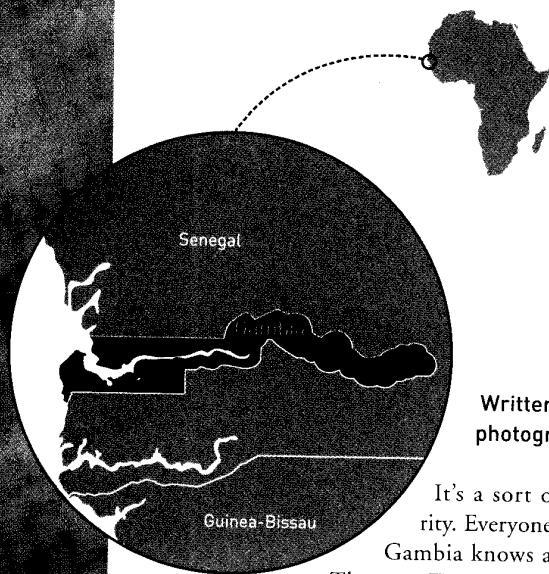




Little Gambia makes a big move: West Africa's first wind turbine has been spinning in the village of Batokunku since late January.

A second life in Africa

The project may be small, but it is symbolically very important. The first wind power plant in West Africa has been connected to the grid in The Gambia, and everyone hopes that more will soon follow.



Written by Dierk Jensen,
 photographed by Michael Kottmeier and Cordula Kropke

It's a sort of celebrity. Everyone in The Gambia knows about it. The state TV station Gambia Television, Radio Gambia, and the Daily Observer newspaper have all reported on it. When you go to Banjul International Airport and mention that you stayed in Batokunku, even the man checking your passport looks up to ask, "Did you see the windmill?"

Of course. No one who visits Batokunku, a small village on the Gambian Atlantic coast, can miss it. The turbine, built by former Danish manufacturer Bonus and with an output of 150 kilowatts, may not be particularly big, but it still rises above the otherwise flat landscape. The machine is not hot off the presses; it provided Nystedt, Denmark, with green electricity for years. It's now living its second life on a 30-meter high pylon, feeding electricity to the local grid since late January.

People in Germany, China, and the US would see this first-generation model more as a curiosity – and hardly worth any attention. In The Gambia, however, the robust steel turbine leads the way to a new energy era. It is, after all, the first machine to provide wind power in this country, the smallest in Africa with 1.5 million residents. In fact, it's the first turbine in all of West Africa, making this small country a role model for energy policy for the entire region.

Many years of battling the state enterprise

The second-hand machine arrived in The Gambia three years ago in the spring of 2006, packed in a 40-foot container on a

ship from Hamburg, Germany. Peter Weissferdt was in the bustling harbor of the capital city of Banjul at the mouth of the Gambia River to receive the individual parts. "The windmill was in terrible condition," Weissferdt, who lives in Gambia, recalls the moment he opened the container. "The pylon was in a thousand individual pieces that were just thrown into the container willy-nilly." Weissferdt and his colleagues were disappointed by the donation. The German grid technician, who has connected several wind parks in the name of the Engineering Agency for Electric Energy Plants (IEE) in Kiel, Germany, had simply imagined something better when he had heard about a used turbine.

Nevertheless, he determinedly – in fact, almost stubbornly – continued striving toward his personal goal to contribute wind power to the grid in The Gambia. To this end, he personally took wind measurements with a twelve-meter pole. To this end, he founded and played a leading role in the Association for Rural Electrification in The Gambia, a German development organization (Dorfelektrik in Gambia). And to this end, he also erected a 27-kilovolt diesel generator on his own land in The Gambia in 2004 and used it to feed electricity into the seven-kilometer long grid he had built. At the same time, he oversaw the laying of water conduits along the same distance; since then, the village's 2,000 residents have always had enough electricity and water. He now hopes to replace the electricity from the diesel unit with wind power in the long term. Weissferdt even attained the official status of a distributor for the village grid.



Close scrutiny: Carl-Rasmus Richardsen of Windstrom SH checks the second-hand machine and shows the ropes to Global Energy's Jim Mbowe, who will service the turbine.



Turning it on: Björn Schäfer, Richardsen's colleague, struggles with the controls.

The energy put into this initiative also reached Dirk Ketelsen, a big player in wind energy from North Frisia, Germany. Among other things, he has completed projects with an output of about 175 megawatts with his company Dirkshof Erneuerbare Energien GmbH and has known Weissferdt for a number of years. Ketelsen even had an idea of erecting an entire wind park in The Gambia with first-generation turbines discarded during repowering. However, the national provider, the National Water and Electricity Company (Nawec) backed out shortly before the contract was to be signed. Those in charge suddenly didn't trust wind power anymore and worried that fluctuating power generation could damage the grid.

