

Cost-effective new process gets chitin out of its shell

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By showing that chitin can be extracted from shells at scale in an efficient and environmentally sustainable manner, the EU-funded CHIBIO project has positive implications not just for Europe's seafood industry but also for a range of sectors keen to replace fossil-based polymers with bio-based polymers. These include catering product manufacturers, packaging manufacturers and tyre manufacturers, to name but a few.

Key potential economic benefits were outlined during a seminar at the EU's Bioeconomy Investment Summit in November 2015. For the [seafood industry](#), the new extraction processes pioneered by the project promise to reduce waste and cut costs. In Europe alone, hundreds of thousands of tonnes of shells must be disposed of carefully each year, a

costly but necessary process due to the risk of toxins seeping into the environment. In addition to being a potential sanitation issue, throwing away shells wastes organic material that could help Europe move away from its reliance on fossil fuels.

In this respect, a key component contained in shells is a substance called chitin, a sugar-like polymer. The key breakthrough achieved by the CHIBIO project has been to show that this chitin can be harvested cost-effectively and efficiently. A major challenge to establishing a viable chitin extracting industry has until now been the expense and vast amount of energy needed to extract chitin at a profitable scale.

The project developed an integrated bio-refinery platform to produce high value, high performance bio-based polymers. This process uses microorganisms to degrade the shell in order to get at the chitin, removing any need for chemicals. Enzymes are then used to achieve sugars, which are further broken down into [chemical building blocks](#) that are of interest to the chemical and polymeric industries.

In addition to saving the seafood industry from having to dispose of this waste, the new process opens up a potential new revenue stream. For their part, the chemical and polymer industries will have access to bio-based materials that can be synthesised and used in the cost-effective and sustainable manufacture of a range of bio-plastics.

In the long term, the sustainable and cost-effective extraction of chitin will help economies reduce their reliance on fossil-based resources. The technology certainly has global appeal. Millions of tons of shell waste are disposed of in Asia and the US, where the potential of [chitin](#) as a source of bio-polymer material also remains untapped. The innovation could also benefit in particular rural, economically depressed regions of the EU where most fisheries operate.

The CHIBIO presentation concluded by pointing out that large-scale commercialisation is still a while away. The next step will be to discuss with project partners about how best to seek funding, in order to enable industry to upscale and demonstrate that the process is economically viable at the industrial level. This is the next step towards bringing the technology to market.

More information: For further information please visit the CHIBIO project website: www.chibiofp7.fraunhofer.de/index.html

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