

## Exclusive interview with

### Huw W. Hampson Jones, CEO, OXIS Energy

*OXIS Energy is a cell manufacturer who has developed its technology around sulphur based cathode materials, highly stable electrolyte systems and anode made of lithium metal and intercalation materials, claiming that this combination can effectively replace a fuel tank. cars21.com talked to Mr. Huw W. Hampson Jones, CEO at OXIS Energy, to learn more about the advantages of this technology as compared to li-ion.*

**[cars21.com](#): OXIS is pioneering Polymer Lithium-Sulphur battery technology – can you explain in a few words what the advantages of this technology are?**

**Huw W. Hampson Jones:** The first major advantage is the superior energy density of polymer lithium-sulphur as compared to lithium-ion technology, because with more energy you can power the vehicle for greater distances. With our technology we can actually show that the chemistry is capable of replacing the petrol tank. That is one factor.

The next factor is safety: the scientists of OXIS have developed and produced a method by which the sulphur acts as a fire suppressant to the lithium, and that is unique to OXIS. This means you get greater energy performance with much better safety, and in conjunction with that you have the lightness of the material itself.

So to summarise, the 3 distinct advantages of polymer lithium sulphur over lithium-ion are power (by a factor of 5), safety and lightness. All of them combined can replace the petrol tank.

**[cars21.com](#): How does Polymer Lithium-Sulphur compare to other battery chemistries such as zinc-air, lithium-air....?**

**Huw W:** The basic difference is that we have already reached commercialisation. Lithium-air, from what I have learnt from presentations by lithium-air chemists, is still quite a number of years off. And of course, air is a gas, which means that there are serious safety issues to be tackled. Theoretically, lithium-air is a capable technology, my point however is that our chemistry will be on European roads within the next 12-18 months. We will power European electric bikes by this time next year for testing certification purposes, the objective of which is to launch these batteries on the European market in 2013.

Everything we do for the electric bike is a branch of the same tree as electric vehicles. The application is different but the chemistries are the same.

**[cars21.com](#): What are drawbacks of your technology?**

**Huw W:** I can safely say there are no drawbacks to lithium sulphur, because for a number of factors: sulfur is non-toxic, non-carcinogenic, and biodegradable. Now, the area where improvements are required are of course the growth in energy density. We don't just sit back and are happy about what we achieved already (300 Wh/kg). The objective is to push the energy density up as high as possible in the next 3-5 years. We are signalling to the car manufacturers that we will be in the range of 400-600 Wh/kg in the course of the next 5 years.

The lifecycle as well, needs improvements and real work. The customers in the electric bike sector are happy with today's lifecycle, which is around 300-350 cycles, but this is not good enough for the car industry. The car industry wants 5000 cycles, which is almost 14 years more than the life of the car. But we will see improvements, and experimental work today shows that we can achieve 1000+ over the course of the next 2-3 years, which is good. But the real question is if we can improve further than that.

[\*\*cars21.com\*\*](#): **Have you tested your battery technology with OEMs? Are there currently EVs driving with Polymer Lithium-Sulphur batteries?**

**Huw W:** We are in collaboration with a French city car manufacturer. We are currently collaborating on the design and build of the new Polymer Lithium Battery system. Further announcements will be made in October 2011.

[\*\*cars21.com\*\*](#): **Standardisation is one of the key issues being discussed. What kinds of standards are relevant and important for battery manufacturers?**

**Huw W:** Well, standardisation is for specific applications. Let's call electric bikes one application, electric cars another one etc... The reason why we are addressing the electric bike market first is because the decision making process is swifter than for electric cars. We ensure that our battery technology complies with EU, UN, US certification processes. We need manufacturers to work with us for the certification process. Right now, we are working with one Dutch and two British electric bike manufacturers in this respect.

The electric car market is a little bit more complex and we have to work closely with car makers to achieve certification but essentially we will do everything that is required to comply with the standards.

[\*\*cars21.com\*\*](#): **What kind of developments do you expect in the EV battery market in the short-term, over the next 6-12 months?**

**Huw W:** Our in-house target for the next 6 months is to deliver a battery system prototype for electric bikes at 160-200 Wh/kg, 10A, with battery management system (BMS) included. Our target for the next 12 months reaches even beyond and will be achievable by tailoring the battery packs to the application. We are working currently with electric bike manufacturers to fit our battery pack on to their bikes.

We are also starting collaborations with battery manufacturers who will mass market the production cells and battery systems. In the world market, you have battery manufacturers who only produce cells. They then send them to companies like Panasonic and Samsung who make the battery pack. But there are also battery manufacturers who produce the cells and assemble the battery pack, and we are collaborating with those.

**[cars21.com](#): Are you manufacturing the battery management system (BMS) yourself?**

**Huw W:** Yes, we are making good headway working with American chip manufacturers.

**[cars21.com](#): Could you give us an estimate of the battery price development over the next few years and the price of Polymer Lithium-Sulphur batteries as opposed to lithium-ion and NiMH?**

**Huw W:** There is no doubt in our mind that lithium-sulphur will be considerably cheaper than lithium-ion battery technology, for the very simple reason that cobalt is \$33,000/ton, nickel is \$22,000/ton, whilst sulphur comes at \$200/ton. That alone will bring down the production price of the battery itself.

**[cars21.com](#): If you look at the development rates of batteries and uptake rate of EV, does it look like the demand will match the supply or do you see a big gap coming?**

**Huw W:** Well, based on my research, there are over 25 million electric bikes sold every year today, and Europe is emerging as the 2<sup>nd</sup> largest market worldwide. With regards to electric cars, the ramp-up will be gradual. I think that it will happen around 2014-2015. If then you succeed in selling 200,000 electric cars, the amount of cells needed will be greater than what is required for the entire laptop and mobile market today.

I think our timing is right. If we can hit the Geneva Motor Show with the full battery system for the electric car, there could be a shortfall in the period of 2014-2015.

Of course the reduced cost of our battery has to be a positive impact on the consumer take-up of electric cars, because one of its biggest drawbacks for the moment is the price of the technology.

**[cars21.com](#): If you would be asked to formulate a global action plan for a rapid introduction of electric vehicles, what would be your top 3 points on the agenda?**

**Huw W:** I think the first one would be the mass production of a safe battery system. Because if you deviate from that and if there is a failure on that point it will have a colossal effect on the take-up of the technology. Safety has to come first.

Secondly, I think we need to demonstrate that we cannot only power the car but we can power all the new features and functionalities that are in a modern car.

And last but not least, it is key for the European governments to sponsor charging points.

[cars21.com](http://cars21.com): Many thanks, Mr. Jones!