

# Different and better than diesel generators?

## TowerXchange speaks with fuel cell pioneers CHEM Energy about their fuel cell technology



Hal Koyama, CEO, CHEM Energy

### Read this article to learn:

- Who are CHEM Energy?
- How long have fuel cells been in use?
- How easy is it to deploy with CHEM Energy?
- How “green” are fuel cells?

In a period of increasing energy stress and supply chain disruption TowerXchange discusses a fuel cell technology that has been providing reliable cell site power in South Africa since 2011. The technology continues to improve and fuel distribution and service continues to improve. This is what Hal Koyama, CEO, CHEM Energy had to say to TowerXchange ahead of TowerXchange Meetup Africa.

### **TowerXchange: What are the top drivers of renewed interest in fuel cells as reliable non-diesel alternatives?**

**Hal Koyama, CEO, CHEM Energy:** What we hear from our customers is “cost and reliability.” Diesel generators are relatively cheap to start with, but they require a lot of maintenance and are plagued with reliability problems. On top of that the price of diesel fuel has been high and volatile, and theft of batteries and fuel is a huge problem in some areas, as well as vandalism. Most of these problems have been around from the start, but they’ve grown during the pandemic and recently to where network cost and reliability due to power supply is coming to the front of the operational issues. Also, there is a global recognition that our current dependence on fossil fuels is simply unsustainable. Some of the more forward thinking towercos and

MNOs have recognised this and are moving to get ahead of the curve by reducing or eliminating diesel generation in their networks. In many cases, it’s a win-win scenario where they reduce the carbon emissions and reduce costs while increasing network uptime.

### **TowerXchange: Our readers care most about results: what can you tell us about your fuel cell deployments and distribution networks in South Africa?**

**Hal Koyama, CEO, CHEM Energy:** We’re on the same page when it comes to results. CHEM Energy SA is all about reducing the cost of primary and backup power to the towercos and MNO networks. We’ve moved to offer parts and operational guarantees for the performance of our systems with our service partner 24 Solutions. We have over 200 fuel cells deployed in South Africa.

Many since 2011. And we have thousands more deployed around the world in some of the most difficult grid areas, such as Indonesia and India. We know your readers require results because we’ve been in there serving them for over a decade. Delivering results is one of the primary drivers for CHEM building its factory here in South Africa. We did that to bring faster service, local supply chains and lower costs to our customers. They’re tough customers and I doubt we’d be around if we could not deliver the results they expect.

### **TowerXchange: Where else are fuel cells deployed outside SA and how does the supply and fuel distribution situation compare?**

**Hal Koyama, CEO, CHEM Energy:** We’ve deployed fuel cells all over the world, but the main areas currently are

in Japan, Indonesia, India, South Africa and Malaysia. Everywhere we've gone, we have been able to quickly establish fuel supply lines and never have a disruption. In places like Indonesia that can mean having to transport the fuel by canoe in jugs. We're about getting "power anywhere, anytime." It's not just a slogan. It actually is a requirement.

**TowerXchange: Is alternate fuel distribution a challenge? What has been key to addressing this in SA and the rest of Africa?**

**Hal Koyama, CEO, CHEM Energy:** The way we handle fuel distribution is in two stages. First there is bulk mixing, which typically CHEM handles. Sometime, such as here in South Africa, we also have another company doing it. That creates the bulk fuel supplies that are sent to depots around the country which our partner 24 Solutions runs. Along with fuel at those depots, we can also stock spare parts for faster reaction times. 24 Solutions can monitor fuel usage and schedules "last mile" deliveries to the sites. Our fuel is called HydroPlus™. It's a liquid, so anywhere diesel fuel can be distributed, Hydroplus™ can too.

**TowerXchange: Introducing a new technology can complicate internal logistic, so how would a telco or TowerCo deal with a mix of diesel generators and fuel cells in their portfolio?**

**Hal Koyama, CEO, CHEM Energy:** We try to make it easy. The fuel cells are different – we think better – compared to diesel generators. There are two key factors to integrating them into the network. First is segmentation. We tend to work best in areas of the highest power cost and/or lowest reliability. Typically, those are places the telco really is tired of attending to. So the second part of the plan is that we can provide a turnkey service. What that means is essentially "fire and forget it." Together with 24 Solutions, we provide everything from installation and commissioning through fuelling, monitoring and service. Once the fuel cell is deployed, the towerco or MNO doesn't need to attend to any aspect of it. Of course, if the towerco or MNO wishes to use its own resources, we can work with them to bring the appropriate skills in.

**TowerXchange: Are all fuel cells basically the same? What are some of the key differences when it comes to telecom applications?**

**Hal Koyama, CEO, CHEM Energy:** There are a range of different types of fuel cells based on different chemistries. The kind most suited for telco applications are low temperature proton exchange membrane or LT-PEM, which are the same kind used in fleets of cars, trucks and buses around the world. These are ideal because they are fast starting and are able to cycle well,

as you might imagine a car would have to be. A slight variant on LT-PEM, is high temperature PEM. This type of fuel cell uses a different chemistry and operates at a slightly higher temperature. So far there is only one company in this category for telco applications. Other fuel types are much higher temperature and higher power, such as molten carbonate and solid oxide do not cycle. They are designed mainly for continuous operation and primarily over 100kWe output. CHEM has also started pursuing higher power applications and anticipates launching a 100kWe power system next year. This can be scaled to 1 megawatt to 10 megawatts for a range of high-power applications such as data centres and power grid support.

**TowerXchange: The power requirements on site are going up, can fuel cells keep up? Are they still a "new" technology that needs to prove itself?**

**Hal Koyama, CEO, CHEM Energy:** In addition to the 100kWe system I just mentioned, CHEM will be launching a 10kWe system more focused on higher power cellular tower applications. All of the systems are also compatible with solar hybrid arrangements and can power mini-grids for rural electrification. Fuel cell technology has been around a long time and has proven itself in a range of applications, such as telco for decades. However, the technology is advancing. The areas of focus

are lowering capital costs and increasing efficiency. The technology is mature enough that CHEM backs it with guarantee programs and companies such as Panasonic of Japan have deployed over 100,000 in homes.

**TowerXchange: How is "green" defined when it comes to fuel cells? Can they meaningfully contribute to emission reduction strategies?**

**Hal Koyama, CEO, CHEM Energy:** CHEM's Fuel cells are "greener" than diesel generators with lower CO<sub>2</sub> and almost no NO<sub>x</sub>, SO<sub>x</sub> or particulate matter (PM) emissions. Our fuel is Hydroplus™ which is converted to hydrogen on demand. The HydroPlus™ is made from methanol and water. The methanol can be derived from a range of sources. The most common method is from coal or natural gas, as is the case at SASOL here. So the "shade" of green from a fuel perspective depends on those inputs chemicals. For example, if the natural gas used to make the methanol would otherwise be flared into the atmosphere, then the process is a net reduction compared to other power generation methods. Methanol can also be produced from biomass, such as sugar cane waste here in South Africa. It can even be produced by pulling CO<sub>2</sub> out of the atmosphere, which would result in a negative carbon balance. CHEM strives to offer a range of fuel options so that if the towercos or MNO wants to "dial in" a greener, or lower CO<sub>2</sub> profile, they have that option.