

ETV SUPPORTS AGRICULTURAL TECHNOLOGIES

Agriculture plays an important role on both a global and European level in ensuring food supplies and livelihood throughout all communities. At the same time, agriculture is also considered a contributor to water, air and soil pollution, as well as to the emission of CO₂ and other greenhouse gasses. The agricultural sector is highly regulated at the national level, with significant effort and research invested in ensuring a resilient and sustainable future for the sector.

Agriculture technologies at a glance

To address the environmental challenges in livestock production, new technologies are being developed within the European Union (EU) member states and beyond. These environmental technologies are designed to enhance the eco-efficiency of agricultural production by reducing material inputs, emissions of pollutants, and energy consumption; recovering valuable by-products; and minimising waste disposal issues. Environmental technologies for agriculture can be implemented at various stages of the production chain, such as techniques used in animal housing or for manure storage, processing, or land application. However, key stakeholders, including farmers and authorities, have limited information on their performance, which hinders the adoption of these technologies in the agricultural sector.

Standardised test protocols have been developed to assess the environmental performance and operational stability of technologies, providing reliable and comparable information on the performance of technologies to farmers, authorities, and other stakeholders. Currently, protocols are available for the following:

- Technologies and management systems related to livestock production
- Air cleaning technologies
- Land application
- Manure separation
- Manure storage covers, and other mitigation technologies.



The main aspect of verification is the technology's ability to reduce emissions of ammonia and other greenhouse gases specified in the protocols, as well as its effectiveness in reducing odour and dust emissions.

In Denmark verification is used as a legislative tool to ensure that the environmental performance of the technologies is credible and well-documented. The Danish Ministry of Environment maintains a list of verified technologies for the use of local municipalities in their approval of new facilities.

Examples of agricultural technologies verified using ETV procedures *)

Technology name	Technology function	Producer/Provider	ETV Statements of Verification No:
Management system for removal of slurry every day	Reduction of ammonia emissions in mink houses	Kopenhagen Fur	002
Meadow Floor	Reduction of ammonia emission from the Meadow Floor used in cattle flooring	Proflex Betonproducten	008
JH Forsuring NH4+	Reduction of ammonia from pig finishing units	JH Agro A/S	006
Farm AirClean BIO Flex 3-stage	Reduction of ammonia, odour and dust emissions from pig finishing units	Skov A/S	005
SyreN	Reduction of ammonia emission by acidification of manure during application	BioCover A/S	001

*) These technologies have been verified under the former VERA cooperation.

Statements of Verification of these technologies are available on:

https://green-business.ec.europa.eu/eu-environmental-technology-verification_en#technology-areas

or <https://www.vera-verification.eu/vera-verification/>

EXAMPLES OF OTHER VERIFIED AGRICULTURAL TECHNOLOGIES IN DENMARK

AGRO CLIMA UNIT (ACU) CLIMA+ 200, TYPE 2.5

The evaluated technology is the Agro Clima Unit (ACU) Clima+ 200, type 2.5

Broiler production has a high energy demand, especially in the first stage of the production period due to the high temperature requirements of newly hatched chickens. The in-house temperature in broiler houses follows a preset temperature schedule and must be regulated by heating. This heating can be partly provided by the use of a heat exchange system.

The ACU is a heat exchange system developed for broiler houses. It utilises the thermal energy of the air drawn out of a broiler house to heat incoming air through a countercurrent heat exchange system. The potential for reducing ammonia emissions with the ACU lies in the drying of the litter mat, which is facilitated by the heat exchanger and the additional in-house air circulation which is part of the ACU system.

The heated incoming air that passes through the ACU is directed to the ridge of the broiler house. The system includes internal mixing of the in-house air, which potentially results in homogenization of in-house temperatures and improved drying of the broiler litter.



Verified environmental efficiency:

A 28% reduction of ammonia emission per animal place per year can be achieved in broiler houses with the tested technology combination.

Verified operational stability:

The tested technology combination has demonstrated satisfactory operational stability

VERA verification statement No: 007

Manufacturer: Rokkedahl Energi ApS

Link: https://www.vera-verification.eu/app/uploads/sites/9/2019/12/3459_VERA_template_EN_131119_V3_LR.pdf

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EXAMPLES OF OTHER VERIFIED AGRICULTURAL TECHNOLOGIES IN DENMARK

EASYFIX SDR SLATTED RUBBER MATS (SLATTED FLOOR)

EasyFix SDR are installed in double 'strips' and fixed in the lattice gaps. Each mat has a width of approx. 300 mm, with 35 mm openings in the middle that align with the grid slits. The width of each track matches the width of a grid beam, which is 135 mm.

