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Sustainability and detergents: environmentally friendly innovation

Sustainability is the key topic on the agenda for global industry today, directly impacting decisions around products, packaging, branding and the supply chain. Consumers and governments are together forcing discussions on how to implement strategies to reduce negative environmental and social impacts that business has on the environment.

During May 2021, the European Commission led the first High-Level Roundtable on the implementation of the Chemicals Strategy for Sustainability (CSS), which aims to better protect citizens and the environment, and to boost innovation for safe and sustainable chemicals. The event saw the participation of the International Association for Soaps, Detergents and Maintenance Products (A.I.S.E.) and the European Chemical Industry Council (Cefic).

The good news is that the industry is ready to play its role and will support an “effective and coherent implementation of Chemicals Strategy for Sustainability” but, at the same time, all the players agreed on two requisites: an EU border enforcement (of the existing chemicals legislation) and a safety-and-sustainability-by-design innovation.

In a joint statement, they explained that these requisites “will reassure those who comply with legislation and invest in sustainability in chemistry that their competitiveness will be safeguarded” and that “sustainability must be achieved without compromise on safety”.

It is not the first time that innovation is key to drive change and improvements and, in the sector of detergents, companies are already developing new technologies to produce innovative formulations and more sustainable products with reduced environmental impact.

We have looked at patents’ owners in the space of Sustainable detergents to identify the key companies producing new formulations and the countries leading innovation in this space. Understanding the patents landscape also allows us to unveil and understand details of technologies making detergents more environmentally friendly.

How to make a sustainable detergent?

There is no univocal definition for a sustainable detergent and therefore each company is developing one or more technologies to produce cleaning formulations that demonstrate a sustainable feature. From the patents landscape we have identified a series of ingredients and industrial processes crucial to produce sustainable detergents. The key ones are described below.

Bio-surfactants

Biomolecules produced by microbial cultures. Their function is to mix substances and fluids having different polarities, for example oil and water. Compared to chemical or synthetic surfactants, biosurfactants show several advantages including their biodegradability and a very low toxicity.

Optimal solubility and efficiency of enzymes

These two aspects are often related to detergents that are used in low temperatures washing cycles, for example laundry formulations. Enzymes digest and dissolve the dirt during the

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washing process and, like many other enzymes, their efficiency is related to optimal temperatures. Using these innovative formulations, consumers can run washing machines at low temperatures, using less energy and therefore having less impact on the environment. The high solubility also allows you to use it at low temperatures: granular detergents can fully dissolve during the washing cycle and don't leave any residues.

Concentrated formulations and renewable materials

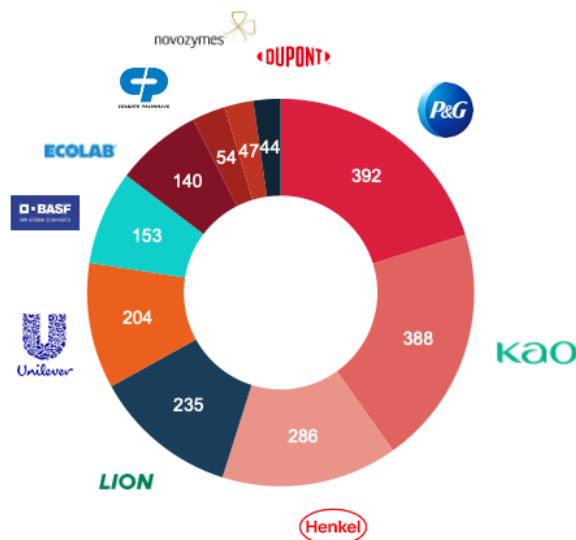
Detergents are often sold in concentrated formats with a clear benefit being the reduced amount needed for example for a laundry load, but also with savings on the packaging materials used and on costs of transportation and storage. These concentrated formulations include structurants based on renewable material like cellulose, where the function of the structurants is to convey the idea of concentration by increasing low shear viscosity whilst allowing the composition to flow freely when poured.

Who leads innovation and where?

Several CPG (consumer packaged goods) multinationals can be seen as leaders in this sector with P&G, Kao and Henkel at the top of the list but also companies providing specific ingredients and services for the industry such as Novozymes and Ecolab.

These top 10 organisations own around 35% of the currently active patent families in the area of Sustainable detergents, which is a sector where more than other 6,000 organisations are currently patenting new sustainable ingredients or technologies.

Active patent families (granted and pending) by top 10 invention owners

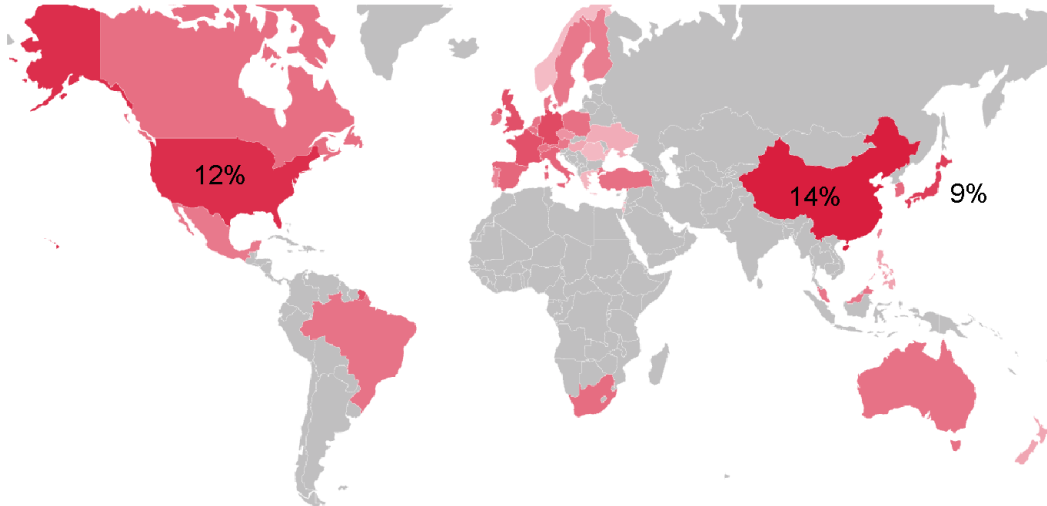


Source: Cipher

Kao and Lion are both companies with headquarters in Tokyo and this has a clear impact on the geographical distribution of patented innovation around the globe. The geographically small Japan alone has 1071 granted patents, which is a number comparable with grants in countries like China and US, respectively first and second country by number of granted patents.

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Percentage of granted patents by geography



Source: Cipher

While there is not a single definition for detergent sustainability, organisations have the opportunity to develop different strategies and therefore different inventions and technologies i.e. formulations with biosurfactants rather than concentrated detergents. Understanding all these options through the patents landscape prompts further insights, such as understanding the different costs of implementation to make, for example, a laundry formulation more sustainable or if one technology can be more efficient than others in relation to a specific detergent formulation.

For more information on who owns what and where in the Sustainable detergents space, please contact Paolo Montone: paolo.montone@cipher.ai