

## Smart design of nano-enabled products in green technologies

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Designed nanomaterials can open up major opportunities for green technologies in opto-electronics, energy conversion and energy storage. The scientific challenge lies in understanding the material structure-property relationships. Moreover, nano-engineering is intrinsically strongly multi-disciplinary, which poses the organizational challenge to assemble the required expertise and resources that may be distributed worldwide.

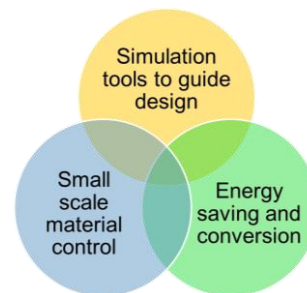


Fig.1 Main pillars driving MMP's ambition for: "smart design of nano-enabled products in green technologies".

For this purpose, the MMP consortium [1] will develop an integrated modelling platform, especially equipped to target multi-scale and multi-physics engineering problems. The innovation of MMP lies in its generic and modular concept, supported by data standardization and proper definition of application interfaces. This allows integration of existing and distributed simulation software and data repositories as plug-in components. The versatility and power of the platform is demonstrated through two case studies.

This poster highlights the predictive modelling of mid-power LED packages with remote phosphor (case study 1). Proper thermal management of such devices is critical to guarantee performance and reliability. However, the behaviour of phosphor-encapsulated dices is extremely difficult to predict, due to the absorption and spatial distribution of the heat generation. The MMP approach provides a unique platform to perform the required opto-thermal analysis at multiple length scales. This enables integral optimization of material structure and device design.

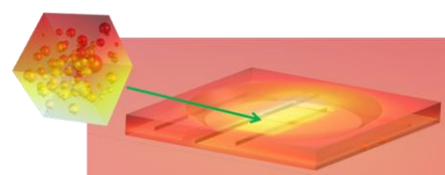


Fig 2 Thermal management in LED devices

### References

1. MMP, multiscale modelling platform: <http://www.mmp-project.eu/>



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