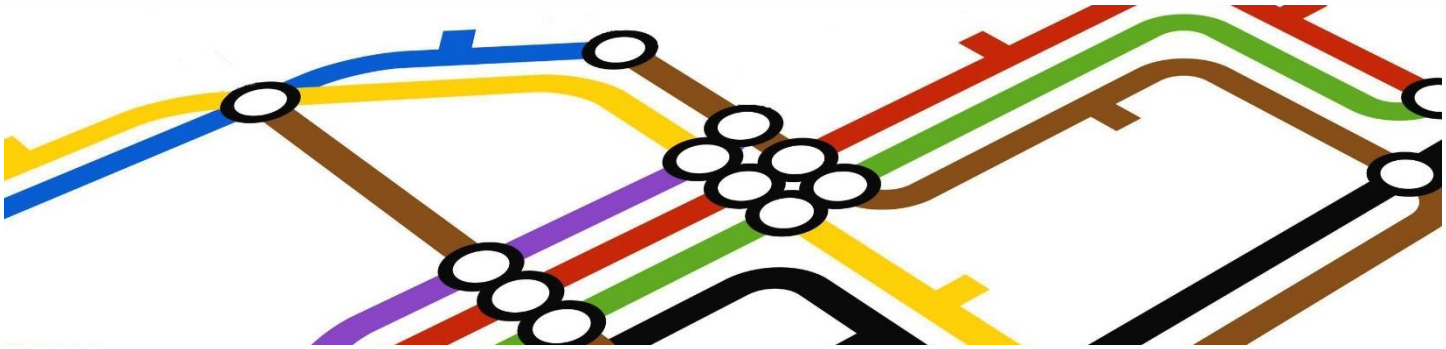
sccer mobility

Swiss Competence Center for Energy Research
Efficient Technologies and Systems for Mobility



Newsletter

No. 15 / March 2020

Dear Reader
We are pleased to present the latest SCCER Mobility news to you. This issue communicates major advances and events of our research platform. Enjoy reading!

News & Highlights

Funding program "SWEET"

On 26 February 2020, the Swiss Federal Council passed the dispatch for the new energy research program "Swiss Energy Research for the Energy Transition" (SWEET) to the Swiss Parliament for approval. The program is intended to run for 12 years from 2021 to 2032. Only consortia projects will be funded through competitive calls for proposals, which deal with research themes promoting the Swiss Energy Strategy 2050.

Read more

SCCER interviews with Stephanie Wegmann & Olga Weiss

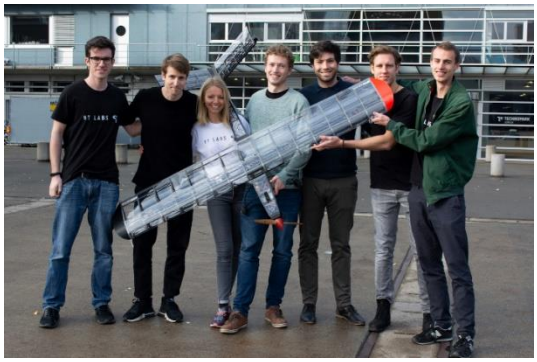
Two new interviews with Stephanie Wegmann, researcher at the Institute of Polymer Engineering at the University of Applied Sciences and Arts Northwestern Switzerland, and Olga Weiss, postdoctoral researcher in the Energy Systems Group at ETH Zurich, are online. Read about their take on energy research.

Read more

How can we fly less?

ETH Zurich has launched a university-wide project to reduce CO_2 emissions from business air travel. At an event held by the university, more than 200 participants discussed the ways in which individuals and ETH as a whole can change their behavior.

Read more



Morphing composite drone

A team at the Laboratory of Composite Materials and Adaptive Structures at ETH Zurich collaborated with the ETH Spin-off 9T Labs to develop and manufacture a 3D printed morphing composite drone. The drone uses morphing for roll, pitch, and yaw control on the main wing and the empennage. After verifying the structure with static tests, a flight test was performed, showing the high maneuverability of the drone.

Read more

Moving into the future with real-time and predictive traffic management

HERE Technologies, named number one location platform this year by Strategy Analytics, focusses on stepping beyond maps to building a digital representation of reality. In an interview, David Jonietz, former PostDoc scientist in the SCCER Mobility network, shares his experience in switching from academia to being a research group leader at HERE Technologies.

Read more

More news highlights

MAS | CAS ETH "Future Transport Systems" News

Technology options for future mobility

Thirteen students participated in the CAS "Technology Potentials" last fall semester. Students learned about state of the art in powertrain, energy carrier and spatial information and communication technologies as well as integrated assessment of these technologies and agile and user-oriented innovation. Student groups chose a specific problem statement to analyze in their semester projects. The final presentations of these projects were held on January 31st.

