A FOTON FUTURE

Foton Mobility only recently started commissioning hydrogen buses in Australia. Its new FTH12 hydrogen city bus showcases the evolution that the new energy heavy vehicle distributor is undergoing.

WORDS AND IMAGES PAUL ALDRIDGE

Foton Mobility CEO Neil Wang certainly isn't a newcomer to the bus and coach industry, with many knowing him from his involvement with associations and other companies.

A few years ago, Wang changed paths and decided to operate his own business, using all the experience and expertise he had acquired. As a result, he decided to introduce new technology to the market to help build Australia's hydrogen industry.

Wang is now CEO of Foton Mobility, the first project of which was to bring its test drive vehicle – a hydrogen city bus with zero emissions – to Australia. Although hydrogen technology is new to Australia, hydrogen fuelled vehicles have been successfully operating in both the Chinese and world market since 2008.

When we think of new technologies, we are all now accustomed to understanding the benefits of electric vehicles in both the domestic and transportation markets. The introduction of another new technology with environmental benefits is set to change the game again, and *ABC* got the chance to test drive Foton's new FTH12 hydrogen bus.

As hydrogen fuel cell technology is new to the Australian market, Wang discusses how the system works. Hydrogen tanks are fitted to the roof of the bus, with the motor using the fuel cell to recharge the battery. When the bus power drive motor's state of charge falls below 80 per cent, the fuel cell is activated to operate the power motor and, in turn, recharge the power battery. The power battery drives the power motor using a similar process to what is used on a fully electric bus.

"In simple terms, the hydrogen fuel cell acts as an onboard charger to charge the battery and also powers the buses' electric drive motor," Foton Mobility national sales manager Greg Abel told *ABC*.

"It works through a set of parameters that are based on the state of charge and the speed of the bus as to what stage the fuel cell runs the bus and charges the battery."

With hydrogen power still being relatively new for Australia, we wanted to know where the Foton Mobility CEO sees the Foton hydrogen bus in the market.

"We see this bus as a solution for the metro city bus operator that works in an environment where they might have limited land space and they would find it difficult to upgrade their power supply," Wang told *ABC*.

"Operators will have the option to have a hydrogen hub onsite, or have it delivered as they would their diesel buses.

"In the future when there is a larger volume of hydrogen usage, we plan to build hydrogen hubs that allow for expansion into regional areas and this will mean employment opportunities for a growing industry."

INFRASTRUCTURE BENEFITS

With all new technologies there are of course changes needed to infrastructure to support the new fuelling requirements. With both electric and hydrogen powered vehicles, Wang says operators need to consider the costs and any limitations while these new fuel sources are becoming more established in our industry.

"A real benefit of the switch to hydrogen is that it doesn't require significant infrastructure changes for operators," Wang says.

"With our current partners, we can provide hydrogen to operators by two different methods. We can build a hydrogen station within the bus depot and the operator will pay a fee per kilogram just like you would pay for purchasing standard fuels. The other option is that we can have the hydrogen delivered straight to the depot and the hydrogen tanks refilled."

Above: Fonton Mobility CEO Neil Wang says a significant benefit of hydrogen power is that it doesn't require significant infrastructure changes

Left: Everything is clear and in reach for drivers

Opposite: Capacity is for 44 passengers seated and 20 standing

THE TEST DRIVE – FOTON MOBILITY FTH12

The test drive of the Foton Mobility FTH12 is my very first drive of a hydrogen bus. Externally the FTH12 is wrapped in blue and green announcing that the future has arrived.

In the driver's cabin, there's plenty of room, even for taller drivers. The

Specs

MODEL: BJ6123FCEVCH
LENGTH: 12.48m
FUELSTACK: SinoHytec TS60 (Toyota fuel stack) 60kW
TRACTION MOTOR: Dana 1,200/3,300Nm 150/250kW
FRONT AXLE: ZF 7.5T disc brakes
REAR AXLE: ZF 13T disc brakes
SUSPENSION: Air suspension with stabliser
STEERING: Bosch
ABS / EBS: Yes
LDWS: Yes
ECAS: Yes
SEATS PASSENGER: Ster
DRIVER: Grammer
AIRCON: Thermo King EL200LW

> In the future when there is a larger volume of hydrogen usage, we plan to build hydrogen hubs that allow for expansion into regional areas and this will mean employment opportunities for a growing industry.

driver's seat is a Grammer high backed model, meaning it's very comfortable and can be raised up or down to suit the driver. The leather-bound steering wheel feels really nice in hand and everything is easy to see and reach.

Once we're away, it immediately drives really nice and smooth. The very first feature that stands out is the visibility onboard. A big bonus is the mirrors on this bus. You can have all the safety features under the sun, but if the visibility of the road, vehicle and surroundings is perfect, then it's a big safety bonus for all drivers. There are also digital internal mirrors, meaning the driver has eyes everywhere.

The FTH12 is powered by a SinoHytec TS60 Fuelstack (Toyota Fuel Stack) 60kW and the traction Motor is a Dana 1,200/3,300Nm 150/250kW.

When taking off at lights, it really does go. The FTH12 accelerates very quickly and effortlessly up to 80km/h. The instant acceleration is smooth and linear and there's no jerky behaviour.

The front and rear axles have ZF disc brakes, and this model comes with an anti-lock braking system, electric braking system, lane departure warning system and electronically-controlled air suspension, meaning there's plenty of safety features for driver ease and peace of mind. Never underestimate the responsibility a driver has with a loaded vehicle. Added safety features give drivers another layer of protection.

The Foton FTH12 is a route bus and has very good accessibility for passengers. It's got a low flat floor until you hit the rear back door and there are two roomy areas for wheelchairs with fold down seating for passenger usage. The passenger capacity is 44 passengers and 20 standees. This configuration can be adapted to operators needs, along with the seating choice. For standing passengers, there is ample head height. At each passenger seat, there is the all-important USB port.

Simplicity is the key to avoiding time off the road and, as you walk around the bus and check out each area, the same simplicity and access continues all around. At the rear of the bus is the hydrogen fuel cell and this is where things look very different. There are multiple safety systems in place, including covering leakages or impacts to ensure ultimate safety of the vehicle and passengers. In all of the service areas, simplicity of visuals and access is a feature that really stands out.

The warranty periods are impressive and this means confidence on the part of a company with their product. The vehicle has a five year or 400,000km warranty, whichever comes first. The power battery warranty is eight years or 600,000km, while the fuel stack is five years or 400,000km.

Going forward, it is going to be interesting to see just what impact this new hydrogen technology has on the industry. With Foton having built and operated hydrogen-powered buses since 2008, it really isn't a newcomer. With the lag we've had to experience this technology, it seems with the FTH12 that any issues have long been ironed out.

I feel frustrated that the switch to the new technologies may be slower than what our environment needs. This is probably based on infrastructure and not the actual vehicles. It is people like Neil Wang, driving and believing in the importance of advancements in greener power, that are just what's needed to go forward. Like Wang says, it's all about taking the first step out there.

"When people are aiming for the goal of zero emissions for public transport, they think the only option for them is to go electric," Wang says.

"But now there is another option to consider. When you really compare the capital costs for electric and hydrogen, even if you don't include the infrastructure costs to upgrade your depo, their prices are pretty much the same.

"You must remember the chargers also have a limited warranty and lifetime. It's the big picture and lifetime costs that also need to be considered, and we're confident operators who choose our FTH12 bus will reap these rewards."

Above: The future is here, and it's powered by hydrogen

Below: The FTH12 is powered by a SinoHytec TS60 Fuelstack