

# NEK to bring Green Energy to Ghana for the Transition to Net Zero, creating a New Renewable Energy Platform called Anansi Green Energy



NEK UMWELTECHNIK AG  
CLAUSIUSSTRASSE 41  
CH-8006 ZURICH  
SWITZERLAND  
+41 44 261 07 07  
info@nek.ch  
www.nek.ch

NEK (GHANA) LTD.  
14 KOI STREET  
KUKUN - OSU  
P.O. BOX CT 8181  
ACCRA, GHANA

RENEWABLE ENERGY  
PROJECTS WORLDWIDE

## About NEK Umwelttechnik AG (NEK)

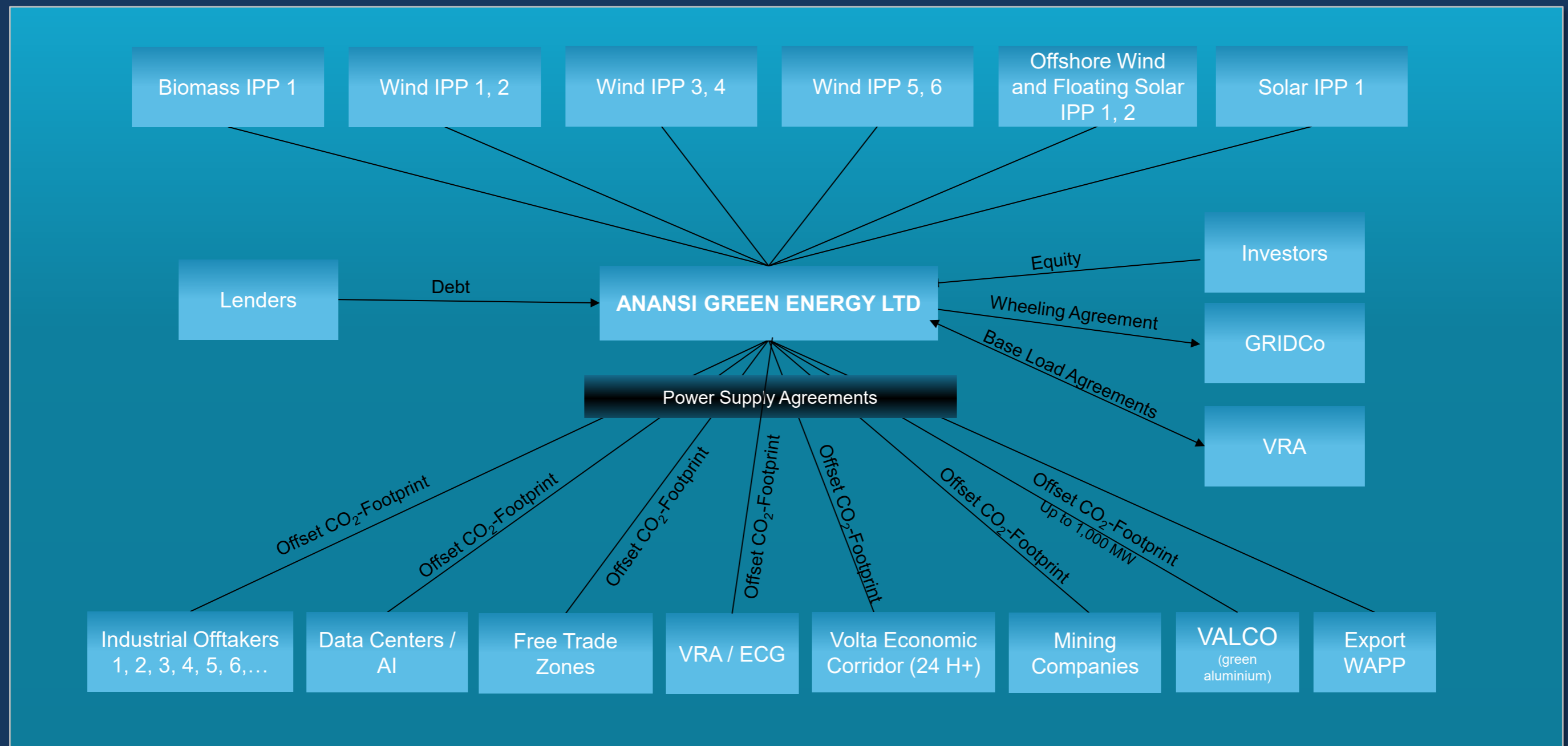
- † NEK is a Swiss engineering company in the green energy sector, active in Ghana since 1998.
- † NEK has successfully developed 6 land-based wind energy projects between Tema and Ada with a total planned capacity of 1,500 MW, two of them ready for implementation, based among others on long-year comprehensive wind measurements.
- † NEK has initiated in 2021 the development of 2 large-scale offshore wind energy projects off the coasts of Ningo and Anloga in combination with floating solar devices with an expected installed capacity of more than 3,000 MW, to be implemented in phases.
- † The 6 onshore and 2 offshore wind / floating solar energy projects of NEK will produce in the future more than 11,000 GWh of green, cheap and reliable electricity per year for its clients.
- † NEK has established in Ghana together with its partners a green energy platform called **Anansi Green Energy Ltd.** to deliver to its future clients clean, cheap, reliable, home-made, sustainable and never-ending electricity.
- † NEK's projects do not require any fuel, LNG, gas, oil or other fossil, outdated energy sources to produce electricity - our "fuel" is the wind and the sun, which is never ending, based in Ghana and for free, coming home every day.

