

Ballard 50 kW fuel cell stack



SPOTLIGHT ON BALLARD

Nicolas Pocard, Director of Marketing at Ballard, talks to the World Platinum Investment Council about proton exchange membrane fuel cell development

For over 35 years, Ballard Power Systems Inc. has been a world leader in the development of proton exchange membrane (PEM) fuel cells that use a platinum catalyst as a key component. Today, its mission is to accelerate fuel cell technology adoption. Its products are used in various markets, from heavy duty automotive power to materials handling, back-up power, unmanned aerial vehicles and marine and rail applications.

What does Ballard see happening in the PEM fuel cell segment right now?

Mobility solutions are a real focus for us – especially the heavy-duty vehicle segment. As we see it, fuel cell electric vehicle (FCEV) applications are currently best suited to high duty-cycle, high-usage fleets like buses, trucks, trains and, to some extent, maritime vessels. We are seeing real momentum here and our PEM products have now successfully powered around 3,000 FCEVs in commercial applications for more than 30 million km on roads around the globe.

How important is platinum to PEM fuel cells and is there an alternative?

Today we are able to provide a fuel cell power module for heavy duty vehicles that is approaching the operation and performance maturity of the current internal combustion engine. For example, fuel cell stacks in buses, deployed in central London for eight years, have demonstrated the ability to operate for over 30,000 hours of life without degradation – the equivalent of 500,000 km. Durability and efficiency

are vital to making FCEVs an affordable option for fleet owners. Platinum is the only proven catalyst for fuel cells that delivers on that front – we have not yet found anything else that matches the performance of platinum. Never say never, but replacing platinum with an alternative material is not in the offing.

Last year Ballard launched its 8th-generation fuel cell power module – why is this significant?

Fleet owners and operators are concerned with total cost of operation (TCO) when considering a vehicle. As I mentioned, durability and efficiency matter, and they are part of the equation, but for the FCEV to be a competitive option we need to drive TCO down by addressing costs as well – all costs; upfront as well as running costs like servicing and maintenance. This latest generation fuel cell module does just that. In fact, with the 8th-generation FCmove™ module Ballard has achieved a 35 per cent reduction in total



Heavy duty vehicles like buses are paving the way for wider adoption of fuel cell powertrains

life cycle cost. Driving down TCO is vital in the long run for FCEVs to really take off as a powertrain and reach scale.

What are current platinum loadings in Ballard fuel cell modules?

The loading on an 85 kw fuel cell module – effectively two stacks – is around 75 g (almost 2¼ oz) and slightly, although not significantly, less on the 8th-generation module. It is worth noting that 95 per cent of the platinum on a module is recycled when the time comes for the stack to be refurbished.

Is reducing platinum loadings over time key to achieving large scale adoption?

As I have said, driving down total life cycle costs of our products is critically important to achieving our goal of increasing megawatts shipped and for the industry as a whole to move towards scale. Platinum loadings, while of course a factor, are not a major consideration. I would expect some reduction in loadings over time, but we are not talking hugely significant amounts.

How does Ballard measure the effectiveness of the Platinum it uses?

At Ballard we know that higher power density (in kilowatt per litre or kW/L) is critical for vehicle integration, especially trucks. Only platinum-based fuel

cell stacks can produce the level of 4 kW/L we have achieved in our latest generation stack.

How does Ballard measure progress?

We look at megawatts of power shipped as a key measure; in 2019 over 100 megawatts of fuel cell products were shipped. Our ambition is to see this rise to 1,000 megawatts of power shipped, hopefully in the next three to five years. However, this will depend on market demand, which we believe is building for a number of reasons, not least the need to address climate change. The potential for the hydrogen economy to become a game changer in terms of decarbonisation of our economy and reducing emissions is firmly on the agenda around the globe.



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