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# Bio-based chemicals one step closer to commercial breakthrough

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- Braskem and Haldor Topsoe partner to validate the MOSAIK™ sugar-to-biochemicals solution for production of MEG (monoethylene glycol) in a demonstration plant.
- The new partnership accelerates the development of the MOSAIK™ solution that forms the basis for a growing portfolio of bio-based chemicals produced through patented processes.
- MEG is a key component of PET plastic used for food packaging, especially bottles, and polyester fabrics. The global MEG market represents a value of 25 billion dollars.

Catalysis will be as essential in the sustainable production of chemicals from renewable feedstocks as it has always been in the production from fossil fuels. And in the near future, innovative processes along with customized catalysts and equipment could make chemicals from biomass a real commercial opportunity for producers. One such example is Topsoe's MOSAIK™ solution.

"Our customers in the chemical industry deal with challenging market conditions on a daily basis. We intend to show that chemicals from biomass can be a commercially attractive option, even in a tough, mature market such as thermoplastic resins," said Kim Knudsen, Executive Vice President at Haldor Topsoe.

He added: "Catalysis will play an extremely important role in the development of competitive solutions that produce important chemicals from renewable sources. We dedicate our world-leading capabilities within catalysis to accelerate the process for the good of our customers and the environment. And we really look forward to taking the next step together with Braskem."

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**Svend Ravn**

Media relations manager

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Americas, and Topsoe. The aim is to develop a pioneering route to produce MEG from sugar.

With the agreement, Braskem wants to expand its portfolio of renewable products to offer new solutions that complement its bio-based polyethylene marketed with the I'm green™ seal. "With this new partnership, we strengthen our position as protagonists in the development of innovative solutions that will leverage the competitiveness of different biomasses and complement the traditional solutions offered by the petrochemical industry," said Gustavo Sergi, director of Renewable Chemicals at Braskem.



The agreement calls for the construction of a demonstration plant in Denmark, with operation slated to begin in 2019. Topsoe will deliver a packaged solution for this project with Braskem, including catalyst and technology. The companies will combine their expertise to further develop, test and validate the process. The overall goal of the partnership is the start-up of a commercial plant in 2023.



### More about MOSAIK™ for production of MEG

MONoSACcharide Industrial Cracker – or MOSAIK™ – is a solution for cracking of sugars to an intermediary product which can be further converted to monoethylene glycol (MEG) or other chemicals using Haldor Topsoe's patented

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Current processes to produce MEG from biomass involve several steps. This can be reduced to two simple steps with MOSAIK™ and Topsoe's unique catalyst and technology for production of MEG. The new solution brings down investment costs and boosts productivity to a level, where it can compete on commercial terms with traditional production from fossil feedstock (naphtha).

MEG is predominantly used in the manufacture of polyester (PET) resins, films and fibers. The global MEG market represents a value of approximately 25 billion dollars.

### About Braskem

With a global, human-oriented vision of the future, Braskem's 8,000 team members strive to improve people's lives by creating sustainable solutions in chemistry and plastics. It is the largest resin producer in the Americas, with an annual output of 20 million metric tons, including basic chemicals and petrochemicals, and R\$55 billion in revenue in 2016. It exports to customers in approximately 100 countries and operates 41 industrial units, located in Brazil, the United States, Germany, and Mexico – the latter in partnership with Mexico-based company Idesa.

### FIND US

 Haldor Topsoe A/S (HQ)  
Haldor Topsøes Allé 1  
DK-2800  
Kgs. Lyngby  
Denmark

 +45 4527 2000

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