



LoCEL Horizons

The second half of 2023 was busy for our project partners between progress with socio-cultural analysis, technological developments, presentations at international events, and intra-consortium visits and collaborations.

In this second edition of our newsletter, we bring to you some of this semester's highlights in our path towards a new clean energy and cooking fuel solution for off-grid communities.

VISITS TO COMMUNITIES TO UNDERSTAND ENERGY NEEDS

A field work campaign in Pakistan has equipped our partners with a wealth of information about energy needs of isolated communities. This will help to support future uptake strategies of LoCEL-H2's energy innovation in Zambia and Côte d'Ivoire.

The team of University of Naples Federico II (UNINA) was welcomed by the team of Lahore University of Management Sciences (LUMS) in Lahore, Pakistan, in November 2023. They had a week-long collaboration to exchange about LoCEL-H2 goals and methods, and the main objective was to gather information about energy practices and community energy needs in three villages that are currently partially electrified or fully off-grid located in Multan, around 300 km to the southwest of Lahore.

Combining the social science expertise of UNINA with the electric engineering and local expertise of LUMS, they carried out focus group discussions with men and women of the villages and interviews with relevant stakeholders. This collaboration was not only a great step forward in the development of methodologies for socio-cultural analysis, but also strengthened the relationship between our project partners.



“It was miraculous how our team worked together and managed to conclude our work in a span of a day and a half, given we had to pack-up before sunset and three different languages with multiple accents and intonations were involved.”

Reesha Arshad, PhD researcher at LUMS

“Illuminating the exterior and interior of houses often made of mud bricks is the light collected during the day by small solar modules, stored in batteries, powered intelligently by the energy management device set up by the engineer colleagues. You can charge a mobile phone all night, if needed you can pump water from the well.”

Professor Dario Minervini, UNINA

LoCEL-H2 team members have shared their work in this first year of the project with international audiences.

Dr Hassan Khan (Lahore University of Management Sciences) at the IEEE Global Humanitarian Technology Conference in Villanova, Pennsylvania, USA

Dr Khan presented his work on performance assessment of multiple module technologies including Si and thin film solar modules and a case study of a DC microgrid deployed in an off-grid village in Pakistan with a business model tailored to cater to the community's energy and social needs, providing an example of how the LoCEL-H2 system could work in practice.

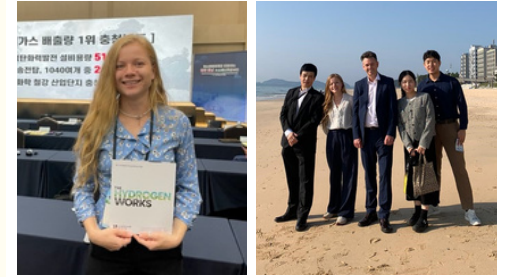


Dr Lizzie Ashton (Loughborough University) and Dr Carl Telford (Consortium for Battery Innovation) at the Batteries Event 2023 in Lyon, France

- Dr Ashton presented the design and performance overview of the novel combined lead battery-electrolyser being developed for energy storage and green hydrogen production, and Dr Telford gave an overview of LoCEL-H2.

Dr Lizzie Ashton (Loughborough University) at the 6th International Hydrogen Energy Forum in Chungcheong Province, South Korea

- Dr Ashton discussed the combined battery-electrolyser technology with other participants
- committed to the advancement of hydrogen energy technology, including the Mayor of Boryeong-si, the Governor of South Chungcheong Province, and academics from Danook University.



CULTIVATING COLLABORATIONS BETWEEN PARTNERS

Our project brings together people from different countries covering a wide range of expertise. The consortium believes that team building and internal collaborations are a key to our success. Read in this section some of these exchanges.

October 2023 - **Dr Lizzie Ashton** (Loughborough University) visited Massachusetts (USA) and was welcomed by **Nicolas Clement** at Hollingsworth & Vose to conduct electrochemical testing on various additives to the sulfuric acid electrolyte solution used in the combined battery-electrolyser system. These studies aim to enhance the yield of hydrogen gas produced in the system, to provide cooking fuel for the communities when installed.



Working alongside industry experts, I gained hands-on experience utilizing cutting-edge equipment. I also had the opportunity to immerse myself in the company culture and forge personal connections. The experience was not only informative but also greatly enhanced my understanding of the intricacies involved in our project's development.

Dr Lizzie Ashton, Loughborough University



- November 2023 - **Dr Giulia Mininni** (UNINA), **Dr Athanasia-Maria Tompolidi** and **Dr Carl Telford** (Consortium for Battery Innovation) were welcomed by **Prof. Dani Strickland**, **Dr Jonathan Wilson**, **Dr Lizzie Ashton** and **Matt Brenton** at Loughborough University. The visitors had the opportunity to learn more about the novel combined battery-electrolyser system being developed there and record a video about our project - stay tuned!

