

Press Release 15 February 2013

Taurus Energy AB's research studies show the potential for improved ethanol extraction

A three-year joint project involving Taurus Energy AB, SEKAB e-technology, Chalmers University of Technology and Lund University aimed at developing the process technology for large-scale ethanol production from forestry and agricultural waste has shown considerable promise. Vinnova contributed 50% of the funding for the project, with the remainder shared equally between Taurus and SEKAB. The results of the research show that the yeast strains used now have improved fermentability, more rapid growth and greater resistance to inhibitors than the original yeast strains.

Taurus Energy AB supplies a new method for ethanol production from forestry and agricultural waste, in which both hemicellulose and cellulose are converted to ethanol. The method generates major environmental benefits, with the production cost of ethanol cut drastically compared to existing methods.

One of the challenges until now has been to ferment all the sugar in lignocellulose, a process known as pentose fermentation, with high yield and productivity, while achieving a high concentration of ethanol. The yeast strains developed through the joint project exhibited a higher fermentation capability, more rapid growth and a higher tolerance to inhibitors than the parent strains. A unique marker has been added to the new strains, so that the origin of the yeast can be verified. This becomes particularly useful when Taurus Energy enters into agreements with external parties for testing the company's yeast strains.

Some of the research was carried out on yeast strains which are free from ampicillin resistance genes – an important factor, since US regulations prohibit this gene in industrial tests and production. Initially, the fermentability of the yeast was reduced when this gene was eliminated, but the xylitol yield was subsequently improved with modified yeast strains, and the fermentation capability is now back to the same level as when the yeast strain containing the ampicillin gene was used.

The studies, therefore, have demonstrated improved fermentability in using sugar solution (hydrolysate) for the production of environmentally low-impact ethanol as a fuel. As a result, the methods employed to produce ethanol on an industrial scale can now be improved, with considerable benefits for the future commercialization of ethanol production.

The project has focused primarily on Swedish raw materials, such as wheat straw, but the technology can be adapted for raw materials which are significant on a global scale, such as corn cobs and stover, increasing the potential for exporting this Swedish technology for 2nd generation ethanol production worldwide.

The next stage in Taurus Energy's development effort is to increase the ethanol content after the fermentation stage, and boost the xylose yield. This three-year project, which is currently under way, is supported by the Swedish Energy Agency. The full Vinnova Report will be published on Taurus Energy's website, www.taurusenergy.eu

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About Taurus Energy AB Taurus Energy AB is a research and development company, which aims to commercialize its extensive research and development program in the field of ethanol production. Since 2006, the company's mission has been to license energy producers to use the methods developed by the company on a global market. Taurus holds over 10 world-leading patents which have been developed with the help of around 20 internationally recognized scientists. The company is based in the Ideon Science Park in Lund, Sweden. Taurus is listed on the Aktietorget equities market. For more information, please visit www.taurusenergy.eu