COSMHYC INTERVIEW

Uwe Albrecht, Managing Director of Ludwig-Boelkow-Systemtechnik, shares his vision for hydrogen mobility in Europe

Ludwig-Boelkow-Systemtechnik (LBST) advises clients from industry, finance, politics and NGOs in all aspects of renewable energy and mobility. Within the COSMHYC project LBST is in charge of conducting a techno-economic analysis, ensuring the competitiveness and commercialization potential of the COSMHYC innovative compression system. In this interview LBST director Uwe Albrecht reflects on the state-of-the-art of sustainable mobility in Europe and how COSMHYC will contribute to a further commercialization of FCEVs.

Ludwig-Boelkow-Systemtechnik (LBST) is an expert consultancy for sustainable energy and mobility. With expertise bridging technologies, markets, and policy LBST supports international clients from industry, finance, politics, and non-governmental organisations in strategy, feasibility, and market assessments.

LBST is particularly experienced in energy (renewables, energy storage, hydrogen and fuel cells) and mobility (fuels and drives, infrastructure, mobility concepts) topics, with work on sustainability cross-cutting all sectors. A common denominator of all activities is the rigorous system approach, making sure all relevant elements of a tightly networked system are taken into account, and providing LBST partners and customers with a comprehensive and reliable basis for their decisions.

Uwe Albrecht is Managing Director of Ludwig-Boelkow-Systemtechnik GmbH (LBST). He joined LBST in 2008, coming from Siemens Venture Capital, where he was a Managing Partner supporting the corporate growth strategy of Siemens AG by investing into international startup companies in the energy and industry sectors. Prior responsibilities include various innovation and technology management roles at Siemens AG and at Mannesmann AG.

He holds a Bachelor of Science degree from University of Washington, Seattle, a Physics Diploma from Johannes-Gutenberg-Universität Mainz, and a Ph.D. in physics from Universität Konstanz.

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Mr. Albrecht, LBST has contributed to several European studies on sustainable mobility with a special focus on fuel cell technologies. What is your view on the future of hydrogen mobility in Europe?

Transport is responsible for about 20% of European greenhouse gas emissions. Moreover, it is the only sector emitting more emissions at the present than in the 1990 benchmark year. So, in light of the global threats posed by climate change the transport sector will have to undergo massive changes in the upcoming years and move away from combustion engines – especially, if international greenhouse gas emission reduction goals shall be met.

Fuel cell electric vehicles (FCEVs) powered by hydrogen will complement battery electric vehicles (BEVs). **We expect FCEVs to play an important role in the future portfolio of mobility technology.** While BEVs are great for short and medium range trips, we need to keep in mind that the lion share in terms of vehicle kilometres comes from long drives over 300 km, which will not be easily accessible to BEVs in the foreseeable future. **FCEVs** on the other hand **offer the range, refuelling convenience, and comfort customers are already used to from incumbent combustion engine vehicles.**

More specifically, how do you see the place of hydrogen and fuel cell technology in the Germany energy transition?

Germany has been the first European country to proactively ramp up renewable energy generation big time. About 32% of German electricity produced in 2016 came from renewable sources; the largest share of that stemming from intermittently generating sources like wind and PV.
With plans for greater generation capacity, large scale demand flexibilities as well as large scale storage will play an increasingly important role in the overall energy system.

Producing hydrogen by electrolysis from renewable electricity does not only fill this gap perfectly; it is actually the only available solution to condition electric energy at Terawatt hour scale for storage over extended periods of time. Allowing to bridge between hitherto separate energy consuming sectors, this so-called ‘sector-coupling’ will be a key element of our future energy system, not just in Germany but in any country moving more strongly into renewables.

How would you describe the activities of LBST within the fuel cells and hydrogen field?

The focus of our activities is on techno-economic analysis in the fields of sustainable energy provision and sustainable mobility. We look at emerging technologies and solutions and evaluate, when, how, and under which boundary conditions these are able to shape the future, impact existing business, and open up new opportunities. Our customers from the public sector are of course interested in how such developments interact with the current policy environment and how policy makers can adapt and sensibly prepare for the things to come. **LBST has been actively working on the hydrogen and fuel cells for over 30 years and is one of the premier international competence centres in the field.** About

half of our assignments involve hydrogen related technologies and solutions. Currently, also the associated infrastructure plays a big role in our studies.

At the beginning of the project, you were responsible for defining the applications and evaluating the requirement for the compressor to be developed by COSMHYC. Based on this work, which will be the main challenges for the project?

We looked at various refuelling applications and their technical requirements such as intake and output pressure, compression capacity, reliability, hydrogen purity, energy consumption, or noise limits. Based on existing station concepts, **we know that technology reliability and energy consumption are the main challenges for any compressor technology**. In contrast to some established compressor technologies, the new concept developed in the COSMHYC project will easily fulfil the requirements regarding output hydrogen fuel purity.

LBST is also responsible for conducting techno-economic analysis over the life of the project. Can you already assess the impact of the COSMHYC developments on the upcoming H2-station (HRS) roll-out in Europe?

We expect an increase in installed hydrogen dispensing capacity by a factor of about 10 in the next 10 years. This development will largely be triggered by public and industry commitments towards this technology. However, economic competiveness and technical reliability of the refuelling technology will also play a major role in the success and speed of the upcoming hydrogen refuelling station roll-out. **The research and developments within the COSMHYC project will contribute to a further reduction of HRS investment costs and electricity consumption.** But the specific impact on the HRS roll-out can only be estimated at a later point in the project.

What excites you the most about the COSMHYC project?

Within **COSMHYC** an **innovative compression** concept is being developed, having the **potential to provide significant benefits to hydrogen refuelling stations**. We are very excited to be part of this process.

With its somewhat different requirements regarding system integration and operation due to the alternative approach we are eager to see how the expected improvements will manifest themselves during long-time tests in real-life conditions.