ETV
ISO 14034

Unlocking the trust in green innovations:

Environmental Technology Verification (ETV)

An ISO 14034 standardised scheme ensuring credibility, inspiring confidence

Prove your green technology performs

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Introduction

New environmental technologies provide sustainable alternatives to currently used solutions allowing to reduce environmental impacts of operations or create new business opportunities thanks to innovation

New environmental technologies are under a greater mandate than many other innovations to satisfy current or even anticipated future needs and obligations of industries in meeting the sustainability goals. They are essential in achieving the targets set up in environmental, climate and innovation policies and regulations.

They help reduce GHG emissions contributing to climate change mitigation, conserve resources such as water, energy and raw materials, promote circular economy, make our environment toxic-free, help mitigate environmental degradation and offer economic opportunities.

They do so because they offer innovation which may consist in a novel design, raw materials and energy involved, production/manufacturing process, use/operation, recyclability or final disposal.

This innovation is demonstrated by technology performance features that result in a reduced environmental impact compared to solutions currently used.

Environmental technologies also include new measurement equipment. Compared with existing instruments, innovative measurement technologies demonstrate performance features helping to better measure the parameters reflecting environmental impacts.

This brochure presents the ISO 14034 Environmental Technology Verification (ETV) scheme and provides insights into how ETV enhances the market acceptance of green innovations

The brochure is dedicated to technology developers, providers, buyers and users, decision and policy makers and other interested parties who are actors of the environmental technologies marketplace.

It offers a comprehensive understanding of ETV aiming to propel the scheme towards widespread acceptance and recognition in the market as the scheme dedicated to green innovations when they are ready for commercial uptake and up-scaling.

What awaits you in this brochure:

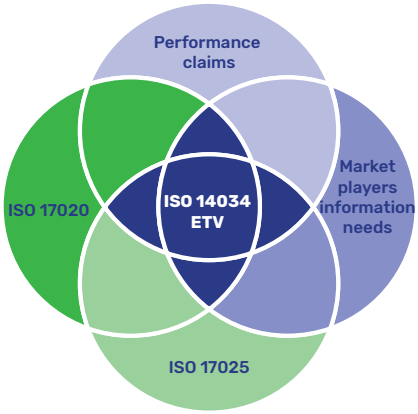
- **A concise explanation of Environmental Technology Verification (ETV):** Get to know ETV and its role in validating the performance and credibility of new environmental technologies
- **Why ETV matters:** Learn the key benefits of ETV in addressing market entrance and adoption of environmental technologies
- **Insights into the ETV process:** Go for a step-by-step journey through verification procedures
- **Advantages for technology developers/ providers:** Learn how ETV provides a competitive edge
- **Information and support:** Learn where to get more information about ETV or get support to verify a technology
- **Benefits for other stakeholders:** Understand how ETV empowers informed choices and decisions

Building a sustainable future with ETV

Environmental Technology Verification (ETV) is an environmental scheme tailored to address the performance demonstration needs of new, commercially-ready environmental technologies

ETV consists in proving in an impartial and credible way that the claims about the performance of an environmental technology made by providers, developers and manufacturers are true and based on test data generated under quality-controlled conditions.

The scope of ETV includes technologies ready to enter the market or already on the market designed either to result in reduced environmental impacts or help better monitor environmental parameters reflecting these impacts compared to current alternatives.



