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## The Graphene Technology and Innovation Roadmap: Innovation interfaces enabling industrial value creation.

Based on the multitude of scientifically explored application areas [1] for graphene and related 2D materials (GRM), Fraunhofer ISI developed a first version of the Technology and Innovation Roadmap (TIR) of the Graphene Flagship aiming at merging the potentials of GRM with market needs. It considered insights of scientists and industrial experts within and beyond the Graphene Flagship on both technological potential and commercialization perspectives within Europe for the full breadth of proposed applications. A selection of promising application areas based on unique selling propositions of GRM and European market and competitive potential is depicted in Figure 1. On that foundation, we pushed the TIR process one step further, now focusing on in-depth exploration of potential future value chains enabled by GRM utilization. We developed the innovation interface investigation (3I) concept to explore and stimulate the diffusion of GRM technology into secondary industries based on evolving commercial and societal demands in final product markets. Beyond the elaboration of topic-specific roadmaps, the results also identified common issues such as lack of reliable materials supply and standards mainly for high-volume applications and not fully resolved scaling issues for high-tech application. In all cases, 3I workshops created unique settings fostering cross-sectoral information exchange along the potential future value chain where GRM-based innovation may form novel supply-demand relationships.

### References

- [1] Ferrari et al., *Nanoscale* 7, 11 (2015) 4598.

### Figures

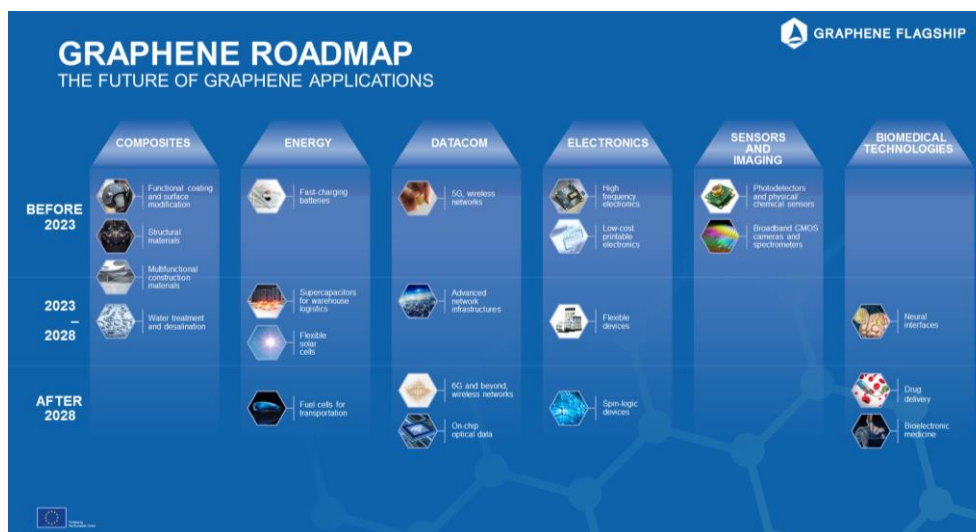


Figure 1: Graphene technology and innovation roadmap: Schematic overview of selected applications.