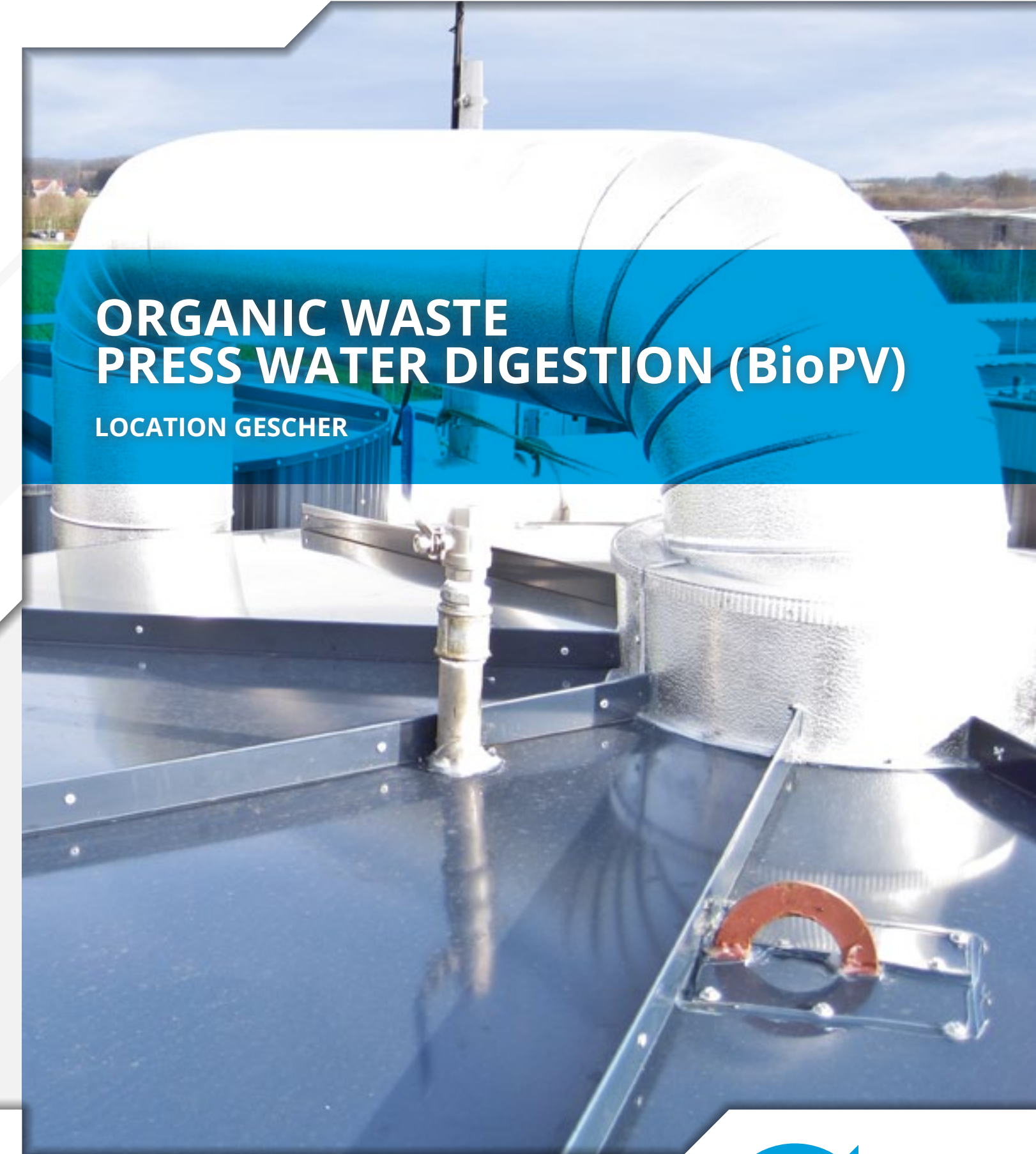
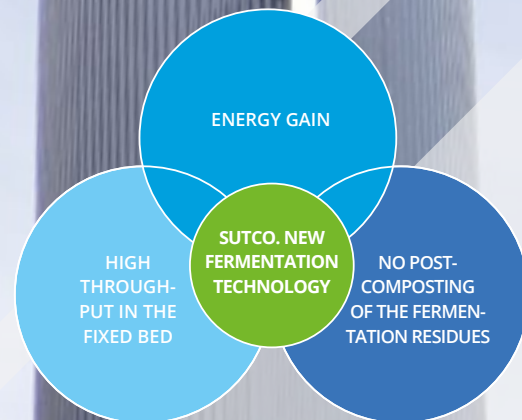


