



AIR POWER



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A plane commissioned by Symbion Power to fly equipment into Iraq. The company plans to do the same for its first hydro power project in the DRC.

Symbion Power CEO Paul Hinks plans to use air freight to overcome logistical challenges and get his company's hydro-power projects in the Democratic Republic of Congo (DRC) off the ground.

From the start of 2024, flights will be used to transport turbines from the US to the DRC for an initial project because it's faster than shipping, Hinks tells *The Africa Report*.

Shipping times from the US to Africa are about four to six weeks, followed by a wait for port clearance and the need to get the turbines by road to Kinshasa and then on to the final destination, the south-central city of Mbuji Mayi. The timeframe is "unacceptable", Hinks says.

"Africa does not come close in difficulty compared to the challenges we faced in Iraq and Afghanistan"

Symbion, which is based in New York, develops, builds, and operates power projects in the Middle East, Asia and Africa. The company to date has invested in 1,378MW of generation capacity and built over 4,000 km of transmission and distribution lines.

Project logistical issues have been aggravated by Covid-19 and the Russia-Ukraine war, Hinks says, with turbines now taking between three and six months longer to manufacture.

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"We want to short-circuit global supply-chain problems," he says. The urgency now is to "prove the concept and derisk it. It's worth paying more for the first one."

Having used such flights to supply projects in Iraq, the prospect doesn't bother him. His company undertook about 50 flights to Iraq between 2003 and 2010 to bring in materials such as steel and wiring. "Africa does not come close in difficulty compared to the challenges we faced" in Iraq and Afghanistan, Hinks says.

According to the African Development Bank (AfDB), the DRC's hydro power potential at 100,000MW is the largest in Africa and accounts for **13% of potential globally**. Yet the country's 6% electrification rate is one of the lowest on the continent.

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Factors that have prevented mobilisation of the resource, the AfDB says, include poorly developed transmission and distribution systems and lack of infrastructure maintenance. The ELKAP non-profit organisation in the DRC says that the country's hydro resources alone could supply three quarters of Africa's energy needs.

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Hinks has worked in rural electrification for 40 years. **In development terms, rural DRC is "as frontier as it gets" which is part of the attraction.** "The places with the most need are the ones where no one wants to go."

Experience shows the security situation in conflict zones often improves when electricity becomes available, he says. "Once the power is flowing the local populations want it to be continuous. Our experience has been that "hot" areas are often calmed by the advent of electricity."

Small-scale industries also tend to quickly emerge in such cases. "Someone will begin milling flour and selling it, or they might build a workshop. Once this happens village economies improve and the growth is exponential."

Project plans

MyHydro is a partnership between family-owned Symbion Power and San Francisco-based Natel Energy, which has invented a new type of hydropower turbine. The partnership is investing \$1bn over the next 10 years to install hydropower-based systems with mini-grids across Africa.

The DRC government has signed an agreement for **33 MyHydro sites**, which Hinks estimates may cost \$500m to \$600m. The plan is to seek to raise about 70% of that in equity and debt, with the rest being self-financed.

DRC is part of the company's overall hydro ambitions in Africa with targeted investment of \$1bn. Hinks says that the costings used are "very conservative" and expects that turbine prices will fall over time.

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The company is in discussions to raise debt for the first project, but would in any case be able to go ahead on an all-equity approach, Hinks says.

The first installations will be on the **Lubi River near Mbuji Mayi**. The city was developed by European colonialists after diamonds were found there in 1909, but electrification has passed it by.

Mbuji Mayi has a population of about 3 million people but is completely off the grid. Construction of a 4.48MW facility at Kabeya-Kamwanga is expected to start in the second quarter of 2023, with regulatory approval and an environmental certificate received.

The plan is to **divert water from the river through a canal to the power plant**, where it will pass through a turbine before being returned into the river a few metres away. The company says the process keeps the river's fish safe, and that the turbines can be installed using local labour and materials.

Phase 1 of the project (1.2MW) will be ready within 14 months, which means that the project will be delivering electricity in the third quarter of 2024. The balance of 3.6MW will be completed in the first quarter of 2025. In the meantime, construction of two further plants near Mbuji Mayi is due to start by the end of 2023, and other plants will be built in Butembo and Bukavu.

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Symbion has also won a tender to develop the Makelele biogas block on Lake Kivu. The project will see investment of \$300m in investment to develop a 60 MW gas-to-electricity system. Even Kivu with its M23 insurgency doesn't worry Hinks. On a one to ten scale of danger, Kivu ranks as five or six, while Iraq and Afghanistan are ten, he says.

Renewable power costs

Elsewhere, Symbion plans to build and operate a \$97m 35MW geothermal power plant in the Menengai volcanic crater in Kenya's Great Rift Valley. The company has a 25-year power purchase agreement with Kenya Power and Lighting Company and a steam supply agreement with the Geothermal Development Company.

DRC, Hinks notes, **has 50% of Africa's water yet suffers with a power supply** which is as bad as any on the continent. Hinks argues that the case for hydropower is strengthened when an existing grid system is lacking. Neither solar nor wind power are constantly generated.

"They are fine when they are connected to grid systems that have other forms of generation capacity," Hinks says. "But if that is not available it means that there is a shortfall of capacity every time they stop operating."

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Cost to the end-user is the decisive factor. Off-grid solar is very expensive because an alternative source of power capacity is required such as a diesel generator. Solar prices are also loaded in favour of urban as opposed to rural consumers.

In Kenya, for example, the cost for a household to buy power from the state utility in Nairobi is about \$0.18 per kWh, Hinks says. In rural areas the rates for isolated mini-grids are a minimum of **twice that cost** and more likely three times or more. That's without taking into account the fact that disposable incomes are usually higher in cities and so the real burden on the rural consumer is higher, he adds.

Provided that the rivers used are perennial with verified historical flow rates, hydropower operates 24 hours per day, 365 days per year, Hinks says. The tariffs from a MyHydro power plant will be **closer to the cost of the state utility in Kenya** in off-grid situations at around \$0.19, Hinks says. If the power is made available on-grid, the cost is likely to be closer to 10 cents, he adds.

Bottom line

If mass rural electrification is achieved any time soon in the DRC, then hydro will be a large part of the answer.

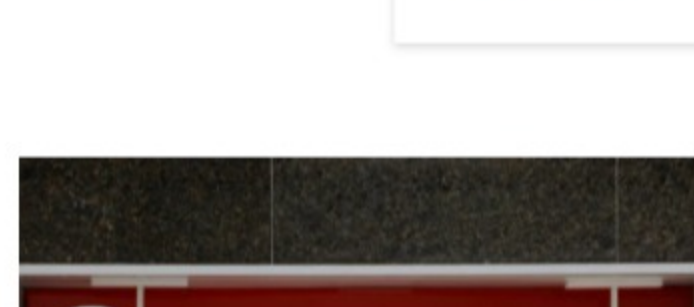
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