

Proposal full title:

Advanced Manufacturing of Multi-Material Multi-Functional Products towards 2020 and Beyond

Participant no.	Participant legal name	Short name	Country	Organisation type
1. (Coord.)	C-Tech Innovation Ltd.	CTECH	UK	SME
2	University of Birmingham	UoB	UK	HE
3	FOTEC Forschungs- und Technologietransfer GmbH	FOTEC	Austria	SME
4	Karlsruhe Institute of Technology	KIT	Germany	HE
5	Pôle Européen de Plasturgie	PEP	France	RTD
6	Valtion Teknillinen Tutkimuskeskus	VTT	Finland	RTD
7	Commissariat à l'Energie Atomique et aux Energies Alternatives- Laboratoire d'Innovations pour les Technologies des Energies nouvelles	CEA	France	RTD

Summary

4M2020 is focused on building upon the durable integration mechanisms/structures and innovation chains created within three levels of project clusters in the field of multifunctional miniaturised products and their applications in energy, medical, optoelectronics and microoptics, printed electronics and ultra-precision engineering industrial sectors that led to the creation of long term R&D+I partnerships. The aim of the 4M2020 programme is to strengthen the “foundations” of the technological research and product demonstration pillars in commercialising these diverse range of products and their underpinning value chains and manufacturing platforms in a coordinated action to bridge the “valley of death”. In particular, 4M2020 aims to coordinate high quality research in this key area for European competitiveness in a number of industrial sectors by promoting and capitalising on three main trends underpinning the creation of novel multi-functional miniaturised products and their underlying KETs: i) the continuous advances of a multitude of new functional materials, ii) innovative integration of a “tool box” of “constructive” bottom up and “ablative” top down structuring technologies and iii) the convergence of formerly separated enabling technologies. **A key motivation for this programme is to promote and facilitate cross fertilisation of product centred advanced manufacturing platforms along five R&D+I streams and thus to create alliances based on interrelated technological research and product demonstration activities and add value to its stakeholders by establishing R&D+I environment for combining KETs heterogeneously in the context of specific technology and product requirements.**

The 4M2020 vision is to achieve this by clustering together projects in the main application fields of multi-material micro and nano manufacture at three levels, and coordinating and facilitating “five-star” cross-fertilisation along their well established and proven R&D+I streams. In this context, these are the main objectives of the programme:

- **Cross fertilisation of product centred advanced manufacturing platforms** developed and validated in projects in the main application areas of multi-functional miniaturised products in order to cross link their value chains and speed up the take up of key enabling technologies;

- **Forming and developing networks and alliances** at three levels by clustering together projects in key application fields of the NMP theme with interrelated technological research and product demonstration activities and thus to facilitate the formation of industry alliances;
- **Advancing further innovation chains** by combining heterogeneously at all levels KETs in developing advanced manufacturing platforms in order to speed up the pre-commercial procurement for pilot line design and implementation;
- **Assessing the maturity of application/product focused advanced manufacturing platforms** towards possible future large-scale demonstration and pilot line activities and thus to reduce the risk in their implementation and standardise some key component technologies in these platforms.

4M2020 will build upon long-term research and innovation partnerships formed in 8 major EC funded programmes that form the core cluster of 4M2020 projects, and then through the proposed “five-star” cross-fertilisation along the R&D+I streams of more than 70 associated EU and national programmes to bring benefits to three tiers of partners/stakeholders. Through these three tiers’ networking and collaboration activities the programme will bring together research and industry experts from a diverse range of technologies, disciplines and application fields, which is only possible at the European level. Ultimately, 4M2020 in collaboration with NANO futures and Manufuture ETPs and European multi-material micro and nano manufacturing knowledge community will support/contribute to a number of key knowledge-intensive industry sectors in Europe by overcoming the barriers towards the commercialisation of multi-functional miniaturised products.