

ENGINEERING
TOMORROW

Danfoss

Case study | VLT® AutomationDrive FC 302

Energy efficient VLT® drives at one of the world's largest **biogas plants**

MEC – BioGas is the world leader in the production of environmentally friendly and sustainable energy

150

AC drives for pumps,
blowers, decaners
and conveyors with
central control



VLT® AutomationDrive FC 302 controls critical applications, such as pumps, blowers, decaners and screw conveyors, and ensures reliable operations at MEC – BioGas.

World leader since **2012**

World leader since 2012

MEC – BioGas in Holstebro, previously known as Maabjerg BioEnergy, was the world's largest biogas plant when the plant commenced operations in 2012. Every year, they process more than 830,000 tons of biomass, which primarily consists of slurry from local farmers, sewage sludge and residual products from local dairies. Slurry transport alone consists of 50-60 tractor trailers per day traveling to and from the biogas plant. The many thousand tons of biomass create the basis for an annual production of 21.5 million cubic metres of biogas.

The finished biogas is sent to Vinderup, among other places, via a 17 km long underground gas pipeline or is burned in large gas engines, which constantly produce 1.8 MW of heat

that is delivered to the city of Holstebro and 1.5 MW of electricity that is delivered to the grid. In addition to producing environmentally friendly and sustainable energy, the plant also helps local agriculture to reduce the discharge of nutrients into waterways and fjords in the region.

A great benefit to society

Overall, there are two central socio-economic benefits from the biogas plant: The first is energy, where fuel costs are saved and environmentally friendly electricity and district heating are produced, and the second is in the area of agriculture.

The advantage for farmers in the area is that the biogas plant improves the fertilization value of the degassed sludge. The farmers deliver their raw

manure to the plant and get degassed sludge back. The degassed sludge can be 'designed' so that the content of fertilizer substances suits the specific farmer's fertilization plans. At the same time, it is nearly odorless, which is a big advantage for the farmers and their neighbors. Thus, the plant helps the farmers to optimize their fertilization plans, which would otherwise place limitations on the size of their animal stock. In this way, workplaces in the local area are also protected. Finally, the plant also delivers degassed sewage sludge to Hede Danmark, which uses it for fertilizing forest areas, where this is approved.

All in all, it is estimated that MEC – BioGas protects up to 300 workplaces and creates a socio-economic gain of DKK 1 billion over 20 years.

150 AC drives from Danfoss Drives

MEC – BioGas has approximately 150 VLT® AutomationDrive FC 302 and AQUA Drive FC 202 drives with PROFIBUS for controlling everything from screw conveyors to pumps, blowers and decanters. The smallest of the AC drives is 0.75 kW, and the largest is up to 90 kW. Nearly all of the AC drives have been in operation since the plant started production in January 2012.

The many VLT® drives give the plant an energy-efficient solution and the possibility for central control and monitoring of the many critical processes, all of which are controlled by a SCADA system in the control room.

Because the plant is physically large and requires a lot of space, it was critical that a large number of the AC drives could be moved to the central technical rooms and that the motor cables could be up to 120 meters long. This was possible with Danfoss VLT® drives, which allow up to 150 meters of shielded motor cables without extra filters.

Martin Lorentzen, Electrician at MEC – BioGas, says: "The Danfoss VLT® drives were chosen because they were reliable, easy to understand and intuitive to use."



Martin Lorentzen, Electrician, next to a 45 kW VLT® AutomationDrive FC 302 drive.



The VLT® AutomationDrive FC 302 drives control the large district heating pump systems.



MEC – BioGas has used enclosure rating class IP55 for a number of their VLT® AutomationDrive FC 302 drives, because this type is especially suitable for installation in demanding environments.

