



Report on the potential for EU market acceptance and recognition opportunities for ETV

Executive summary

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The project LIFEproETV aims to facilitate promotion and implementation of Environmental Technology Verification (ETV) as an EU voluntary scheme for verifying performance of environmental technologies at EU level and national level focusing on 6 countries: Hungary, France, Italy, Poland, Slovenia and Spain. It responds to the conclusions from the evaluation of the pilot phase of the EU ETV Programme¹ accomplished in 2018 and addresses the objectives set up for the development of the full-scale EU ETV Programme defined in the Commission Staff Working Paper on the ETV Initiative².

This document summarises the key findings of comprehensive studies implemented under preparatory actions of the LIFEproETV project with a two-fold aim:

1. Define the status quo of the ETV market acceptance and recognition based on:

- up-to-date performance of the EU ETV Programme under the transition phase from the pilot to a full scale initiative with an extended technology areas scope and ambition to involve Member States beyond the 7 countries participating in the pilot phase
- definition and characteristics of key factors that determine EU ETV market acceptance and recognition including:
 - ETV value perception,
 - market relevant factors with focus on the obstacles and opportunities offered for ETV use in Green Public Procurement and Innovation Procurement,
 - links of ETV with current policy framework at EU level and LIFEproETV focus countries,
 - compatibility of ETV with the needs of innovation marketing cycle and the family of other environmental schemes (competitive landscape mapping)
 - financial factors including price and risk aspects,
 - ease of access/infrastructure and capacities based on ETV verification bodies offer and outlooks,
 - ETV awareness level and effectiveness of up-to-date communication and promotion efforts
- benchmarking of EU ETV with the most successful ETV schemes operating at national level in Member States (Denmark and France) and outside Europe (US, Canada, Japan, the Philippines, South Korea) to identify complementary factors that may drive the market uptake of EU ETV

2. Set-up a strategy for boosting the ETV potential for market acceptance and recognition:

- mobilising key contributors to boost the factors determining the current ETV market uptake market acceptance and recognition including:
 - extension of ETV objectives,
 - strengthening the credibility and certainty of ETV,
 - geographical and technological extension of the scheme,
 - accessibility of the ETV service,
 - collaborative institutional framework,
 - favourable external framework combining market and policy factors,
- setting up strategic directions and actions at EU and national level aimed to:
 - improve ETV value perception,
 - unleash the potential of ETV use in GPP and IP,
 - make ETV a sustainable mechanism of transformative innovation ecosystem,
 - promote ETV as a tool fostering execution of challenge and performance led environment and climate policies,

¹ The evaluation involves 3 external studies: Support study for the evaluation of the EU ETV Pilot Programme including an ex-ante assessment of possible options for the future of an EU ETV scheme, Synopsis report on the stakeholder consultation, and a Feasibility study report. All three reports are available at: https://ec.europa.eu/environment/ecoap/etv/evaluation_en

² COMMISSION STAFF WORKING PAPER The Environmental Technology Verification (ETV) initiative Helping Eco-Innovations to reach the Market Accompanying the document Communication from the Commission to the European Parliament, the Council, The European Economic and Social Committee and the Committee of the Regions Innovation for a sustainable Future – The Eco-innovation Action Plan (Eco-AP) https://ec.europa.eu/environment/ecoap/sites/default/files/etv-files/documents/sec_2011_1600_f1_other_staff_working_paper_en_v3_p1_674169.pdf

- strengthen the compatibility of ETV with other environmental schemes,
- make ETV more accessible to SMEs.

SUPPORT FOR THE STUDY

The studies have been supported by:

- desk studies on EU ETV available data and internet sources,
- a survey carried out in the six LIFEproETV focus countries among 521 technology providers, buyers and business support organisations³ focused on ETV market needs, challenges, communication, skills and knowledge in using the scheme and ETV assessment,
- a survey carried out among verification bodies of the EU ETV Programme (total of 9 including 7 operational bodies and 2 with suspended activity),
- desk study on the different certification schemes including compliance schemes and environmental performance schemes relevant for the extended scope of ETV technology areas and schemes referring to environmental management of organisations,
- a benchmark survey carried out among the operators of the national ETV schemes implemented in parallel to the EU Programme in France and Denmark and outside Europe i.e. US, Japan, Canada and the Philippines and internet source studies on the South Korean ETV scheme to determine the key contributors to ETV market,
- interviews carried out with national stakeholders relevant for identification of opportunities and bottlenecks of the use of ETV as a tool in public tenders (Green Public Procurement and Innovation Procurement),
- interviews with several holders of the EU ETV Statements of Verification on the utility and market aspects of ETV,
- several meetings with decision makers relevant for EU policies and programmes (Industrial Emissions Directive, Green Taxonomy, Innovation Fund, Zero Emission Action Plan, ERA-MIN, Horizon Europe).

OUR UNDERSTANDING OF MARKET ACCEPTANCE AND RECOGNITION

Market acceptance and recognition are terms often used in marketing of new products and services. Borrowing from the marketing approach, our understanding of **market acceptance** in relation to ETV can be defined considering two aspects⁴:

1. As a process in which market actors adopt and accept ETV. To be attractive and widely used, the scheme as a service for technology providers must have a clear business case behind it, while for technology buyers, especially with innovation ambitions, it must provide a mechanism and a technology offer that helps address their challenges in purchasing procedures and technology choices.

³ The 521 respondents included 242 technology providers, 203 technology buyers and 76 business support organisations from 6 countries: Poland, France, Italy, Slovenia, Hungary, Spain

⁴ Adopted from the Business & Strategy Knowledge Resource for Management Students, Aspirants & Professionals
<https://www.mbaskool.com/business-concepts/marketing-and-strategy-terms/11004-market-acceptance.html>

2. As a measure by which it is seen whether ETV is satisfying a large stakeholder base with focus on target groups: technology buyers and technology providers as key market actors so as to increase its current market uptake.

In relation to other stakeholders e.g. policy makers, R&I programme operators, regulatory bodies, investors etc., market acceptance means adoption of ETV to their own needs and purposes that are different than the needs of key target groups, however, still very relevant for the market uptake of ETV for example:

Policy makers



ETV may facilitate achievement of objectives set up for environmental, climate relevant policies where innovation is demanded yet challenging

R&D programme operators



ETV may play an impactful role as an element of post R&D business model to accelerate the R&D outputs to the market and facilitate exploitation of project results

Capital providers



ETV perfectly works as an investment derisking tool making technical due diligence easier and providing trustful proofs on sustainability claims

Market recognition refers to the level of awareness of ETV: both as a service and as a product i.e. a portfolio of verified technologies in the marketplace. It is important because technology providers and buyers are likely to consider services and products they recognise when thinking about a purchase or use. Products and services with high levels of market recognition occupy a position known as "front of mind or top of mind" compared with competitive products/services.

KEY CONCLUSIONS FROM THE ETV STATUS QUO MARKET ACCEPTANCE AND RECOGNITION ASSESSMENT

The current ETV market acceptance and recognition is determined by 8 factors as presented below.

Up-to-date ETV scheme performance

The data on the up-to-date performance of EU ETV scheme demonstrate the utility of the scheme on EU and international market and confirm that geographically the scheme already raised interest in countries beyond the EU ETV pilot, however most of the completed verifications originate from the ETV Pilot countries. The scheme managed to raise much higher interest among technology providers in countries which offered a strong national support e.g. running in parallel national ETV schemes (Denmark, France) followed by countries participating in the pilot with high ecoinnovation level (Italy) or countries with high ecoinnovation potential of companies (Spain). The transition phase and the uncertainty about the future of the scheme and its marketing power seriously affected the performance of the scheme resulting in a drop-down of enquiries (only 6 Quick Scans in 2019) but also limited the accessibility of the service with the number of verification bodies reduced from 16 operational in 2017 to 7 in 2021. The subsidy for the initiation of activities and ETV promotion from the European Commission under the ETV Pilot resulted in an increased interest in verifications reflected in 50 ETV enquiries (Quick Scans) registered in 2015 and resulting 11 verifications in 2016. The data on the ETV enquiries and verifications may suggest that reputation, position and activity of entities on the market performing as verification bodies stimulates the interest in

verifications. Analysis of the data on the enquiries for ETV and performed verifications shows that beside the national support for ETV, an interest in verification may also result from the established and well recognised position of the verification bodies e.g. as in the case of UK, France, Denmark and Italy who beside ETV offer other certification services or technology assessments and thus have a long-term track record of relationships with clients including technology providers. A strong national branding of green innovations e.g. Germany or the Netherlands create competition to ETV and limit the interest in verifications. ETV is a learning by doing process requiring a lot of effort, time and costs from the applicants in particular at the application stage and testing stage which is reflected by the number of enquiries vs the number of completed verifications and the process duration. Effort required from technology providers at the application stage and testing costs slow down the verification process which often lasts over a year. A high discrepancy between the submitted quick scans and the completed verification processes results in many cases from the process duration and costs. Many of the verifications have been extended in time or even suspended due to effort needed from the side of technology providers to prepare the application documents and lack of funding for test performance. Accompanied by the cost risk (total ETV costs are hard to predict at the beginning of the process) and uncertainty factors as of the future of ETV, they contributed to an impression that ETV is highly complicated, expensive and time-consuming with unsure return on investment.

ETV value perception

Value perception occupies the priority place among key factors responsible for ETV market acceptance and recognition as it determines the attitude and interest in the scheme not only among technology providers but also among buyers and decision makers. It is shaped first of all by such attributes as credibility and certainty of ETV as well as its transparency and quality. The ISO based framework of the scheme alone does not satisfy such aspects relevant from the market viewpoint as scheme performance (i.e. facts and figures on ETV performance including number and character of the verified technologies, ETV scheme governance, placing of ETV in policies and its empowerment, third party proofs on the effectiveness of ETV in line with its objectives). Other aspects of ETV value perception are currently built on its differentiating advantages, mainly related to the fitness of the scheme to support the market entrance of early market products with innovative features e.g. flexibility in the choice of performance parameters vs predefined set of parameters as in the case of e.g. compliance schemes and recognition including not only the recognition of ETV Statements of Verification on UE market but also recognition of performance test data produced outside ETV for the needs of verification. Despite the existing potential, the recognition of the EU ETV Statements of Verification by ETV schemes outside Europe is rather hypothetical as show the responses from the operators of these schemes collected from the survey.

ETV and market factors

The driving factors for ETV uptake for Green Public Procurement (GPP) include the volume of the market, focus on "green" performance or combination of technical performance with solving an environmental problem, risk aversion. However, the major barriers relevant for the use of ETV in GPP especially in the 6 LIFEproETV countries include: voluntary character of GPP, except for Italy where minimum criteria are obligatory, lack of skills and capacities of national public procurers in using GPP, potential problems with assigning environmental technologies into the GPP categories of products, services or construction works, the approach focused more on certified/verified products, technologies and services already available on the market, duration of the ETV process if to become a part of procurement procedure, strong competition from product specific labelling schemes indicated in the EU GPP guidance as methods of proof of compliance to technical specifications. So far in none of the LIFEproETV focus countries ETV is providing a clear competitive advantage in public tenders like in e.g. South Korea or the Philippines where such advantage is legally empowered. Also, the push for including ETV as a tool to be considered in GPP is weakened by the low number of the up-to-date verified technologies vs the number of products with e.g. Ecolabels. The window of opportunities for ensuring that ETV provides a competitive advantage in public tenders is created by three facts. First, although the current EU GPP guidelines include a dedicated, yet quite outdated, document only for water technologies, however, their analysis showed that references to

products, processes, technologies or services that are likely to comply with the definition of environmental technology and fit into ETV technology areas can be found in a vast majority of the guidelines. Secondly, ETV verification bodies fulfil the definition of a conformity assessment body within the meaning of art. 44 of the Directive 2014/24/EU and art. 62 of the Directive 2014/25/EU so do the EU ETV Statements of Verification. ETV Statements of Verification may be used as means of proofs to demonstrate the conformity with the tender requirements.

For innovation procurement (IP) involving typically a multistage process, green innovations are a special case combining the ambitions concerning environmental performance of novel solutions with their functional/technical performance including risk as an inherent part of the process. The driving factor for ETV uptake and the additional value it can offer in Innovation Procurement (IP) is the ability of the scheme to address all these three aspects: ensure the technical viability of the green innovation, ensure that the problem will be solved or opportunity created without causing harm to the environment and help avoid failure (reduce risk) with the choice of solutions for full scale application. Also, the multistage character of the IP and their planning allow to accommodate ETV much better than GPP enabling verifications to become a part of the process. The key barriers involve very limited practice in using IP for green innovations e.g. in Poland the National Centre for Research and Development launched dedicated programmes for wastewater treatment, biogas production, duration of the ETV process vs time constraints of the IP process, unclear rules who should apply for ETV: the buyer/investor or technology provider, etc.

ETV and policy factors

The current policy framework of ETV involves 4 EU policies where ETV is specifically referred to i.e. The EcoInnovation Action Plan (EcoAP), The Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan (SCP/SIP), Green Action Plan for SMEs and European Circular Economy Action Plan. At the level of the 6 LIFEproETV countries references to ETV in national policies and strategies can be found only in France (2 policies) and Poland (7 policies and strategies). However, as the analysis shows, sole reference to ETV in policies does not facilitate its market recognition and acceptance if this reference is not made operational e.g. through ensuring a clear competitive advantage of ETV in GPP (even as an option) or including ETV as a stage in IP or linking ETV directly with funding (public or commercial) either dedicated to R&I or implementation of technologies, programmes supporting SMEs in getting global or in combination with a legislative or tax relief etc.

Competitive landscape of ETV

The competitive landscape of ETV involves over 51 different environmental schemes operating at global, EU and national levels. Some of them are voluntary with an established market position, while some others are obligatory (e.g. compliance schemes for some technologies or products). The ETV technology areas with the highest competition from other schemes include water technologies, energy technologies and waste, materials and resources. For the ETV technology area of cleaner production processes it was impossible to identify appropriate schemes as the area is extremely broad. High competition of schemes in some ETV technology areas poses a challenge in defining the additional value and the differentiating advantage that needs to be taken account of in promotion efforts and at the same time creates opportunities for potential performance test data recognition especially between mandatory compliance schemes and ETV. Technology areas with low competition from the side of different environmental schemes e.g. soil and groundwater remediation or environmental technologies in agriculture create niches for ETV.

Financial factors

Beside a reduced availability of funding schemes to cover verification costs, the financial factors relevant for ETV are dominated by two major uncertainties related to return on investment and total verification costs. Unlike certification schemes, the total costs of verification including testing are never fixed and cannot be provided before entering the process. It makes providing a straightforward answer to the key

question: *How much it will cost?* rather difficult, whereas providing estimates ranging from 10.000–40.000 EUR excluding testing diminishes the attractiveness of ETV especially when combined with a question *How long does ETV take?* Currently, as our survey showed, none of the verification bodies uses a fixed price system, determining the ETV service costs on a case by case basis. Good practices from ETV schemes outside EU show, that these uncertainties can be reduced for example by a system of subsidies provided by government directly to verification bodies (e.g. in South Korea) to cover partly or in full the verification costs incurred by the verification body and thus reduce the costs of technology provider only to testing.

