

Increasing innovation in green chemistry

The chemical industry is often 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 in the oceans and the amount of unrecyclable packaging and composite goods in the UK (and global) market has had a negative impact on the reputation of the industry.

These issues have led to change, and innovation, as the chemical industry seeks to address the issue of climate change, meet new environmental legislation and improve its reputation. As patent attorneys working with a variety of clients in the chemical industry we see this exciting change on an almost daily basis and have an active interest in green chemistry and helping our clients to protect their “green” innovations.

This interest in green chemistry has led to our inaugural [Inside Green Innovation: Progress Report 2021](#). In this report we analyse patent filings to assess the state of progress for innovations relating to several key environmental challenges, including the development of bio-derived, biodegradable and recyclable polymers – also known as bioplastics.

Our report shows that particular advances have been made in improving properties of bioplastics (to provide performance and longevity), as well as optimising processes for producing bioplastics on an economically viable scale. Advances have also been made in chemical recycling technologies, with an aim of reducing waste plastic going to landfill. Making advances in these areas, so as to reduce environmental impact, is challenging, but our report shows that innovation is increasing and it seems unlikely that patent filings will reduce.

Bioplastics patent activity – a renewed focus

The number of patent filings since 2015 suggests a renewed upsurge in bioplastics innovation, reversing the decline seen since 2003. The leading patent filers have focused on biopolymer composition and structure, for example relating to biodegradable materials for orthopaedic medical devices and cleaning products.

Investment in developing new, biodegradable polymer blends is also aimed at increasing bioplastic strength and flexibility, while other biopolymer compositions are designed to make plastic bags both biodegradable and easier to open.

Recent patent filings have been led by organisations in Europe, South Korea and Japan, with the German and Korean

businesses BASF and LG Chemical filing the most patent applications in 2020.

Plastics recycling – finding alternatives to mechanical recycling

Analysis of patent filings in plastics recycling technology also shows that innovation has been gathering speed in recent years.

The top patent filers include Eastman, Bridgestone, Chevron and Solvay. Eastman’s filings since 2018 are centred on an improved process for pyrolyzing mixed plastic waste. While there is interest in pyrolysis techniques, we also anticipate increased patent activity in enzymatic breakdown of existing polymers and see indications of interest in ring opening polymerisation and ring closing depolymerisation.

Patenting green chemistry

Whilst in some ways patenting inventions that relate to green chemistry is the same as patenting any other chemical inventions, it is worth noting that when green chemistry patent applications are examined by Patent Offices, many patent examiners now recognise the benefits of biodegradability, sustainability and reduced toxicity as technical goals. This means that patenting in this area does not necessarily require inventiveness associated with more efficacious or improved products/processes. Instead, equivalent or even less efficacious products/processes that have unexpected benefits in biodegradability, sustainability, toxicity etc may be considered inventive.

In the UK, the UK Intellectual Property Office (UKIPO) Green Channel can be used for green technologies. This offers an accelerated patent process where the applicant “makes a reasonable assertion that the invention has some environmental benefit”. The benefit can be associated with green technology, e.g. a simple manufacturing process that uses less energy relative to another would be eligible for filing through the Green Channel.

Having a UK patent for a green innovation can also help to release more funds for R&D through the corporate tax relief that is obtainable from the UK Government’s Patent Box scheme. Further discussion can be found in [this episode of The Greenshoots Podcast \(episode 15\)](#), a programme for innovation owners and creators produced by the IP specialists of Appleyard Lees.

For more information on patenting your innovation, contact Kate Hickinson, Partner, Appleyard Lees.

<https://www.appleyardlees.com/inside-green-innovation-progress-report-2021/>

<https://appleyardleesgreenshoots.com/>