## About the current Energy Situation of Ghana

- † Ghana requires a drastic, immediate and engaged revolution of its energy sector.
- † The actual situation with no diversification of the energy mix (approx. 70% are thermal, while approx. 30% are hydro) can no longer satisfy the increasing demand.
- † The dependence on the possibility to deliver gas to the different thermal plants and the unpredictable level of the lakes at Akosombo, Kpong and Bui do not allow for a strategic planning of the future energy output if just having these two energy sources available.
- † Especially the dependence on the timely delivery of gas, depending on financial resources to pay for it, led to increased load sheddings in the country in the past months; this brought back the dark times of Dumsor - immediate actions are required.
- † During the past 10 years, only few additional MW of power was installed in the country, and no substantial new generation plants are in the planning or implementation phase.
- † According to different independent reports, the country will plunge into an even deeper power crisis in the years to come with generation and supply deficits of more than 1,000 MW already in the very short term. Energy deficits will increase on a yearly basis.
- † Further conventional IPP's are not possible due to ongoing challenges with existing IPP's.
- † ECG / VRA and the Government will not be able (or willing) to contract with IPP's with a "take-or-pay" PPA and with typical PCOA / GCSA support.
- † Power generation needs will continue to increase notwithstanding the challenges of the power sector with estimated more than 500 MW each year.
- † A new structure model will be required to allow a diversification of the energy sector towards a drastic increase in renewable energy sources which will be implemented without impacting on public sector borrowings or IMF imposed restrictions - NEK's renewable energy platform **Anansi Green Energy Ltd.** will be the instrument to do so.

## About the Creation of Ghana's New Renewable Energy Platform called Anansi Green Energy Ltd. by NEK

- † The renewable energy platform Anansi Green Energy Ltd. is the new SPV in Ghana with a number of specific partners.
- † Discussions with Ghanaian stakeholders to become a partner in the platform are ongoing; a potential candidate would be, among others, VRA and ECG. Stakeholders have confirmed that they would wish to play a role in the platform - (a) by providing baseload energy, (b) by being an off-taker from the platform for green energy and, eventually, (c) by becoming a shareholder in the platform on agreed terms.
- † Major industrial / power funds and investors from abroad will play a role in the equity of the platform, such as Azura Power, Norfund, AFC, Janus Continental Group, Savannah Energy, Green Climate Fund, and others.
- † The platform will also source debt from typical DFI / commercial lenders, which already have confirmed their interest to participate in the diversification of Ghana's energy sector.
- † The platform will be a "captive" industrial power generator, which produces its own green energy from the renewable energy projects acquired and selling capacity / energy directly to ECG, VRA, 24 H Economy and to large industrial off-takers, such as for example mining companies, steel manufacturers, cement producers, other large industries, etc. and also go for export in the future.
- † The carbon savings resulting from this initiative will be huge; the green certificates can be used to make Ghana fulfil its NDC's, to reduce the CO<sub>2</sub>-footprint of involved entities such as ECG, VRA, VALCO and others and to also showcase the pioneering role of Ghana to combat climate change.
- † The resulting green certificates can then also be internationally traded based on the bilateral agreement signed between Switzerland and Ghana in 2020, among others.



