First graphene sheets factory opens in Italy

While most Italians were finding distractions to compensate for their national team's elimination from the 2014 FIFA World Cup in Brazil – myself included – a small handful of those involved in the research of graphite and graphene had reason to celebrate. Yesterday, in fact, the Science & Technology Park ComoNExT in Lomazzo, near Como – fittingly, the very city that gave birth to the inventor of the battery, Alessandro Volta, in 1745 – inaugurated what is the largest graphene sheet production plant in the world. The facility will be run by Directa Plus, an Italian technology company that has developed an innovative, patented and approved process to produce graphene at an industrial level. The plant has a truly remarkable capacity of producing some 30 tons of graphene per year; the plant itself has also been designed to replicable and exportable. In 2015, one of its 'clones' is expected to be built in Thailand, followed by another in Europe. Graphene has 50 times the mechanical strength of steel, more than twice the thermal conductivity of a diamond, and half the density of aluminum. Therefore, graphene offers highly desirable properties for countless technology applications: electrical conductivity, transparency, lightness and flexibility.

Directa Plus's story is not so different from that of the Californian garage where Steve Jobs in the seventies launched Apple's adventure and silicon-based computers. Lomazzo and Directa Plus are about nanotechnology and graphene. The protagonists are a group of Italian engineers, physicists and chemists involved in a start-up that will produce 'G+' graphene under a patented method. The initial idea is to add the graphene, coating it to already existing products such as bicycle tires. Everything here is done with private capital:

Venture Fund TTVenture and FondoComo. As for the tires, Directa Plus has formed a partnership with the Vittoria Group, a world leader in the production of high performance tires and tubes (seven million tires per year, including units that are used by bicycle teams running the various European cycling championships and tours). Together, they will make and sell tires containing graphene. And some will be made in the Thailand based facility. Graphene will be used to add strength and to replace harmful materials currently used in tires that are strongly suspected of very harmful effects to human health.

The European Union (EU), meanwhile, is very interested in promoting and developing graphene, having chosen it as a strategic technology for the next 10 years. Indeed, the EU is betting on graphene's success and it seems that Italy, hungry for new technologies that might lead toward a path of economic recovery, is very optimistic about the future of this material. The Graphene Flagship Project (GFP) – launched by the European Commission in early 2013 to stimulate research on one of the most innovative materials in recent years – has added 66 new partners, more than half of which are located between Italy and Germany that will join a partnership that now includes more than 140 organizations from 23 countries. The GFP fully intends to shift the "miraculous graphene" and related layered materials from the academic laboratory to the store shelf and in applications that are best described under the umbrella of everyday use.

The European Commission Vice President Neelie Kroes is especially interested in graphene's applications related to new medical technology, such as artificial retinas, as well as more environmentally sustainable means of transport fitted with lightweight batteries and ultra-efficient motors. With one billion Euros of funding for the GFP for this decade, Europe will be able to transform cutting-edge scientific research into marketable products. This important initiative

places Europe at the forefront of the global race to develop graphene. Italy to now plays a central role in the project, absorbing over 11% of total funding, with research centers involved in the operation ranging from the northernmost regions to Sicily; the National Research Council, and the University of Pisa have put together the forces creating a unique synergy in a country, better known for intense debates. The practical results are expected within two years, including new solar panels and new batteries.