

Graphene and 2D materials in the perspective of a global energy player

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As a major energy player Engie develops its businesses (power, natural energy and energy services) around a model based on responsible growth to take up today's major energy and environmental challenges: meeting energy needs, ensuring the security of supply, fighting against climate change and maximizing the use of resources.

Innovation is a key assets to achieve this development and as one of the most active domain of research and development, nanotechnologies are a useful part of the toolset at hand. Furthermore, long awaited large scale commercial applications of nanomaterials and nano-objects start to appear and real improvements in performances and/or costs are observed (figure 1).

In that perspective, this talk will try to give an overview of the potential application of graphene that may quickly find usefulness in the energy industry.

At first, we will look at the development of graphene based devices for energy storage, energy transformation through catalytic processes and energy harvesting.

Then we will try to assert the impact of graphene based electronics on the development of smart energy network, from sensors and actuators to low energy consumption devices that allow local process or transmission of the collected data.

Finally, we'll expose through which processes and framework an international industrial group such as Engie can become an early adopter of such emerging technologies.



Figure 1. Commercial products that rely on nanomaterials or nano-objects: From left to right: SUHDTV from Samsung (Quantum dots), light bulb from Graphene Lightning PLC and handheld supercapacitor from Zap&Go (Graphene).