In Europe the future is called graphene

Ten years and funding for a billion euros. This is what graphene-based technological innovation is worth to the European Union. A summary of the industrial applications in a recent three-day event in Modena, which saw on stage Konstantin Novoselov - Nobel Prize winner for Chemistry - and a series of innovative companies hosted by Tetra Pak, which showed the performance of graphene in the most disparate artefacts.

The Graphene Flagship project is a project funded by the European Union with a budget of one billion euros over 10 years (deadline 2023), to develop an industry that exploits the extraordinary properties of graphene, identified as strategic in countless application areas. In Italy many research institutions (from the CNR to the Universities) and companies have joined the project, individually or driven by incubators such as the CRIT of Vignola (MO). CRIT was not by chance involved in the great event that took place a few weeks ago that saw Konstantin Novoselov, 2010 Nobel Prize in Chemistry for the discovery of graphene and lecturer at the University of Manchester, vincenzo Palermo (CNR-Chalmers University) and a drapery of innovative companies or already industrialized containing graphene, which Tetra Pak has housed in its Italian headquarters, introducing a revolution similar to that caused in the last century by the use of polymers for producing plastic. The material is an excellent conductor of heat and electricity and has exceptional light-absorbing properties, lending itself to feeding revolutionary innovations in almost all industrial areas, from electronics to automotive, going via energy and packaging, optics and more. Available in nature in sufficient quantities to supply industry’s needs, it has a very high cost but is manageable according to the minimum quantity required in the application phase, and, technologically mature, it now sees the entire extraction-production-transformation chain in the field.

Possible uses in packaging
Even the packaging and labeling industry can make use of these features, for example in the creation of innovative coatings or in the printing of possible uses in the field.
I possible impieghi nel packaging

Anche l’industria del packaging e del labeling possono avvalersi di queste caratteristiche, ad esempio nella creazione di coating innovativi o nella stampa di circuiti elettrici, ma anche nella creazione di superfici estremamente lisce senza ricorrere alla lubrificazione; inoltre, il mix di leggerezza e resistenza lo rende ideale nell’industria meccanica, per la costruzione di componenti idealmente “eterni”, Tetra Pak, che ha raggiunto la Graphene Flagship pochi mesi fa, ne dà testimonianza, mettendoci in campo risorse e competenze per seguire una serie di progetti esplorativi. Tre, sostanzialmente gli ambiti di riferimento: «La connettività - spiega Andrea Campelli, direttore Comunicazione Italia, Iberia, Francia & Benelux Tetra Pak - per lo sviluppo di imballaggi “intelligenti” dove l’uso del grafene, ad esempio in sensori flessibili ultrasottili, consente di aggiungere nuove funzionalità ai contenitori di cartone, trasformandoli in un medium di dati su larga scala.

Un secondo ambito applicativo deriva dalla flessibilità di questo materiale, che rende le apparecchiature più leggere ed efficienti dal punto di vista energetico, riducendo consumi e costi di alimentazione. Inoltre, un terzo ambito dalle grandi potenzialità riguarda i rivestimenti barrieri, prospettando ad esempio nuovi packaging primari in grado di proteggere gli alimenti dall’ossigeno e dalla luce, più sostenibili e con maggiori potenzialità di riciclo.

Più in generale, in ambito packaging il grafene potrebbe contribuire a ridurre la carbon footprint nell’intera catena di fornitura, aumentando le prestazioni dei materiali tanto dal punto di vista funzionale quanto della riciclabilità”.

electrical circuits, but also in the creation of extremely smooth surfaces without resorting to lubrication; moreover, the mix of lightness and resistance makes it ideal in the mechanical engineering industry, for the construction of ideally “eternal” components.

Tetra Pak, who joined the Graphene Flagship project a few months ago, bears witness to the same, putting in place resources and skills to follow a series of exploratory projects. There are basically three areas of reference: “Connectivity - explains Andrea Campelli, Director of Communication Italy, Iberia, France & Benelux Tetra Pak - for the development of smart “packaging where the use of graphene, for example in ultra-thin flexible sensors, enables new features to be added to the cardboard container, transforming it into a large-scale data medium.

A second field of application derives from the flexibility of this material, which makes equipment lighter and more energy efficient, reducing consumption and power costs. Furthermore, a third area with great potential is barrier coatings, for example envisaging new primary packaging capable of protecting food from oxygen and light more sustainable and with a greater potential in recycling.

More generally, in the field of packaging, graphene could contribute to reducing the carbon footprint throughout the supply chain, increasing the performance of materials both from the functional point of view and in terms of recyclability.”