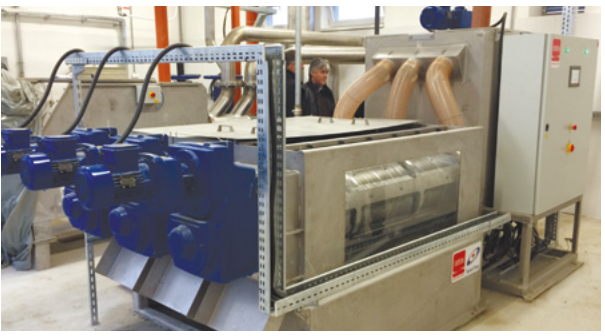
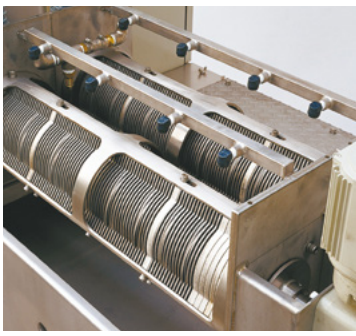
+44 01494 526 155 www.esmil.co.uk info@esmil.co.uk





CASE HISTORY

ECONOMIC CASE FOR ANAEROBIC DIGESTER [AD] DIGESTATE

Esmil Process Systems have designed and developed an economically attractive digestate disposal process which would largely eliminate the need for haulage and spreading of whole digestate. This process is viable for any size of AD plant operation.

Haulage and spreading of AD digestate represents the single largest cost for AD plant operations. Beyond the need to constantly acquire suitable agricultural land for digestate disposal, current transport economics indicate a “break even” point at around 30 km per round trip. Any disposal trip over 15 km radius from the AD plant is essentially economically unfeasible.

Esmil propose to change this equation antly through unique processing to concentrate and separate whole digestate into 3 valuable (and pr able) revenue streams. This process is depicted pictorially.

Figure 1. AD Digestate value adding process

Process

Whole digestate from the digester is treated and processed through an Esmil de-watering system (MDQ) to recovers and concentrates residual suspended solids as a stackable cake of around 30% DS. This cake is easily transported and stored and represents a valuable bio-compost material which is high in available Phosphorus and Organically Absorbable Carbon necessary to improve the overall long term soil structure.

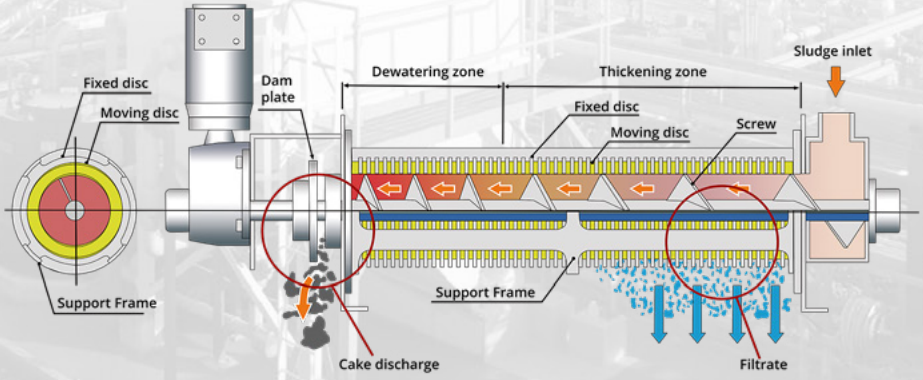


Figure 1. Dewatering drum construction

The residual ate recovered from the MDQ is treated in 2 or 3 specialised BAT membrane treatment blocks which reduces th ate to 2 further valuable by-product streams:

1. A concentrated liquid fertiliser with high levels of plant available Nitrogen

2. A clear permeate stream which can be recycled into the process (dilution, cleaning & boiler feedwater applications. Essentially the need for bought-in town water is eliminated. This permeate can also be discharged to sewer at low or no cost dependant on the receiving authority.

MDQ filtrate | Concentrated liquid fertiliser | Clear permeate

Case History

Typical data realised for a 50 kilo ton mesophilic wet feed AD operation is tabulated below.

Table 1. Typical values AD digestate plant 50 kiloton per annum

Description	thr^{-1}	Dry solids DS %	Value, $ton^{-1}	Revenue $'000 p.a.
1 Stackable compost	1.40	30.0	14.70	167.90
2 Conc. Liquid fertilizer	2.30	1.8	10.10	189.60
3 Clear Permeate	1.80	na	6.00	88.20
Total	**5.50**			**445.70**
Whole Digestate	5.50	6-9		
4 Haulage *	5.50	6-9	(8.20) – (13.13)	(368.02) – (589.27)
5 Spreading **	5.50	6-9	(3.50) – (7.00)	(157.08) – (314.16)
Total	**5.50**			**(525.10) – (903.43)**

* - Basis 80 km round trip with no back-haul. Sensitivity using 128 km round trip with no back-haul and no offset for possible nutrient value or adverse GHG emissions charges.

** - Basis $3.50 per ton for spreading charges using a sensitivity of $7.00 per ton and no offset or environmental damage charges.

Conclusions

Separation and concentration of whole digestate into 3 separate streams provides the AD plant with numerous alternatives which can antly impact the pr ability of the operation as well as positively displacing petrochemical based fertilisers with “biofertilisers”.