OVERVIEW OF THE ADVANTAGES

- Fermentation of a highly energetic liquid phase, recovered from the biowaste in the bypas for the existing composting process
- Removal of easily available organic material from the solid waste: to facilitate a further aerobic treatment
- Simple fermentation system of modular design with low investment costs
- High throughputs and low dwell times in a fixed-bed fermenter with a fixed bacterial colonisation
- Very high methane content of 60 - 70% and thus a high energy content in the biogas
- Circulation of the fermentation residue for wetting the fresh biowaste; no waste water to be disposed of externally
- Low-wear plant equipment which is easy to operate and maintain
- Automatic sand separation in the current fermentation process
- Hygienization by thermophile and continuous fermenter flow possible

➤ The EGW digestion plant with a fixed-bed digester for organic waste press water produces biogas which is used as biomethane or is converted to electrical and thermally useful energy via a biogas motor.



ORGANIC WASTE PRESS WATER DIGESTION (BioPV)

LOCATION GESCHER

THE EFFICIENCY OF THE FERMENTATION PLANT FOR RESIDUAL WASTE IS AS FOLLOWS:

RESIDUAL WASTE < 80 MM + WATER [Mg]	PRESS WATER VOLUME PRODUCED [m³]	DWELL TIME DIGESTION PLANT [d]	BIOGAS [m³] FOR EACH TON OF PRESS WATER	BIOGAS [m³] FOR EACH TON OF ORGANIC
100 + 60	60	8 - 10	90	54
PRESSING EQUIPMENT FOR RESIDUAL WASTE AND THE DIGESTION OF PRESS WATER		QUANTITIES	PROFITABILITY	
Estimated investment costs		60.000 Mg of residual waste < 80mm/a	~3.500.000 €	
Estimated wearing and operating costs		Incl. presses and BHPP	~200.000 €/a	
Estimated energy consumption		~190.000 kWh/a	~30.000 €/a	
Estimated energy generation with a CH ₄ content of 60% in a CHP plant		3.240.000 m³/a -> 9.200.000 kWh _{el} /a	~100.000 €/a (0,12 €/kWh _{el})	

Information provided without guarantee





ORGANIC WASTE-PRESS WATER DIGESTION

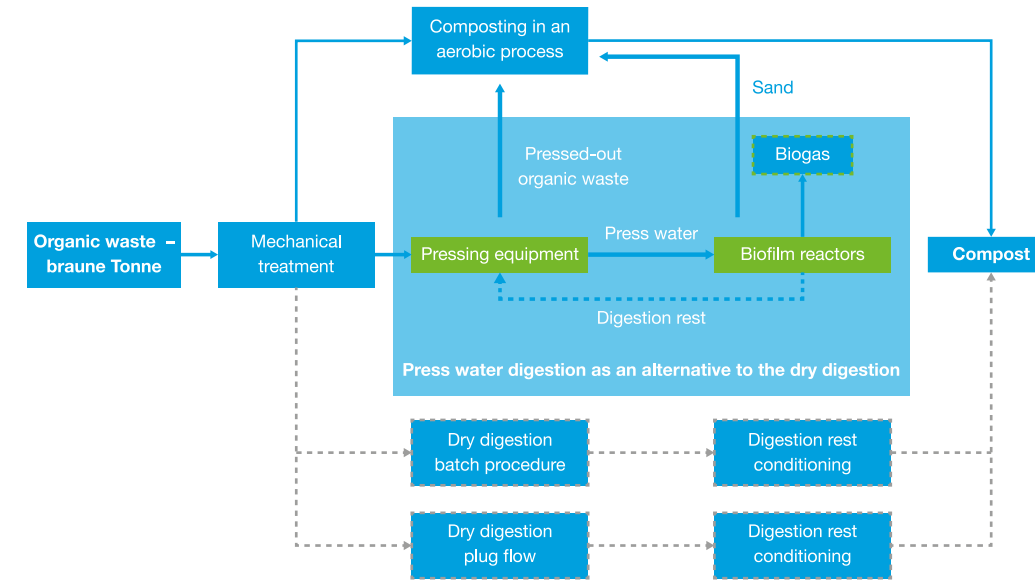
Sutco Recycling Technik GmbH has developed a new digestion technology BioPV (organic waste press water digestion) as an alternative digestion process which significantly improves the energy balance and the processing capacity of composting plants.