ETV accessibility and infrastructure

The current ETV infrastructure involves 7 verification bodies 6 in EU Member States (IT, FR, CZ, DK, PL, FI) and the UK. Water technologies can be verified in all 6 EU verification bodies, all 7 verification bodies verify technologies from waste, materials and resources area, energy technologies can be verified in the UK and in 5 verification bodies in EU except for the body in the Czech Republic. Only one verification body in Denmark is currently accredited to perform ETV in all 7 technology areas as planned for ETV extension. As our survey showed, verification bodies generally declare interest in getting their accreditation scopes extended, determining it, however, strongly on the interest of clients in verification and in some cases the attitude, willingness and preparedness of the accreditation bodies to perform relevant audits. Verification bodies indicated also the need to review the way the technology areas are defined, especially the examples of applications considering these descriptions as a limiting factor for potential verifications. The survey also showed that only in the case of Poland accreditation is granted on the level of the examples of application areas NOT on the level of technology areas as defined in GVP. An analysis of the origin and the number of verifications performed by individual verification bodies shows, that the selection of the verification body by the technology provider is not necessarily based on the cheapest option. The factors determining the choice of a verification body include experience of the verification body, its marketing efforts, customer relations, support offered to the technology provider for the verification process and probably also lack of language barrier.

ETV awareness, communication and promotion

Despite different ETV communication and promotion efforts carried out by verification bodies and by the services of European Commission, as our survey carried out in 6 LIFEproETV countries among technology providers, buyers and business support organisations (n=521) in general the awareness level about ETV remains low regardless if the country participated in the ETV Pilot or not. The key promotion deficiencies result from a wrong approach based on market push rather than stimulating market pull and are related to the content that was promoted about ETV (mostly promotion of ETV related events), ETV promotion channels (low visibility of ETV in social media used by professional communities e.g., LinkedIn) and target audiences – most of the promotion activities were addressed to technology providers with little if no promotion towards buyers (especially public sector), decision makers, capital providers etc. – groups that stimulate the market.

Benchmarking of EU ETV with other national ETV schemes in EU and outside Europe

The key take ways from the benchmarking of the EU ETV scheme with the other ETV schemes operating at national level in EU and outside EU showed that the market success of the scheme and its performance depend heavily on an active and visible involvement of institutional stakeholders like governments and their agencies or public institutes and their role in governing the scheme and ensuring that the technology areas of ETV stay in line with the national priorities, challenges and needs. Therefore, as the examples of the best performing ETV schemes demonstrate, an ETV favourable external framework must empower ETV in environmental, climate policies and programmes, promote the scheme as an element of innovation ecosystem, all supported with strong national branding of ETV e.g. like in South Korea. These elements add strongly to the credibility of the scheme and its value perception by target groups, provide a competitive

advantage and minimise the risk of ETV as a missed investment. The external framework (e.g. innovation programmes) should provide for reducing the cost risk and burden of ETV for technology providers e.g. offering funding schemes to verifications, subsidising verification bodies to reduce the verification costs of applicants, defining fixed costs of the process that make the verification costs more foreseeable to the technology providers etc. (e.g. Japan, South Korea). The institutional framework for ETV and the external framework should be mutually supportive for ETV. The competitive advantage offered by ETV in public tenders seems the most impactful factor in the market acceptance and recognition of the scheme. It can be built in two ways: by making ETV or a third party performance confirmation a regulatory requirement in certain sectors on national level as in the Philippines or regional/municipal level as in Canada (link with the external framework) or by recognising ETV Statements as a method of proving compliance with technical specifications in public tenders including also turn-key projects like in South Korea.

Key reasons responsible for low market acceptance and recognition can be summarised as follows:

- general lack of awareness about the scheme,
- lack of knowledge and understanding concerning the different use opportunities offered by the scheme based on its unique features and compelling attributes among technology providers, buyers (private and public), authorities and other stakeholders who could benefit from it e.g. investors, regulatory bodies,
- a generally low value perception of ETV; technology buyers, providers and authorities often perceive the scheme as complicated, expensive, time consuming and with an unsure future and return on investment,
- some deficiencies in ETV communication and promotion due to “product marketing” rather than “content marketing” approaches used in ETV communication and dissemination and focus on technology providers only,
- lack of a clear and credible ETV business case that would demonstrate the opportunities of ETV for technology providers,
- strong competition in some technology areas from other certification schemes well established on the market as well as national green innovation branding,
- lack of a clear explanation and demonstration on the ability of ETV to provide additional advantages for organisations and public authorities as a tool facilitating the execution of environment, climate and innovation policies and programmes at EU and national level,
- lack of a mutually supportive framework for ETV integrating a collaborative institutional framework with a favourable policy environment for ETV at EU and Member States level,
- lack of guidance on how to use ETV for the needs of Green Public Procurement and Innovation Procurement – the two strong market drivers for ETV,
- limited accessibility of ETV in terms of funding and access to the service.

KEY CONTRIBUTORS AND STRATEGIC DIRECTIONS TO BOOST THE POTENTIAL OF ETV MARKET ACCEPTANCE AND RECOGNITION

ETV market boost contributors

Based on the analysis of the 8 key factors responsible for the EU ETV market acceptance and recognition and capitalising on the experiences and practices applied in the most successful ETV schemes considered in the benchmarking exercise, the following 6 contributors enabling implementation of strategic directions for ETV market boost can be identified:



1. **Extended objectives of ETV to better reflect the ETV use potential and make ETV a business case:**
 - ETV as a tool for accelerating innovations for sustainable industrial processes,
 - ETV as a tool for fostering circular supply chains and business models,
 - ETV as a derisking tool for green innovation investments,
 - ETV as a tool for creating a level playing field for green innovations in public tenders,
 - ETV as a tool for internalising technology performance into environmental performance of products and organisations,
 - ETV as a global scheme to foster international trade opportunities for green innovations.
2. **Strengthened credibility and certainty** of ETV built on facts and numbers of ETV performance as well as a visible reference to ETV in environmental, climate and innovation policies and programmes at EU and national level;
3. **Extended geographical and technology scope** to match it better with policy objectives of the EU Green Deal as well as national priorities and challenges;
4. **Upgraded infrastructure** to ensure better accessibility of the ETV service in line with the extended geographical and technology scope of ETV;
5. **Strong collaborative institutional framework** with active involvement and clear roles and responsibilities of ETV stakeholders at EU and national level;
6. **Favourable external framework** involving market factors stimulated for ETV market pull (GPP and IP) and policy factors with a clear indication of ETV as a support tool for implementation of policies with defined environmental/climate targets.

Strategic directions and actions

Analysis of the boosting power of these 6 key contributors in terms of factors that may strengthen or weaken their push allowed us to define 6 strategic directions of actions towards building a mutually supportive framework for market acceptance and recognition of ETV (Figure 1):

- ➔ Improve ETV value perception
- ➔ Unleash the potential of ETV use in GPP and IP
- ➔ Promote ETV as a tool fostering execution of challenge and performance led environment and climate policies
- ➔ Make ETV a sustainable mechanism of transformative innovation ecosystem
- ➔ Strengthen ETV compatibility
- ➔ Make ETV more accessible to SMEs

The resultant synergies generated by this framework enhance the effectiveness of the individual strategic directions.

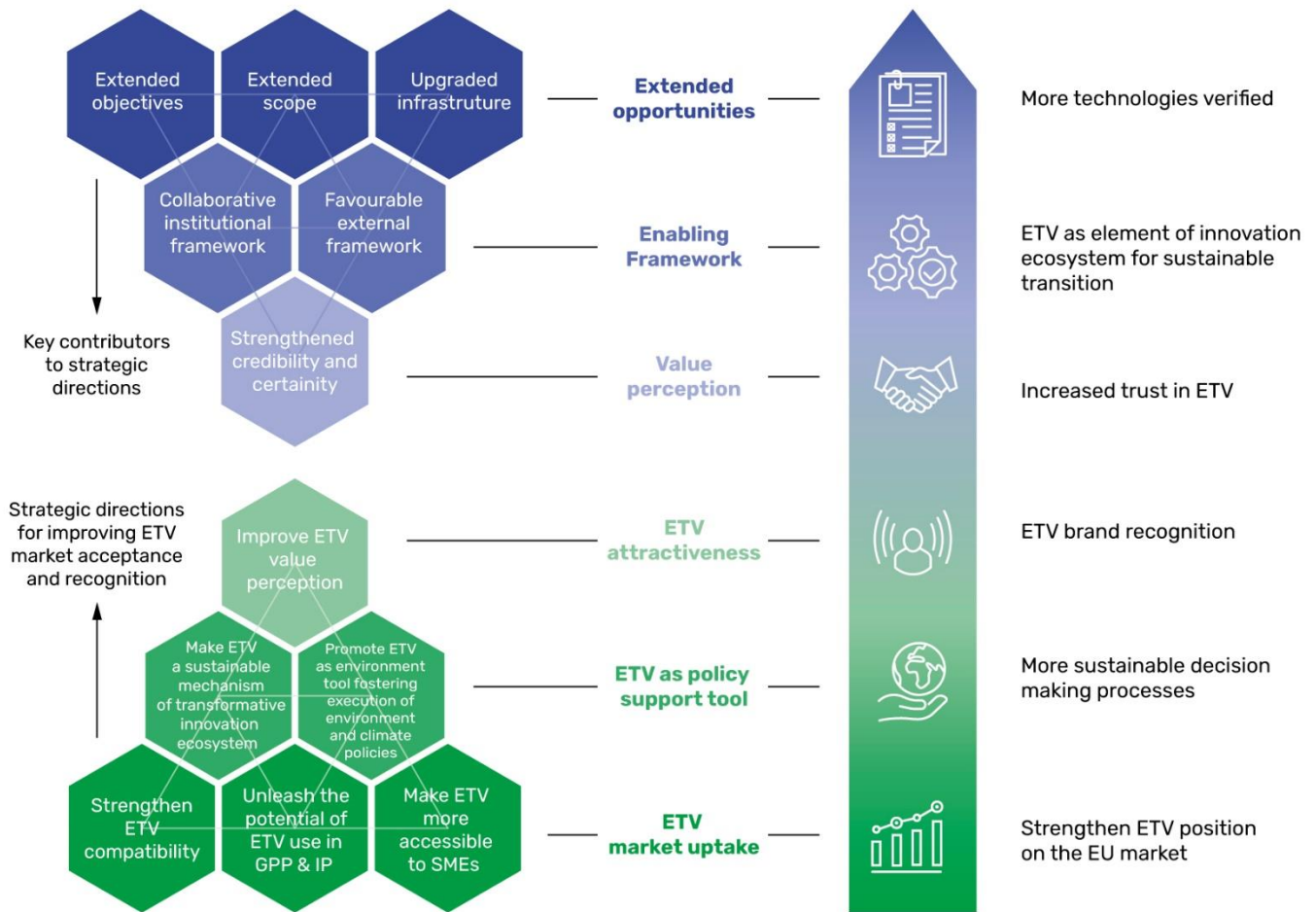


Figure 1 Contributors and strategic directions: building a mutually supportive framework for increasing the market acceptance and recognition of ETV

Improve ETV value perception

The ETV value perception of ETV could be improved by addressing the perceived risks associated with ETV such as:

- risk associated with verification costs: high total verification costs, difficulty in predicting them upfront (especially if testing is to be involved) like in the case of certification schemes, and unsure return on investment,
- risk associated with complexity and duration of the process,
- risk concerning uncertain return of investments from the use of Statements of Verification on EU and international markets.

through actions focused on:

- amplifying the compelling attributes and uniqueness of ETV in communication and promotion,
- facilitating the transparency of ETV benefits with third party proofs,
- making ETV logo a “trust symbol” a brand for green innovations with proven performance,
- promoting the compatibility of ETV with other environmental schemes,
- promoting the opportunity for technology performance test data recognition offered by ETV as means to reduce the time, costs and duration of the process.

Unleash the potential for the use of ETV in public tenders

Unleashing the potential of ETV as a tool providing information on innovative environmental technologies for the needs of Green Public Procurement (GPP) and Innovation Procurement (IP) requires a clear understanding of the differences between these two modalities of public tenders in terms of objectives, innovation focus and risk tolerance (Figure 2). Also, in that context, purchasing green innovations under GPP and IP is a special case. In GPP, beside proven technical performance requirements, the focus is more on demonstrating the environmental performance of goods, services that already exist on the market with innovation aspects being additional attributes while in innovation procurement, by definition, the focus is on purchase of novel solutions with superior technical/functional performance, not existing on the market yet which may, however, include environmental performance aspects. Also, the difference between GPP and IP consists in the risk factor, where risk is an inherent element of the innovation procurement process whereas in GPP the tendency is to avoid the risk.

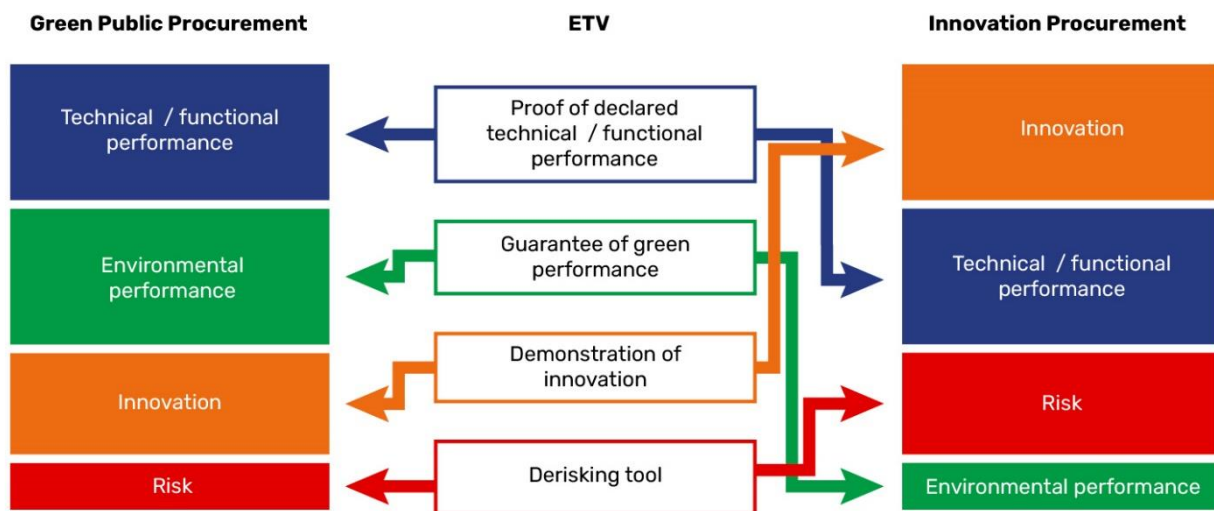


Figure 2 Similarities and differences between GPP and IP and the role of ETV.

Despite the differences between GPP and IP, ETV offers support compatible with the needs and priorities of the public buyers that fits both types of procurement:

- as proof of declared technical/functional performance,
- as a green performance guarantee,
- as demonstration of innovation,
- as a derisking tool.

From the viewpoint of the whole tendering process ETV may offer the following support:

IDENTIFICATION OF CONTRACTING AUTHORITY'S NEEDS:		
Green Public Procurement and Innovation Procurement	Green Public Procurement	Innovation Procurement
ETV Statements of Verifications may serve as a reference for the sourcing purpose.	ETV Statements of Verification may serve to: <ul style="list-style-type: none"> - identify the current state of performance and environmental parameters of existing products and services, - to determine whether the performance of available technologies meets the needs of the contracting authority. 	ETV Statements of Verification may help determine: <ul style="list-style-type: none"> - availability of products or services satisfying the needs of the contracting authority - facilitate decision making on the need for concluding an Innovation Partnership if such offer does not exist on the market.

