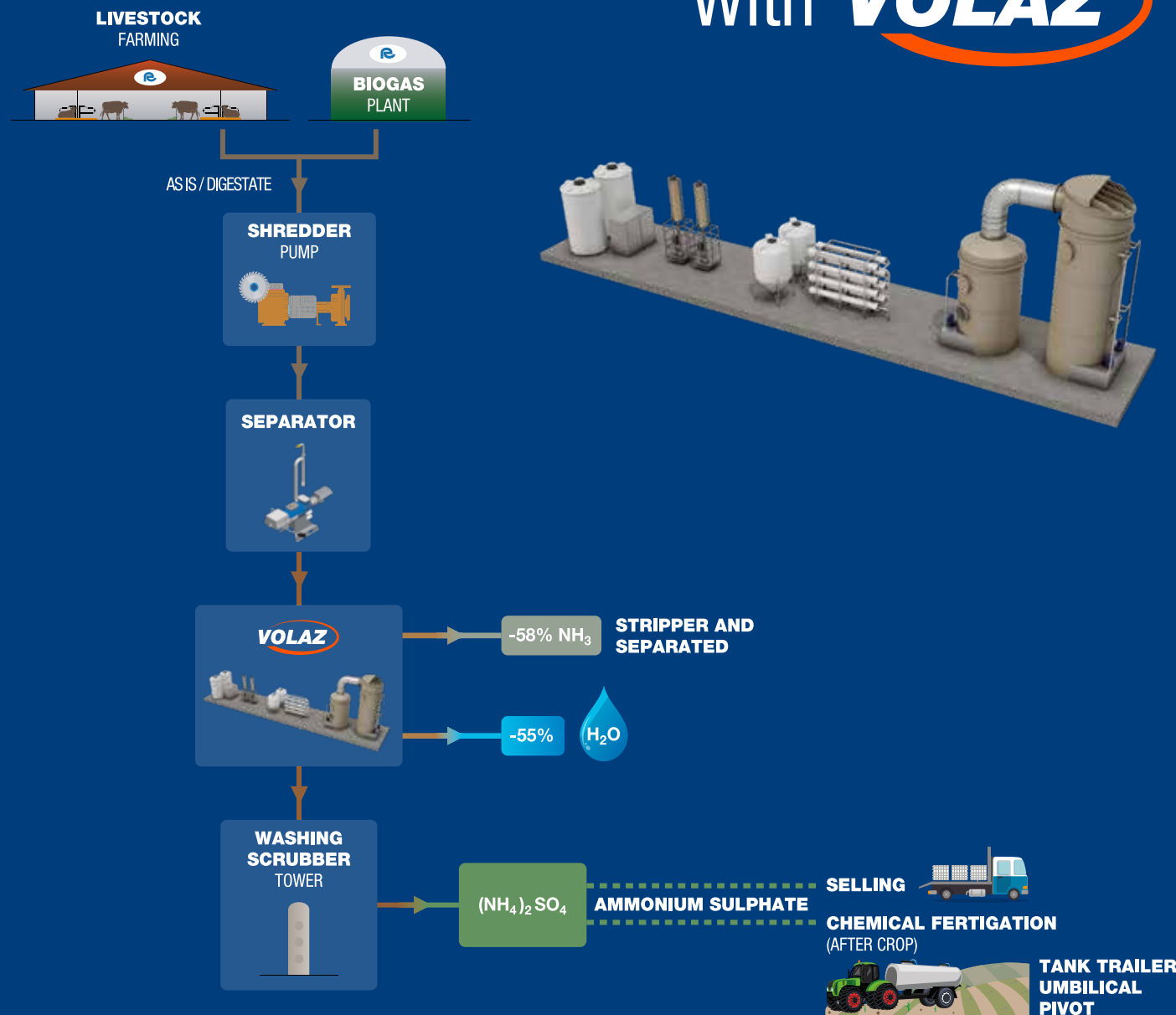


Because the **EARTH** can worth more.

With **VOLAZ**



Because the **EARTH** can worth more.

With **VOLAZ**

Here's the **solution** to **NITROGEN**

An Efficient And Innovative Cycle For The Sustainable Management Of Livestock Manure And Biogas/biomethane Digestate!



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VOLAZ TREATMENT SYSTEM for MANURE AND DIGESTATE represents an innovative approach to the management of biogas/ biomethane plant digestate, reconciling environment, economy and well-being of the territory.

