

Developing and patenting ‘green’ chemical innovation: drivers, trends, considerations, growth areas

Over the years, the chemical industry has been seen as a significant contributor to climate change. Chemical industry waste products generated during use or production, such as VOCs and industrial by-products, have been under scrutiny for several decades. More recently, the level of plastics and microplastics in the oceans and the amount of unrecyclable packaging and composite goods in the UK (and global) market is having a particularly negative impact on the reputation of the industry.

Changes in the chemical sector are coming fast-driven not only by national and international legislation but also by the detrimental effect a lack of Green credentials can have on an organisation’s commercial reputation.

The chemical industry is responding; its innovators are creating new products and processes designed to reduce the industry’s negative environmental impact.

There are many sectors in which companies are inventing and patenting green technologies. In the chemical field, there is considerable activity in relation to carbon dioxide gas reduction, developing sustainable non-polluting processes and using alternatives to fossil fuels.

Patent applications related to ‘green’ innovations are rising, and are predicted to increase

The World Intellectual Property Organisation (WIPO) has recently called for a much-needed boost in environmental-related technology innovation by working ‘together to create a green-tech innovation surge that meets the requirement of our times’. The statement followed analysis published by WIPO showing a rise in green patent applications, and an underlying expectation for continued growth in the future.

The United Nations defines Green technologies as those that “protect the environment, are less polluting, use all resources in a more sustainable manner, recycle more of their wastes and products, and handle residual waste in a more acceptable manner than the technologies for which they were substitutes”.²

Patenting green inventions is a way for inventors/companies to secure the commercial benefit of their innovation, and to offset research and development

costs. Patents are key to a sustainable business model, as companies can stop competitors from making, using, selling or importing their patent-protected products or processes.

In the UK, green technologies can be filed using the UK Intellectual Property Office (UKIPO) Green Channel.

This route offers an accelerated patent process where the applicant “makes a reasonable assertion that the invention has some environmental benefit”. The benefit does not have to be completely self-evident (for example, solar panels or wind turbines), and can be an application associated with green technology. For example, a simple manufacturing process that uses less energy relative to another would be eligible for filing through the Green Channel.

Special considerations when patenting ‘green’ chemical innovations

The evolution of our environmental understanding has led to an easy recognition of the benefits of biodegradability, sustainability and reduced toxicity. Patent examiners readily recognise these as technical goals in and of themselves. As a result, patenting in this area need not necessarily require inventiveness associated with more efficacious or improved products or processes etc but potentially equivalent or even less efficacious ones that have instead unexpected benefits in biodegradability, sustainability, toxicity etc.

A significant area of patenting in the future will relate to the impact of synthetic products throughout their lifecycle. In other words, how does production and after end-of-product life impact the environment? We expect this to be a growing area of future innovation which will compliment and run alongside innovation directly relating to product or process utility.

Green chemical innovation growth areas

Carbon dioxide – lowering, capturing carbon emissions

Carbon dioxide produced from burning fossil fuels was first linked to causing a warming effect in 1896. Over a century later, scientists are still striving to find ways in which to lower the level of carbon dioxide in the atmosphere.¹

Carbon dioxide reduction includes methods of carbon capture and storage (CCS). CCS involves trapping the carbon dioxide at its emission source, transporting it to a storage location (usually deep underground) and isolating it. CCS techniques are under constant development driven by the need to improve separation of carbon dioxide from non-greenhouse gases and reducing the ultimate cost of capture.