PLANNING AND PREPARATION

Green Public Procurement and Innovation Procurement	Green Public Procurement	Innovation Procurement
<p>. ETV Statements of Verification may serve as a reference for :</p> <ul style="list-style-type: none"> - definition of methods of proof and other requirements to be specified in tender documentation (incl. draft contract) relevant for: <ul style="list-style-type: none"> o demonstrating compliance with the technical specifications and award criteria at the evaluation stage o demonstrating a proper fulfilment of the contract (achieved performance) at the end of contract performance. - development of technical specifications to define the required minimum environmental and technical performance parameters - definition of award criteria including environmental criteria and their relative weighting. 	<ul style="list-style-type: none"> - ETV Statements of Verification may support the definition of the numerical values of the parameters in technical specifications (minimum requirements) as well as identification of other parameters relevant for technical specifications not referred to in the existing EU GPP guidance documents or procurement categories but relevant for specific needs of the contracting authority. - In the draft contract ETV Statements of verification may be indicated as an optional method of proof of the achieved performance together with a requirement that the performance data used as proof must be generated by an accredited third-party body . 	<ul style="list-style-type: none"> - EU ETV Statements of Verification may be helpful to define technical and environmental performance criteria for the successive phases of the Innovation Partnership to set up intermediate targets and their ambition level to be attained by the partners/developed innovations; - ETV procedure including the requirements of performance test data generation compliant to the requirements of ETV may provide an overall framework to be adopted in tender documentation (including a draft contract) for specifying a method to be applied for tender evaluation as well as verifying contract fulfilment at individual stages of the procurement.

TENDER EVALUATION AND CONTRACT AWARD

Green Public Procurement and Innovation Procurement	Green Public Procurement	Innovation Procurement
<ul style="list-style-type: none"> - ETV Statements of Verification may facilitate offer selection processes when considered as a method of proof with the tender requirements (requires consideration at the planning and documentation development stage) - Third-party testing according to ETV requirements may be adopted as a procedure in flexible procurement procedures including Innovation Partnership for generation of incomplete or non-reliable performance data for large scale installations/ technologies at min TRL7 to complement the tenderer selection and contract award processes (applies to) - ETV may provide basis for developing a multi-criteria analysis grid for tenders evaluation. 	<ul style="list-style-type: none"> - ETV procedure concerning the analysis of exiting performance test data may be applied to check reliability, completeness, relevance and sufficiency of the data to confirm the veracity of the tenderer's claims for non-ETV verified technologies, for verified – ETV Statements apply as method of proof. - ETV Statement of Verification may serve as a method of proof with tender requirements similarly as Ecolabel type I. 	<p>ETV requirements concerning quality performance test data generation may be adopted to the evaluation tenders which offer solutions both below TRL7 and above TRL7. It will allow to evaluate the veracity of the declared performance against the targets defined in the tender.</p> <p>For innovations with TRL7 and above ETV Statements of verification may apply as means of proof to these requirements and confirm the trueness of the declared performance of the offer.</p>

PERFORMANCE OF AN AWARDED CONTRACT

Green Public Procurement and Innovation Procurement	Green Public Procurement	Innovation Procurement
ETV Statement of Verification can serve the contracting authority as means of proof to confirm the proper fulfilment of a contract i.e. achievement of declared performance by the purchased technology (subject to consideration in the planning and documentation development stage)	ETV procedure may be implemented among other independent third party verification schemes as a requirement for the purchased environmental technology to prove a proper fulfilment of the contract, subject to inclusion of appropriate provisions in the tender documentation and draft contract at the tender planning and preparation phase. .	<ul style="list-style-type: none"> - For Innovation Partnership stages resulting in TRL7 or higher testing requirements based on ETV procedure may be applied to demonstrate fulfilment of the contract performance to e.g. to reduce the number of partners by terminating individual contracts that are not resulting in the delivery of innovation performance as defined in the targets. - Based on these requirements full ETV verification can be implemented as means of proof to demonstrate fulfilment of the contract requirements performance at the final stage of an IP.

Capitalising on the support and functions that ETV in GPP and IP, the potential for use of ETV in public procurement could be unleashed by actions gathered in the three following groups:

TECHNICAL:

- ETV Statements of Verification get a similar level of recognition as other third party certificates currently used as a method of proof for compliance to technical specifications e.g. Ecolabel type I;
- Mandatory requirement of performance assessment by independent third party in IP and GPP
- Reference to environmental technologies in the GPP guide e.g. by providing a definition of environmental technology based on the ISO 14034 standardised definition;
- Providing a clear guidance and showcasing the application of ETV in public procurement procedures and individual procurement stages taking into account the objectives and specificities of GPP and IP in terms of the subject matter of the tender, focus on environmental considerations, risk factors and innovation aspects;

FINANCIAL:

- Linking ETV with sustainable financing tools e.g. the EU Green Taxonomy (green subsidies, tax exemptions) with a requirement of the technology green claims to be verified by third party bodies, preferably with competences confirmed by means of accreditation by national accreditation bodies;
- Providing and promoting environmental criteria to tackle green claims/sustainability claims of technologies for capital providers (public or private) e.g. benefiting from the ETV methodology and criteria used for the assessment of the environmental added value in ETV as well as e.g. technical screening criteria provided in the EU Green Taxonomy.

ORGANISATIONAL:

- Building ETV awareness and commitment on procuring green among public stakeholders including utilities and other large public buyers (e.g. state owned enterprises);
- Demonstrating compatibility and mutual recognition pathways between existing environmental certifications, standards and labels (both relevant for products but also environmental management schemes of organisations) and ETV.

Promote ETV as a tool fostering execution of environment and climate policies

EU Level

The following policies and strategies linked with the EU Green Deal as the most relevant ones for ETV. We have looked especially into policies that are challenge or performance led and defined the way how ETV could contribute to their execution, with reference to the extended scope of ETV into 7 technology areas.

- Industrial Emissions Directive
- Zero Pollution Action Plan
- Sustainable Products Initiative
- EU Green Taxonomy
- EU Plastic Strategy
- EU Action Plan on Critical Raw Materials
- EU Bioeconomy Strategy
- Farm to Fork Strategy
- 8th Environment Action Plan

Member States level

At national level, the definition of environment and climate policies of relevance to ETV is much more challenging as it requires a different approach that takes into account the fact that although environmental and climate policies in the EU Member States are compatible with the EU level policies and regulations, each country may, however, determine how these goals will be achieved depending on the country-specific problems, priorities and challenges. This is reflected in the national policies, strategies and programmes that are not necessarily on-to-one equivalents of the EU policies. Another aspect that requires attention is the power of regions, their policies and ambitions which is very strong in countries like e.g. Italy or Spain. For such countries the potential of ETV to support regional policies also needs to be considered. Therefore, the national environmental and climate policies where ETV could provide additional value for policy makers in the achievement of targets, goals or implementation of specific objectives should be identified from the perspective of the following environmental aspects that typically appear in policies of all Member States and are reflected in performance or challenge led policies and programmes:

- Air,
- Climate,
- Water,
- Soils,
- Raw Material Efficiency,
- Energy Efficiency,
- Waste.

Determining the added value of ETV as a national policy support tool requires an additional analysis of:

- the target and priority sectors relevant for a specific environmental aspect,
- existing regulatory framework relevant for the aspect/sector (especially performance-based regulations),
- identification of other complimentary policies and programmes that could contribute to a mutually supportive framework

Such approach allows to identify not only the policies and programmes but also clear levers for ETV which is important in communicating ETV towards decision and policy makers and other stakeholders that may influence the uptake of ETV as a given policy support tool. A trial of such approach has been implemented for the 6 LIFEproETV focus countries leading to identification of a portfolio of policies per country together with an attempt to define the levers for ETV relevant for these policies and the 7 technology areas of the scheme.

Make ETV a sustainable mechanism of transformative innovation ecosystem

As an element of sustainable transitions innovation ecosystem ETV fits ideally as an option with an added value to:

- R&I programmes dedicated to development of close to-market innovations corresponding to the needs of the environmental and climate policies (or societal challenges),
- business development services for SMEs such as coaching, training, mentoring,
- innovation support mechanisms such as e.g. innovation vouchers or fiscal incentives to foster innovation in SMEs (e.g. tax reliefs both for investments in R&I to commercialise own innovations or for purchase of innovative technologies),
- public innovation under innovation procurement for purchase of green innovations,
- existing as well as new financial and policy instruments in which there is an explicit need to mitigate the financial risk of breakthrough environmental technologies e.g. project development programmes designed to help SMEs or start-ups attract private capital to demonstrate and/or scale up their green innovations.

Similarly as in the case of environmental and climate policies, the innovation tools, policies and programmes constitute the external framework for ETV that should provide that there is a balance in the way that the scheme is supported on the supply side (support for technology providers) and demand side (technology users, buyers). In order to build ETV into the framework supporting innovation and SMEs as a tool facilitating transformative

innovation policy towards sustainability we have carried out an analysis of strategies, programmes and policies again focusing on the 6 LIFEproETV countries and at EU level.

EU Level

ETV demonstrates a potential as a tool facilitating the implementation of the EU SMEs Strategy at least in two such areas indicated in the document as:

- Improvement to Single Market and global market access for SMEs: ETV helps reduce barriers for SMEs in entering markets with innovative environmental technologies;
- Improvement of access to finance for SME: ETV demonstrates a strong potential as a derisking tool in decision making processes related to investments in innovative green start-ups or scale-ups which are high-risk, often capital-intensive and need significant support to scale up and for the needs of institutional financiers offering 'green' financial products (e.g. banks) in the context of the EU Green Taxonomy as presented above.

Promotion of ETV could be additionally facilitated by the Sustainability Advisors proposed to be established within the Europe Enterprise Network.

Concerning the innovation support programmes at EU level which are much more impact oriented than previous ones, ETV as an exploitation measure should be mentioned as a tool facilitating reaching the expected project outcomes increasing the potential of project results uptake, diffusion, deployment, and/or use shortly after the end of the project. It should be included as eligible costs making the scheme combined with the pre-commercialisation phase for innovations achieving at a minimum TRL level of 7 while providing an EU level subsidising mechanism for the scheme. Our analysis on ETV status quo showed that these programmes, besides providing financing to perform verifications, are an impactful tool for ETV promotion which has been proved by the number of projects that we managed to identify that included reference to ETV in their actions (33 projects from Horizon 2020, LIFE and other funding schemes e.g. Urban Innovation Action) and the ETV awareness level of the surveyed business support organisations which, among others, provide assistance to project proposals development. Beside the ones that already mention ETV (Horizon 2020, LIFE), they include:

- ERA-NET Co-fund on Raw Materials (ERA-MIN),
- European Innovation Council – EIC,
- Innovation Fund,
- Horizon Europe (especially Innovation Actions under cluster 4 and 6)
- innovation supporting mechanisms and calls offered by the Innovation Communities (KICs) established under the European Institute of Innovation and Technology.

Member States level

Since national innovation systems face different structure in each of the 6 LIFEproETV focus countries providing a different set of tools, we have prioritised these policies and programmes relevant for innovation support that are either already in place or which are planned. We have depicted first of all these programmes which may enable or improve accessibility of ETV to technology providers through e.g. providing financing for verification (publicly funded R&I programmes) or where ETV could add a value otherwise (Figure 3).

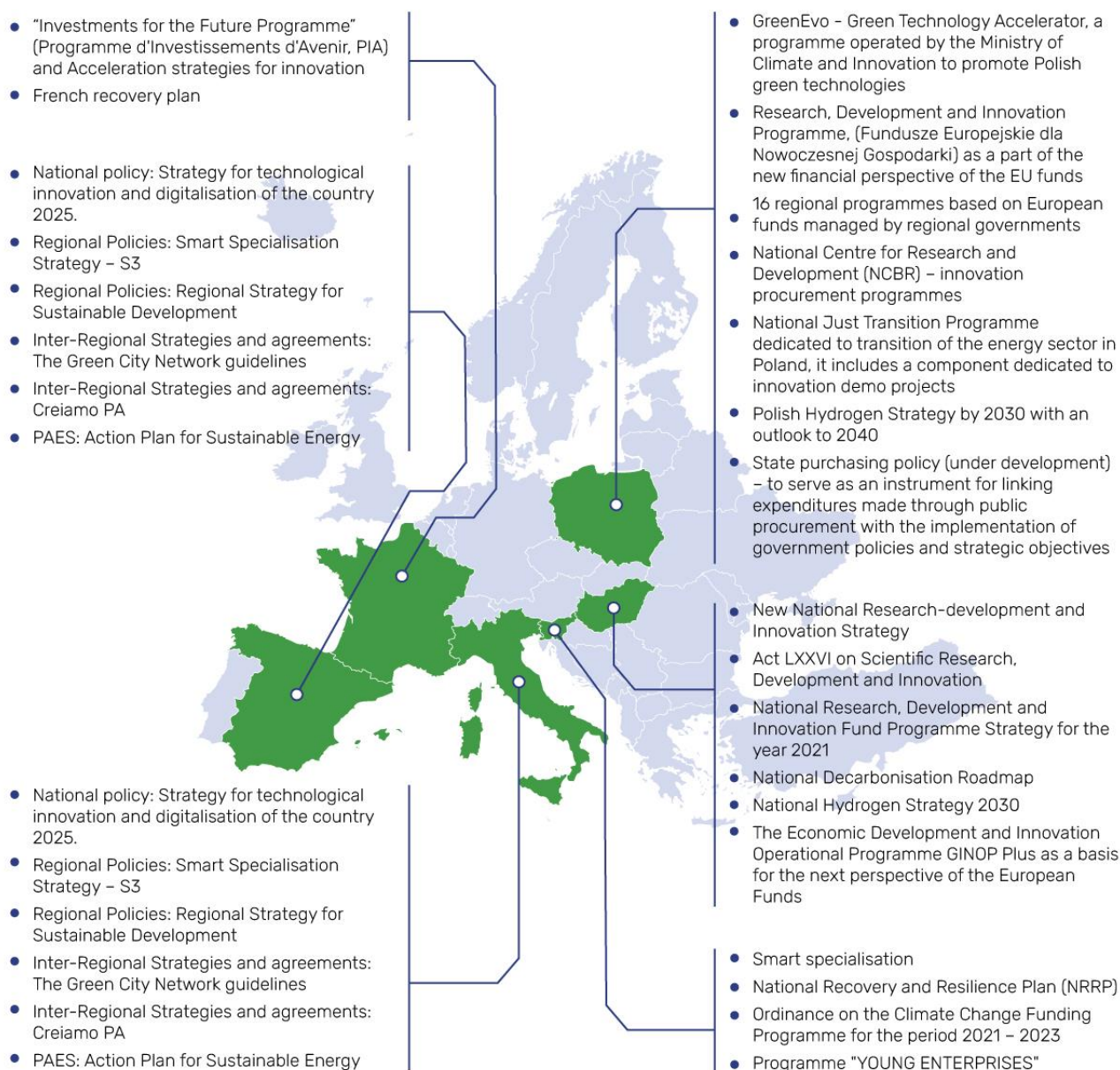


Figure 3 Country innovation policies relevant for ETV in the 6 LIFEproETV focus countries

Promote the compatibility of ETV with other environmental schemes

Our studies on the competitive landscape of ETV with respect to the 7 technology areas of the EU Programme revealed areas of synergies and opportunities which could strengthen the ETV business case and/or result in potential savings in costs and time of ETV and possibly reduce its complexity.

In particular we focus on two compatibility cases:

→ role of ETV as a scheme that allows to internalise technology performance into environmental performance of products and organisations.

- ETV provides relevant information on new technologies and their environmental added value for EMAS, ISO 14001 or OEF certified organisations to **make choices of solutions to optimise their processes and achieve**

the desired levels of environmental performance or indicators in line with their ambitions or to businesses wishing to acquire an EPD or PEF for their products

- ETV Statements of Verification can be used as **proofs of compliance in purchase policies of ISO 14001** certified organisations and value chains
 - under **Ecodesign** directive **ETV facilitates the choice of specific design solutions** involving materials and technologies that result in substantial improvements of the targeted environmental aspect of the product
- ➔ **opportunities for technology functional and environmental performance test data recognition between ETV and e.g., technology performance based compliance schemes** to align the efforts, reduce cost and time as well as maximise the utility of test data for proving technology performance necessary for its market uptake.

