PRESS RELEASE

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Breakthrough in biomass fractionation technology

Turning crop residues into high-value material streams – sustainable feedstock for 100% bio-based materials

Crop residues are still a largely unused feedstock in the bioeconomy. Today, European crop residues account for more than 400 million tons per year. Most of this valuable feedstock is burnt to create energy or simply left to rot. A highly promising new technology allows the efficient, high-quality extraction of lignocellulosic biomass constituents in an economically sound way.

Working towards a technological shift: what if oil could be replaced completely?

Clothes, plastics, cosmetics, packaging – oil form the basis of so many materials and products used in daily life. There are, however, two other practical options that could be utilised to produce most of our everyday consumables: cultivated plants such as cotton, and pulping technologies that draw on wood as feedstock.

None of these approaches can always be described as sustainable. The oil industry in particular has a negative impact on climate change all around the world. Farmland should be used to feed the growing population instead of being used to grow feedstock for textiles or packaging. There are also many challenges facing today's pulping industry.

– The mainstream pulping industry focuses only on extracting cellulose and typically burns half of the biomass it requires. In the worst case, biorefineries use unsustainable feedstock, which leads to deforestation. All of these practices are harmful in the long term and there is growing pressure to find solutions that are both economically sound and environmentally friendly, says **Sebastian von Schoultz**, co-founder of Finnish start-up CH-Bioforce.

Mr. von Schoultz and his colleagues Dr. **Lari Vähäsalo** and Mr. **Nicholas Lax**, all wood chemists and scientists, started experimenting with biomass fractionation in a garage eight years ago. Today, they hold multiple international patents and run a company based on a brand new technology that has the potential to revolutionise a whole industry.

– We have managed to develop a breakthrough technology which allows the efficient extraction of lignocellulosic biomass constituents in an economically sound way, with extremely high purity, and on an industrial scale. Our technology produces high-quality biopolymers – high-purity pulp, polymeric hemicellulose, and sulphur-free lignin. Each of these material streams have a wide range of possible end applications, especially in replacing fossil-based materials and less environmentally friendly bio-based products such as food-based starch or cotton.

From residue to high-value material streams – even straw can be refined to replace oil

CH-Bioforce's technology is able to utilise over 90% of biomass, which is much more than the amount achieved by other methods. None of the current alternative methods have managed to fractionate all of the constituents in one process. Another feature that makes the technology unique is the fact that it can utilise almost any kind of biomass as feedstock: wood such as birch, pine, and spruce, and also non-wood such as straw and bagasse, which are not suitable for commonly used pulping processes.

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– Crop residues are still a largely unused feedstock in the bioeconomy. Today there are over 400 million tons of crop residues in Europe alone a year, of which wheat residue accounts for over 150 million tons. All of this could be used as valuable feedstock, at the moment however it is mostly burnt to create energy or simply left to rot. Our technology enables the conversion of waste material into valuable biopolymers that can be used in higher value applications, for example in the chemical or textile industries, says von Schoultz.

A worldwide problem demands a worldwide solution

Aside from oil, biomass fractions can be used to replace other unsustainable materials such as cotton. Cotton represents over 25% of the fibre used in textiles worldwide. It is mostly produced in developing countries and has a dramatic impact on the local environment. Both the quality and availability of water in these areas suffers as cotton requires huge quantities of land, water, fertilisers – and even harmful pesticides. Valuable farmland is being used to produce clothes instead of feeding the local population.

– We should be concentrating more on renewable and sustainable alternatives. The problem is global, but luckily so is the solution. CH-Bioforce's technology can utilise almost any kind of biomass as raw material, and it can use locally available materials in almost any market, says von Schoultz.

– The possibility to turn the whole spectrum of biomass sources into high-end, bio-based raw materials that are cost efficient and environmentally friendly presents a new opportunity for our industry. Furthermore, a technological shift towards the use of agricultural residues as feedstock is a must if we really intend to replace oil-based materials. We are looking forward to creating a positive impact with as wide a reach as possible.

INFO BOX: PROBLEMS AND SOLUTIONS

High-end biomaterials, cost efficient and environmentally friendly

GLOBAL CHALLENGES

- Growing demand for renewable and sustainable feedstock to replace oil- and food-based raw materials
- As things stand, biorefineries utilise less than 50% of biomass efficiently. An enormous amount of potential is being wasted.
- Current pulping technologies utilise mainly wood, while non-wood feedstock such as straw cannot be used.

SOLUTIONS

- CH-Bioforce's technology fractionates biomass into its three main constituents, producing high-purity pulp, polymeric hemicellulose, and sulphur-free lignin.
- The technology is able to utilise over 90% of biomass.

- Almost any kind of biomass can be used as feedstock; wood such as birch, pine and spruce, and non-wood such as straw and bagasse. These fractions provide a viable alternative to oil- and food-based raw materials.
- Applications can be found in multiple industries such as textiles, packaging, plastics, and cosmetics.
- The technology is already in place, has been widely tested and is ready to be scaled up to industrial level.

Additional information and media enquiries

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