ABSTRACTS

From new generation mainstream Photovoltaic technologies to optimized integration for buildings, agriculture and transport

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While the so-called PERC technology has settled in few years as the mainstream photovoltaic technology, new generation cells and modules technologies are being developed for higher performance. The presentation will show this evolution towards heterojunction-passivating contacts, back contacted solar cells as well as potentially tandem structures, highlighted with results achieved in CSEM plaftorms. In addition to technology evolution, lot of developments are being conducted to ease the PV modules implementation in various applications, such as building, transport and agriculture, and various examples will be given via CSEM on-going developments.

Bringing back Photovoltaic cells and modules manufacturing to Europe with high quality products

Madlen Apel
Head of Product Management
Meyer Burger

For over 30 years, Meyer Burger technologies and production equipment have been shaping the solar industry. Now, Meyer Burger is taking the next step. With Swiss precision and German engineering, next-generation solar cells and modules are being produced in Europe, based on patented and enhanced silicon heterojunction and SmartWire technologies. Meyer Burger leads the way for a PV reindustrialization in Europe.

Flexibility assessment of multi-energy districts

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The future energy districts are expected to have an increasing level of integration between different energy carriers. Different sectors such as power, heating and cooling as well as transport will be coupled through conversion and storage technologies. Based on the Ehub optimization tool analysis, this presentation covers the flexibility assessment of e-mobility as well as power-hydrogen to power in multi-energy districts. To demonstrate e-mobility flexibility, an e-mobility module is developed and integrated into the Ehub optimization tool. The optimal operation of electric vehicles is a function of the overall multi-energy system boundary conditions given by the available supply and demand and the set objectives to minimize costs and CO_2 emissions. Using a hypothetical case study based on the City of Chur, the effect of e-mobility on supply and demand-side flexibility in the multi-energy district is demonstrated. The flexibility assessment of the Power to hydrogen to Power system is based on the data from the world`s first autarkic multi-family house in Brütten.

ABSTRACTS

Pathways and strategies into the energy and climate future of Switzerland

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How does Switzerland achieve its energy and climate goals? This is the crucial question that is driving politics, industry as well as society. In view of current changes in the energy system and climate policies, it is important to find pathways and strategies that will lead Switzerland (and all other countries) into a sustainable and resilient energy and climate future. These pathways and strategies have to be based on facts and to be situated within different national as well as international boundary conditions (scenarios). To this end, we employ an integral energy system model of Switzerland with several submodules to answer the most relevant questions with respect to decarbonization, security of supply, electrification of heat and mobility as well as seasonal energy storage. Those submodules encompass for instance the (archetype) building scale of Switzerland, regional and national scales as well as a surrogate model of the international scale to investigate interactions with the European energy system.

Strom aus Fotovoltaik-Anlagen – ein Kernbestandteil der zukünftigen Energieversorgung

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Die Stromproduktion mit Fotovoltaikanlagen soll in Zukunft einen grossen Beitrag zur Energieversorgung leisten – weltweit, wie auch in der Schweiz – und hat damit eine wichtige Rolle inne um das Ziel von Netto-Null Treibhausgasemissionen zu erreichen. Dieser Vortrag beleuchtet die Vor- wie auch Nachteile von Fotovoltaikanlagen hisichtlich Kosten, Umweltauswirkungen und technischen Aspekten.

Saisonale Speicherung von Photovoltaikstrom

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Mit dem massiven Ausbau von Photovoltaikanlagen wird die Substitution fossiler Energieträger stark vorangetrieben. Da jedoch die Stromproduktion aus Sonnenenergie und der Energiebedarf saisonal auseinanderklaffen, fällt der saisonalen Energiespeicherung eine immer bedeutendere Rolle zu. Diese Herausforderung muss gelöst werden, soll die Speicherung nicht zum Flaschenhals für den Umbau des Energiesystems werden.

Mit der innovativen Technologie von AlphaSYNT kann der erneuerbare Strom vom Sommer in einen chemischen Energieträger umgewandelt und in der bestehenden Infrastruktur für den Winter gespeichert und transportiert werden. Zudem trägt sie zur Stabilisierung des Stromnetzes (Sektorenkoppelung) bei und ermöglicht eine inländische Produktion von erneuerbaren Energieträgern.

With the massive expansion of photovoltaic systems, the substitution of fossil fuels is being strongly promoted. However, since there is a seasonal gap between electricity production from solar energy and energy demand, seasonal energy storage is playing an increasingly important role. This challenge must be solved if storage is not to become a bottleneck for the restructuring of the energy system.

With AlphaSYNT's innovative technology, renewable electricity from summer can be converted into a chemical energy carrier and stored and transported in the existing infrastructure for the winter. In addition, it can contribute to the stabilisation of the electricity grid (sector coupling) and enable national production of energy carriers.