

## International Conference on Sustainability in Energy and Buildings

### Invited Sessions

**Title of Session:** RENEWABLE ENERGY SYSTEMS FOR RESIDENTIAL BUILDING HEATING AND ELECTRICITY PRODUCTION

**Name, Title and Affiliation of Chair:**

**Chair:** Prof. Andrea Vallati, Department of Aerospace, Electric and Energy Engineering (DIAEE), Sapienza University of Rome, Italy

**Co-Chair:** Dr. Costanza Vittoria Fiorini, Department of Aerospace, Electric and Energy Engineering (DIAEE), Sapienza University of Rome, Italy

**Co-Chair:** Dr. Miriam di Matteo, Department of Aerospace, Electric and Energy Engineering (DIAEE), Sapienza University of Rome, Italy

**Description:**

The development of renewable energy systems is one of the ten priorities of the European Commission, being the EU's major vector for a global transition toward a climate-neutral economy. With the growing production and the increase in population, demand for energy has increased rapidly in the last century. World's primary energy source are fossil fuels; it is formed at a rate slower than the rate at which the whole world is consuming it, resulting in an imbalance which makes it available only for some more years. Furthermore they are responsible for about 30% of global greenhouse gas emissions (GHGE), such as carbon dioxide, which lead to issues such as global warming and air pollution. The global environmental concern for the non-renewable energy shortage and impact, together with the price increase in oil, makes it necessary for countries to turn to renewable energy sources such as solar, wind, biomass and hydrogen-based sources to satisfy their energy demand. These clean and reliable sources are becoming the most preferred compared to the fossil-based ones, due to their inexhaustibility, non-external dependence, and zero CO<sub>2</sub> emissions. The clean energy transition will help Europe to improve the meeting of energy needs, to modernize its economy, thus contributing to job creation, and in the efforts for reducing global warming. The building sector is one of the main contributors to energy consumption and GHG emissions, especially in the operation, that is why further advances in renewable energy technologies application in buildings represent nowadays a primary concern.

This session will be the venue to discuss about different strategies to obtain the clean energy, involving research, demonstration, innovation related to different low-carbon energy sectors, among others renewable energy, smart energy systems, energy efficiency and Carbon Capture Utilization and Storage (CCUS).

Within this session, a special focus is given to an important strategic research field: "Secure, Clean and Efficient Energy" to decarbonise the buildings stock.

Topics of interest for the session include, but are not limited to:

- Hybrid and integrated renewable energy system in buildings: design and control;
- Renewable grids for the built environment;
- Retrofit strategies for historical/existing building;
- Hybrid Heat Pumps;
- Solar photovoltaic and solar thermal energy systems; wind power, hydro power and geothermal energy technologies; biomass and bio energy;
- Energy conversion;
- Renewable Energy Storage;
- Machine Learning for building energy applications;
- Energy modelling;
- Occupants' comfort and energy performance;
- Carbon accounting and life cycle assessment (LCA) of buildings and building technologies;
- Innovative technologies for low energy buildings;
- Carbon Capture Utilization and Storage (CCUS).

**Important deadlines:**

- Submission deadline of **full papers (not abstracts)**: **June 21<sup>th</sup> 2022**
- Acceptance/Reject notification: **June 25<sup>th</sup> 2022**
- Camera-ready: **June 27<sup>th</sup> 2022**
- Author Registration: see general deadlines on the SEB website

**Submission:**

Each submission should be at most 10 pages in total including bibliography and well-marked appendices and must follow the Procedia proceedings format.

Submissions for the conference must be made as complete papers (there is no abstract submission stage) submitted as **PDF** documents through the **PROSE online submission and review system**.

<http://seb-22.kesinternational.org/prose.php>

**Publication:**

The conference proceedings will be published by Springer as book chapters in a volume of the KES Smart Innovation Systems and Technologies series, submitted for indexing in Scopus and Thomson-Reuters Conference Proceedings Citation Index (CPCI) and the Web of Science.

**Website URL:**

Conference: <http://seb-22.kesinternational.org/index.php>

Session: <http://seb-22.kesinternational.org/cms1Sdisplay.php>

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