Make ETV more accessible to SMEs

Accessibility of the ETV service i.e. how easy is it to verify a technology belongs to the critical factors influencing market acceptance and recognition as well as ETV value perception. Beside financial support for verifications that definitely is a strong contributor to make ETV more accessible for SMEs but also to other early stage green technologies providers e.g. startups, the experience of ETV implementation both under the EU ETV Pilot Programme as well as at national level (e.g. in France) clearly indicates the need to make the potential ETV applicants equipped with better knowledge and understanding of ETV as an alternative in building their green innovation marketing cycle and make them better prepared for the ETV process. It also means bringing the ETV service closer to them.

In that respect we propose the following actions:

- improve access to ETV service in terms of ease of accessibility of verification bodies and availability of the service in technology areas, which is directly linked with the upgrade of the ETV infrastructure and extending the technology scope of ETV so that it matches the offering of a full scale ETV Programme;
- improve accessibility of the verification procedure in terms of making the ETV process easier and simpler for SMEs through providing guidance and assistance tools enabling strategic planning for ETV prior to application which is directly linked with building ETV as an element of innovation framework and providing better access to ETV information through corresponding business development services offered by business support organisations;
- improve financial accessibility of the service by offering opportunities to compensate the verification costs, which, similarly as above, is linked with integrating ETV as an element of innovation framework and support for SMEs as well as promotion of ETV compatibility enabling test data recognition.

A CLOSER LOOK AT SOME VALUABLE INFORMATION AND FINDINGS

EU ETV performance in numbers

In the framework of LIFEproETV project, we have carried out a detailed analysis of the EU ETV performance focusing on enquiries for ETV (Quick Scans), submitted applications for verification and concluded processes based on the data as of 2013 – November 2021⁵. It allowed us to determine the actual interest in the EU ETV Programme among technology providers. The interest is reflected in 206 quick scans processed by the verification bodies and the EU ETV Pilot Programme originating from 23 countries since 2013, 26 ongoing verifications and 46 successfully completed processes⁶ of technologies originating from 12 countries as presented in Figure 4.

⁵ Data available on the web site and data acquired from the EU ETV Secretariat

⁶ As of 1 November 2021

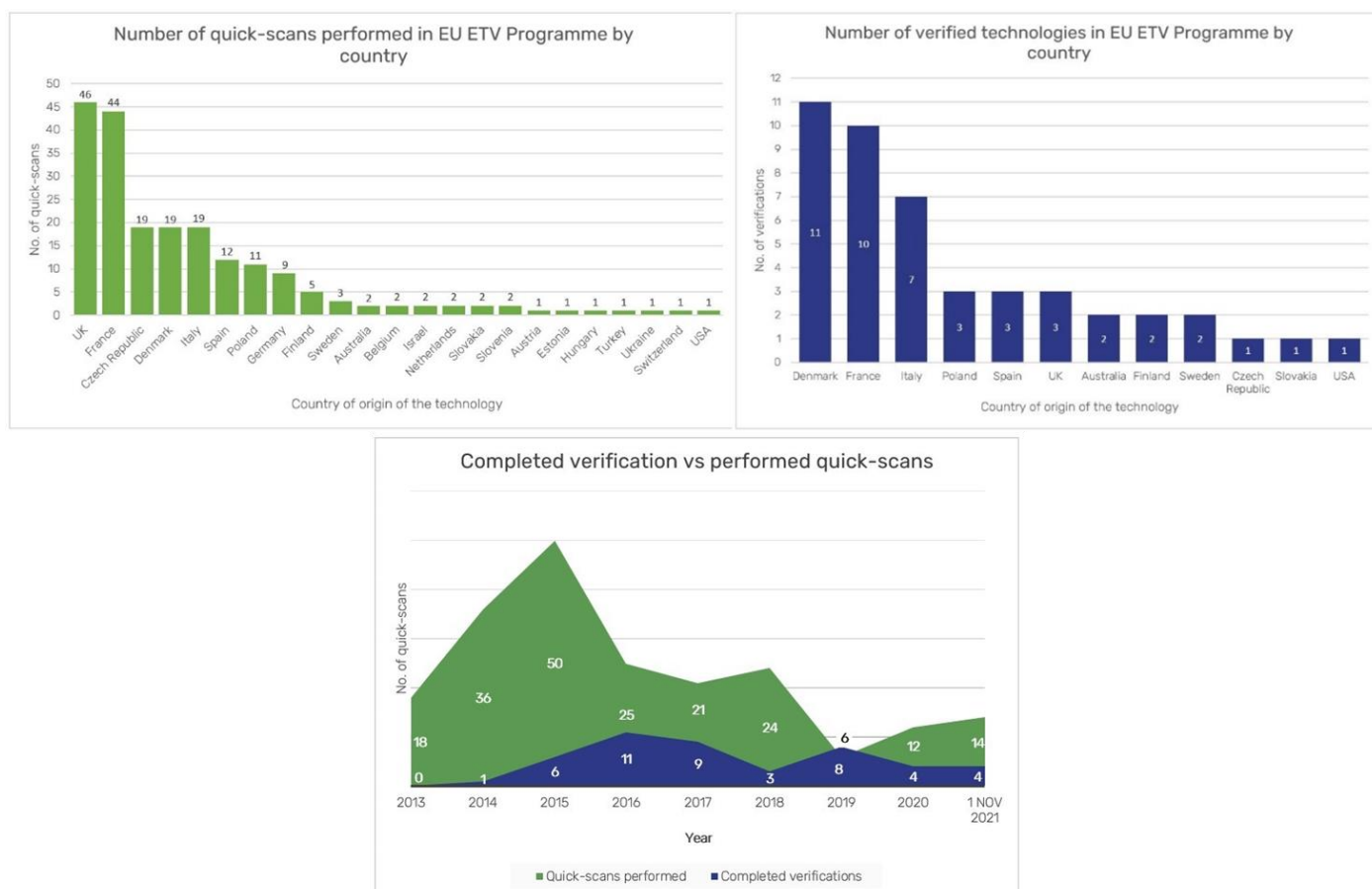


Figure 4 EU ETV performance 2013-2021 in numbers

Characteristics of the key factors that determine the potential of ETV market acceptance and recognition

Based on our understanding of the terms of market acceptance and recognition and the performance of the EU ETV scheme, we have defined, characterised and analysed 7 key factors considering the opportunities and bottlenecks that beside ETV awareness currently determine the ETV market acceptance and recognition at EU and national level as presented in Table 1. All these factors are strongly interrelated. Among them, value perception is the most powerful one and heavily depends on and at the same contributes to the other ones.

Factor	Characteristics	Key opportunities	Key bottlenecks
<div>1</div> <div>ETV value perception</div>	<p>Priority factor for market acceptance, shaped by such attributes of ETV as credibility, quality and impartiality, certainty, transparency, recognition, completeness, flexibility. It is relevant particularly to the target groups and stakeholders who either already had an opportunity to learn about ETV or become actors in the communication and promotion processes. The way ETV is presented to them determines the attitude and interest in the scheme.</p>	<ul style="list-style-type: none"> ▪ The scheme is certain because it is implemented as an EU scheme and governed by EC, and public authorities at national level. ▪ ETV is credible and transparent because it is ISO standardised and based on a strong quality and impartiality assurance framework. ▪ Promoted as EU market recognised. ▪ Flexible and fit for green innovations. ▪ Referred to in EU and some national policies (e.g. in PL, FR). ▪ Providing complete information on technology: both on its performance and environmental aspects from life cycle perspective. 	<ul style="list-style-type: none"> ▪ Uncertainty and transition aspect of the EU ETV Programme. ▪ Limited number of countries/national authorities involved. ▪ Low number of verified technologies to confirm the credibility of the scheme. ▪ Character of verified technologies (few technologies with strong environmental impact for industrial applications). ▪ Lack of third party proofs on the utility of ETV for technology providers and buyers which makes ETV promotion towards new countries (authorities), technology providers and buyers more challenging. ▪ Lack of good practice and a clear guidance on the technology, performance test data recognition for the needs of ETV. ▪ Lack of good practice and a clear guidance on ETV Statements of Verification at EU single and home markets as a credibility aspect.
<div>2</div> <div>Market relevant factors</div>	<p>Green Public Procurement (GPP) and Innovation Procurement (IP) are two important market relevant factors that may become strong levers for ETV with respect to developing an ETV business case for technology providers and reduction of the risk related to return on investment in ETV.</p>	<ul style="list-style-type: none"> ▪ GPP represents a strong buying power in Europe. ▪ The role of GPP and IP is increasing due to EU Green Deal objectives. ▪ GPP is focused on environmental performance. ▪ EU ETV Statements of Verification meet the criteria of third party certificates of an 'independent third-party certifier' or 'an independent third-party body' i.e., a body that performs conformity assessment activities accredited either in accordance with Regulation (EC) No 765/2008 of the European Parliament and thus may serve as means of proof with e.g. technical specifications in public tenders. ▪ The definition of environmental technology according to the ETV standard ISO 14034 that allows technologies to fall under one or more subjects of green procurement i.e. goods, services, construction works. ▪ Environmental technologies covered by the 7 EU ETV technology areas are already addressed in the EU GPP criteria. ▪ Dedicated water and wastewater GPP guidance is available. 	<ul style="list-style-type: none"> ▪ In majority of EU countries including LIFEproETV countries (except for Italy) GPP is a voluntary scheme. ▪ The competitive advantage of ETV is unclear and not reflected in the EU GPP guidelines. ▪ A general lack of experience, skills and good practices in the use of GPP especially in relation to environmental technologies. ▪ Status of environmental technologies (processes, products or services) may be difficult to determine in procurement terminology: environmental technologies may fall either under the category of goods or services or construction works if they refer to infrastructure assets. ▪ There is very limited experience and evidence to demonstrate the use of ETV in GPP. ▪ IP is a new concept with limited track record of procuring innovative environmental technologies.

3

Policy framework

This factor is complementary to the value perception factors and supports in particular credibility and certainty of ETV as an EU scheme as well as scheme supporting national policy priorities.

- Currently, ETV is mentioned specifically in 4 EU policies: The Ecolnnovation Action Plan (EcoAP) The Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan (SCP/SIP) Green Action Plan for SMEs and Circular Economy Action Plan.
- France and Poland gave visibility to ETV in their strategic national policies.
- As a part of innovation policies, uptake of ETV has been supported by EU level R&I programmes (Horizon, LIFE, Cross-KIC Climate calls).

Lack of a mutually supportive framework: no or limited synergy between using ETV as a tool to address the innovation challenge of environmental / climate policies (both EU and national) and the programmes supporting green innovation and marketing of environmental technologies.

4

Compatibility & Competition

This factor can be understood in two aspects:

1. compatibility with the needs and challenges when commercialising early innovative market product,
2. compatibility of ETV as an environmental scheme with other environmental schemes or compliance certification schemes including also competition and niches for ETV.

- ETV provides proofs of performance with the same quality and impartiality as certification and compliance testing schemes designed for mature technologies while offering flexibility in the choice of performance parameters to be verified.
- ETV is compatible with environmental management schemes ISO 14001, EMAS, OEF as well as environmental product certification schemes based on LCA e.g. EPD, PEF as it allows to internalise technology performance into environmental performance of products and organisations.
- Technology areas such as agriculture or soil and groundwater remediation and cleaner production processes are niches for the application of ETV due to a limited number of competition from other schemes.
- There is a strong potential for test data recognition between ETV and performance based schemes involving third party testing that are in competition to ETV e.g. for energy, waste and recycling and water technologies

- Lack of knowledge on ETV enabling its use as an element of the innovation marketing cycle.
- No test data recognition pathways established and promoted either for the compatibility with other environmental schemes or test data recognition.
- ETV suffers strong competition from a number of certification and compliance schemes, either regulatory required or with well-established market position in such areas as energy technologies, water technologies and waste, materials and recycling.

5. Financial factors

This factor is associated with the risks related to the costs of ETV and the return on investment. It also covers the opportunities for costs reduction e.g. through strategic planning of ETV as a final part of a publicly co-financed demonstration project/first of a kind application or savings on testing costs thanks to recognition of test data produced outside ETV (e.g. for the needs of obligatory compliance testing)

- ETV is eligible costs as an element of demonstration projects in several EU Programmes (e.g. Horizon Europe, LIFE), dedicated ETV KIC Climate calls.
- There are some national funding schemes, where ETV can be covered e.g. in Denmark, Poland and France.
- Testing costs for ETV can be reduced thanks to the opportunity for test data recognition.
- Uncertainty of the total verification cost and duration at the application stage makes ETV hard to plan and calculate e.g. in a demonstration project.
- Unsure return on investment due to limited ETV recognition and awareness about the scheme.
- ETV costs too high for startups and SMEs while too high for investors to cover them.

6. Ease of access, ETV infrastructure and capacities

Accessibility of the ETV service can be one of the barriers for market uptake of ETV.

Currently, ETV service under the EU Programme is provided by 7 verification bodies, basically in the 3 technology areas of the EU ETV Pilot Programme. The verification bodies are located in Finland, UK, Denmark, France, the Czech Republic, Italy and Poland. All of them verify technologies in the areas of waste, materials and resources, 6 in water technologies and 6 in energy technologies.

- Launch of the full scale EU ETV Programme and extension of its technology scope over new technology areas as well as geographically provide foundations for building new capacities for the existing verification bodies as well as establishing new ones.
- Some verification bodies declare interest in developing their competences in new technology areas stimulated by the request for verifications of technology providers.
- EU and national policies related to air pollution, climate change and adaptation, sustainable industrial processes and agriculture as well as green taxonomy may work as drivers increasing the demand for new environmental technologies with proven performance.
- Costs and effort needed to extend the accreditation scopes of the existing verification bodies at uncertain return on investment/ ETV business case.
- Limited or even lack of capacities, readiness and interest of the accreditation bodies either to establish accreditation schemes to carry out accreditation of verification bodies in new countries or to enable extension of the scopes of the existing ones.
- Lack of a mutually supportive framework at national level promoting the verification bodies and supporting ETV incl. policies, funding schemes and competitive advantage offered by ETV.

7

ETV awareness, communication and promotion

Lack of ETV awareness is a major factor currently inhibiting the uptake of ETV by the market.

Despite communication efforts implemented by the EC, its designated services, verification bodies and two projects dedicated to ETV promotion (Innovation4Water and ETV4Innovation), the awareness level about the scheme is very low as it has been confirmed by a survey carried out under LIFEproETV in 6 countries involving over 500 technology providers, buyers and business support organisations.

- ETV is a topic for organisations supporting companies in improving their environmental performance /sustainability efforts and ambitions. There is a network of business support organisations including the KICs community and Europe Enterprise Network who work with innovators, technology commercialisation and transfer. They provide framework that should be utilised for ETV communication.
- Social media such as LinkedIn are highly used by professionals and their use should be maximised to reach different audiences about ETV.

- The up-to-date ETV communication and promotion efforts have been targeted mainly towards technology providers missing other key groups i.e. technology buyers, investors, regulatory bodies, decision and policy makers.
- ETV has been promoted mainly from the perspective of "product marketing" i.e. ETV as such, rather than context marketing e.g. presentation of ETV as an answer to a challenge or problem or an opportunity in relation to some policies, funding schemes etc.
- The efforts have been missing a clear communication on benefits to a wider group of stakeholders e.g. technology buyers, investors, decision and policy makers.
- The communication channels used for ETV have been too narrowed, with limited use of opportunities provided by social media.
- The communication and promotion effort of ETV was shifted to verification bodies as a part of their service marketing which turned out inefficient at their limited capacities and promotion budgets.
- Low budget for ETV promotion reducing the range of actions to be implemented at EU and national level.