Each mat covers two bars of the concrete slat, with a curved profile that slopes from the centre of each mat towards the opening in the slat, directing waste to the manure collection tank below.

The rubber mats have a sloped surface profile of approximately 8.5% - (1% is equivalent to a 1 mm slope over a length of 100 mm), with the sides sloping more than 6%. On average, the rubber mats have a slope of about 7%.

Urine drains through the openings into the underlying manure cellar, a process that can be supported by regular cleaning of the surface (at least once every 2 hours) using a manure robot, a scraper (pulled by chain, rope, or cable), or a LELY collector.

The walkways and crossings are cleaned continuously twice a day. It is important that the rubber mats are not damaged by the cleaning. The normal movement of animals on the rubber also helps to clean the surface.

The profiled rubber mats are applied to the concrete slatted floor elements in such a way, that the ridges fit the opening in the rubber mat exactly. The mats are secured to the slats with wedges placed underneath.

The emission-reducing principle of the Easyfix SDR is based on two aspects:

- Profiled rubber mats are applied to the slats of a slatted floor, with the profile inclined towards the slots, enhancing urine runoff to the slurry pit, thus reducing floor emissions;
- Rubber, as opposed to concrete, lowers the pH of the urine on the floor;

Link:

https://www.vera-verification.eu/app/uploads/sites/9/2021/10/Verification-Statement_Easyfix-SDR-slatted-rubber-mats-Final-v01.pdf

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Verified ammonia emission factors:

Ammonia emissions are 9.5 kg NH₃ per animal per year when used with dairy cows, corresponding to 8.8 kg per animal place per year and 8.0 kg per animal place per year.

Verified operational stability:

The tested technology demonstrates satisfactory operational stability when operated and maintained as indicated in this verification.

VERA verification statement No: 009

Manufacturer: EASYFIX

ABOUT ISO 14034 ETV SCHEME



Environmental Technology Verification (ETV) is a scheme tailored to address the performance demonstration needs of new and even disruptive environmental technologies in a credible and objective way. The scheme is aimed to help companies that are developing innovative environmental technologies resulting in a reduced environmental impact reach new markets.

ETV: an internationally harmonised and recognised scheme

Historically, ETV in Europe was established in 2012 at the EU level as a Pilot Programme of the European Commission. It contributed significantly to the development of a globally harmonised ETV process adopted in 2016 as an internationally recognised standard ISO 14034¹: Environmental Management: Environmental Technology Verification (ISO 14034:ETV). Approved in many EU countries as a national norm, the standard eventually became a European Norm in 2019. At international level, the standard provides the basis for performing independent verifications of new environmental technologies in such countries as Japan, South Korea, US and Canada, Philippines with ETV developments ongoing also in China, Malesia and Indonesia.

Since 2022 ETV operates in Europe as an ISO 14034 ETV based voluntary scheme without the support of the European Commission.

ETV: An ideal tool for proving performance of green innovations

ETV offers a robust and credible process for third-party verification of performance claims made by technology providers based on test data generated under controlled quality. ETV allows bespoke performance parameters to be defined which enable a technology's characteristics to be fully assessed. It allows proving technology performance which falls outside the bounds of existing regulations or standards or is not covered by standardised performance frameworks. Therefore, ETV is the ideal tool for green innovations for industrial applications.

ETV: The quality and impartiality assurance

Compliance to standard ISO 17020²: Conformity assessment – Requirements for the operation of various types of bodies performing inspection for type A inspection bodies ensures that the Verification Bodies performing ETV according to ISO 14034 are competent and impartial. Test data used to verify the performance claim must be generated following the requirements of ISO 17025³ General requirements for the competence of testing and calibration laboratories which ensures its quality control.

ETV: The relevance of information

The key output of ETV is the Statement of Verification which holds the status of an inspection body certificate in the meaning of ISO 17020. It provides information about the verified technology performance parameters relevant for:



technology manufacturers as a proof of technology's performance credibly assured towards their peers,



permitting and regulatory bodies to understand the technology and get trustful evidence necessary for informative permitting or compliance decisions,



technology purchasers and users to identify innovative solutions which address their environmental needs and challenges and help make their value chains and operations more sustainable,



investors and funding bodies to ensure that their decisions on investments and financial support are environmentally sustainable and result in a reduced environmental impact.

1) ISO 14034:2016 Environmental Management: Environmental Technology Verification

2) ISO/IEC 17020:2012 Conformity assessment – Requirements for the operation of various types of bodies performing inspection

3) ISO 17025:2017 General requirements for the competence of testing and calibration laboratories



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