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ABSTRACT:

Diverse Paths in Nanotechnology Addressing the Energy Efficiency Challenge

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Published in September 2023, the revised Energy Efficiency Directive (EU/2023/1791) marks a significant leap in the EU's commitment to energy efficiency. It establishes 'energy efficiency first' as a fundamental principle of EU energy policy, now backed by legal standing. In the quest for cost-effective solutions to the energy transition, research and development efforts focused on energy devices and technology are paramount. Nanotechnology emerges as a pivotal tool, offering new and unexpected avenues to achieve our primary goal.

During this organized Special Session, numerous works dedicated to nanotechnology for light and heat harvesting and conversion were presented by internationally recognized scientists. Here, I provide a contextualization of these contributions within a broader, worldwide 'excursus' on the high-tech-driven strategies reliant on nano-innovations in the energy field. This includes highlighting the most compelling and innovative pathways pursued globally, alongside showcasing select and relevant projects carried out by my research group in this research area.