The differentiating advantages of ETV to improve value perception

The unique features of ETV and their compatibility with the needs and challenges of technology providers and buyers are the main assets to build a strong market acceptance and recognition of the scheme. ETV offers a number of advantages that differentiate it from other certification and compliance schemes applying either to green products or to mature technologies (Figure 5). These advantages should be amplified in ETV communication.

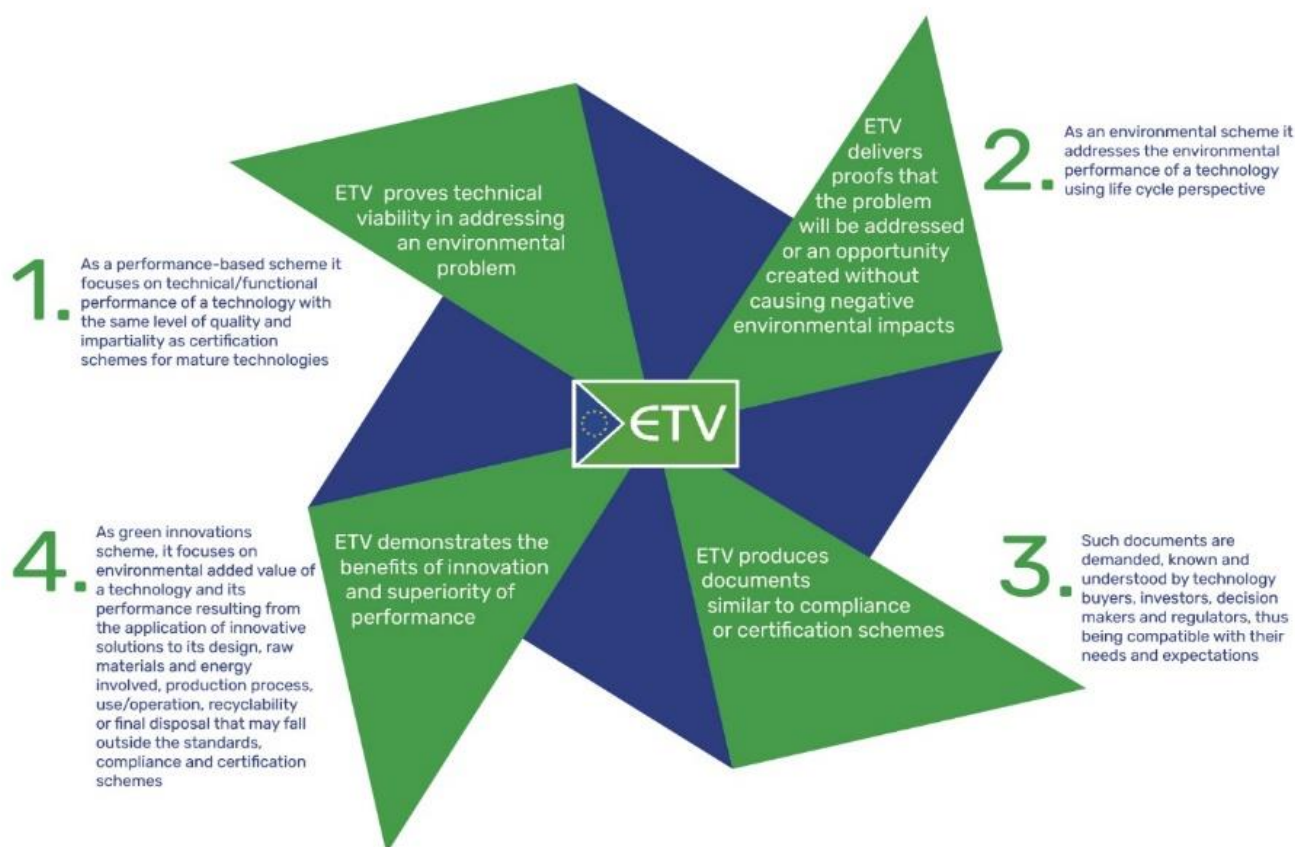


Figure 5 The differentiating advantages of ETV

ETV awareness level vs needs and challenges of technology providers and buyers in the 6 LIFEproETV focus countries

Data from the survey carried out under LIFEproETV project among technology buyers, providers and business support organisations (N=521) in 6 countries: Italy, Poland and France which participated in the EU ETV Programme clearly indicate low ETV awareness level and the need of ETV promotion (Figure 6). Only France represents a relatively high level of ETV awareness, however this is to be attributed to three facts: France has been involved in ETV Pilot from the beginning, a parallel national ETV Programme has been implemented and the number of responses acquired from France is low (N=58) compared to responses collected in Poland (N=150). Interesting is the awareness level of business support organisations (BSO), which except for Poland have some knowledge on ETV. Half of BSOs from Spain was aware of ETV, similarly in Italy. The main source of information on ETV for Spain were EU research programmes, whereas for Italy internet and press articles. Interestingly, except for France, the role of verification bodies in ETV awareness building is very low. It proves the suspicion, that verification bodies become sources of ETV information only to those who have learned about the scheme elsewhere.

Have you ever heard about Environmental Technology Verification (ETV)?
N=521

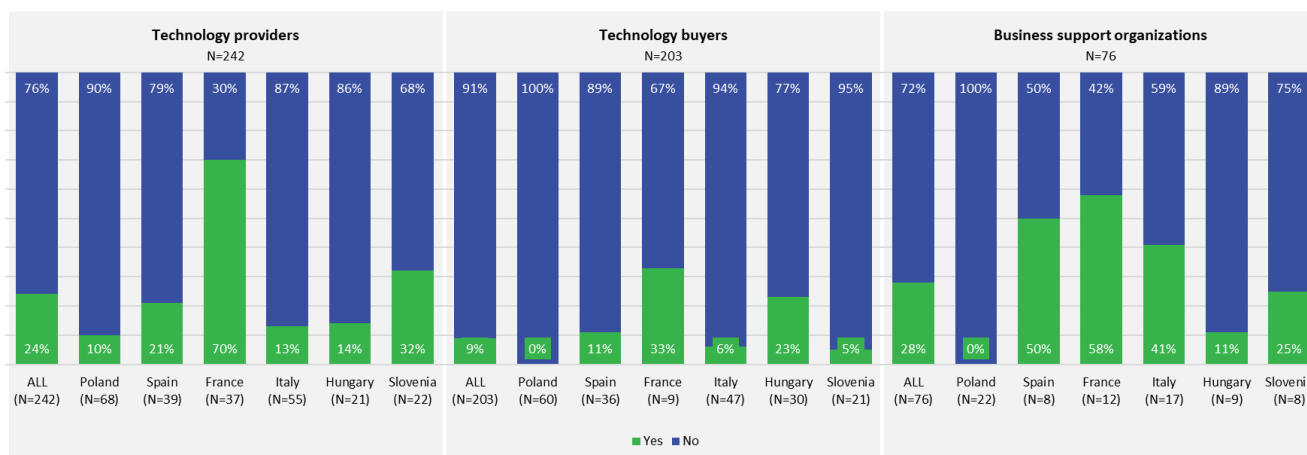


Figure 6 ETV awareness level among technology providers, buyers and business support organisations in the 6 LIFEproETV focus countries

At the same time the collected data shows that about half of the technology providers claim, that legally required certification, in-house testing and references from previous applications are not efficient enough in helping them build a competitive advantage for their innovations on the market. However, over 50% is unsure about using ETV to help them. The findings of our survey show that innovation plays an important role both in offering and purchasing environmental technologies (Figure 7).

Do you think that highlighting innovation of the technology is important when offering it to customers / buying it from technology providers / to succeed in the marketplace?
N=521

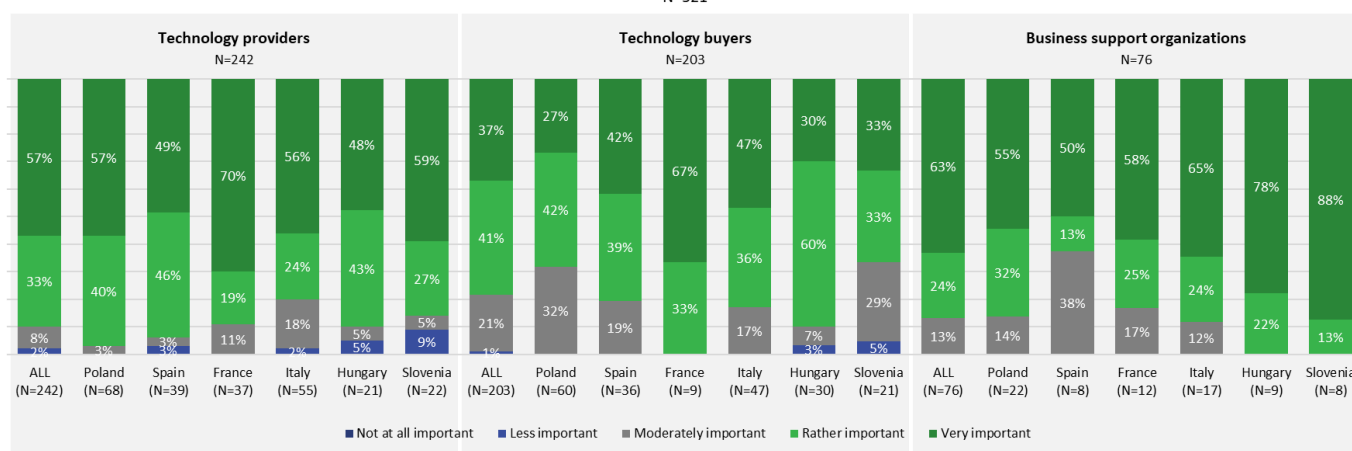


Figure 7 The role of innovation demonstration as a selling point/purchasing factor in successful marketing of an environmental technology.

However, even more than innovation, technology providers, buyers and business support organisations recognise the importance of demonstrating the environmental effects of a technology (Figure 8).

Do you think that highlighting environmental effect of the technology is important when offering it to customers / buying it from technology providers / to succeed in the marketplace?
N=521

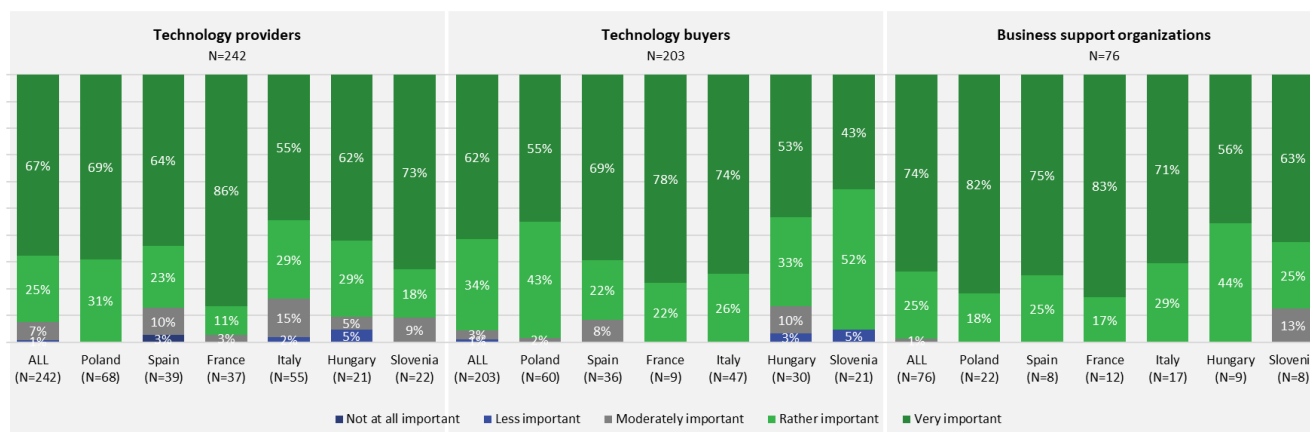


Figure 8 The role of environmental effect demonstration as a selling point/purchasing factor in successful marketing of an environmental technology.

At the same time about 45% of technology providers (n=242) and 78% of technology buyers (n=203) consider certificates as a preferred way of communicating innovation and environmental effects of a technology.

Our respondents indicated that in house-testing and references from previous applications still occupy ex equo second position (43%), after legally required certifications (64%), among the ways in which buyers ask providers to demonstrate the innovation and environmental effects of a new environmental technology. At the same time however, about half of the technology providers claim, that these methods are not efficient enough in helping them build a competitive advantage for their innovations on the market (Figure 9).

To what extent do the methods you are currently using to demonstrate the innovation and environmental effect of your technology differentiate it from your competitors on the market?
Technology providers, N=242

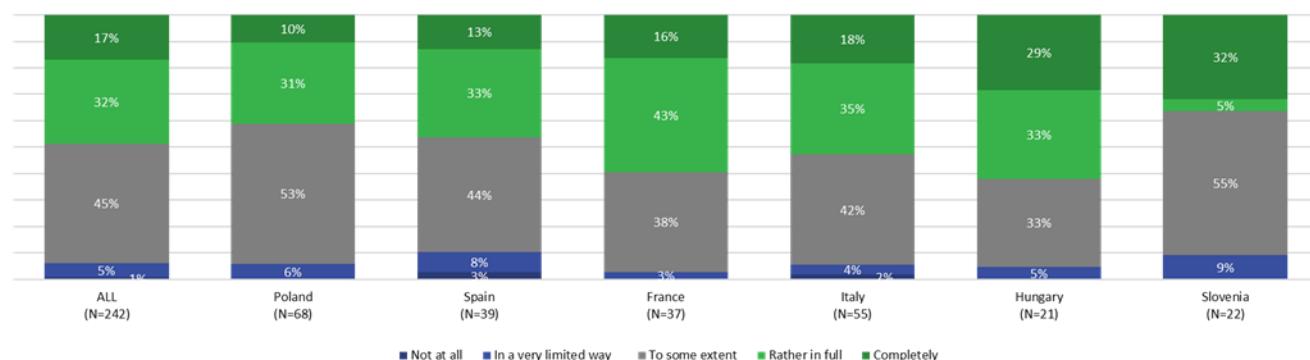


Figure 9 The effectiveness of compliance certification, in-house testing, references from previous applications in demonstrating innovation and environmental effects in building a competitive advantage of a new environmental technology.

Our survey data also show that credibility, relevance and sufficiency of technology performance test data and definition of performance claims that meet the real needs of buyers are the two biggest challenges that technology providers face in proving the effectiveness and environmental benefits of their technology towards buyers. ETV could definitely help address these challenges. However, as the scheme is rather unknown on the market, the interest in verifications and the use of the Statements of Verification in purchasing decisions raises scepticism especially among technology providers, only 35% would consider verifying their technology under ETV while at the same time over 50% are unsure. At the same time 43% of technology buyers recognise the utility of the Statements of Verification as support buying decisions, while business support organisations definitively consider ETV as a scheme worth advising to SMEs as a tool facilitating market entrance (Figure 10).