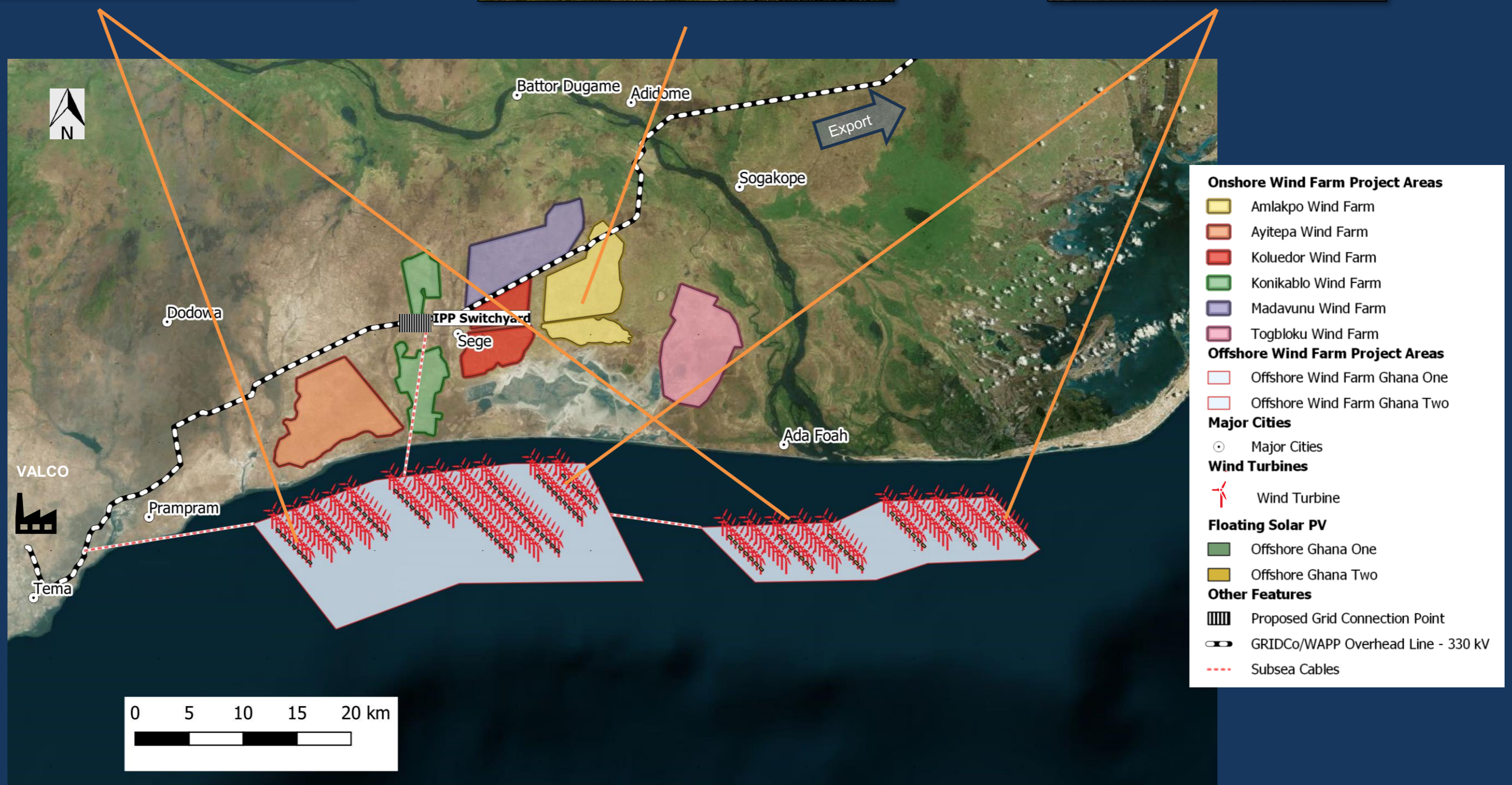
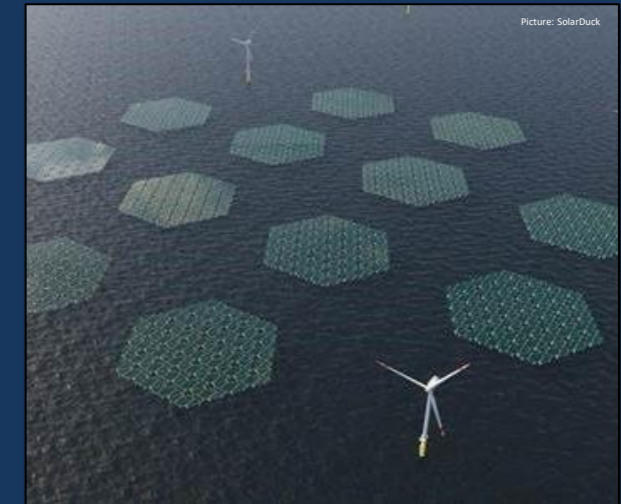
### Offshore Wind Energy - 2,500 MWp