The noble initial idea had thus become a tough uphill battle. Weissferdt, who moved to The Gambia from Germany six years ago with his wife Gitra, almost saw his renewable dream for the subtropics fail. The struggle with Nawec touched a number of nerves. "The power from wind energy gets lost in the losses," Weissferdt quotes from a letter from Nawec turning him down once again. The tide finally turned in the struggle with the public utility when the Gambian Parliament set up the Public Utilities

Regulatory Authority (Pura). Pura broke through the blockades and forced Nawec to approve the feed-in and the operation of a local grid (see interview). "Nawec is one of the typical state-run businesses in Africa with lots of old-school bureaucrats. They're just scared of decisions about new things," Walter Klotz explains. The German electrical engineer knows about the inner workings of the public utility, since he has been a contracted leader of a task force for over a year at the company, which has 1,200 employees, produces and distributes power, and operates grids. Klotz has been working on energy problems in various countries in Africa for years and is now trying to help the state-run energy and water monopolist work more efficiently.

Up to 40 percent network losses

This has proven to be difficult. One problem is that one-fourth of electricity is delivered directly to public agencies – and is not paid for, "because they don't have anything to pay with," Klotz says. It also doesn't help that Nawec's network losses are exorbitantly high: it's estimated that up to 40 percent of the energy is lost. The main losses are due to conductor weaknesses, but theft by

simply bypassing electricity meters is also a problem. In addition, only one-half of urban residents and one-fourth of rural residents are connected to the grid.

For this and other reasons, electricity production in The Gambia has remained low. According to Klotz, the country has a little more than 60 megawatts, all from diesel generators. Like most African countries, The Gambia is therefore at the whim of the oil industry. Eighty percent of all the country's budget expenses go to oil. Klotz says this dependence was "a real catastrophe" when oil prices rose significantly in summer 2008.

The managing director of Pura, Alagi B. Gaye, emphasizes that changing the way energy policy is thought about is now more important than ever, but "it's a very tough process." However, he sees mid-term opportunities for wind, sun, and biomass energy based on a World Bank-funded study currently being conducted on tariffs for renewable energy. It is especially encouraging that a new medium-voltage conduit will connect all the West African countries and make it possible to export more power production to the grid.

The machine in Batokunku is a preview of how that could look. A light breeze blows ▶

“We won’t be discouraged”

Interviewed by Dierk Jensen

new energy: How important is the first wind turbine in Batokunku?

Alagi B. Gaye: You have to keep in mind that, until the 150-kilowatt turbine got connected to the grid this January, there wasn’t a single commercial wind energy plant in all of West Africa. This project demonstrates that renewable energy is a viable alternative.

ne: What does Pura, your regulatory authority, do in The Gambia?

Gaye: Our agency was created by the government in 2004. We develop guidelines that the water, transportation, telecommunications, and energy sectors have to stick to. We also support the liberalization process and initiate investments. We exchange knowledge on technologies and strategies with our counterparts in other African countries – 48 of 52 now have regulatory authorities.

ne: The National Water and Energy Company, or Nawec, is The Gambia’s public utility. How is your relationship with the former energy monopolist?

Gaye: To be honest, our relationship is difficult. The energy market reform has just gotten underway and calls for a clear separation of politics and economics. This is the only way we can have transparency in the electricity sector. Then, both levels were interwoven with each other, in Nawec’s case leading to miserable operating results – and they just wouldn’t listen to any advice, despite criticism from outside.

But we won’t be discouraged. We developed quality guidelines for electricity and water. To establish these, we’re in a constant dialogue with Nawec, even though things can get a bit touchy when it comes to the details.

ne: Are you backed by the government in an emergency?

Gaye: At first, the government didn’t understand our case at all. Now that we’ve had some success, for example in the telecommunications sector, they see how valuable our work is.

ne: Is the opening of the market your biggest challenge?

Gaye: That’s definitely our biggest task. We can certainly imagine that other market participants besides Nawec will look into business in The Gambia. Those who want to invest in energy production here go through the usual approval process. Once all requirements are fulfilled, business can start, according to our energy law. However, we do have some limiting factors at the moment, such as low energy consumption and significant grid weaknesses. But in terms of expanding the grid, several West African countries now have the common goal of building a cross-border 30-kilovolt line.

ne: Does that increase the opportunities for more wind projects in the region?