Would you consider verifying your technology under ETV / including ETV's SoV in the purchasing process / advise to use ETV as a tool?
N=521

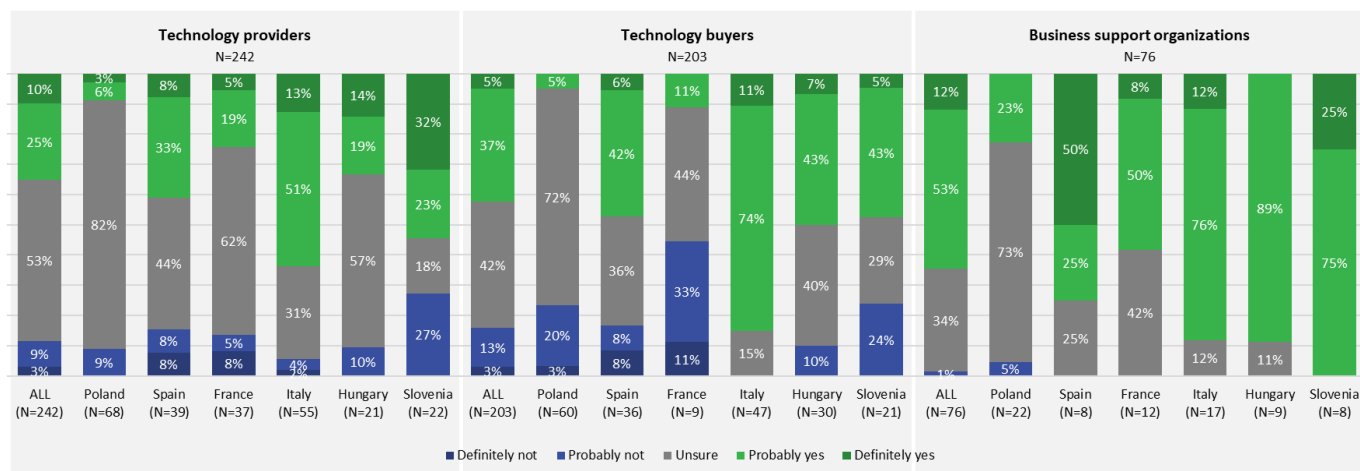
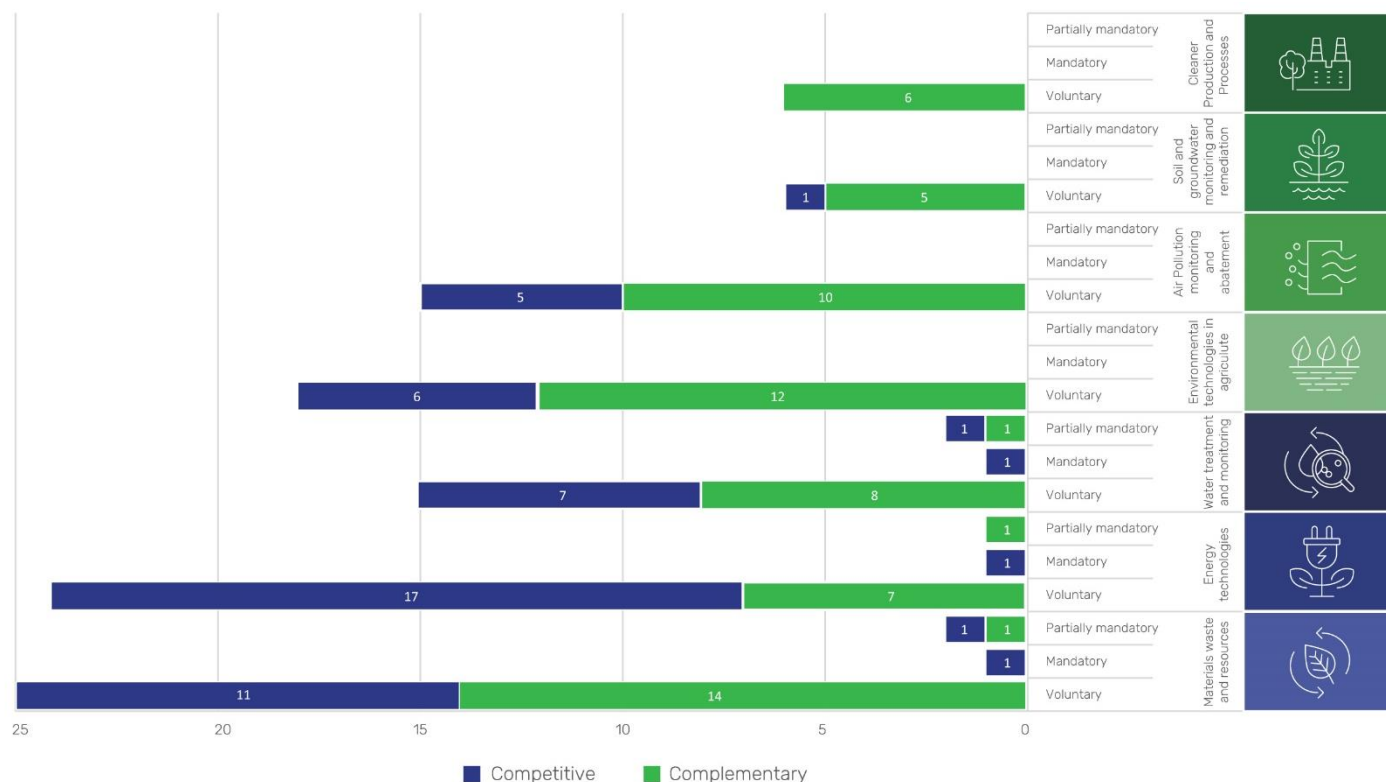


Figure 10 Interest in using ETV by technology providers, buyers and business support organisations.

THE COMPETITIVE LANDSCAPE OF ETV

The competitive landscape of ETV is shaped by about 51 different schemes (Fig. 11). The competitive schemes are the ones that are performance-based schemes aiming at testing technologies or materials belonging to at least one of the 7 ETV technology areas. From the 51 schemes identified, 47 are voluntary, 3 are mandatory and 1 partially mandatory (i.e. mandatory in some countries or contexts). Most of the schemes operate at EU level with only a few at national level. This landscape helps to identify the ETV technology areas with less schemes available where ETV can be a niche for performance verification, and also, the technology areas with the highest number of schemes, competitors to ETV, yet creating opportunities for technology performance test data recognition. The landscape of ETV also involves schemes that are not intended to performance evaluation rather than environmental assessment of products or companies, about 39 additional environmental schemes which are complementary to ETV and provide opportunities for building synergies based on data inputs.



ETV Technology area	Examples of schemes competitive to ETV	Examples of schemes complimentary to ETV
Cleaner production and processes	N/A	Voluntary: Environmental Product Declaration (EPD); UL ECOLOGO; Eco-Management and Audit Scheme (EMAS); ISO Environmental management – Life cycle assessment – Principles and framework; EU ETC; ISO 14030 family of standards
Soil and groundwater monitoring and remediation	Voluntary: WaterSense for Soil Moisture-Based Irrigation	Voluntary: Environmental Product Declaration (EPD); UL ECOLOGO; Eco-Management and Audit Scheme (EMAS); ISO Environmental management – Life cycle assessment – Principles and framework; CEN/TC 223 'Soil improvers and growing media'
Air pollution monitoring and abatement	Voluntary: AIRLAB Microsensor Challenge; Eurovent Certita Certification; INERIS - Certification of sensors system for air quality monitoring; ECARF, Certified Air Purifiers; RESET™ Air	Voluntary: ISO 14064-1:2018 Greenhouse gases – Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals; ISO 14067:2018 (en) Greenhouse gases – Carbon footprint of products – Requirements and guidelines for quantification; UL ECOLOGO; Environmental product declaration (EPD); Eco-Management and Audit Scheme (EMAS); ISO Environmental management – Life cycle assessment – Principles and framework; Indoor Air Quality Certification; EN 19694 series. Stationary source emissions - Determination of greenhouse gas (GHG) emissions in energy-intensive industries; ISO 14001. Environmental Management System; CEN/TC 264 Air quality

<p>Environmental Technologies in agriculture</p>	<p>Voluntary: VERA, UL S 8000 Horticultural Lighting Performance Specification; The Biofertiliser Certification Scheme; CERES – organic fertilizers; EN 13406 Agricultural machinery – Slurry tankers and spreading devices – Environmental protection – Requirements and test methods for the spreading precision; ISO/DIS 16119-5 Agricultural and forestry machinery – Environmental requirements for sprayers – Part 5: Aerial spray systems</p>	<p>Voluntary: Agri-Environment Schemes; UTZ certification; Rainforest Allianz Certification; 4C Certification; SRP Standard; Eco-scheme; Entry Level Scheme; Environmental product declaration (EPD); UL ECOLOGO; Eco-Management and Audit Scheme (EMAS); ISO Environmental management – Life cycle assessment – Principles and framework; ISO 17989-1:2015 Tractors and machinery for agriculture and forestry – Sustainability – Part 1: Principles</p>
<p>Water treatment and monitoring</p>	<p>Voluntary: ISO 15839:2003. Water quality – On-line sensors/analysing equipment for water – Specifications and performance tests; Water quality association (WQA) certification; NF validation certification;</p> <p>ICES – Verification of ballast water compliance monitoring devices;</p> <p>MCERTS: performance standards and test procedures for continuous water monitoring equipment;</p> <p>WHO International Scheme to Evaluate Household Water Treatment;</p> <p>ISO 20468-7:2021 Guidelines for performance evaluation of treatment technologies for water reuse systems</p> <p>Mandatory: BS EN 12566-3:2016: Small wastewater treatment systems for up to 50 PT Packaged and/or site assembled domestic wastewater treatment plants</p> <p>Partially mandatory: Various NSF subtypes, as an example NSF/ANSI 42, 44, 53, 55, 58, 62, 177</p>	<p>Voluntary: Schéma Directeur d'Aménagement et de Gestion des Eaux (France); Environmental Product Declaration (EPD); UL ECOLOGO; Eco-Management and Audit Scheme (EMAS); ISO Environmental management – Life cycle assessment – Principles and framework; ISO 14001. Environmental Management System; ISO/TC 147 Water quality</p> <p>Partially mandatory: Building Research Establishment Environmental Assessment Method (BREEAM),</p>
<p>Energy technologies</p>	<p>Voluntary: Certification for sustainable transportation (eRating); Solar Keymark; NI631 Certification Schemes for marine Renewable Energy Technologies; REDcert-EU; Energy Star; IEC 61400-12-1:2017 Wind energy generation systems – Part 12-1: Power performance measurements of electricity producing wind turbines; DNVGL-SE-0163 Certification of tidal turbines and arrays; IEC 61853-1:2011 Photovoltaic (PV) module performance testing and energy rating – Part 1: Irradiance and temperature performance measurements and power rating; EN 14511- Standards for Air conditioners Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling; Heat Pump KEYMARK; CertifHy (Green and low carbon Hydrogen certification); Hydropower Sustainability Standard; ISO 23590:2020. Household biogas system requirements: design, installation, operation, maintenance and safety; EN 14236:2018. Ultrasonic domestic gas meters; EN 12976-2:2019. Thermal solar systems and components – Factory made systems – Part 2: Test methods; EN ISO 18243:2019/A1:2020 Electrically propelled mopeds and motorcycles – Test specifications and safety requirements for lithium-ion battery systems; EN</p>	<p>Voluntary: Environmental product declaration (EPD); UL ECOLOGO; Eco-Management and Audit Scheme (EMAS); ISO Environmental management – Life cycle assessment – Principles and framework; ISCC (International Sustainability & Carbon Certification); EN IEC 62941:2020 Terrestrial photovoltaic (PV) modules – Quality system for PV module manufacturing; ISO 50001. Energy management</p> <p>Partially mandatory: Building Research Establishment Environmental Assessment Method (BREEAM)</p>

	1776:2015 Gas infrastructure – Gas measuring systems – Functional requirements Mandatory: European Ecodesign Directive (ErP Directive 2009/125/EC)	
Materials waste and resources	<p>Voluntary: Assessment and Verification of Constancy of Performance (AVCP); Plastica Seconda Vita (second life plastic); Recyclability certificate; EuCertPlast; Kiwa Watermark certification; Recycled Claim Standard; DIN-Geprüft test mark: (DIN EN 13432 or DIN EN 14995 standard); Seedling compostability mark (DIN EN 13432 or DIN EN 14995 standard); UL 746D Standard for Polymeric Materials, Fabricated Parts; CEN/TC 411 Bio-based products; ISO/TC 61 'Plastics'</p> <p>Partially mandatory: NSF/ANSI 14 product certificate for Plastics Piping System Components and Related Materials</p> <p>Mandatory: Potable Water Standards (i.e., Royal Decree 140/2003 Spain)</p>	<p>Voluntary: CEWASTE; Environmental Product Declaration (EPD); UL ECOLOGO; Eco-Management and Audit Scheme (EMAS); ISO Environmental management – Life cycle assessment – Principles and framework; LEED certification (buildings); DGNB System (buildings); PassivHouse (building); HQE – Haute Qualité Environnemental (High Quality Environmental standard); Minergie (buildings); European Technical Assessments – ETA; CERA 4in1 certification system; CEN/TC 350 'sustainability of construction works'; ISO 14001. Environmental Management System</p> <p>Partially mandatory: Building Research Establishment Environmental Assessment Method (BREEAM)</p>

EU ENVIRONMENT AND CLIMATE POLICIES MOST RELEVANT FOR ETV AT EU LEVEL AND THE 6 LIFEPROETV FOCUS COUNTRIES

EU Level

Industrial Emissions Directive	<p>ETV could add a value delivering innovations for large industrial applications to be considered as emerging techniques under reference documents BREFs. Reciprocally, BREFs may also serve as source of information on the key environmental aspects relevant for a given industry to be considered as elements of performance claim to be verified under ETV for technologies with an intended application in a specific industry sector covered by BREFs.</p> <p>Link to ETV technology areas: all areas, however with focus on technologies for industrial applications.</p>
Zero Pollution Action Plan	<p>ETV may contribute to provide adequate level of technical data on the performance of verified technologies to support the implementation of the Action Plan and the resulting regulations. ETV may contribute in particular to:</p> <ul style="list-style-type: none"> creating thematic hubs such as a Clean Air Tech Hub and a Soil Pollution Hub offering a mechanism to support a transparent, robust, systemic and integrated benchmarking of technologies, providing a complementary set of tools for creating a level playing field for new technologies, now the document mentions such tools only for organisations/enterprises based on Product Environmental Footprint and Organisation Environmental Footprint. It will ensure that the technologies placed on the EU market are sustainable, circular and minimise waste and pollution, supporting the link proposed in Zero Emission AP for accelerating innovation uptake in relation to IED and Innovation Observatory as mentioned above, improving compliance with EU pollution prevention laws and promotion of the use of cutting-edge technologies to boost national capacities for monitoring (monitoring and

