

# THE BIOBASED INNOVATION STUDENT CHALLENGE EUROPE



## A wealth of innovative ideas at BISC-E final

**Make the world a little more sustainable by developing a biobased product or process: that was the task that students were set earlier this year for the BISC-E competition. Teams from the Netherlands and Denmark took up this challenge. The result was a broad spectrum of innovative ideas, from the recovery of valuable materials from waste flows in the food-processing industry to the cultivation of alternatives for fertilisers, the production of self-destructing plastics and the extraction of valuable components from syngas.**

BISC-E (Biobased Innovation Student Challenge Europe) is an annual competition for Bachelor's and Master's students. The competition was conceived by TKI-BBE with the aim of bringing students into direct contact with the biobased sector. As part of the competition, teams were set the task of developing a biobased product or process which would be assessed for its sustainability and technical and economic feasibility in the final. Five teams took part in this, the first event of its kind.

### VALUABLE MATERIALS FROM CARROT WASTE FLOWS

Valuable materials from carrot waste flows  
"More than just a carrot", a team from the University of Southern Denmark took first prize (€1000) with its value creation of sidestreams derived from the processing of carrots. They aim to produce antioxidants and nutritional supplements on the basis of a commercially viable procedure.

### REPLACING FERTILIZER WITH AZOLLA

The second prize (€500) went to students from the University of Utrecht. "Velvet" - the name of their team - aims to cultivate water fern, or Azolla, commercially. This

You can find more info on [www.bisc-e.eu](http://www.bisc-e.eu).



is a plant that captures nitrogen from the atmosphere and thus offers a possible alternative to fertiliser, or use as an animal feed substitute for soya. Because current nitrogen production methods for fertiliser are highly efficient, the jury were unclear as to whether a valid business case could be made for the production of Azolla. Nevertheless, they see the possibilities of recovering valuable proteins from the plant.

## PECTIN FROM CITRUS PEEL

A second team from the University of Southern Denmark developed a process whereby peel from citrus fruit can be processed into four valuable components, including D-limonene oil and pectin. In order to make the process



financially viable, the team concentrated its efforts on the extraction of pectin. The jury felt that this was a wise choice, not least because the production of D-limonene oil is so exacting that the high price per kilo for the oil was cancelled out by the production costs. The team carried off third prize (€250).

## SELF-DESTROYING PLASTIC

A team from Maastricht came up with another ingenious idea: why not develop an enzyme in plastic that helps degrade it use? In the long term this would eradicate

the problem of plastic litter. Although the jury deemed it an excellent idea, they believed it would be difficult to justify the additional costs in a good business case. However, the students have full confidence in the process and will continue to work on developing their idea.

## BACTERIAL PRODUCTION OF FLAVONOID

To produce flavonoid from an African bacteria on the basis of syngas was the goal of the team from Wageningen University. The flavonoid can be used in the pharmaceutical, food-processing and chemical industries. Although the idea is innovative and produces some high-quality results, the revenue projections would seem to paint too rosy a picture. Here too, the students have complete faith in the idea and will continue to develop the process.

## ENTHUSIASM THE KEY

The jury, chaired by Kees de Gooijer (TKI-BBE), was full of praise about the inventiveness and enthusiasm of the participating teams. "All teams involved managed to combine creativity with technological know-how," concluded De Gooijer. "The fact that their ideas didn't necessarily result in a sound business case is a matter of secondary importance. Ultimately, of course, the figures must add up, but nothing can be achieved without enthusiasm." The other members of the jury were: Luuk van der Wielen (Distinguished Professor for Biobased Economy, TU Delft); Ed de Jong (Vice-president of Development, Avantium); Gadi Rothenberg (Chair of Heterogeneous Catalysis & Sustainable Chemistry, University of Amsterdam); and Freek Smedema (Senior Consultant, Biobased Economy RVO.nl).



## 2019: EUROPEAN FINAL WITH MORE COUNTRIES

A BISC-E competition will be organised once again next year. "We have had contact with a number of



other countries about organising national competitions," De Gooijer reports. "It would seem that these will be starting next year. In that case, the idea is to hold a European final in late 2019."