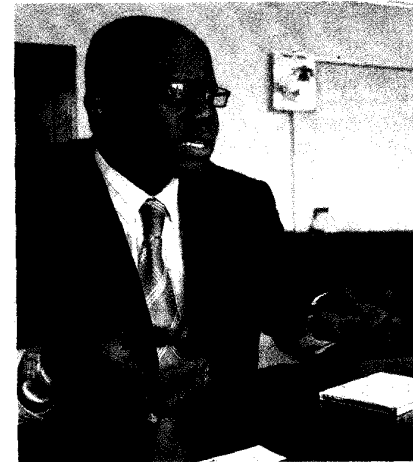
Gaye: Yes, when the loop grid is finished, the basic framework will change. But first we have to convince Nawec that this offers the opportunity to install more wind energy. Connecting the turbine in Batokunku proved we can manage that even with the grid as it is. The euphoria for renewable energy is great, but we can’t forget that large parts of the Gambian population still don’t have access to electricity.

ne: Do you think The Gambia will have fixed tariff rates for renewable energy in the near future?

Gaye: It’ll happen eventually. At the moment, a study on the Gambian electricity market is being conducted with World Bank funding. A future tariff model will be based on the results. But I can’t yet say how that will look.

ne: How high are electricity prices right now?

Gaye: Oh, they’re very high, the highest in Africa. They depend heavily on the dollar exchange rate and move between 20 and 30 cents per kilowatt-hour. The extremely high network losses are especially responsible for this. In Batokunku’s case, there’s a specially negotiated feed-in price of 80 percent of the consumer price. But in the long term, we need to get away from these individual contracts.



Alagi B. Gaye

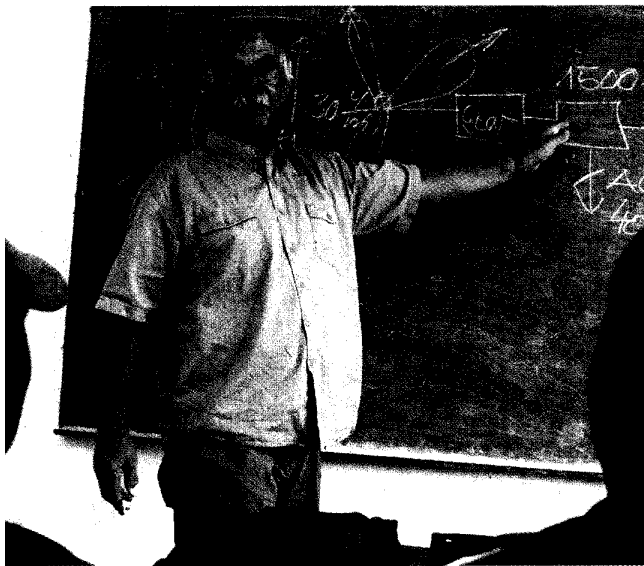
is the director of the Public Utilities Regulatory Authority (Pura), which works to set up the liberalization process in the water, transportation, telecommunications, and energy sectors in The Gambia.

ne: What does Batokunku mean for the future of wind energy in West Africa?

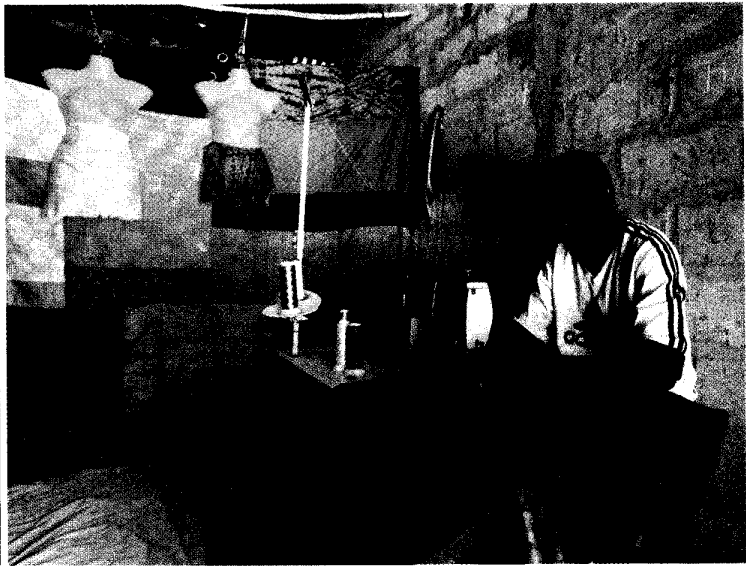
Gaye: I think it’s the beginning of a big development. It’s a milestone. A lot of experts from our neighboring countries come to take a look at the windmill. The project in Batokunku sent a signal that wind energy in West Africa can be economically viable. It’s a sign of hope for potential investors who haven’t made a move yet because of frustrating bureaucracy.

ne: Do you think that we’ll see a lot of wind energy plants producing electricity in The Gambia in five years?

