Filling in the blanks

David Robertson, vice president of solutions for Europe, the Middle East, and Africa (EMEA) at Energy Exemplar, explains how solar and other energy asset operators and consultants in Africa use Plexos, the company's digital-twin simulation modeling engine, to make business decisions despite limited data availability.

What is simulation modeling?

Our product is based on the concept of a digital twin. We build a representation of a particular energy asset, or set of assets within the software. We represent all the technical characteristics associated with how the asset can operate, and we capture all the economics associated with how the asset operates, as well as the economics associated with construction of the asset, or the capital costs associated with deploying that asset.

And how does this technology benefit solar?

Solar is going to provide a level of output during the day but for the overnight periods some kind of additional flexible technology, maybe battery storage or some other flexible technology system is needed. Our software would allow you to build the digital representation of each of those technology components, showing any economic criteria you want to look at to maximize the investment. For example, what's going to give you the maximum revenue over the lifetime of the project, or the maximum expected revenue? Which one's going to give you the maximum internal rate of return? Which approach to the project is going to give you the lowest risk?

What are the main challenges associated with African energy?

Data transparency is a big challenge in Africa. You don't typically have detailed operational data that sits behind energy assets. Typically, we build a representation of each asset that is in a particular country. Generating that initial capacity list is reasonably straightforward – you can get information by scraping data from the transmission system operator websites, looking at who are the registered utilities and IPPs [independent power producers] within the market, and looking at their asset portfolios.

We approximate the operation of assets based upon similar assets that we see in other, more established markets. We've built a sort of register of assets around the world. We can input a number of these key parameters, such as the asset size, the technology, the climate it is operating in, and then we can look up comparable units from other geographies, such as the United States or Europe, which we can use as a proxy for the technical and economic characteristics in Africa.



South Africa is a key market for Energy Exemplar. National utility Eskom uses the company's software to plan future investment.

Who are your customers in African markets?

Our product can be used to look at an entire system or market. For example, [South African state-owned energy utility] Eskom uses our software to be able to plan future investment. They have a representation of every asset in the South African system today and then they use our technology to simulate every single hour of how those assets are going to operate, every possible weather profile that you could expect to see for the next 25 years. We work with a lot of consultants across the region and those consultants are working with a lot of the developers. They're doing things like project financing and bankability studies when the developers are looking at obtaining finance, for example.

We work with developers directly, too, and not exclusively solar. Where our product tends to be the most useful to develop-

applications & installations

Photo: Energy Exemplar

ers is when they're getting into more complex project deployments, such as hybrid projects that have multiple technologies. These types of projects are becoming more common in Africa, where there is a firm capacity requirement.

We also work with industrial customers who may be undertaking that work themselves and then going out to an EPC [engineering, procurement, and construction services provider] for the technologies.

Are you planning to add any new features to the platform?

We've recently launched Plexos Intelligence, which is an artificial intelligence-based layer within our software. This allows you to do a couple of things. It helps the development of the models using AI technology so the users- rather than having to go and add all of the inputs



6 Data transparency is a big challenge in Africa ン

> David Robertson, **Energy Exemplar**

directly -can ask the intelligence feature to actually go and build out parts of the model itself.

The amount of data that has to be looked at and analyzed is overwhelming, so we're using AI to be able to make sense of all the insights that are coming out of the model itself, to identify things that you may not be able to see normally.

If you, for example, ask "show me the top 10 most interesting events over the next 25 years," the AI would then be able to go in and look at all the different components. If there is oversupply on a transmission line, for example, is it because you have a particularly high amount of load shedding in the system? Is it because you know you're getting 100% renewable generation within certain hours?

The AI will be able to look and identify the areas where the results are completely different from what you see in the rest of the sample space, and that's going to be powerful in terms of helping people move through results to get direct insights. The feature is in beta now, in the hands of a few of our customers and we hope to be rolling it out Interview by Blathnaid O'Dea at the end of this year.

Advertisement

Solplanet

Solplanet Winter-Ready Power Solutions

Smart consumption, steadfast supply: Hybrid inverters + energy storage.



Charging and



Multi-purpose applications, self-consumption and time of use tariffs

Easy commissioning

Solplanet app

and 24/7 monitoring with



Up to 150% PV array oversizing

> earn more about our products



Advanced BMS for full protection