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DIMETHYL ETHER SUPPORTING DIGESTATE REFINING TO WATER AND LIQUID FERTILIZER

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In the project Hagenbrunn, we now show the combination of steam gasification and biogas to enlarge the production of dimethyl ether. In turn, the energy efficiency and the conversion efficiency in the production of dimethyl ether are shown. In the project Hagenbrunn, we also have a combination of the dimethyl ether plant with a biogas plant based on biogenic wet waste. At the end of the fermentation process in the digester, the digestate is stored in a large normally open tank. In former times, the digestate was used to fertilize the agricultural fields. Because of the high content of potassium, phosphate, metals, sodium and ammonium, using heat and electric energy from the DME plant, the digestate can be separated into the liquid phase and the solid phase. The liquid phase can be cleaned up with the known process of ultrafiltration. The result is a clear liquid fertilizer, which can be used as fertilizer in the viticulture based on trickle irrigation. The results of such an application are shown in energy efficiency and energy consumption. In the next and last step of refining the liquid clear fertilizer, we use the known process of nanofiltration. As products, we gain distilled (nearly salt free) water and high concentrate on liquid fertilizer, in turn, showing the energy consumption and energy efficiency. In combination with the DME plant, a high part of used water can be gained back in easy way that can be used as fertilizer or as distilled water (deionat) used for the steam production in the steam gasification, or the hydrogen plant based on the wet electrolysis used and needed for the DME production. The practical application is shown in the project Hagenbrunn.

Biography

Johann Gruber Schmidt has completed his PhD in Mechanical and Chemical Engineering from Technical University Vienna in 1992. He then started at Waagner Biro GmbH in plant division. In the year 2000, he moved to the projects in renewable bioenergy in Lower Austria, where he worked in erection and commission till 2003. In the following years, he designed and erected biomass and biogas CHP plants in Austria and turned to the field of small fixed gasification redesigning a prototype plant with mainly focus on gas cleaning and gas preparation and conversion for CHP Units. In the year 2011, he started biogas upgrading project to biomethane and syngas finished at 2013. From this time on he worked on the field DME and zero emission application in realizing projects in the power range up to 5000 kW till today and attends besides the projects congresses in agriculture and renewable energy and gives oral presentations.

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