### Onshore Wind Energy - 1,500 MWp



### Floating Solar Energy- 600 MWp



## Ghana's National Determined Contributions (NDC's)

- ↑ The Government of Ghana intends to implement its committed NDC's, fulfil the COP26, COP27, COP28, COP29 and COP30 obligations and to move towards net zero emissions.
- ↑ The country launched its new Energy Transition and Investment Plan during a Global Africa Business Initiative event in New York in late March 2023.
- ↑ In there it is stated that the growth in Ghana in the coming years requires a substantial growth in new electricity capacity, dominated by wind and solar power.
- ↑ The document also expresses that the installed power capacity in Ghana will grow from actually around 5,5 GW to approximately 38 GW in 2040 and to 64 GW in 2045.
- ↑ This means that up to 2040, Ghana's installed capacity may have to increase at least by about five-fold to meet demand compared to today's situation, while up to 2045, it increases to around 11 times. Where shall this urgently required power come from? Where is the space to install such huge additional generation capacities? They must be green, and they require therefore space, and one solution for space is offshore. NEK's offshore wind and floating solar plants do exactly fit into this model, also based on scientific studies regarding the use of offshore wind and solar in the Gulf.
- ↑ Investments in fossil power plants will in the future most likely become critical for financing and therefore, they are no option for the country already in the short term.
- ↑ The only solution, which will also be completely in line with the new NDC Government, is to switch from outdated, very expensive, climate damaging and unsecure fossil plants towards net zero emissions, pushing for large renewable energy facilities.
- ↑ This can be achieved by quickly developing and implementing large scale renewable energy power plants such as solar and wind - onshore and offshore.
- ↑ Anansi Green Energy Ltd. has the capacity to do so, and by operating renewable energy plants in Ghana, the urgently required diversification of the energy sector can quickly start.

## Collaboration with Ghana Grid Company (GRIDCo)

- ↑ GRIDCo has an existing grid network which has the capacity to transport large amounts of Anansi's green energy to the off-takers.
- ↑ GRIDCo is interested in partnering with NEK / Anansi under wheeling agreements to transport the green energy to the off-takers; respective documents are signed.
- ↑ GRIDCo's network will be extended and reinforced in the future to take even more green energy from Anansi's green energy platform with investments coming from abroad.
- ↑ The 6 onshore wind projects will be connected to GRIDCo's 330 kV grid at Sege.
- ↑ The 2 offshore wind and floating solar projects will be connected in phases via the VALCO substation to GRIDCo's network with an undersea cable and will in addition be connected also at Sege to the 330 kV line, which fits for export facilities as well.
- ↑ This concept will allow all customers located in Ghana and abroad to profit from the cheap and green electricity produced in the different renewable power plants and transported via the GRIDCo network to the clients.
- ↑ The green energy circuit will be combined with BESS (Battery Energy Storage Systems) to flatten potential load intermittences due to changing wind and solar conditions and to deliver energy also in times where there is no wind and no sun.



### About Anansi's off-takers

- † Through the platform, Anansi and its partners will be able to deliver as much green energy as required to all interested customers under individual and tailor-made Power Purchase Agreements on a "take-and-pay" basis with a generation price being well below the actual generation prices of the individual fossil IPP's.
- † Off-takers will be mining companies, steel manufacturers, concrete producers, refineries, and all kind of other industry players all around Ghana, but also ECG, VALCO, VRA, GPHA and any other state-owned entity which desires to profit from the cheap and green energy of inexhaustible sources is able to purchase in the future clean electrons.
- † Surplus electricity produced in NEK's plants will be exported via the GRIDCo / WAPP network to neighboring countries including Nigeria, Togo, Benin, Mali, Ivory Coast and others on a "take-and-pay" basis.
- † All clients are welcomed to join the clean energy platform and profit from an independent, clean and cheap power producer.

### About Green Hydrogen

- † It is widely assumed that Green Hydrogen will be the energy source of the future - this will also apply to West Africa.
- † Green Hydrogen must come in order to be accepted as being green from 100% renewable sources - only NEK has those projects ready for implementation as per today and tomorrow in Ghana.
- † Green Hydrogen facilities will be installed both, onshore in the Tema Free Trade Zone and in the Dawa Industrial Zone, and offshore at the two offshore wind park and floating solar locations.
- † Green Hydrogen to be used for national consumption and for export.
- † Green Hydrogen will be the game changer for Ghana by producing green fuels for shipping and aviation, agriculture, seawater desalination plants and a lot of other industrial applications - to make Ghana become THE African pioneering country for energy transition.
- † Green hydrogen can be used for the production of other green fuels like green ammonia and green methanol for the shipping industry.

