



FACT SHEET: ETV SUPPORTS CIRCULAR ECONOMY



Circular economy brings opportunities at business level encouraging new business models leading to substantial material savings throughout value chains, making them more resilient and building industrial symbiosis collaborations. Innovative environmental technologies, products and services are enablers in these processes. However, their implementation is often hampered by the lack of credible, high-quality information on their performance and resulting outcomes that could effectively guide the purchase decisions of technology users and buyers.

The Environmental Technology Verification (ETV) scheme has been successfully used to provide independent, credible and market-relevant information about 15 innovative environmental solutions with circular applications for following areas:

 new technical solutions for waste separation and recycling, energy and resource recovery from waste, and water recycling

 new materials, such as biobased and biodegradable plastics

Their performance characteristics could not be measured and verified otherwise as they fall outside the existing regulations, certification, approval or standard frameworks.

ETV helped these technologies demonstrate their unique features related to technical and functional performance and resulting environmental benefits relevant for circular economy.

Examples of verified technologies for circular economy applications *)

Technology name	Technology function	Producer/Provider	ETV Statements of Verification No.:
RECYOUEST process	Recycling of contaminated plastics from agricultural environment	Recyouest, France	VN20190036
BIO-COM SYSTEM	Biostabilisation and composting of organic waste	SELMA Sp. z o. o., Poland	VN20150005
ECOGI	Separator for extraction of organic waste from pre-sorted household waste	Komtek Miljø A/S, Denmark	VN20160011
EWA Aerobic Fermenter, model 2020	Aerobic stabilisation of organic waste and sanitation of animal by-products	RSP Ostrava, a.s., Czech Republic	VN20160014
PURROT	Separation of dry matter from liquid waste	PurFil Aps, Denmark	VN20150006
ReStoRe	Transformation of low-value spent refractory waste into high-value products for steelmaking	Deref S.p.A, Italy	VN20210048
BIOMINE® BM-LMI-03	Biobased (80% organic carbon) polymer from PLA	Futuramat, France	VN20170020
BIOPOLYME BP-LXX-06	Biobased (81% organic carbon) polymer from PLA and starch	Futuramat, France	VN20170019
Re-Match Artificial Turf Recycling	Recycling of synthetic turf	Re-Match, Denmark	VN20170025
LIGNO-ENZYM	Enzyme decomposition of organic waste to intensify methane production in biogas plants	CONFORMITY, s.r.o., Czech Republic	VN21210045
Periodic anaerobic bioreactor ANABIOREC	Enhance the energy recovery from separated organic fraction of municipal waste	NOVAGO Sp. z o.o., Poland	VN20190037
Rich Water series 2018	Wastewater treatment for combined irrigation and fertilisation purposes	BIOAZUL S.L., Spain	VN20200042
HYDRO-1	Reclamation of water and nutrients from wastewater for agriculture applications	IRIDRA Srl, Italy	VN20220054

*) These technologies have been verified under the EU ETV Programme.

Statements of Verification of these technologies are available on the European Commission website:

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

FOCUS ON BIOPLASTICS

BIOPLASTICS AT A GLANCE

- ✓ Bioplastics are a large family of plastics which includes plastics made of biobased components, biodegradable plastics or both. Most of them are innovative materials with different properties and functions and related environmental aspects. There is now a bioplastic alternative for almost every conventional plastic and a corresponding application. Bioplastics have the same or similar properties as conventional plastics, but offer additional benefits such as a reduced carbon footprint, improved functionality or additional waste management options, such as organic recycling. Therefore, replacing conventional, fossil-based plastics with bioplastics is a demanded direction for a circular change.
- ✓ The market demand for bioplastics in Europe is dynamically growing, making Europe a global leader in bioplastics innovation and consumption. Bioplastics currently account for ca. 1% of the world's total plastics production. By 2027 however, bioplastics are expected to increase from 1.8 to 6.2 million tons. The European bioplastics market size is valued at USD 3,460.8 million in 2020. In 2022, Europe accounted for 26.5% of global bioplastics production¹⁾.
- ✓ Biobased plastics are considered a green alternative to conventional plastics mainly due to possible significant reduction in carbon emissions during the manufacturing process. While manufacturing of conventional plastics involves fossil fuels, biobased plastics are produced from renewable materials, i.e. agro-based or cellulosic feedstock.
- ✓ However, the current EU and national legislative frameworks, standards and certification schemes do not cover all environmental aspects of bioplastics and focus mainly on determination of biobased carbon content (according to EN 16640²⁾ or EN16785³⁾), compostability of products (according to EN 13432⁴⁾ and EN 14995⁵⁾) or biodegradability in soil (according to EN 17033⁶⁾).
- These standards are additionally complemented by a dedicated methodology for performing Life Cycle Assessment of bioplastics (according to EN 16760⁷⁾) and other environmental schemes, such as Product Environmental Footprint (PEF).
- ✓ To ensure a reliable communication about the performance and true environmental impacts of bioplastics, the European Commission Communication on biobased, biodegradable and compostable plastics calls for further development of coherent European standards for testing and certification of bioplastics.

