INTERNATIONAL

INVITED SESSION SUMMARY

Title of Session:

Building-to-Vehicle-to-Building as a key for empowering energy sustainability

Name, Title and Affiliation of Chair:

Chair:

Dr. Dario Pelosi
University of Perugia, Department of Engineering.

Details of Session (including aim and scope):

To accelerate the clean energy transition, it is required to cut the energy consumptions of both building and transport sectors, which have a huge impact on the air quality of urban areas and accounts for two third of the global energy consumption and greenhouse gases emissions.
In this framework, to achieve net zero emissions as EU targets by 2050, renewable energy sources (RES) integration into buildings is mandatory, whereas the use of Electric Vehicles (EVs) accelerates the reduction of the environmental cost related to transports. Specifically, EVs adoption can greatly reduce energy consumption and pollution when powered by RES.
Anyway, the intermittent and fluctuating behavior of the renewables represents a major concern for a fast clean energy transition. In this framework, buildings and energy communities will play a key role in moving toward RES-based decentralized power generation. Since solar energy is the most suitable technology for powering buildings, its stochastic nature is not able to widely cover buildings loads. Therefore, in the view of maximizing buildings energy independence and self-consumption, energy storage systems (ESS) represent an effective solution since they allow the postponed use of renewable generation, due to their high flexibility, scalability, efficiency and fast response. Nevertheless, installing stationary ESS with sufficient storage capacity could be very expensive.
In the view of the expected massive penetration of battery electric vehicles (BEVs), an effective solution could be represented by using BEVs as mobile ESS for contributing to buildings energy balance, according to the so-called Building-to-vehicle-to-building (B2V/V2B) operating mode. As a matter of fact, BEVs can work in synergy with RES integrated buildings to perform several operations, such as load balancing, frequency regulation, power smoothing, etc.
Thus, this session aims to disseminate novel and original works about the impact of BEVs integration in RES-based buildings to improve their energy efficiency and sustainability, also in the view of energy communities. A wide range of disciplines is invited to contribute to this session to widespread knowledge about this topic.

The topics of the session include, but are not limited to:

- B2V/V2B techno-economic analysis

- Control and energy management strategies for homes and buildings including EVs
- Smart grids and micro-grids including B2V/V2B
- Advanced modelling approaches and experimental activities on B2V/V2B concept
- System modelling and integration
- All related EVs operating modes to support energy independence of buildings and communities

Main Contributing Researchers / Research Centres (tentative, if known at this stage):

Website URL of Call for Papers (if any):

Email & Contact Details:

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