



**ClieNFarms**  
Climate Neutral Farms

## ClieNFarms EIP-AGRI Practice Abstracts

# N<sub>2</sub> slurry processing (a method of acidification)

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The N<sub>2</sub> slurry processor uses an electrically powered plasma torch to ionise air which is then passed through raw slurry where nitrogen is absorbed. The treated slurry (known as Nitrogen Enriched Organic fertiliser or NEO) has more available nitrogen and is more acidic than raw slurry. The ammonia and methane emissions from storing and spreading the slurry are reduced by the acidification. This also reduces the odour from slurry spreading which is an advantage for farm workers and neighbours.

Less NEO is needed than raw slurry to treat the same area of land thus reducing the cost of chemical fertiliser and reducing the GHG emissions from producing and transporting fertiliser to the farm.

A farm with a supply of renewable energy (from wind, solar or anaerobic digestion) could reduce fertiliser costs and reduce GHG emissions. However, the unit consumes a lot of electricity and without local renewable generation the process is unlikely to be cost effective, or to result in a net reduction of GHG emissions.

This solution is already used for cattle slurry and needs to be tested on a pig farm to understand: the technical performance of the N<sub>2</sub> unit processing pig slurry, the energy use, the emissions from the slurry (methane and nitrous oxide), the reduction of chemical fertiliser use, the impact on crop yields, and the net impact on GHG emissions.



**Figure 1 :** The N2 unit at the University of Leeds farm showing from right to left: the raw slurry tank, separator, separated slurry tank, N2 unit and NEO storage tank.



**Figure 2 :** Slurry application to winter wheat using dribble bars on the University of Leeds arable farm.