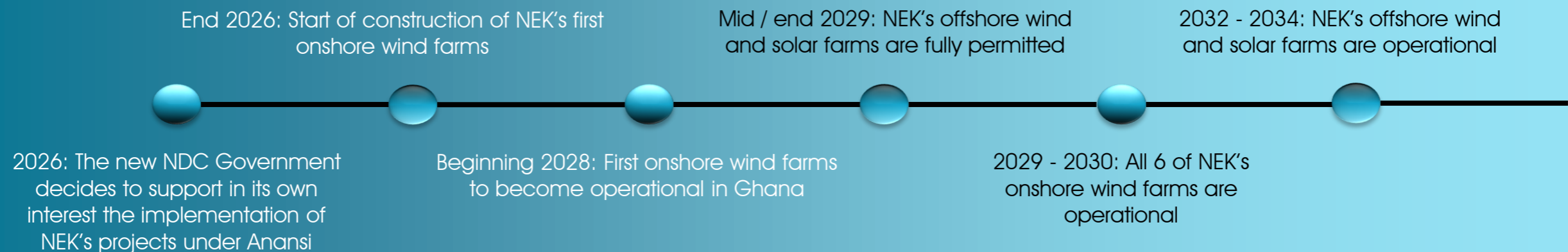
### About the role of VRA / ECG

- † Conventional PPA's with VRA/ECG on a "take-or-pay" basis are not possible anymore.
- † The new structure model as applied by NEK through the Renewable Energy Platform however would allow especially VRA and ECG to participate in this huge green market of the future.
- † VRA / ECG can profit from the cheap, clean, and reliable green electricity.
- † VRA / ECG would have access to huge foreign investments and opened up a big cheque book capable of financing all of the future renewable deals capable of being implemented - including then the deals that VRA / ECG themselves wanted to do apart from Anansi.

### About E-mobility

- † Electric vehicles are widely used in a lot of countries worldwide already - in Africa and also in Ghana, this is not yet the case.
- † The penetration of electric vehicles in the transportation sector in Ghana and other West African countries will start however very quickly - they will push-out conventional fuel driven vehicles soon.
- † The use of electric cars only is environmentally friendly if the required electricity comes from clean sources such as renewable energy. Otherwise, it is just a shift in the pollution chain.
- † Therefore, NEK's renewable energy projects are a condition precedent for the clean use of electric vehicles in Ghana.

### About Timing



## Potential Cooperation with Volta Aluminium Company (VALCO)

- ↑ VALCO intends to raise approx. USD 4 - 6 b through a private strategic partnership to improve its operations and to extend its activities, requiring up to 1,000 MW of installed power in the future - the today's installed generation capacity in Ghana is not able to cover this demand.
- ↑ Such a strategic partner can be attracted much easier if VALCO can assure to its potential partners that it will aim to produce in the future up to 100% of green aluminium - this requires 100% of green energy, which Anansi can easily produce in its offshore projects and an agreement with for example VRA to combine it with cheap hydro power.
- ↑ If being connected to Anansi's offshore wind and floating solar farms, VALCO will become the first green aluminium smelter in Africa - others to follow because only green aluminium can be sold in the future.
- ↑ Discussions are ongoing to which extent the delivery of cheap hydropower from Akosombo and Kpong can be extended to VALCO to become an industrial pillar of the country, while the additional electricity required will come from Anansi.

## About costs

- ↑ Anansi Green Energy can provide to its clients in the future the cheapest available electricity in the country apart from the existing hydro power.
- ↑ The generation price of electricity which is produced in the land-based wind farms lies below 9 US Cents per kWh; in addition, GRIDCo requires a wheeling price of around 1 US Cent / kWh, which will guarantee to the end-users a final price of less than 10 US Cents per kWh.
- ↑ The generation price for the offshore wind and floating solar energy must be calculated in the near future when offshore wind measurements have been conducted and the supply agreements with the turbine manufacturers are in an advanced stage.
- ↑ The end-user tariff for the platform clients is not subject to any PURC price adjustments and therefore safe with regards to any future price hicks of energy in Ghana.
- ↑ NEK will be able to offer to its end customers a fixed price for the next 10 - 20 years with a maximum potential upside margin of just 4 - 5 % per year.