Sutco Recycling Technik GmbH succeeded in achieving a maximum gas yield from the liquid phase pressed out organic waste with lowest technical efforts during the development of their new digestion process BioPV (organic waste press water digestion). With this technology organic ingredients from the biowaste as a liquid phase are digested and pressed out in biofilm reactors for generating biogas. Up to now, mainly dry digestion plants have been used

for the energetic use of the organic substances contained in organic waste. However, these processes achieve a high biogas yield but require considerable efforts and expenses for the treatment of the digestion rest to provide a quality-based and marketable compost. The conditioning and drying of the digestion rest requires a high energy consumption for that.

Contrary to that, Sutco could largely avoid digestion rests to be disposed of externally with their BioPV. Here, digestion is performed in parallel to the composting process with the liquid phase separated from fresh organic waste. The digestion rest is run in a cycle and is only disposed of in case of excess water in the total plant.

THE BIOPV (ORGANIC WASTE PRESS WATER DIGESTION), THE BIOLOGICAL WASTE TREATMENT PROCESSES CAN BE CLASSIFIED AS FOLLOWS:

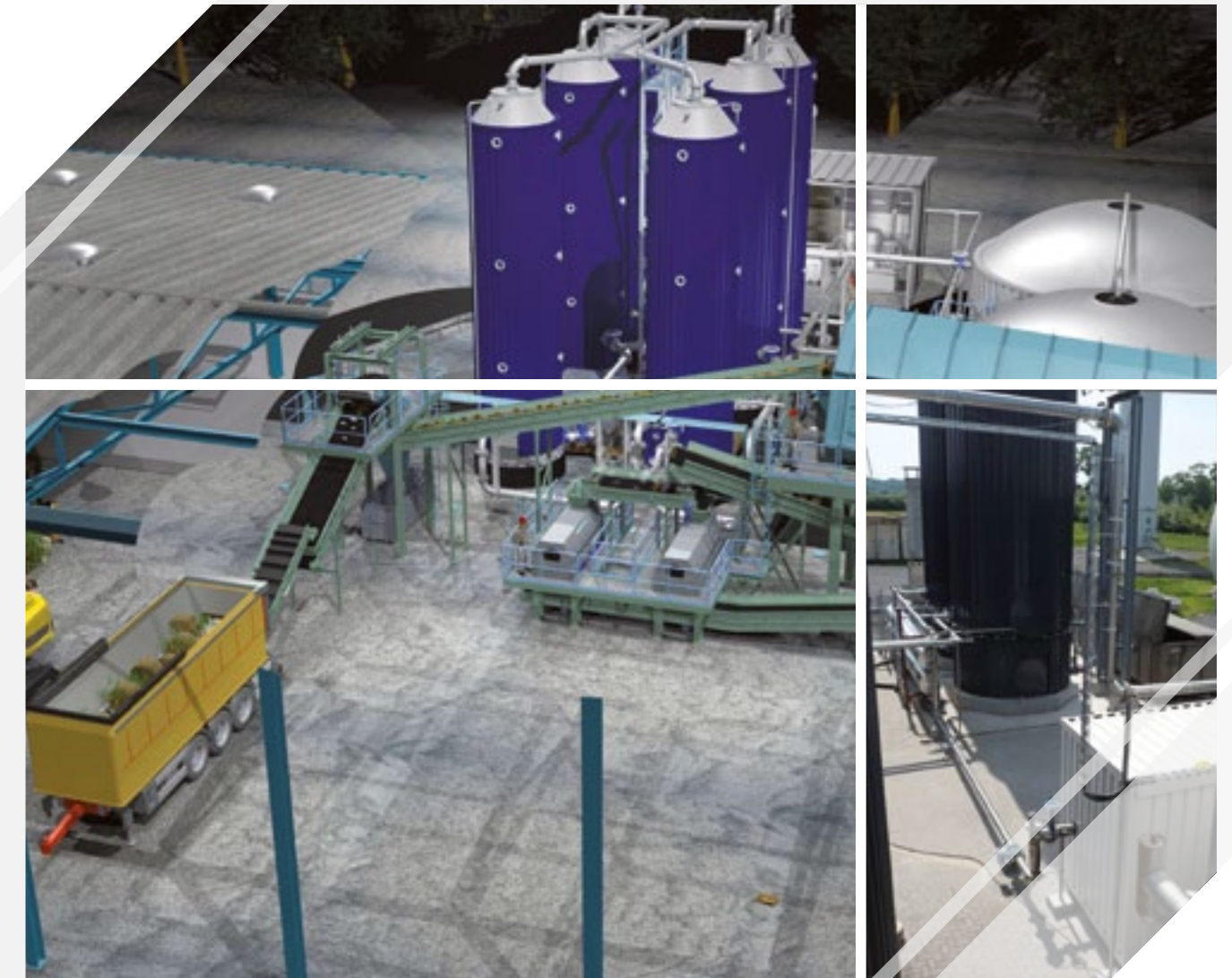


HIGHLY EFFICIENT ENERGY PRODUCTION PLUS QUALITY COMPOST

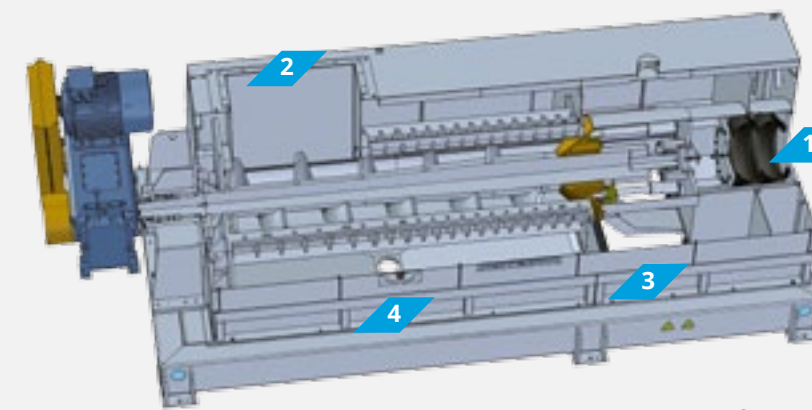
The wet digestion of a suspension obtained from organic waste can be implemented with significantly lower efforts and expenses than the alternative dry digestion of organic waste as a solid material - this is the result from the knowledge obtained from the large-scale operation of the composting and digestion plant of the Entsorgungsgesellschaft Westmünsterland (EGW). Due to the high time-space charge (dwell time in the digestion process of 8 to 10 days) the wet digestion in fixed-bed digester additionally provides a highly efficient production of energy.