	<p>measurement technologies for water, air, soil emissions can be verified under ETV) as well as pollution control solutions,</p> <ul style="list-style-type: none"> digitalisation as cross-cutting issue (possible option: verification of services under ETV based on digital solutions, ETV standard ISO 14034 defines technology as product, process service) that could also open new opportunities for ETV. <p>Link to ETV technology areas: all areas, however with particular focus on the new technology areas such as soil and groundwater remediation, cleaner production processes and air pollution abatement technologies.</p>
Sustainable Products Initiative	<p>A core aspect of the initiative includes revision of the Ecodesign Directive and extending its scope beyond energy-related products and make it deliver on circularity. ETV could contribute with providing technologies that are enablers for improving product durability, reusability, upgradability and reparability or confirming the performance of technologies and products in that respect, technologies enabling increasing of recycled content in products and facilitating remanufacturing in the context of the revised Ecodesign Directive and the Sustainable by Design Initiative.</p> <p>Link to ETV technology areas: waste, materials and resources as well as cleaner industrial processes.</p>
EU Green Taxonomy	<p>EU Taxonomy is an important tool to direct funding towards sustainable innovation. ETV may support the implementation of Taxonomy by:</p> <ul style="list-style-type: none"> providing a mechanism enabling the uptake and financing of innovative, emerging technologies that is currently somehow missing. For example, ETV could serve as a default mechanism for providing proofs on their significant contribution to sustainability objectives via verification of performance in order to make these innovations eligible for financing by default if they are ETV verified. This mechanism could be based on the link between the Technical Screening Criteria defined for the environmental objectives that often correspond to the performance parameters of technologies that may help achieving the required minimum values/thresholds. ETV can also support demonstration by the technology owner, especially in the case of SMEs, of the compliance of the verified technology to the technical screening criteria of Technical Report, for the purpose of assessing the environmental sustainability of the verified technology towards financial market actors offering 'green' financial products as well as other market actors. Reciprocally, when verifying the performance of green innovations under ETV, the Technical Screening Criteria may serve as a source for the definition of the performance claim and environmental parameters to be verified taking into account the environmental impacts associated with the intended application of the technology. ETV could contribute to creating a monitoring or revision mechanism based on the verified technologies enabling updates of the Technical Screening Criteria. For documenting taxonomy eligibility and alignment. ETV Statements of Verification, on the same principle as third party ecolabels may help auditors in such assessments providing information relevant to compliance to the technical screening criteria. <p>Link to ETV technology areas: all 7 ETV technology areas.</p>
EU Plastic Strategy	<p>ETV covers verification of technologies that can support the uptake of technologies contributing to an increase in the share of recycled materials in end products, the conversion of</p>

	<p>(difficult) waste plastics into raw materials as well as the development of new biodegradable or compostable polymers with a lower environmental impact than those used so far.</p> <p>An ETV Statement, may also be potentially used to evaluate the suitability of this technology / polymer as a substitute for other plastics in a given application.</p> <p>Link to ETV technology areas: waste, materials and resources.</p>
EU Action Plan on Critical Raw Materials	<p>Similarly as above, ETV may serve as a mechanism to address the innovation challenge related to the implementation of solutions that reduce the use of critical raw materials that can replace conventional technologies e.g. technologies that can separate critical raw materials from waste or by-products, leading to a significant reduction in imports from outside Europe.</p> <p>Link to ETV technology areas: materials, waste and resources.</p>
EU Bioeconomy Strategy	<p>ETV can support the innovation challenge addressed in the strategy offering a mechanism relevant for modernisation of primary production systems through bio-based innovation supporting the market uptake of new green technologies especially:</p> <ul style="list-style-type: none"> ▪ new technologies which can turn waste from farming, cities, food & forests into new added values products, ▪ develop best renewable alternatives to replace fossil material, ▪ develop substitutes to fossil-based materials that are bio-based, recyclable and marine biodegradable. <p>The strategy also seeks to promote standards, labels and market uptake of bio-based products. ETV could be one of them especially in B2B relations.</p> <p>Link to ETV technology areas: waste, materials and resources, water technologies, cleaner production processes and environmental technologies in agriculture.</p>
Farm to Fork Strategy	<p>ETV could play an important role delivering innovations with proven performance for applications either in agriculture to make agricultural practices beneficial for the climate and the environment, for efficient and sustainable water use, along with water protection, improving the environmental performance of food production value chains and reducing waste. The strategy also mentions the need for investments, innovation and derisking investments which ETV could support either as derisking tool or providing a portfolio of innovations to invest. Support of ETV for the Field to Fork Strategy could be built on the existing programme VERA⁷.</p> <p>Link to ETV technology areas: water technologies, energy technologies (energy efficiency), cleaner production processes, environmental technologies in agriculture and waste, materials and resources.</p>

⁷ VERA: <https://www.vera-verification.eu/> The purpose of VERA is to enhance a well-functioning international market for environmental technologies to help solve the environmental challenges of agricultural production.

<p>8th Environment Action Plan</p>	<p>Priority (f) of the 8th EAP calls for promoting environmental sustainability and reducing key environmental and climate pressures related to production and consumption, in particular in the areas of energy, industrial development, buildings and infrastructure, mobility and the food system. ETV could clearly contribute to this priority, supporting also EMAS as well as other technical standards, complementary environmental schemes and labels relevant for demonstrating environmental performance of products and organisations.</p> <p>An impactful option strengthening and streamlining ETV recognition at the EU level would also be through setting up a supportive EU legal framework for ETV, similar as the one established for the European Environmental Management and Audit Scheme (EMAS). With ETV remaining a voluntary environmental scheme. There is already a pool of knowledge, experiences and lessons learned from the development of the EMAS legal framework including the EMAS Regulation with later amendments 53 supported by an appropriate guidance on its implementation 54, rooted in the subsequent Environment Action Plans. The adoption of the 8th Environmental Action Plan could create an opportunity for a legislative proposal for ETV.</p> <p>Link to ETV technology areas; all 7 areas</p>
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LIFEproETV focus countries

Poland

Air protection policies

Air quality in Poland is very bad, and the standards for nitrogen oxides are notoriously exceeded in major agglomerations. Protection of air quality poses many challenges for Poland. This concerns not only national authorities, but also regional and local authorities and the economic sector. Wide implementation of ETV scheme could support many actions undertaken by local authorities to improve the situation. For example, ETV could form the basis for a certification system for sensors to monitor local air quality. Currently in Poland there are no clear quality guidelines for this type of equipment, while the demand for building local air quality monitoring systems is constantly growing. The creation of such networks is not regulated in any way, and devices of various manufacturers with different quality parameters are used, which affects the reliability of those systems and the data they provide. This is especially important when these data are the basis for local decision-making processes. The need for an evaluation system for air quality sensors that would provide reliable and clear information about the performance of these devices has been reported by both manufacturers and local government entities, including, for example, resort cities and metropolitan associations. In addition, ETV can help, for example, in the area of secondary street emissions – caused primarily by street cleaning – when verifying street cleaning equipment in connection with public procurement. According to the adopted Environmental Protection Law, individual local governments were given the right to introduce regulations prohibiting the operation of certain types of boilers and heating stoves and selected types of fuels. Basically, the anti-smog resolution indicates the following systems as preferred heating methods: district heating, gas heating, electric storage heating, renewable energy sources, installations burning biomass (low moisture). ETV Statements held by technology providers can assist local authorities in their decision making and thus accelerate the implementation of the anti-smog regulation. As far as industrial emitters are concerned, air pollutants include substances emitted into the atmosphere as a result of fuel combustion + VOCs, in which power generation plays a major role, as well as technological processes of chemical, metallurgical and refining industries, and mines and cement plants. In this case, ETV can play an important role in the permitting process (integrated permit or permit to introduce gases or dust into the air). A permit application requires information on the type of installation, the equipment and technologies used, and the technical characteristics of the emission sources. An ETV Statement obtained by a permit applicant would sufficiently facilitate streamline the permit decision-making process. ETV could also be used to demonstrate compliance with legally required emission levels for new technologies, again as part of the environmental assessment process. Funding for implementation of the ETV Programme is included in environmental funding, allowing ETV to be incorporated into technology projects across a broad environmental spectrum.

Climate policies

The National Green Investment Scheme offers a wide range of funding opportunities for climate change mitigation and adaptation actions at local, regional and national levels. These actions cover many areas ranging from education, infrastructure, research and innovation, nature-based solutions, industrial transformation, etc. The Law on the system of managing emissions of greenhouse gases and other substances creates instruments for the implementation of the ETV scheme. The ETV scheme can be embedded in technology-related projects implemented with national or regional funds on a voluntary or mandatory basis. For example, all new technologies in the area of climate change adaptation or mitigation (energy, transportation, construction, water, nature-based solutions) could be subject to ETV verification. In addition, since most climate change adaptation activities are carried out by local authorities, the ETV scheme could be included in green public procurement or green innovative procurement systems.

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The GHG Emissions Trading System Act has some options to incorporate ETV and improve the emissions management process: 1) the application forms for opening a registry account and for allocation of emission allowances include, among others, complete information about the installation, the ETV Statement could be an additional source of information/verification of the information provided by the installation owner 2) in the process of allocation of emission allowances for a new installation, ETV could be an additional condition/precondition.

Water policies

ETV Statements could serve as evidence of technology performance required in water permit application documents, such as for wastewater discharge developments to demonstrate the quality of discharged wastewater and its compliance with minimum requirements, or for water recycling developments and its use for various purposes to demonstrate the quality of recycled water. For utilities, ETVs can play a role as evidence of compliance with the revised Water Directive under the Green Deal's zero-pollution goal in adopting current processes used by wastewater treatment plants and water treatment plants to achieve stricter water quality standards that are more stringent than WHO recommendations, and in combating emerging contaminants such as endocrine disruptors and PFAs, as well as microplastics. These requirements will stimulate the need for utilities to adopt new technologies on the one hand and new monitoring solutions on the other. It may stimulate interest in ETV, provided, however, that utilities, consider ETV Statements as evidence in bidding procedures. ETV can also be linked to new business opportunities and models related to wastewater treatment and nutrient or chemical recovery and sludge management. ETV can facilitate such business opportunities by both: providing utilities and industry with information on the performance of technologies for the water sector that improve energy efficiency, enable substance recovery or produce secondary raw materials (recovery efficiency, quality of the resulting product vs its use, quality of recycled wastewater and their compliance with the requirements of Regulation (EU) 2020/741 of the European Parliament and of the Council of 25 May 2020 on minimum requirements for water reuse or other specific uses), as well as technology providers: with the ability to demonstrate to users in a credible way the performance of their offerings, so that they are able to identify the best performing solutions that meet their operational conditions and needs.

Innovative solutions and technologies in the water and wastewater management are one of seventeen national smart specialisations (NSS). It covers 6 areas: improvement of water quality for consumption and economic purposes; increasing water resources for consumption and economic purposes; improving the quality of surface and groundwater; wastewater treatment; recovery of water and other raw materials from wastewater; use and recovery of energy in water and sewage management. The location of such targeted solutions among NSS creates additional opportunities, and entrepreneurs implementing projects that fit into smart specialisations can count on support from EU funds. By linking ETV with smart specialisation, a mechanism could be created that would combine development of such solutions with the post R&I business models development for them to support their market uptake, reduce the risk of market failure and provide a green guarantee of their performance to the technology users/investors.

Soil protection policies

Soil degradation in Poland is largely due to industrial activities (mainly steel mills, landfills, open-pit mines and waste dumps), agricultural activities and the activities of former Soviet military bases (contamination with petroleum compounds), which require remediation. In connection with these obligations, various types of studies are conducted to determine the location of contamination and to decide on remediation

measures. The landowner is required to develop a remediation plan that includes the method of remediation. The ETV Statement of Verification could be considered as a tool to assist in the identification and selection of effective technologies, in particular in-situ soil and groundwater remediation methods, as an alternative to ex-situ methods, contributing to the reduction of overall remediation costs and the generation of large amounts of waste that must then be managed or landfilled. The Strategy for Sustainable Rural, Agricultural and Fisheries Development 2030 defines strategic actions and projects to support rural, agricultural and fisheries development on a regional basis. ETV can be considered as a tool to support investments that foster sustainable farming in line with some of the strategy's assumptions including the protection of agricultural soils, support for investments that foster environmental protection on farms, dissemination of technologies that increase productivity with less use of crop inputs i.e., pesticides and mineral fertilisers.

Raw Materials policies

Introducing new Extended Producer Responsibility (EPR) regulations into national law should be one way to promote eco-design and manufacturing of products that take full account of and facilitate the efficient use of resources throughout their life cycle. With ETV it will be possible to verify whether natural resources are used efficiently in a given technology, whether materials are made according to customers' needs, so that they can reduce EPR charges.

Energy Efficiency policies

Public authorities may use the ETV Statement as a confirmation that verified materials used for construction and equipment having direct influence on the energy efficiency level of the building will meet the requirements imposed by the Act. If Polish verified technologies are used for construction/renovation, the administration will directly contribute to the promotion of these technologies and to the increase of innovation in Poland in this sector. This may especially apply to Polish innovative technologies developed under national R&D support programmes. Technology developers can take advantage of ETV with the required certifications for building materials that offer the potential for significant energy savings (especially those with energy efficiency parameters above standards). If Polish verified energy efficient technologies are promoted by governmental institutions (the law imposes the necessity of promotion of energy efficiency measures by central and local administration), the producers can reduce their marketing budget and reach the market that is contracted by public authorities. Improving energy efficiency in the energy sector, for example, improves the efficiency of energy distribution with the use of smart-grid solutions, increases the production from distributed sources of RES, the use of modern energy storage, including new technologies for the production and use of hydrogen, new batteries. Heat recovery from ventilation and the use of energy-efficient lighting will soon be a required standard in newly constructed residential buildings. ETV can very well serve as an enabler for the above strategic goals of rapid deployment of new energy efficiency technologies emerging on the European market. Strategic documents also indicate that the improvement of energy efficiency will be fostered by innovative solutions, therefore it is very important to conduct research and development work in this area. Utility parameters (expected effect) of the produced innovative technologies being the subject of R&D works may be independently confirmed within the EU ETV Programme.

Waste policies

ETV can help to reduce the administrative burden in particular in the following situations: when applying for a waste treatment permit, which can only be issued after an inspection of the installation for compliance with the requirements set out in the legislation. ETV can help to decide whether such requirements are met. If a new product is developed using a particular type of waste, the ETV Statement can help to ensure that the verified by-product meets the declared technical/functional parameters for further use as a raw material and to obtain a certificate of loss of waste status. ETV can help in the selection of technology in the process of obtaining the required waste permit the applicant needs to identify ways to prevent or reduce waste and its negative impact on the environment. ETV Statement can assist in the selection of technology that meets such requirements. According to the National Waste Management Plan 2022 in Poland, financial support will be given to SMEs carrying out activities related to changing technologies to innovative and low-waste technologies. ETV Statement can help prove that a technology is innovative and/or low-waste. Eco-design will also be promoted where ETV can be part of the scheme. According to the National Environmental Policy 2030 the target and priority sectors are: waste recycling, processing and utilisation of secondary raw materials. According to this policy, Polish environmental technologies should be promoted by government programmes at home and abroad. The ETV would help to identify the most innovative and environmentally added value technologies. Low innovative activity of Polish SMEs is one of the weaknesses of the Polish economy. Innovative solutions are connected with higher risk in comparison with commonly used solutions. In this case ETV supported by the state should increase the number of implementations of innovative technologies. A significant problem in Poland is the failure of the food industry to adjust to the EU

requirements, e.g., in terms of waste generated in the processing of meat, potatoes or sugar. ETV Statement may help to find technologies which properly manage post-slaughter and post-production waste.

Spain

Air protection policies

Monitoring and reporting of air pollution results is mandatory for some industries. Royal Decree 39/2017 states that technologies other than official methods can be used to monitor air pollution only if their accuracy is comparable to official methods as confirmed according to ISO 17025. ETV could be used to identify technologies that meet these requirements. Such solution would be beneficial for both the recipients of those technologies (e.g., industry) and their producers. The national programme of atmospheric pollution control aims to reduce between 50% and 80% of air pollutants such as SO₂, NO_x, PM_{2.5}, among others, by 2030 compared to 2005. To achieve this, the programme indicates the need to acquire new technologies. ETV can be used to identify and verify such technologies that contribute to the achievement of the programme's objectives. One of the activities of the programme is the promotion of innovative technologies for air protection which are in the R&D phase. ETV can be used as a confirmation of meeting the requirements set out in the programme as properly spent public money.