The heart of the system comprises two plant sections: a biogas plant powered by livestock manure from local farms and other agro-industrial matrices which produces renewable electricity and a by-product of biogas production treatment plant: the so-called digestate.

The **VOLAZ SYSTEM** implements an INNOVATIVE CYCLE for animal manure and digestate treatment applicable to multiple forms of breeding and for the anaerobic digester powering.

GOALS

The **VOLAZ SYSTEM** achieves several **specific objectives** in the management of these matrices which allows to:

- 1. **Reduce the nutrient (nitrogen)** load of the sewage or digestate produced by the biogas plant by subtracting a relevant part of the ammonia nitrogen that is transferred to a fertilizer;
- 2. **Obtain a liquid mineral fertilizer, ammonium sulphate**, which is 100% usable as a substitute for equivalent synthetic chemical fertilizers available on the market or directly marketable as a fertiliser according to Italian legislation D.Lgs. n. 75/2010 (Fertilizer Decree) and European FPR 1009/2019 (Fertilising Products Regulation);
- 3. **Obtain purified water that can be discharged into surface water body** in compliance with legal limits, both in Italy and in Europe;
- 4. **Create a sustainable managment model for livestock manure or digestate** which can be implemented in any national and European agricultural or industrial context, based on biogas and biomethane production as renewable energies without causing negative consequences on the local social-enviroinmental context and fixing the issue related to nitrogen surplus in accordance with Nitrates Directive (ECC/676/1991);
- 5. **Feed the digester, if present, with the recirculation of a concentrated digestate rich in organic matter but low in nitrogen content**, reducing the volume of initial digestate and recovering perfectly purified water that meets national and European limits for discharge into surface water body and can also be reused in the farm.

TECHNOLOGIES

The SEWAGE AND DIGESTATE TREATMENT section of the **VOLAZ SYSTEM** consists of the following equipment:

4 MAIN STAGES:

First stage: it involves solid-liquid separation pretreatments of the sewage or digestate, using a studied combination of helical compression separator and a series of vibrating screens to remove solids up to 100 micron (0.1 mm) in diameter (about 10% of the input volume) and prepare the entry of liquid fraction of the digestate into the next stage;

Second stage: it's a totally innovative stage, capable of treating any type of waste or digestate. It uses anti-fouling vibrating membrane system VSEP to concentrate the digestate (about 30% of the input volume) and, at the same time, extract a relevant portion of nitrogen in a liquid volume (permeate) free of solids to send to stage n. 3;

Third stage: it is related to the nitrogen removal system from the second stage permeate through stripper/scrubber towers, where ammonium sulphate is obtained (about 5% of the input volume) concentrating the ammonia nitrogen removed from the sewage/digestate up to legal limits; this section operates more efficiently and with low operating and maintenance costs thanks to the work already performed in the second stage with the vibrating membranes;

Fourth stage: it's the final stage consisting of a reverse osmosis system with wrapped spiral membranes in low-fouling where the low-nitrogen liquid from the stripper tower is furtherly processed, allowing a good volume of purified water suitable for discharge into the surface water body, thus allowing at least 55% of the initial liquid volume to be released.

RESULTS

VOLAZ SYSTEM addresses the growing need for livestock manure and digestate treatment in a **modern, efficient and ecologically sustainable way**, achieving the balance between ecological and environmental compatibility, economic autonomy and a positive social impact.

VOLAZ SYSTEM - AN EFFICIENT AND INNOVATIVE CYCLE!T			
VOLAZ PROCESS RESULTS:T			
NITROGEN REMOVAL:	kgN/d	VOLUME REDUCTION:	m³/d
EFFICIENCY Total N in the SEWAGE RECIRCULATION N in the AMMONIUM SULPHATE	40% 60%	EFFICIENCY REDUCTION OF VOLUMES TO BE HANDLED WATER RECOVERY	85% 55%

FINISHED PRODUCTS

AMMONIUM SULPHATE with 6% ammoniacal nitrogen, product classified according to Italian legislation D. Lgs n. 75/2010 in Type 1.2.2.3 and European FPR Reg. UE 2019/1009 into the category FPR PFC 1 and CMC 15 (EU Fertilising Products Regulation 2019/1009 EU Part in PFC 1 and CMC 15).

PURIFIED WATER discharged into surface water body, according to the relevant Italian or European discharge legal limits into surface water body.

VOLAZ SYSTEM scheme:

