

Mini-symposium 5.5: Mechanical challenges in Energy Production/Harvesting/Storage

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Faced as we are with global environmental deterioration, policies to reduce carbon dioxide emission and to promote cleaner, less polluting technologies must be advocated. Rapid deployment of renewable energy plans will result in significant carbon dioxide reduction, climate change mitigation, and economic benefits. Renewable energy is harvested from natural processes that are replenished constantly but that have an intermittent quality. Supporting the development and deployment of energy storage technologies should be a central element of the green economy. Energy storage can provide much-needed flexibility across different timescales, which is essential to transition to a system dominated by variable renewables. Present realities, however, are not yet at such a technological level to meet the requirements of ambitious actions to tackle climate change, as for decarbonisation of the global economy, and in particular of energy and transport systems. Whereas experimental studies are the backbones of materials and devices investigation, modeling can provide fundamental contributions, particularly in tailoring harvesting processes and energy storage materials in order to improve performances and limit aging and degradation. This mini-symposium welcomes formulations and concepts that meet current challenges in the vibrant area of mechanics for energy harvesting and storage, including but not limited to theoretical models, multi-physics and multi-scale approaches, high performance computing and related experimental works.