The conformity assessment standard ISO/IEC 17020 Requirements for the operation of various types of bodies performing inspection specifies the requirements for the competence and impartiality of the verification bodies performing ETV

The standard ***ISO/IEC 17025 General requirements for the competence of testing and calibration laboratories*** defines the conditions for generation of test data used to verify the performance

Performance claims proposed for ETV by technology developers address bespoke performance reflecting the innovation, the benefits and the resulting reduced environmental impacts of the technology for its specified intended application

ETV satisfies the information needs of market players relevant to: performance claims credibility, market adoption of green innovations, compliance to norms and standards, technology transfer as well as technical and financial risk mitigation accompanying financing and deployment of new environmental technologies

ETV aims to:

- provide technology developers, manufacturers and providers access to third-party validation of environmental technology performance claims to prove their reliability
- strengthen the credibility of innovative environmental technologies by supporting informed decision-making among interested parties e.g. buyers, users, permitting and regulatory bodies, financiers, investors
- promote innovative environmental technologies and accelerate their market entrance into the domestic, EU and international marketplace

ETV follows the technical standard ISO 14034 Environmental Management: Environmental Technology Verification

ISO 14034 specifies principles, procedures and requirements of environmental technology verification.

The standard provides a verification process that integrates the information needs of different interested parties about the performance of new environmental technologies with quality and impartiality frameworks to ensure credibility. These frameworks are provided by well recognised ISO standards: ISO/IEC 17020 and ISO/IEC 17025.

ISO 14034 is technology neutral i.e. it is not tied to any specific environmental technology or its specific intended application. It makes the standard applicable to a broad variety of processes, products or services with different industrial applications, allowing to accommodate changes in technology over time and promoting innovation.

Why ETV matters?

Current EU and national policies and programmes related to climate, environment and research and innovation reinvigorate the commitment of decision and policy makers, providers, manufacturers, investors, purchasers and users in innovative environmental technologies. Therefore, the interest and investment in new environmental technologies is growing rapidly, but their adoption and widespread implementation is not a simple matter.

The key market entry barriers for new environmental technologies stem from real or perceived economic, regulatory, social, and technological risks and uncertainties on the one hand and lack of credible, objective and market relevant information about new environmental technologies that could help mitigate these risks and build trust in green innovations.

These barriers could be overcome with the use of schemes that provide a structured, robust and rigorous process allowing to generate information about the performance of new environmental technologies conducted by independent third parties, offering credibility and assurance.

ETV helps overcome key challenges to market entrance and widespread adoption of new environmental technologies related to lack of market confidence, high costs vs uncertainty of potential long-term savings, regulatory compliance uncertainty, technology adoption hurdle, technology readiness and performance challenge in real-world environments or limited trust of investors.

ETV addresses the challenges of market entrance and adoption of green innovations

Market Confidence Challenge

Buyers and users are often sceptical about the reliability and efficiency of an innovative technology's performance and its market readiness level if they have no credible evidence.

ETV provides a process for verifying the performance claims of technologies in an independent and quality assured way, based on test data generated either by a commercially available unit or a unit checked first as commercially-ready.

ETV uses a factual approach. Statements of Verification present information about the functional performance of a technology and its environmental aspects in the form of parameters and their numerical values which are quantifiable and measurable through testing. Performance is verified based on test data generated in a quality- assured and controlled process.

Technology Adoption Hurdle

Buyers and users need to know if the technology is compatible with their operational environment, whether it can be easily integrated into an existing system and not cause any risks of disruptions or challenges in the value chain.

ETV provides information about technology performance verified for a specified intended application with limitations, assumptions and constrains considered and clearly communicated.

Regulatory compliance uncertainty

Many industries are subject to environmental regulations and standards. Adoption of a new environmental technology raises concerns about compliance and complex permitting processes.

ETV is not intended to confirm technology's compliance to regulatory requirements. It provides, however, independently verified evidence about technology performance that may help buyers and users demonstrate adherence of their operations to legal requirements and aid getting relevant permits.

Why ETV matters?

Limited trust of investors

To get a project involving green innovation financed, investors, beside economic viability, need assurance confirming the technology's effectiveness, environmental benefits/reduced environmental impacts and its potential market acceptance.

ETV may help get such assurance. The performance claim typically includes parameters corresponding with buyers and users' needs and challenges as the purpose of ETV is to facilitate market acceptance of new technologies. At the application stage, a candidate technology is checked for compliance with the definition of an environmental technology as an ETV eligibility criterion. In order to be verified, the technology must demonstrate environmental added value i.e. more beneficial or less adverse environmental impact with respect to technologies currently used in similar situation. The environmental added value is assessed from the perspective of technology's life cycle. It guarantees that the verified solution is green.

Technology readiness and performance challenge

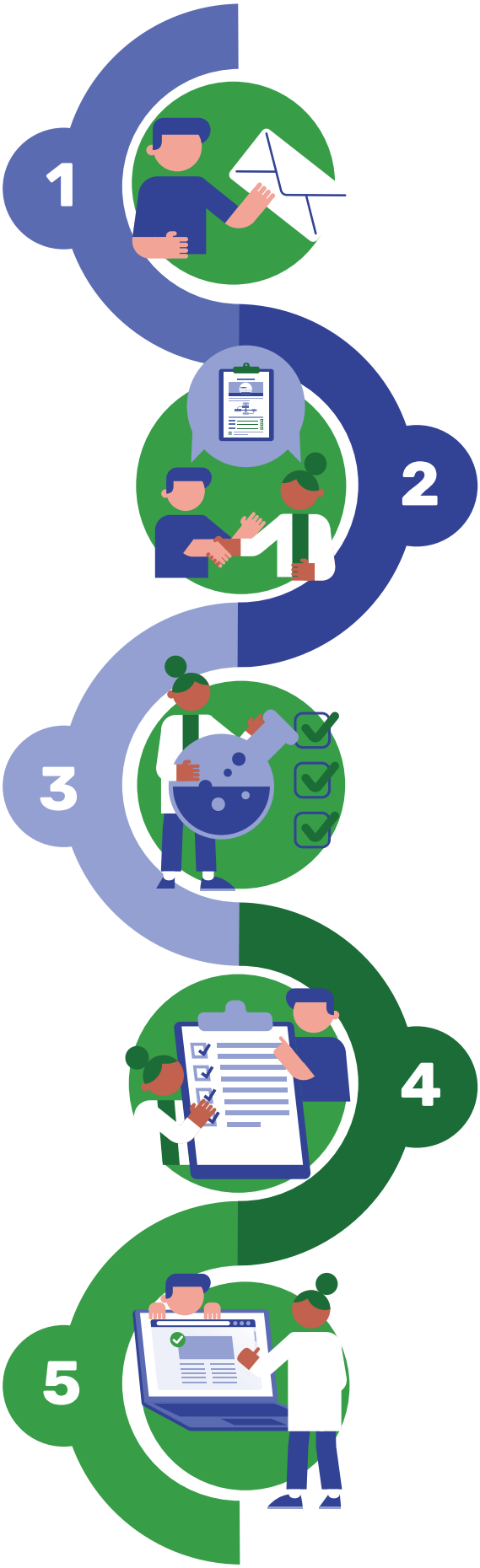
Lack of standardised performance frameworks limits technology developers and providers in presenting in full the performance characteristics of their innovations in a credible and objective way. In-house data produced without adequate quality control and assurance is often insufficient to build trust of buyers, users and investors. Also the ability to demonstrate sufficient technology readiness level, especially for up-scaling purposes is challenging.

ETV scheme is fit for green innovations. It offers flexibility in the choice of performance parameters to be verified, unlike many certification or compliance schemes. It enables an innovative technology characteristics to be fully assessed, covering even these performance parameters that fall outside the existing product or technology standards and certifications or considering several performance parameters together to enable benchmarking with relevant alternatives.

How ETV works?

Application

- The applicant contacts a Verification Body for information and eligibility check
- The Verification Body may request some initial information about the candidate technology and an initial performance claim, e.g. in the form of a Quick Scan prior to application submission
- The applicant submits an application file including initial performance claim and available test data
- The Verification Body reviews the file, decides on the eligibility of the technology for ETV and revises the performance claim together with the applicant.



Pre-verification

- The Verification Body and the applicant specify the performance parameters to be verified
- The Verification Body develops a verification plan (specific verification protocol) which details how exactly the stated performance will be verified, including the testing requirements

Verification

- The Verification Body assesses the available test data on technology performance and decides if further testing is needed
- If such data is not available or it does not meet the testing requirements the applicant is requested to contact an independent test body to do the testing

Reporting

- The Verification Body develops a verification report reflecting all the technical and operational details of the performed verification together with a Statement of Verification summarising the verification

Post-verification

- The Verification Body registers and publishes the Statement of Verification in a publicly available directory (e.g. website)

Before applying: support and information

Which technologies are ETV candidates?

- Products, processes, and services for industrial applications
- Early market stage / Technology Readiness Level minimum 7 or technologies already commercially available
- Designed to result in reduced environmental impacts or to measure and monitor parameters representing environmental impacts, for example:
  - technologies for water treatment, energy production or recovery, solutions for improving resource efficiency, bio-based materials, remanufacturing
  - water monitoring equipment, samplers, sensors, and probes used for environmental measurements

Who may apply for verification?

The applicant can be any legal entity or natural person from Europe as well as outside Europe, which can be the technology owner, manufacturer or an authorised representative of either e.g. an investor. With consent of technology owners and/or manufacturers, the applicant can also be another stakeholder undertaking a specific verification programme involving several technologies (e.g. as part of public procurement of innovation procedures).

Where to verify a technology?

Verifications are carried out by Verification Bodies accredited as type A inspection bodies according to ISO 17020 to perform ETV for a given technology area compliant to ISO 14034.

Visit the website ETV-HUB.eu to find a list of Verification Bodies and their scopes of accreditation.

Where to get support and information?

The ETV-HUB.eu

The ETV Hub offers a compendium of ETV knowledge and guidance materials structured according to the information needs of different target audiences: technology developers and providers, users and buyers, accreditation and verification bodies, investors, permitting and regulatory bodies.
It also provides news and stories about ETV and its developments, contacts to verification bodies and ETV Knowledge Centres in Europe as well as presents the verified technologies.

Guide for ETV Applicants

The guide provides detailed information about the ETV process based on ISO 14034 requirements from the perspective of the applicant. It explains the role and requirements of the applicant in individual process steps together with practical hints and examples on how to satisfy these requirements.

The self-assessment tool for ETV applicants

The tool serves as an aid to prepare a successful ETV application file in line with the ISO 14034 ETV requirements:

- it checks if the applicant already has sufficient and relevant information to develop an ETV application file
- provides immediate feedback to the applicant's answers and indicates what information must still be collected and prepared
- explains why certain information is needed and how it is used to verify a technology
- provides the applicant with guidance and tips on how to obtain the missing data and information

The ETV Network

The network involves verification bodies in Europe accredited to perform ETV according to ISO 14034 and ETV Knowledge Centres – organisations to contact for support and advice on ETV.

Advantages for technology developers and providers

Increased confidence of buyers and users

ETV provides an independent and third-party validation of a technology's performance based on ISO standardised process and ISO standardised quality and impartiality framework ETV. As a third-party scheme it instils confidence in buyers and users who may be uncertain about the performance and environmental benefits of a technology. This increased confidence can lead to higher adoption rates and user satisfaction.

Credibility and trust

Offering a verified technology enhances the credibility and trustworthiness of the technology provider especially when the company is new and challenges competition from established market players.

Market differentiation

Having an ETV Statement of Verification sets a technology apart from competitors in the market. It serves as a tangible demonstration that the technology has been rigorously tested and verified, giving it a competitive edge.

Access to new markets

ETV can open doors to new markets, especially in regions or industries where there is a strong emphasis on environmental sustainability or when standards and regulations applicable to a given technology vary across jurisdictions. Many buyers, particularly in the public sector, prioritise technologies with proven performance that comply to the requirements of their market when making procurement decisions.