1) European Bioplastics, nova-Institute (2022)

2) EN 16640 „Biobased products – Determination of the biobased carbon content of products using the radiocarbon method“

3) EN 16785 „Biobased products – Biobased content

4) EN 13432 – Requirements for packaging recoverable through composting and biodegradation

5) EN 14995 - Plastics – Evaluation of compostability – Test scheme and specifications

6) EN 17033 “Biodegradable mulch films for use in agriculture and horticulture – Requirements and test methods”

7) EN 16760 “Biobased products – Life Cycle Assessment”

ETV may contribute to the development of these standards helping establish, for example, new performance based standards for bioplastics related to, i.a. micro and nanoplastics pollution, toxicity aspects recyclability in cooperation with stakeholders. Together with the definition of dedicated performance verification procedures based on the ETV standard ISO 14034 and related testing protocols, they may help build a solid framework for innovative and sustainable bioplastics market in the EU and globally.

ETV FOR BIOPLASTICS

Current EU and national legislative frameworks, standards and certification schemes already address some of the parameters bioplastics need to achieve to ensure that their use will have a positive impact on the environment. These include biobased content, biodegradability and compostability. However, many issues have not been standardised yet, as the Commission's Communication on Bioplastics⁸⁾ points out. At the same time, research and development work on bioplastics has been very fruitful, resulting in dozens of new solutions coming onto the market.

ETV is ideal for independent confirmation of both the performance parameters and non-standardised properties of bioplastics, as well as those innovative properties that are often beyond currently accepted certification systems. Reliable and transparent information provided by ETV on the performance of bioplastics may be very useful for users, investors, regulators, permitting authorities and value chain owners to ensure that bioplastics successfully replace their conventional counterparts, lowering environmental impacts. ETV can also contribute to the development of new standards for emerging innovative bioplastics and for market requirements.

So far, ETV helped 4 EU made bioplastics confirm their performance: **Mater-Bi, Biofibra, Biomine and Biopolime**. Below two of them are presented.

8) COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, EU policy framework on biobased, biodegradable and compostable plastics, Brussels, 30.11.2022 COM(2022) 682 final

EXAMPLES OF BIOPLASTICS VERIFIED UNDER THE ETV SCHEME



MATER-BI is a family of innovative biodegradable and compostable bioplastics mainly made from renewable materials such as starches, cellulose, vegetable oils and their combinations.

Performance verified under the ETV scheme:

Biodegradability under marine conditions after 259 days of testing:

Mater-Bi AF03A0 - 93.2%

Mater-Bi AF05S0 - 92.6%

Technology provider:
Novamont S.p.A., Italy

ETV Statement of Verification no: VN20150004



The BioFibra® - a range of biodegradable biopolymers made entirely of biobased carbon materials. Their mechanical properties such as stiffness or flexibility can be adjusted to customer requirements. Also they can be processed by conventional plastics manufacturing equipment.

Performance verified under the ETV scheme:

Biobased carbon content

Polymer BF-LHE-01- 100%

Polymer BF-LED-10 - 99,6%.

Technology provider:
FuturaMat, France

ETV Statement of Verification No:
BF-LHE-01 - VN20160013
BF-LED-10 - VN20160021

These technologies have been verified under the EU ETV Programme.

Statements of Verification of these technologies are available on the European Commission website:

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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 14034⁹: 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 17020¹⁰: 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 17025¹¹ 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.

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

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

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



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