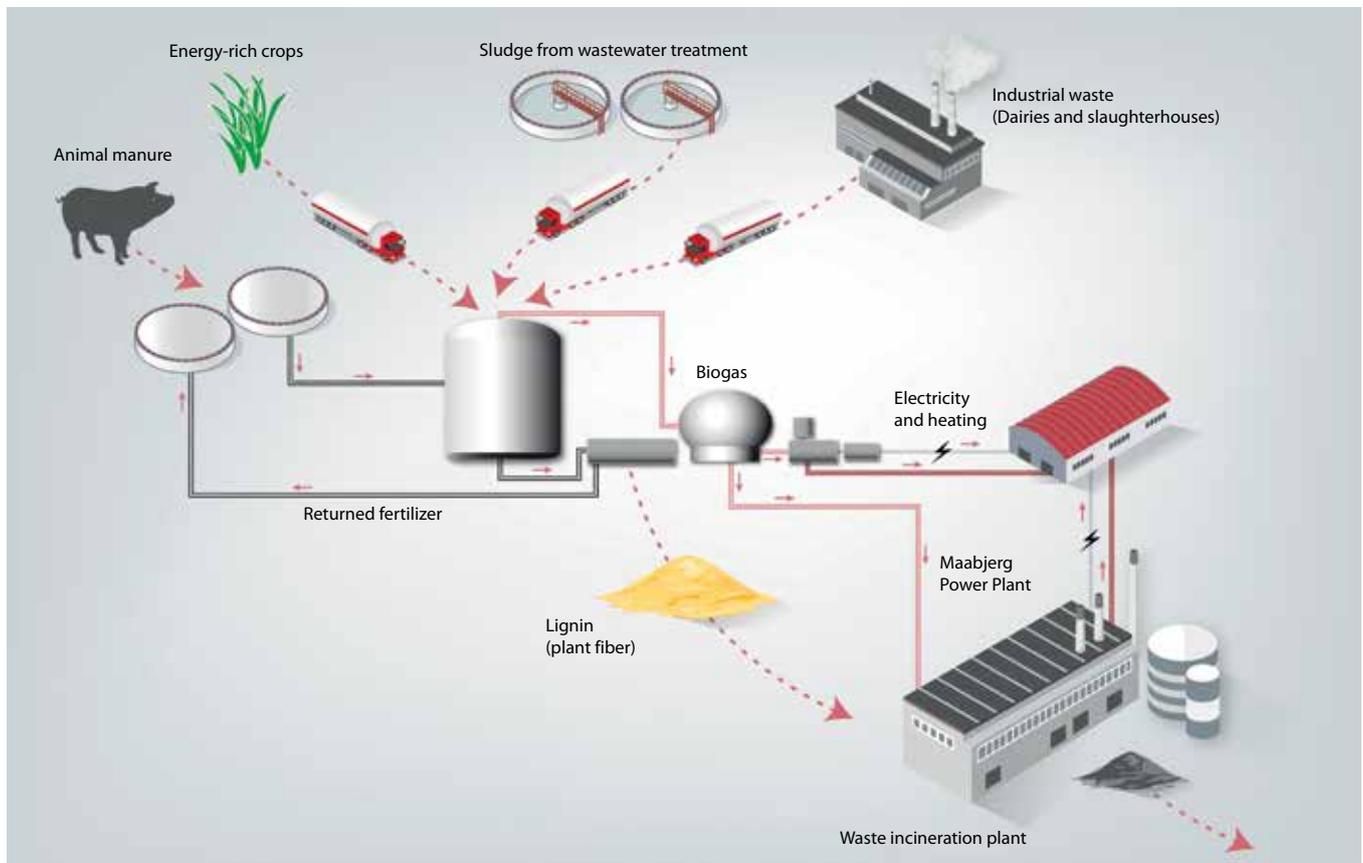
Protection against downtime

With production around the clock, it is essential that the technology functions as it should, and in order to protect against unintended downtime, MEC – BioGas has entered into a DrivePro® service agreement from Danfoss Drives.

With a DrivePro® service agreement, MEC – BioGas is ensured proactive service and a service technician on site within five hours if there is a breakdown. In addition, they only have one point of contact at Danfoss Drives, so they always know who to contact.

Martin Lorentzen says that, through their service agreement, they also have received tips and tricks for programming and optimization of the AC drives. This has contributed to ensuring that they get the full benefits of the many AC drives.

"With a DrivePro® service agreement, we know that our VLT® drives are always running as they should. In this way, our critical processes are secured, and we avoid unplanned breakdowns", says Martin Lorentzen



Danfoss VLT® drives are there from start to finish when MEC – BioGas transforms biomass to environmentally friendly biogas.

Facts about MEC – BioGas

- MEC – BioGas is owned by Vestforsyning Varme A/S and Struer Forsyning Fjernvarme A/S
- Construction commenced in 2010 and was completed in 2012
- Total investment DKK 375 million
- A 20-year payback time
- In 2015, the plant's name was changed to MEC – BioGas
- 830,000 tons of biomass are processed at the plant annually
- 21.5 million cubic meters of biogas come out of the other end
- 50,000-ton reduction in CO₂ emissions annually
- 300 tons less nitrogen and phosphorus per year in the aquatic environment
- Secures 300 workplaces
- Socio-economic benefits amounting to DKK 1 billion