Regulatory compliance

ETV may help technology providers navigate regulatory requirements and administrative burden by ensuring regulatory or permitting bodies as well as buyers and users that their technologies meet or even exceed environmental standards. It may also help buyers and users understand how the technology will help them comply to legal regulations and standards when installed. This can streamline the approval process and reduce barriers to market entry.

Innovation recognition

ETV can be a recognition that a technology is innovative. It allows to prove how the novelty of a technology converts into its performance resulting in reduced environmental impacts.

Risk mitigation

Verification through ETV can help mitigate risks associated with market failure. Potential users are more likely to adopt and potential investors to finance technologies that have been independently validated, reducing thus their risks and uncertainties related to its performance, interoperability or environmental impact.

Facilitated financing and interest of investors

Technology providers whose technologies have been verified by ETV may find it easier to secure financing or attract investment. Investors and financial institutions often view verified technologies as lower-risk investments with potential for positive environmental and financial returns. It applies in particular in the context of ESG and the EU green taxonomy.

Stakeholder engagement

ETV can facilitate engagement with various stakeholders, including regulatory agencies, investors, actors in value chain and environmental organizations. It provides a standardized and transparent way to communicate the performance and resulting environmental benefits of a technology. It applies in particular to technologies that suffer from low public acceptance, raise concerns among regulatory or permitting bodies or address value chains and supply networks with highly restrictive environmental considerations.

Demonstration of long-term savings

Innovative environmental technologies are often perceived as more costly requiring high initial investments and high uncertainty of potential long-term savings. ETV can help demonstrate how the long term savings resulting from reduced environmental impacts are achieved.

Improved marketing opportunities

ETV provides a powerful marketing tool. Technology providers can leverage the verification in their promotional materials, advertising, and communication strategies to attract a wider audience.

ETV: one scheme with multiple benefits for multiple users

ETV provides an added value for:

Permitting and regulatory bodies

- to understand the technology and its innovation
- to get trustful evidence necessary for informative permitting, compliance or approval decisions

Technology buyers and users

- to guide the purchase decisions and select effective and scalable technologies that fit the needs, are compatible with the operations and improve the environmental performance
- to help demonstrate compliance of operations to regulatory requirements or emerging regulations thanks to innovation
- to aid getting relevant permits or accelerate regulatory approvals
- to create value networks and more sustainable supply chains using ETV as a mechanism for setting up multistakeholders' acceptance of performance testing protocols and verification results

Public procurers

- to support value-based procurement
- to integrate the technical requirements into procurement specifications related to performance and environmental aspects
- as means of compliance check with these specifications
- as a mechanism in Public Procurement of Innovation to weed out under-performing options and ensure that top performers meet contract-specific targets

Investors and funding bodies

- to de-risk investment and funding decisions concerning green innovations
- to ensure that their decisions on investments and financial support are in line with green financing principles and result in a reduced environmental impact

Development and testing centres

- to develop client support services, e.g. development of performance testing protocols for new environmental technologies
- to carry out quality-assured and controlled testing for performance verification needs

Policy and decision makers

- to support market uptake and roll-out of green innovations necessary to reach the objectives of EU/national/sectoral policies related to climate, environment and innovation
- to set up national ETV schemes to overcome the technology transfer barriers in support of green innovation market uptake and to build a national portfolio of innovative environmental technologies competitive on domestic, EU and international marketplace

Collaboration and recognition: a unified approach

The standard was adopted in 2016 with an aim to reflect an international consensus that standardisation of the performance verification process is an effective way of establishing the global credibility of innovative environmental solutions. In 2019, ISO 14034 was adopted by CEN/CENELEC as a European Norm.

ISO 14034 provides a basis for establishing ETV programmes which may be operated by public bodies and private entities.