Read more

CAS "New Business Models" starts successfully!

The CAS "New Business Models" started on 4 February with 9 participants, 5 continuing with the MAS and 4 new students. During the semester, they will choose a business idea in the field of future mobility and elaborate a business model.

Read more

Upcoming events

SCCER Mobility webinar series spring 2020

The SCCER Mobility Webinar Series goes into its fourth round this spring starting in March:

- 26 March 2020, 11.15-12.00: Dejan Milojevic, PhD candidate at Empa
- 23 April 2020, 11.15-12.00: Romain Sacchi, Postdoc at PSI
- 28 May 2020, 11.15-12.00: Giacomo Pareschi, PhD candidate at ETH Zurich

Further information about talks from the previous and ongoing semesters can be found here.

SCCER Mobility Annual Conference 2020 – secure your spot today!

As 7 years of SCCER Mobility slowly draw to an end, we invite you to this conference on **30 June 2020** at ETH Zurich to present a synthesis of the competence center, to review the most relevant research results of each capacity area and conclude with an outlook on important future research topics. It will be an opportunity for our academic and industry partners to discuss the achieved results, establish new collaborations and identify future research needs in the fields of mobility and energy. As in previous years, there will be keynotes, poster sessions and the Best Poster Award. Register now!

More upcoming events

SCCER Mobility Glossary

This section intends to widen the common ground between all SCCER Mobility partners. Contributions from our members are welcome. To make suggestions for this section, please contact the Management Office.

Fuel cells are electrochemical devices that convert chemical energy to electricity through redox reactions involving a fuel and an oxidant. Similar to a battery, they have two electrodes, an anode and a cathode, where the chemical reactions take place. However, unlike a battery, where the energy is stored in the electrode materials, electricity generation in the fuel cell is dependent on the fuel supply. Most commonly, hydrogen is the fuel and oxygen (from air) is the oxidizing agent, in which case water is the only product of the reaction. However, since losses occur, a part of the energy contained in the fuel is converted to heat.

The electrolyte, which transfers ions between the electrodes, is another central component of a fuel cell and it usually defines the type. Thus as the name suggests, in a **polymer electrolyte fuel cell** (PEFC) a polymer electrolyte membrane separates the anode and cathode and transfers protons between them. PEFCs are also most commonly used in transport applications and also referred to as **proton-exchange membrane fuel cells** (PEMFC). Since a single fuel cell produces voltages below one Volt, typically several hundred cells are stacked and separated by so-called **bipolar plates**. They supply the fuel and the oxidant to each cell and connect the individual cells electrically.

State of the art PEFCs reach a system efficiency of above 60%, however much heat is still lost to the environment. Conventionally, this excess heat is absorbed by a liquid coolant that flows through dedicated channels inside the bipolar plates, ensuring uniform temperature distribution throughout the cell. However, such a setup requires a complex cell structure, which currently still makes fuel cell technology a pricier option for e.g. a car. A new concept termed **evaporative cooling** reduces this complexity by feeding liquid water to the cell. Excess heat is taken up by the evaporation of the water and is released as vapor. This allows for reduced complexity and volume, which translates into lower costs as well as higher operating temperatures without requiring additional humidification. Such systems can reduce fuel cell volume, complexity and costs by up to 30%.

As part of Capacity Area A2, the group of Felix Büchi at PSI works on such novel systems. If you would like to find out more, contact Michael Striednig, a PhD candidate in the group working on evaporative cooling.

Quiz

What is the challenge of the Traffic4Cast competition set by the Institute of Advanced Research in Artificial Intelligence? The first 10 people to send the correct answer to Pascal Sonder will enter the final drawing and have a chance to win (e-mail subject: QUIZ).

Solution of the previous quiz: electrification of long haul flights was perceived as the least feasible option for decarbonizing aviation during expert interviews in the context of an ETH initiative. The winner was Wolfgang Kling, engineer at BLS AG and MAS alumni. Congratulations!

This information is provided by the SCCER Mobility Management Office. Our newsletter is issued 4 times per year. If you have information that you would like to share, please contact Kirsten Oswald.

In case you do not wish to receive our newsletter in the future, please unsubscribe.

Dr. Gloria Romera Guereca, Managing Director SCCER Mobility
ETH Zurich - LEO C14, Leonhardstrasse 27, 8092 Zurich, Switzerland
Phone +41 44 633 8006, email gloria.romera@sccer.ethz.ch
www.sccer-mobility.ch