

COSMHYC INTERVIEW

INTERVIEW - Pascal TERRIEN, director of EIFER, expresses its views on the challenges taken up by the COSMHYC Project

The COSMHYC project is coordinated by EIFER, a research institute located in Karlsruhe (Germany) and the largest R&D international centre of the EDF Group. In this interview, Pascal TERRIEN, director of EIFER and expert for energy and sustainable cities, takes time to express his views about the challenges taken up by the COSMHYC project. A great opportunity to learn more about the growing links between electricity production, renewable energy deployment and hydrogen mobility.

The European Institute for Energy Research (EIFER)

EIFER is a European Economic Interest Grouping founded in 2001 by the French utility EDF and the German institute KIT (Karlsruhe Institute of Technology) for bridging the gap between science and industry on a range of energy related topics.

Together with high level scientific and industrial partners EIFER conducts research on smart and sustainable cities, energy systems, local energy concepts and low carbon solutions. EIFER participates in several national and European public funded projects on high temperature electrolysis, fuel cells, and hydrogen mobility.



Short Biography

Pascal TERRIEN is a mechanical engineer with a diversified experience of Research and Development in steel and chemical industries as well as in the energy sector.

Within the EDF Group he launched a range of innovative initiatives. With leading scientific partners in Europe, he founded the European Center and Laboratories for Energy Efficiency Research (ECLEER).

As R&D Program director for sustainable cities, he conducted international projects based on systemic approaches for long term urban planning. He is director of EIFER since 2016.

Mr. Terrien, EIFER is part of the R&D division of the EDF group. Why is France's biggest electricity producer investing in research on hydrogen?

EDF is committed in producing low carbon electricity and supports the deployment of renewable energy in the scope of the energy transition.

“By supporting research activities on hydrogen, EDF contributes to speed up innovation in this area and the energy transition.”

EDF is actively committed for climate change mitigation with low carbon solutions both on generation and demand side, stakeholders of regions and cities, public and private consumers. When hydrogen is produced with low carbon electricity, it is a solution to significantly reduce the carbon footprint of the transportation sector, which still relies at 98% on fossil fuels.

Beside mobility, hydrogen is also a low carbon solution for industrial applications. Moreover, hydrogen has the potential to create a link between different energy sectors. For example, renewable energy surpluses can be valorised by producing hydrogen with a water electrolyser for use in the transportation sector. By supporting research activities on hydrogen, EDF thus contributes to speed up innovation in this area and to draw the roadmap for hydrogen technologies for the energy transition.

Which are the main objectives of EIFER activities on hydrogen technologies?

The specificity of EIFER is to be simultaneously involved in upstream research and in the development of low carbon solutions for industry. EIFER has been working for 15 years on electrochemical devices and electrolysis technologies together with German and European partners in the frame of public-funded projects.

“Hydrogen mobility is becoming real”

Today, some electrolysis technologies are mature and we are entering a new demonstration phase before industrialization. The focus is now on capital expenditure reduction and efficiency of technologies for mobility and first applications in industry. Through its participation in different projects together with industrial partners and potential users, EIFER gets to better understand their needs. Remaining bottlenecks and possible technological improvements can also be identified. The objective is to be ready for the industrialization step which is expected in the upcoming years.

Up to now, which are the main achievements of EIFER within the fuel cells and hydrogen field?

Thanks to its test facilities, EIFER focused on long-term testing of high temperature electrolysis technologies and on the optimization of the performance and lifetime of fuel cells. Based on this research EIFER achieved, in February 2016, the demonstration of 23000 hours continuous steam electrolysis operation of a ceramic solid oxide cell for hydrogen production. This operation time is, at present, the longest reported so far, worldwide!

Another main achievement has been the opening in April this year of FaHyence, the first French hydrogen refuelling station with on-site electrolysis using low carbon electricity. EIFER contributed to the development of this station, together with French public and private partners, in the framework of the H2ME project (Hydrogen Mobility Europe) funded by the European program FCH2-JU. Such a demonstration facility is a great opportunity to get a broad audience to realise that hydrogen mobility is becoming real!

Why is the EIFER team working in COSMHYC so excited about the project?

COSMHYC will improve the compression step at refuelling stations to provide hydrogen at 350 and 700 bar for passenger cars and other vehicles. At the end, the new compression solution will significantly reduce the costs of this step and could become a real technological breakthrough, decreasing the cost of hydrogen in refuelling stations and, as a consequence, helping to develop it quicker. The EIFER team involved in COSMHYC has here the opportunity to be at the edge of technological innovation. Working with industrial partners on a product which could be industrialized very soon is particularly gratifying for researchers as well as it creates values for the partners over the short run. We are convinced that we contribute to the development of a technology which has the potential of becoming disruptive and could change the game, both for transportation and the industry.

As an expert for smart cities and urban environment how do you imagine H2 usages in the cities of the future?

The city of the future will need low carbon electricity. Polluting energy systems will be replaced by efficient and clean ones for a better quality of life. Mobility adapted to all needs, good air quality and low noise levels are major factors for the well-being of city dwellers. Technologies using hydrogen produced by low carbon electricity can offer efficient responses to all these challenges while addressing emerging and changing needs related to the delivery of goods or services. Still, the bottom line is that electric mobility will drastically change our lifestyle. The market entry of hydrogen technologies, alongside with the ongoing revolution on batteries, are major steps toward sustainable urban development.