Gaye: Why not? We’re working on it. We have a detailed electricity law; we created a framework for energy production licenses. In any case, the rising price of oil alone will increase investments in renewable energy here.



Dedicated and untiring: German grid specialist Peter Weissferdt instructs prospective electrical engineers.



Sewn with the wind: the village tailor bought an electric sewing machine as soon as wind power started flowing.

around the nacelle thirty meters above the ground. The spray from the waves crashing in the Atlantic Ocean runs along the empty sandy beach like a white line. Fishermen row their boats parallel to the coastline and throw out nets to catch barracudas and red snappers. Along the coast is a bright landscape of trees dotted with houses. The area looks greener from above than it actually is, now that the dry season has started. Most of the fields lie fallow after peanuts – the country’s most important produce and export good – have been harvested. From the machine, the mosque a couple hundred meters away, built by donors a few years ago, seems curiously oversized for the village of Batokunku.

Only a few days remain until operation begins. Reggae music can be heard coming from Global Energy’s Nissan pick-up at the foot of the windmill – a song by Jaliba Koyateh, a well known musician in The Gambia. Global Energy, a small company with a big name, will be in charge of maintenance for the 150-kilowatt Bonus turbine. “We’re looking forward to this job,” says Milko J. Berben, the Dutch owner of the company who has been living and working in The Gambia for more than ten years. His team of technicians services diesel motors, repairs ship motors, and takes care of various other installations. Now he hopes that more wind energy plants will be erected and progress will be made in the bioenergy field.

Service technicians were flown in from Schleswig-Holstein in Germany, where they

work at Windstrom SH, and the men from Global Energy are fascinated by everything they are doing to get the old windmill up to snuff. Björn Schäfer kneels in front of the control cabinet at the foot of the tower. His colleague Carl-Rasmus Richardsen and Jim Mbowe from Global Energy stoop over the power train. Every part of the machine has to be checked. Björn runs out, throws back his head, and shouts at the top of his lungs, “Is there any pressure now?” “Nope, still nothing happening,” Carl answers. “Then open that valve,” Björn cries back. “Say what?” Carl says. “Come on, I said open the valve, then maybe something’ll happen,” Björn shouts. “I already tried, but nothing happened!” “Is there enough oil in the pump to begin with?” The dialogue between the service technicians goes on like this the whole day; the walkie-talkie was left in the office back home in Viöl in North Frisia. The two men are even louder than the local muezzin – and he certainly has a commanding voice.

The windmill brought light

The next evening, Björn broods in the distribution station over the last few control problems: “Let me try something; I’m really close to a breakthrough.” Indeed, to the joy of everyone present, the turbine soon starts up. At the same time, a party is thrown in a farm courtyard. Rhythmic dance music can be heard from everywhere in Batokunku. Women wearing colorful dresses stand in groups in one corner; men sit and chat in

another. Also present are members of the five-person committee that watches over the wind power plant and the village grid in the name of the municipal operator Batokunku Windpower and the development association.

“Peter has done so much for us,” Ebrima Touray says. “So much has changed for us because of his electricity and water lines. We put lights and refrigerators in our homes, we opened a movie theater, we can operate sewing machines, and we can use electric oil presses. It’s a completely different life from before,” Touray emphasizes. “We’re hoping to open a school here soon.” The necessary money could come from the wind power plant: since there weren’t yet tariffs for wind power, Batokunku Windpower signed a contract with Nawec. The utility agreed to pay 80 percent of the consumer price for each kilowatt-hour exported to the grid for the next five years – currently about 22.5 Gambian dalasi (18 euro cents).

And what does Peter, the “father” of the first wind power plant in The Gambia, think? He unlocks the transformer station he put on the main street in December 2005. The station, financed by the Association for Rural Electrification in The Gambia, transforms electricity from the village grid to Nawec’s 30-kilovolt level. “It’s just a lot of fun,” he says, excited about the electricity from West Africa’s first wind turbine. “The dalasi will flow into the village accounts.” His satisfaction with his second life as a distributor is palpable. ◀