340,10	-R1 980,15	R5 353,73	-R183 072,13
8	R0,00	R9 975,07	-R1 407,10	-R2 313,35	R6 254,62	-R176 817,51
9	R0,00	R11 471,34	-R1 477,46	-R2 698,35	R7 295,53	-R169 521,98
10	R0,00	R13 192,04	-R1 551,33	-R3 142,99	R8 497,72	-R161 024,26
11	R0,00	R15 170,84	-R1 628,89	-R3 656,33	R9 885,62	-R151 138,64
12	R0,00	R17 446,47	-R1 710,34	-R4 248,75	R11 487,37	-R139 651,27
13	R0,00	R20 063,44	-R1 795,86	-R4 932,25	R13 335,33	-R126 315,93
14	R0,00	R23 072,95	-R1 885,65	-R5 720,57	R15 466,73	-R110 849,20
15	R0,00	R26 533,90	-R1 979,93	-R6 629,57	R17 924,39	-R92 924,81
16	R0,00	R30 513,98	-R2 078,93	-R7 677,46	R20 757,59	-R72 167,22
17	R0,00	R35 091,08	-R2 182,87	-R8 885,21	R24 022,99	-R48 144,23
18	R0,00	R40 354,74	-R2 292,02	-R10 276,93	R27 785,79	-R20 358,44
19	R0,00	R46 407,95	-R2 406,62	-R11 880,36	R32 120,97	R11 762,53
20	R0,00	R53 369,14	-R2 526,95	-R13 727,39	R37 114,80	R48 877,33
21	R0,00	R61 374,52	-R2 653,30	-R15 854,73	R42 866,49	R91 743,82
22	R0,00	R70 580,69	-R2 785,96	-R18 304,58	R49 490,15	R141 233,97
23	R0,00	R81 167,80	-R2 925,26	-R21 125,48	R57 117,05	R198 351,02
24	R0,00	R93 342,97	-R3 071,52	-R24 373,29	R65 898,15	R264 249,18
25	R0,00	R107 344,41	-R3 225,10	-R28 112,21	R76 007,10	R340 256,27
26	R0,00	R123 446,07	-R3 386,35	-R32 416,12	R87 643,59	R427 899,87
27	R0,00	R141 962,98	-R3 555,67	-R37 369,97	R101 037,34	R528 937,20
28	R0,00	R163 257,43	-R3 733,46	-R43 071,47	R116 452,50	R645 389,70
29	R0,00	R187 746,05	-R3 920,13	-R49 633,00	R134 192,92	R779 582,62
30	R0,00	R215 907,95	-R4 116,14	-R57 183,79	R154 608,03	R934 190,65
TariffR3/kWh; 15% Annual increase; Average Annual wind speed of 6m/s						

Details

Financial Considerations

- Turbine cost R313 092,57
- Internal rate of return 8%
- Payback 18 years

Factors

- Annual Production 1 250kWh
- Initial tariff R3,0/kWh
- Average Annual windspeed 6m/s
- Tariff annual increase 15%

Marina 0.5

Output Power

- Nominal Power 500 W at 16m/s
- Start-up wind speed 3 m/s (14 km/h)
- Max wind speed before destruction 50 m/s (180 km/h)

Turbine Dimension

- Diameter 1,4 m
- Height 1 m
- Speed of Rotation 20 – 130 rpm
- Material Glassfiber plastic (GRP)

Generator

- Rated Output power 500W
- Rated Output Voltage 48 VAC
- Rated Speed 130 rpm

Year	System Cost	Wind saving	Maintenance	Taxation	Annual Cash Flow	Cumulative Cash Flow
0	-R59 000,00	R0,00	R0,00	R0,00	-R59 000,00	-R59 000,00
1	R0,00	R1 350,00	-R500,00	R19 683,00	R20 533,00	-R38 467,00
2	R0,00	R1 552,50	-R525,00	-R277,43	R1 304,93	-R37 162,08
3	R0,00	R1 785,38	-R551,25	-R333,21	R1 567,34	-R35 594,74
4	R0,00	R2 053,18	-R578,81	-R398,08	R1 872,45	-R33 722,29
5	R0,00	R2 361,16	-R607,75	-R473,42	R2 226,82	-R31 495,46
6	R0,00	R2 715,33	-R638,14	-R560,84	R2 638,03	-R28 857,43
7	R0,00	R3 122,63	-R670,05	-R662,20	R3 114,78	-R25 742,65
8	R0,00	R3 591,03	-R703,55	-R779,62	R3 667,10	-R22 075,55
9	R0,00	R4 129,68	-R738,73	-R915,56	R4 306,51	-R17 769,04
10	R0,00	R4 749,13	-R775,66	-R1 072,84	R5 046,31	-R12 722,74
11	R0,00	R5 461,50	-R814,45	-R1 254,71	R5 901,76	-R6 820,98
12	R0,00	R6 280,73	-R855,17	-R1 464,90	R6 890,46	R69,48
13	R0,00	R7 222,84	-R897,93	-R1 707,73	R8 032,64	R8 102,12
14	R0,00	R8 306,26	-R942,82	-R1 988,13	R9 351,57	R17 453,69
15	R0,00	R9 552,20	-R989,97	-R2 311,80	R10 874,04	R28 327,73
16	R0,00	R10 985,03	-R1 039,46	-R2 685,30	R12 630,87	R40 958,60
17	R0,00	R12 632,79	-R1 091,44	-R3 116,16	R14 657,52	R55 616,11
18	R0,00	R14 527,71	-R1 146,01	-R3 613,06	R16 994,76	R72 610,87
19	R0,00	R16 706,86	-R1 203,31	-R4 185,96	R19 689,51	R92 300,38
20	R0,00	R19 212,89	-R1 263,48	-R4 846,34	R22 795,76	R115 096,14
21	R0,00	R22 094,83	-R1 326,65	-R5 607,41	R26 375,58	R141 471,73
22	R0,00	R25 409,05	-R1 392,98	-R6 484,34	R30 500,41	R171 972,13
23	R0,00	R29 220,41	-R1 462,63	-R7 494,60	R35 252,38	R207 224,51
24	R0,00	R33 603,47	-R1 535,76	-R8 658,28	R40 725,99	R247 950,49
25	R0,00	R38 643,99	-R1 612,55	-R9 998,49	R47 029,93	R294 980,42
26	R0,00	R44 440,59	-R1 693,18	-R11 541,80	R54 289,21	R349 269,63
27	R0,00	R51 106,67	-R1 777,84	-R13 318,79	R62 647,62	R411 917,25
28	R0,00	R58 772,68	-R1 866,73	-R15 364,61	R72 270,55	R484 187,81
29	R0,00	R67 588,58	-R1 960,06	-R17 719,70	R83 348,21	R567 536,02
30	R0,00	R77 726,86	-R2 058,07	-R20 430,57	R96 099,37	R663 635,39
Tariff R3/kWh; 15% Annual increase; Average Annual wind speed of 6m/s						

Details

Financial Considerations

- Turbine cost R59 000,00
- Internal rate of return 14%
- Payback 11 years

Factors

- Annual Production 450kWh
- Initial tariff R3,0/kWh
- Average Annual windspeed 6m/s
- Tariff annual increase 15%


STADTWERKE
LÜBECK

Thank you

Head Office

011 897 7800

www.esafrica.co.za

209 Rondebult road, Boksburg, Johannesburg

Rodney Love

082 552 7678

r.love@esafrica.co.za

Bubele Nyiba

083 632 7333

b.nyiba@esafrica.co.za