



September 3, 2014

Background information: Grand Opening marks grand moment in transition to a (bio-)renewable age

Today, Royal DSM - together with our JV partner POET (USA) - is hosting a unique, exciting and important event in Iowa (USA) commemorating the grand opening of *Liberty*, our commercial-scale cellulosic-based biofuel (bio-ethanol) plant.

This event represents more than just the opening of a manufacturing facility; it is in our opinion an important and historic event for industry, science, policymakers and leaders on the issues of CO₂ reduction and climate change, economic development and energy security, advocating sustainability.

We believe that the importance of this event, and what it represents, extends well beyond just the interests of Royal DSM. It represents the introduction of a disruptive technology at scale that will offer the world an entrance to a new age. As a consequence, we are reaching out to you today, to provide you with some background.

This grand opening of the first commercial scale cellulosic-based biofuel facility in the USA represents one of world's first advanced biofuel refineries. This event will be attended by several thousand people, including stakeholders from the business, scientific, political, media and agricultural communities, as well as His Majesty the King of The Netherlands, the US Secretaries for Agriculture and Energy and the Governor of the State of Iowa.

We are confident that this can be a landmark for the further transition from the fossil age to the (bio)renewable age and serve as a catalyst for a broader dialogue on the circular economy. This so called second generation biofuel facility will make cellulosic bio-ethanol out of the non-edible residues of corn production, such as the cobs, stalks, stems and leaves, material which is referred to as "corn stover", a crop residue, not used for food and often regarded as waste.

Our technology can also be applied using other crop residues as feedstock, enabling the sustainable production of green energy and bio-based materials from agricultural waste or residues. This will further reduce our addiction to fossil resources and can further mitigate the impact the use of fossil resources have on the climate and our planet. Utilizing these feedstocks to produce fuel also serves to improve energy security, reduce energy costs, and foster economic growth.

Today, most of this corn stover remains on the field after harvest as there is no economic incentive to remove it and it serves to prevent soil erosion and act as a natural fertilizer. It is proven that as much as 50% of this residue can be sustainably removed without any adverse impact on soil quality, and actually promotes groundwater penetration and increased crop yields.

POET-DSM conservatively advises farmers to currently remove only up to 25% of the residue. In some places in the world this portion of these residues is already removed and used in feed application or burned creating CO₂ and thus contributing to climate change. What was previously left as waste, we can now use to create energy, reduce greenhouse gas emissions and mitigate climate change.

DSM is a strong advocate for the concept of the circular economy; one in which there is no waste, only resources that may be in the wrong place, the wrong part of the value chain or not used appropriately. We firmly believe that existing waste and residue streams can be used as feedstock to create new products, and value chains. Seven years ago DSM started to develop the technology that now enables it to turn the waste/residues of several different types of crops into valuable and useful products like bio energy and bio-based materials.

The corn residue, our starting material, is rich in cellulose, which is not an easy starting material. But we, together with POET, succeeded in developing the technology and we are now ready to open the first plant of its kind in the USA, in the heart of the corn belt, where there is an ample supply of our feedstock from local farmers. By doing so we help them to increase the yield per acre and generate additional income, while developing a new business model where 'waste' becomes valuable.

Our new plant in the USA (Emmetsburg) is designed to produce almost 100 million liters per year of advanced bio-ethanol. When used as fuel, it will result in a "field-to-wheel" CO₂ reduction of 85-95% compared to conventional gasoline ("well-to-wheel"). After the start-up phase we will make licenses to this technology available to others in the USA and worldwide, so that similar facilities can be built across the globe making cellulosic ethanol a commercially viable alternative or addition to conventional gasoline.

We are convinced that this is just the beginning. We believe that in future even more fractions in crop waste/residue could be used and upgraded, such as lignin and proteins for animal and human consumption, so that these facilities become true bio-refineries producing a whole range of valuable products beyond advanced biofuel from a feedstock that was previously seen as, and treated as, waste. We sincerely believe that the opening of this facility, Project Liberty, represents the introduction of a disruptive technology and a historic moment in the transformation of our economy from the fossil-age to the (bio)renewable-age, making the world greener, cleaner and more sustainable.

The circular economy is becoming real: using 'waste' as input for new value chains. We are thrilled that DSM together with POET is at the forefront of this shift, combating climate change, taking care of our planet and creating a brighter future for people today and generations to come.