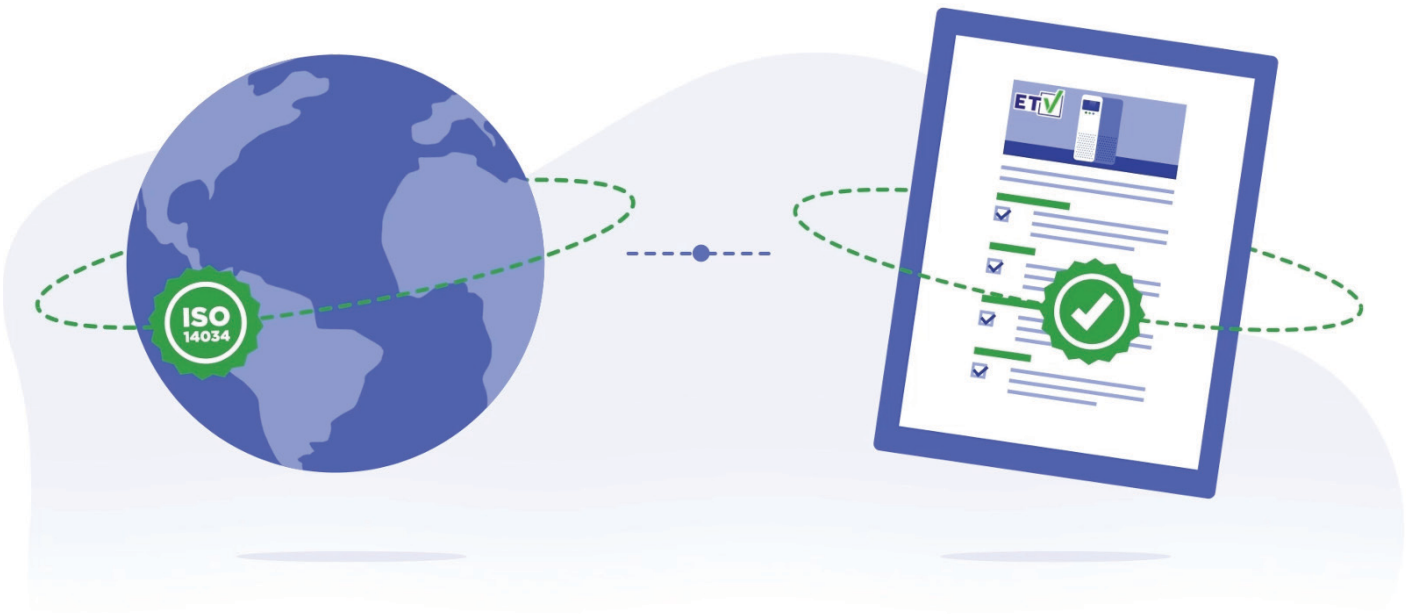
Based on ISO 14034 ETV national programmes performing independent verifications of new environmental technologies currently exist in such countries as Japan, South Korea and the Philippines. ETV programme developments are ongoing also in China, Malaysia, Taiwan and Indonesia.

Historically, the first ETV programme was initiated in 1995 by the Environmental Protection Agency (EPA) in the USA. In Europe, ETV was established in 2012 at the EU level as a Programme of the European Commission. Since 2022 ETV scheme has been operating as a voluntary environmental scheme without the support of the European Commission.

In the US and Canada, ETV operates as a market-driven tool without a programme. At the global level, www.verifiglobal.com offers performance measurement and verification services across multiple jurisdictions based on ISO 14034.

Currently, ETV is expanding its approach by promoting its use cases and building market acceptance and recognition of the scheme to demonstrate the usefulness and importance of independently verified performance results of innovative environmental technologies and the verification process itself as a tool and mechanism supporting decision-making processes related to:

- procurement including green public procurement and public procurement of innovation
- clean and green-tech investment processes and green financing
- permitting
- implementation of the EU and Member States policies and regulations involving environment, technology performance and innovation



Information on ETV?

www.ETV-HUB.eu

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