



# CONSERVA - Innovative plant for the Conservative Removal of Nitrogen from livestock slurries and digestate

## What is stripping

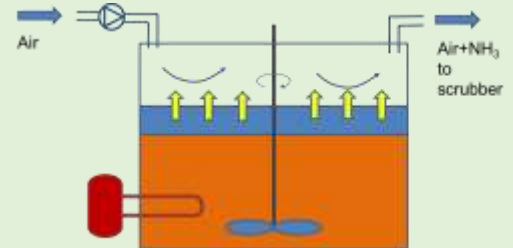
The ammonia nitrogen contained in the slurry or digestate is volatilized and collected by a stream of air which is subsequently "washed" with sulfuric acid, in order to obtain ammonium sulphate, which can be used as a fertilizer.

## How the process works

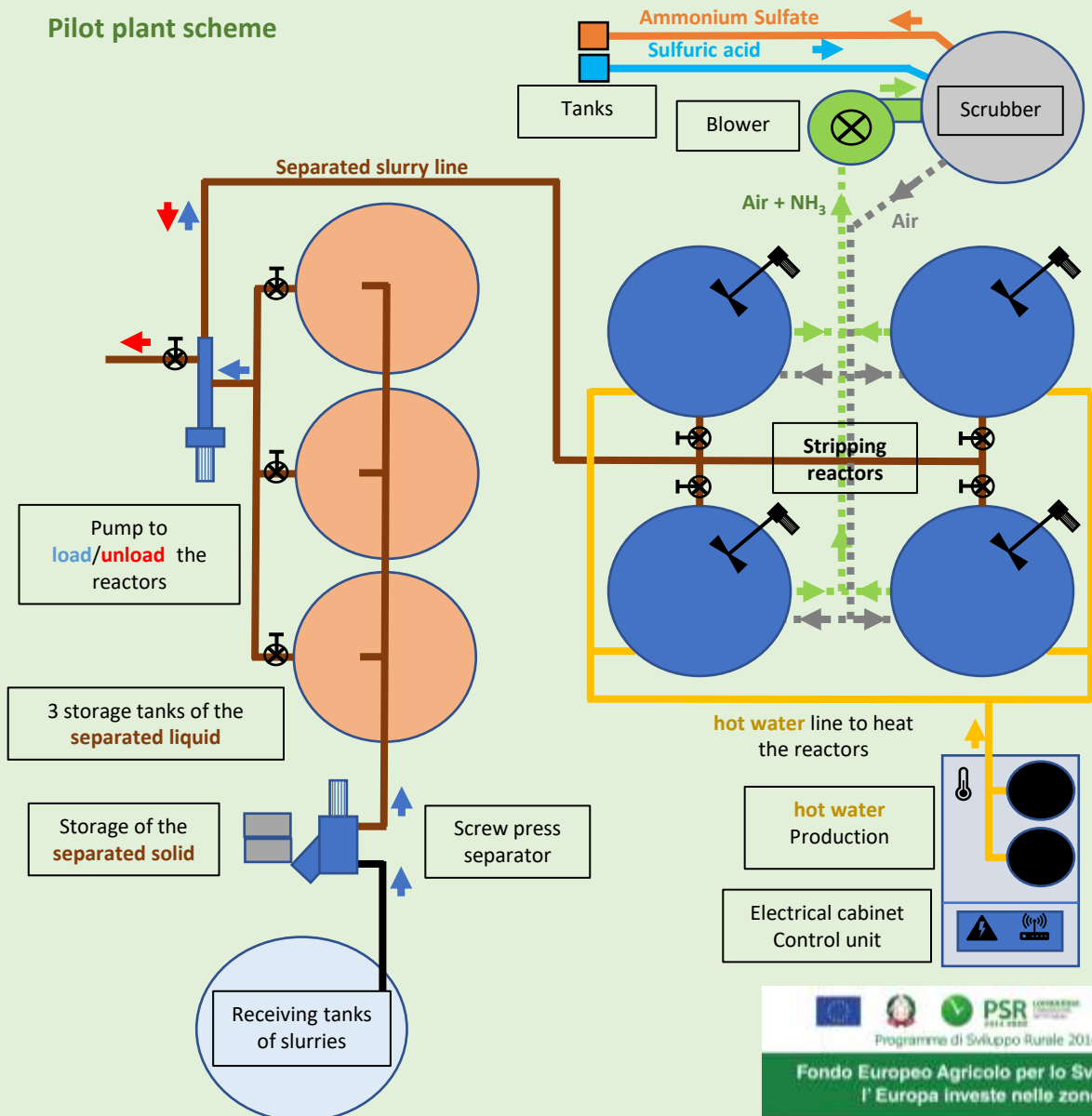
The main factors that influence nitrogen volatilization are pH, temperature, the slurry-air exchange surface and the speed of the air on it. If they increase, volatilization increases.

## The slow stripping

The project **Conserva** uses simplified slow-release stripping. The reactors are mixed and heated, while a flow of air on the surface of the slurry favors the natural increase of the pH (by about 1 point) of the slurry and the release of ammonia into the air. The process lasts a few days (7-20), and remove up to 90% of the ammonia nitrogen.



## Pilot plant scheme





# Pilot plant: operation and characteristics



Tank with a capacity of 30 m<sup>3</sup> to receive the slurries to be treated in the plant from different farms



Screw-press separator to remove coarse solids and facilitate the process of removing ammonia from the treated slurries. Three 7.5 m<sup>3</sup> tanks collect the liquid fraction, while the solid fraction is collected in two bins.



4 kW screw pump to load the liquid fraction into the stripping reactors and unload the reactors at the end of the treatment



Four 7.5 m<sup>3</sup> reactors, mixed and heated to 30-40 ° C, filled to half level. An air flow in the headspace removes the NH<sub>3</sub> released from the surface of the liquid.



The blower generates an air flow in a closed circuit that connects reactors and scrubbers. The air is sucked from the reactors and sent to the scrubber, and then re-enters the reactors.



Air loaded with NH<sub>3</sub> is treated in a wet scrubber. Ammonia reacts with a sulfuric acid solution to form ammonium sulfate. A pH meter monitors the process.



In the reactors there are sensors for monitoring pH, level and temperature.



The plant is monitored and controlled by a PLC, which can also be accessed remotely.



The monitoring of the plant and the periodic analysis of the samples allow to evaluate the performance of the plant. In a test with pig slurry, 50% of ammonia nitrogen was removed in 15 days at 35 ° C.



1 m<sup>3</sup> tanks to store the sulfuric acid used in the scrubber and the ammonium sulphate produced in the scrubber.

