



NEK'S 960 MW WIND POWER PROJECT PIPELINE IN GHANA

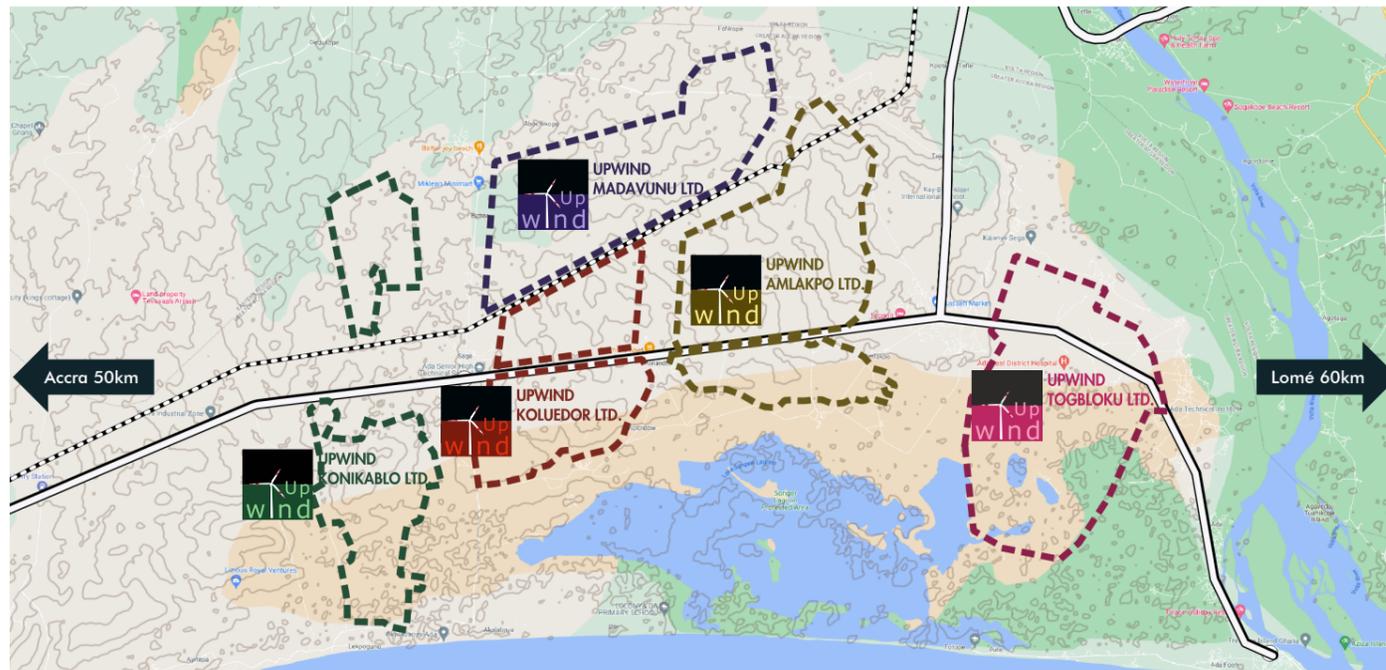
Community Engagement and Environmental Aspects

- ★ A special project fund will contribute on a yearly basis with more than \$ 2 m to support the local population
- ★ The land is just leased and belongs to the traditional owners also once the wind farms will be operational

- ★ Environmental and Social Impact Assessments have been conducted
- ★ Irrigation systems and new farming technologies to motivate farmers to cultivate their land



Locations



The project sites are located in the Greater Accra Region between Tsopoli and Ada. They are North and South of the Accra-Aflao-Road and have a good connection to Tema harbour.

Investment Partners

- ★ The 960 MW wind power portfolio requires \$ 1.2 - 1.4 bio investment, which NEK together with third party equity providers and lenders will provide
- ★ The wind farms have the unanimous support from the World Bank Group, IFC, OPIC, KfW, GIZ and other well positioned international organisations
- ★ The projects are in line with the policy of the ECOWAS states to increase the percentage of renewables within the generation mix and providing guarantees for IPP's

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Filling the electricity supply gap: How NEK's wind energy projects can avert an electricity supply shortage in Ghana and contribute fighting Climate Change



NEK UMWELTECHNIK AG



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NEK Umwelttechnik AG

NEK Umwelttechnik AG, which was established in 1989, is a Swiss engineering company active worldwide in several application fields related to renewable energy, mainly wind park developments. With more than 30 years of experience in the RE sector, NEK is an expert in specialized management and engineering services related to wind energy. The company is active in Ghana since 1998.

NEK (Ghana) Ltd. is one of NEK's affiliated branch offices established 2003 in Accra and works on project developments in West Africa. NEK has comprehensive and long-year wind measuring data available on heights of up to 200 m above ground.

Introduction & Background

- ★ Ghana has good and untapped wind resources at selected locations, for which NEK has contracted the land
- ★ Power demand in Ghana and surrounding ECOWAS states is continuously growing
- ★ In medium- to long-term, Renewable Energies will be the only reasonable and feasible power source also in West-Africa
- ★ Thanks to its geographic position, Ghana has the potential to become a regional Renewable Energy Hub and increase GDP and employment also by means of electricity export
- ★ Interest of foreign investors for Renewable Energy Projects in Ghana is huge - supposed stable conditions and clear structures are granted
- ★ Current challenges in the electricity sector in Ghana (high kWh prices, fuel supply problems, decreasing levels of Volta and Bui Lake, over-supply due to outdated and very expensive emergency power deals) can be adequately addressed by quickly and strongly increasing the Renewable Energy Penetration in the electricity mix

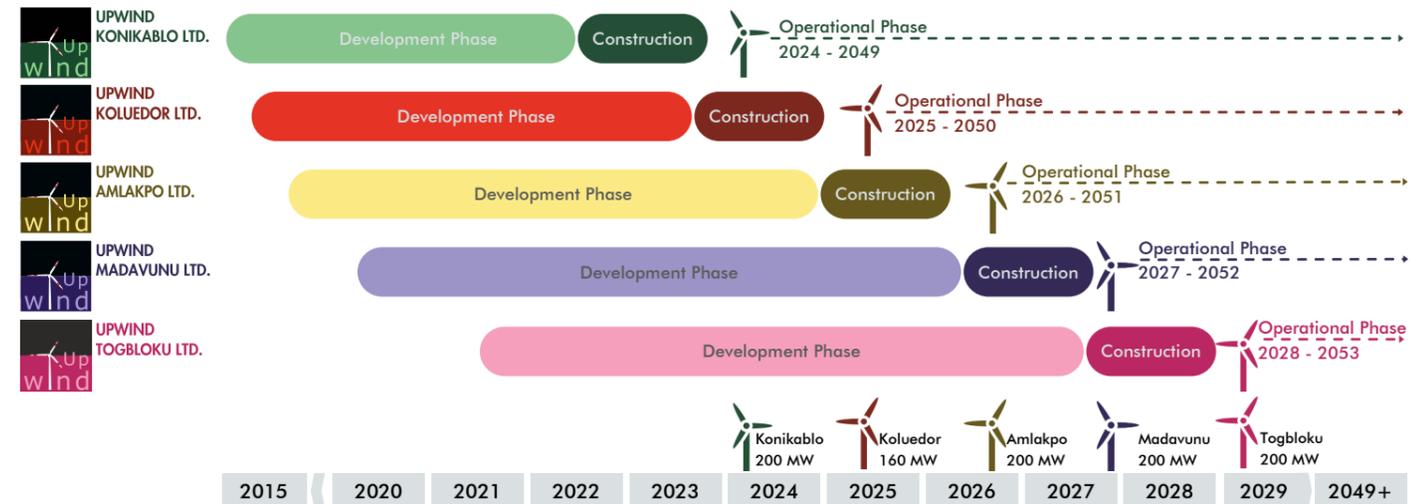
Ghana's electricity supply and deficit forecast

	2022	2023	2024	2025	2026
Projected Demand + 18% Planning Reserve Margin (MW)	4,176	4,412	4,678	4,921	5,262
Total Existing Generation (MW)	4,470	4,600	4,420	4,420	4,420
Committed Generation Projects Expected to become operational in the Medium Term					
Early Power Limited	190	190	390	390	390
Pwalugu Hydro				60	60
Total Committed Generation	190	190	390	450	450
Total Dependable Generation (MW)	4,660	4,790	4,810	4,870	4,870
Actual Reserve Margin (MW)	1,121	1,052	846	700	411
Actual Reserve Margin (%)	31.69%	28.13%	21.35%	16.78%	9.21%
Surplus/Deficit (MW)	484	379	133	-51	-392
Surplus/Deficit (%)	13.69%	10.13%	3.35%	-1.22%	-8.79%

* Official GRIDCo 2021 Electricity Supply Plan

Filling the electricity supply gap

Provisional Implementation Schedule for NEK's project pipeline



Filling the electricity supply gap

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Implementation of NEK Wind Projects (Konikablo, Koluedor and Amlakpo)					
Nominal Capacity (MW)			200	360	560
Average Production (MW) (Capacity Factor 33%)			66	119	185
Total Dependable Generation (MW)	4,660	4,790	4,876	4,989	5,055
Surplus/Deficit (MW)	484	379	199	68	-207

Plus additional capacity to follow from 2026 with the 200 MW Wind Farm Madavunu and with the 200 MW Wind Farm Togbloku, leading to an additional average production of 132 MW. Implementation can also be earlier, if required.

Why the government should support NEK's Wind Energy Pipeline

- ★ **Short implementation and realisation time required:** Projects can become operational 18 months after construction start
- ★ **Fight climate change:** Wind energy is not producing any CO₂ and therefore support the 1.5° C goals of COP26 and Glasgow
- ★ **Electricity Tarrif:** Wind energy production is much cheaper than burning fossil fuels or gas
- ★ **High-Tech:** Ghana can achieve a leadership role in Renewables with the latest wind turbine technology in West Africa
- ★ **Independence:** Ghana becomes less depended from expensive oil and gas imports if implementing Renewables
- ★ **Paris Agreements:** Ghana has signed and must fulfill the Paris Climate Protocoll, which only can be achieved with Renewables
- ★ **Green Hydrogen:** Ghana can become a pioneer for the production and export of Green Hydrogen
- ★ **E-Mobility:** Electricity for electrical cars can only make sense if it comes 100% from Renewables like wind