

## Growing the Graphene Industry

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With the goal of developing a sustainable graphene-based industry in Australia and world-wide, the team at the University of Adelaide's ARC Graphene Research Hub has made several significant breakthroughs in graphene manufacturing and utilisation.

Graphene is a carbon-based nanomaterial with some truly fantastic properties. Its single-atom carbon lattice structure makes it two hundred times stronger than steel, and an incredibly effective conductor of heat and electricity. It's also extremely thin and lightweight – one gram of graphene could cover an entire soccer field!

Graphene is also an excellent team player and readily lends its properties to other materials and products it is incorporated into.

Professor Dusan Losic from the School of Chemical Engineering and Advanced Materials, leads the [University of Adelaide](#) team at the [ARC Graphene Research Hub](#) and has been investigating how graphene can be used to give other materials a helping hand.

"Cement is one of our most essential construction materials, but the process of manufacturing it generates large amounts of CO<sub>2</sub>. My team has discovered that adding just a small amount of graphene to cement substantially reduces the amount of CO<sub>2</sub> released during its production and use, and dramatically increases its strength and durability," says Professor Losic.

"However, graphene has historically been incredibly difficult to produce at industrial scale, and has been far too expensive for most companies to justify investing in it," Professor Losic adds.

This is one of the key problems that the Graphene Research Hub has solved, together with their industry partner [First Graphene](#).

The team has developed a novel electrochemical process that converts graphite rocks into graphene, producing high-quality graphene powders at a significantly reduced cost, and with low energy, no chemical waste and labour compared with other chemical based methods.

First Graphene have now scaled this process up at their manufacturing plant in Western [Australia](#) and will soon become one of the world's largest graphene manufacturers, producing the best quality graphene at a competitive price that can be used by companies around the globe.

### **What's next?**

Armed with these improved manufacturing processes, researchers are developing new graphene-based products and technologies to address some of the most challenging problems in the energy, environment, climate change and agriculture fields.

Projects now underway include biosensors for disease diagnostics using highly conductive graphene inks, protective coatings, new energy storage devices, and new graphene-based adsorbents that can remove toxic pollutants from soil and water.

The dynamic team at the ARC Graphene Research Hub will tackle these exciting ideas and more as they continue to grow the sustainable graphene-based industry in [Australia](#).

Read the [original article](#) on University of Adelaide.