The robust aerobic treatment process was retained for pressed-out organic waste, which was consistent with the purpose of the waste treatment plants, i.e. the production of quality compost. The expensive and difficult conditioning required for a further use of the digestion rests from the digesters of the dry digestion plants is not required for the BioPV.

One ton of organic waste yields 0.7 to 0.8 tons of press water. The digestion plant generates 40 to 60 m³ of biogas with a methane content of 63 to 70 % from that.



“New digestion process combines compost and biogas.”



Screw press of the Bellmer-Kufferath company for compacting biowaste

BioPV PRESSING EQUIPMENT

In the treatment plant the pressing equipment is installed in the windrow equipment before the organic waste which is crushed and screened to < 80 mm is charged. Two presses installed in parallel and alternating continuously are fed via reversing conveyor belt. The homogeneous waste input distributed in the material allows the first wetting to be dispensed with at the start of the intensive composting.

AS A RESULT, THE EFFICIENCY OF THIS DIGESTION PLANT CAN BE REPRESENTED AS FOLLOWS:

ORGANIC WASTE [Mg]	PRESS WATER VOLUME PRODUCED [m ³]	DWELL TIME DIGESTION PLANT [d]	BIOGAS [m ³] FOR EACH Mg OF PRESS WATER	BIOGAS [m ³] FOR EACH Mg OF ORGANIC
100 + 75	75	8 - 10	55	42
PRESSING EQUIPMENT FOR ORGANIC WASTE AND THE DIGESTION OF PRESS WATER		QUANTITIES	PROFITABILITY	
Estimated investment costs		60,000 Mg of organic waste/a	-3.200.000 €	
Estimated wearing and operating costs		Incl. presses and BHPP	-200.000 €/a	
Estimated energy consumption		~190.000 kWh/a	~30.000 €/a	
Biogas produced and digestion energy		2.500.000 m ³ /a -> 7.000.000 kWh _{el} /a	~980.000 €/a (base EEG 2016)	
Revenues of each ton of digestion input		15,000 - 30,000 Mg/a	2 to 5 €/Mg	