Climate policies

The law on climate change and energy transition envisions a broad group of entities that will have to monitor and report their climate impacts and, if necessary, take certain measures to reduce those impacts. ETV could provide utilities and industry with information on the performance of technologies for different sectors in terms of potential GHG emission reductions. The national plan for the adaptation to climate change reinforces the importance of promoting the development of innovative environmentally friendly technologies in various economic services. Economic incentives for research and development can be demonstrated by verifying such technologies in ETV.

Water policies

The ETV can be used as a positive differentiator during the tendering process, helping to promote the acquisition of innovative green technologies for the water sector as it is able to demonstrate technology performance beyond regulatory parameters and polluted water quality limits. The ETV Statement of Verification can assist in the administrative procedure by providing clear information on the characteristics and performance of the technology, facilitating decision-making by the administration when issuing permits to industry. Environmental fees set by law depend on the quantity of water produced as well as its quality. ETV can be used by various industries to identify those technologies that contribute to reducing water discharge and improving water quality. The Royal Decree on Wastewater Reuse, establishes water quality requirements for various reuse purposes. The ETV Statement of Verification can identify those technologies that operate in accordance with water recycling requirements. The National Water Research and Innovation Strategy establishes criteria to determine how innovative a technology is, so ETV can be used as an instrument to identify these innovative technologies, facilitating their market uptake through acquisition by public water utilities. ETV can therefore be used to ensure that public funds are properly spent and as a way to stimulate innovative green technologies. Public water sector focused on traditional water treatment technologies, low innovation risk due to the nature of the sector. ETV as an instrument that guarantees both innovation and efficiency, lowers the risk of acquiring innovative technologies. The National Climate Change Adaptation Plan aims to reduce the use of water used for agricultural purposes to combat desertification. ETV can help identify such technologies. Economic incentives may be considered for those farms that acquire green water saving technologies.

Soil protection policies

The Environmental Responsibility Act establishes certain criteria for selecting technologies to decontaminate contaminated soils, which include environmental and performance criteria. ETV can be successfully used to select soil remediation technologies that meet the objectives of the regulation. The Basque National Plan aims to organise information at the regional level on new technologies for monitoring and cleaning up contaminated soil. The plan identifies technologies that have the greatest economic and environmental potential. ETV-verified technologies with proven environmental and performance parameters could be promoted by the Basque authorities in a revision of the plan. With this solution, companies developing these technologies would benefit from the promotion carried out in this way by the administration, while technology buyers will be able to easily identify the right technologies for their needs. The use of ETV in confirming the performance of new technologies reducing emissions to soil will have a positive impact on the quality of the environment as well as contribute to avoiding sanctions for non-compliance by potential emitters (industry).

Raw Materials policies

The newly introduced waste and circular economy law in Spain sets priorities for recycling and resource efficiency. The use of ETV-verified technologies could help companies or organisations to improve and demonstrate good resource efficiency, while helping to reduce the administrative burden for these companies and organisations. In addition, reputational incentives can be expected for those companies that go beyond the targets and limits required by legislation. ETV can demonstrate above average performance. The circular economy strategy aims to reduce the consumption of raw materials by 30% by 2030 compared to 2010. In the same timeframe, the amount of generated waste should also be reduced by 15% compared to 2010. ETV can be used to identify and promote new technologies for both public and private entities, guaranteeing efficiency and reducing the risks arising from investment in innovation.

Energy Efficiency policies

The Sustainable Economy Act encourages public administrations to include energy efficiency in public procurement. ETV verified technologies and products can be used to demonstrate energy efficiency to help public administrations identify green technologies. Near-zero energy buildings for public administration are regulated by the Energy Efficient Buildings Law. The use of equipment or technologies that produce energy from green sources, tested and demonstrated under ETV, can be very helpful in proving a building's green performance. Energy efficiency is one of the priorities for the coming years included in Spain's Next Generation strategy. ETV as an instrument to support green technologies can be of great importance in the different sectors involved, such as public administration, construction and transport, to incorporate innovative technologies to achieve the objectives of the plan.

Waste policies

Catalan legislation aims to include on-site residue treatment for those companies that produce large amounts of waste. Therefore, ETV can help identify on-site treatment technologies, and then companies that purchase these proven technologies can benefit from a reduction in taxes related to waste disposal.

Italy

Air protection policies

The introduction of an air quality and emissions monitoring network throughout the Italian territory is a necessary action to obtain timely and accurate data. Monitoring activities provide the conditions under which local authorities implement measures required by European, national and regional legislation to protect human health and the environment. Air monitoring is also essential for quickly identifying hazardous situations and tracking changes in pollution levels over time to assess the effectiveness of corrective actions taken. ETV can provide performance proof of innovative air monitoring technologies to the local authorities responsible for monitoring networks building and maintaining the quantitative and qualitative enhancement of existing monitoring networks, in order to obtain more accurate, detailed and timely measurements.

Climate policies

To achieve the targets set by 2030 in the National Integrated Plan for Energy and Climate such as increasing the share of RES, reducing energy consumption and significantly reducing GHG emissions, a number of measures and policies are envisaged. These cover various thematic dimensions, including the decarbonisation and energy efficiency dimension in the reduction of CO₂ emissions in the agriculture, waste and land use sectors, among others; the conversion of renewable energy sources in the electricity, heat and transport sectors; energy efficiency in the main economic sectors. In this very broad panorama of issues, the measures adopted mainly concern the introduction of carbon pricing, the transition to circular models, the simplification of procedures and permits, and the acceleration of the search and dissemination of innovative solutions. In this context, the adoption of ETV as a requirement could play an important role, so that directly applicable technologies have access to incentives for technological innovation, also through recourse to specific European funds, including funds for research and innovation. Furthermore, the use of verified technologies could contribute to simplifying procedures and authorisations.

Water policies

A priority issue in Italy is to upgrade and increase the efficiency of water collection and distribution infrastructure. ETV could play an intermediary role in disseminating innovative technologies throughout the supply chain and, in particular, in solving "systemic problems" by developing technologies to monitor and repair network losses. Water utilities will thus receive confirmation of compliance requirements. ETV could provide assurance that wastewater treatment plants are operating and achieving high environmental performance and effluent quality, both in terms of mandatory national limits and the limits needed to

guarantee quality objectives in different contexts at the local level. Compliance with effluent quality objectives, the limits of which are defined for water bodies in Regional Water Protection Plans, is overriding and in many cases more restrictive than general national limits. ETV Statement could encourage the use of technology for the benefit of businesses and lead to innovation networks between clusters and SMEs, towards broader common goals of protecting and improving water resources. As required by the Transition Plan 4.0, the adoption of water conservation and reuse technologies in the high-pump industry sector could provide economic benefits to businesses and tax incentives that would provide new economic stimulus to the industrial sector.

Soil protection policies

In the remediation of contaminated sites, ETV could play a leading role in proposing verified technologies among those identified by the competent authorities as potentially applicable during the preparation phase of an in situ or ex situ remediation project. ETV could therefore provide local authorities and industrial operators with a technological platform that would allow them to select the technologies to be tested by choosing the most appropriate ones based on the environmental results to be achieved.

Raw Materials policies

The application of innovative technologies that support the circular economy are the basis for the creation of an industrial action that state policy intends to support through the implementation of a series of economic measures, such as bonuses and tax incentives, in order to accelerate the transformation process. ETV can be considered as a tool to support investment towards a circular economy. The ETV Statement can be a proof of performance for technologies to measure and monitor the use of inputs, in order to reduce the amount of materials / inputs used (e.g., raw materials and energy), and therefore to improve the internal efficiency of the company, as well as limited environmental impact.

Energy Efficiency policies

The energy saving objectives outlined in the National Energy Strategy concern different sectors: the residential sector; the transport sector; the services sector; the industrial sector. In each of these sectors, ETV can play a key role in ensuring that the requirements to access the incentives and tax credits available in the different sectors are met. Industry is encouraged to deploy energy efficient technologies using white certificates. Companies using verified technologies under ETV could be more confident that they will achieve the expected results associated with reduced energy consumption. ETV could also play a role in the area of business R&D investment supported by industrial policy through tax credits.

Waste policies

By confirming the environmental efficiency and performance of the technology, ETV will be the ideal solution to facilitate, from an administrative and political point of view, the construction of new waste recovery, treatment and disposal facilities in those areas of the country where there is a great shortage of infrastructure in relation to needs. Such implementation would help increase compliance with the hierarchy, self-sufficiency and proximity principles in waste management operations imposed by current legislation and create an integrated and innovative municipal waste management system. Verified technologies in the EU ETV Programme could therefore ensure compliance with the environmental requirements established in public procurement for the implementation of new plants using the best available technologies and ensure performance monitoring.

Slovenia

Air protection policies

When applying for an environmental permit for an installation that emits pollutants into the air, it is necessary to describe the technology used, the use of fuels and raw materials that may cause emission of gases. Technologies with an ETV Statement of Verification have a better chance of being granted a permit, as the emission reductions are independently verified and the technology must not have a negative impact on the environment in other respects. In addition, innovative ETV-verified technologies could be used to monitor air emissions because their performance is confirmed by accredited bodies. Less administrative burden would be required for companies or institutions that need to report their emissions and would likely speed up the process of applying for an environmental permit for their operations.

On the basis of the NEC Directive, Slovenia has to significantly reduce emissions by 2030 compared to 2005, namely SO₂ by 92%, NO_x by 65%, NMVOCs by 53%, NH₃ by 15% and PM_{2.5} by 60%. The most significant source of SO₂ emissions is electricity generation. The Operational Programme for Low Emission Reduction is expected to fund the replacement of old heating equipment with new energy efficient and renewable energy

sources. Technologies verified in the ETV Programme can be ideal to confirm their high efficiency for the programme operator.

Climate policies

According to the strategy until 2050 in the Integrated National Energy and Climate Plan, Slovenia is to become a climate-neutral country based on sustainable development, which means that it must manage energy and natural resources efficiently. To this end, national support has been created for pilot projects to develop and use sustainable technologies for the production of synthetic fuels from woody biomass and other lignocellulosic sources. This is a great opportunity for innovation in these technological areas and the incorporation of ETV as a tool to validate their performance and environmental impact and to accelerate the deployment of these technologies.

Water policies

According to the regulation on the ecological tax for sewage pollution, homeowners must be connected to the sewerage system, but if there is no regulated public sewerage system, owners must have small municipal sewage treatment plants instead of septic tanks. Before installing a treatment plant, approval must be obtained from the public service provider, after which owners are eligible to apply for an environmental tax reduction. ETV verification can help small innovative biological wastewater treatment plants to enter the market that cannot obtain CE certification due to lack of standards. Moreover, the more environmentally friendly solutions that ETV represents are well accepted by public institutions, especially if they were additionally financially supported by the government. After 2030, only technologies that can recover phosphorus from sewage sludge are expected to be available to all larger municipal wastewater treatment plants. Currently, these are energy-intensive technologies. ETV-verified technologies in this area should be encouraged for use at the national level, as ETV is a qualitative proof of efficient energy use.

Soil protection policies

In some areas there is a need to clean up contaminated soils and remediate land, which is often technologically difficult and expensive to implement. Some remediation technologies can be difficult to certify due to the lack of standards, so ETV can be a good tool to validate the performance in a specific remediation area of a technology. Slovenian Soil Partnership is a voluntary association of organisations and individuals in Slovenia, which can be joined by anyone who wants to get information on content related to sustainable soil management and protection. One of its objectives is to exchange results and information in the field of soil protection and to promote, support and guide research and development in the field of sustainable soil management. ETV should be promoted in such partnerships and help them to select appropriate technology for its members.

Raw Materials policies

Subsidies, loans and later tax reductions are available for exploiting renewable resources and obtaining green energy. This could stimulate research and development of such technologies and give ETV the opportunity to identify them. ETV could support this vision by validating the quality and environmental performance of new technologies e.g., in the construction sector that use secondary materials instead of natural resources. An incubator, ADRIA Raw Materials, has been established to attract holders of innovative ideas to participate in programmes that support business development and help create new companies in the raw materials economy. ETV could be successfully used as part of an incubator operation, or a network of companies working together in the field of sustainable raw materials management.

Energy Efficiency policies

Eco Fund, the Slovenian public environmental fund established under the Environmental Protection Regulatory Act, prepares and implements energy efficiency improvement programmes where grants and loans are available for pro-environmental investments. ETV can be an excellent tool included in these programmes to identify technologies with high potential for efficient energy use or for reducing energy losses.

Waste policies

The Waste Regulation focuses on packaging waste management and implementation strategies for landfill reduction of biodegradable waste. ETV can help innovative technologies that reuse materials from waste (zero-waste technologies) to enter the market faster, as there is usually a lack of CEN standards to certify these technologies. According to the Waste Management Programme, Slovenia emphasises waste prevention, giving priority to preparation for reuse and recycling over energy recovery from waste, and waste recovery over disposal. Specific targets and measures apply to municipal and industrial waste. The use of ETV-verified technologies could help achieve the programme's objectives, by including ETV in tendering procedures. A major problem in Slovenia is sewage sludge and its management. Currently there is a great

need for technologies that would help to reduce this type of waste. This will increase the innovation of wastewater treatment technologies that will be suitable for ETV verification.

France

Air protection policies

Some taxes are directly related to air pollution. These include the general tax on polluting activities (TGAP) that applies to industrial emissions, fuel tax, company car tax, etc. ETV can support the development and deployment of innovative air pollution sensors (e.g., <PM2.5 nanoparticle sensors), as well as the development of new technologies to clean up industrial gaseous emissions.

Climate policies

The project law on the fight against climate change stipulates that the introduction of clauses in public contracts on the environmental aspects of services, which are currently only an option offered to the public purchaser, will become mandatory, for example in the form of technical specifications or specific performance conditions. The ETV can support the procurement process. The Energy and Climate Act encourages the development of a low-carbon or renewable hydrogen sector as a priority area for investment in France. The law sets out the prospect of achieving 20-40% of total industrial hydrogen consumption by 2030, and to implement systems to support and track hydrogen use. This will help achieve the 2030 target in the national low-carbon strategy for industry of more than 33% reduction in greenhouse gas emissions. The French government is providing support for research and development to develop more efficient technologies for all hydrogen applications. ETV can assess the technical feasibility of these technologies as well as their environmental impact in the context of achieving the climate goals.

Water policies

The presence of new contaminants in water (pharmaceuticals, pesticides, disinfection by-products, microplastics) requires the development of new effective treatment technologies as well as the development of sensors capable of detecting, identifying and quantifying these new contaminants and their transformation products in aquatic environments. With ETV, companies developing new treatment solutions or innovative sensors can prove their technology works. Local authorities, responsible for managing water and wastewater services, can select the most appropriate innovative solutions, reducing the risk of not achieving the required performance by selecting verified technologies or by considering the ETV framework when purchasing to assess the performance of innovative solutions.

Soil protection policies

The ETV standard provides a rigorous framework for local authorities and industrialists in charge of redeveloping brownfields and polluted sites to compare and select the technical and environmental performance of the innovative solutions proposed to them, while at the same time securing the risks of non-achievement of performance. ETV enables suppliers of soil monitoring and treatment technology to demonstrate the performance of their innovations.

Raw Materials policies

With the new law significantly expanding the scope of EPR for many materials and products for consumer and industrial use, there will be a marked increase in demand for technologies that will allow these end-of-life waste streams of these materials/products to be separated, characterised, treated (recycled) or recovered. ETV will allow developers of these technologies to demonstrate the technical and environmental capabilities of their innovations. The structures responsible for collecting and treating waste from these new EPR ranges will have to select the most appropriate technologies. These structures will also finance the development of some promising technologies. ETV can be a good tool to bring such innovative technologies to market. In addition, ETV provides a framework for comparing the performance of the different technologies that will be proposed to them and will facilitate the selection of the most suitable ones. The level of recycling that can be achieved by a technology, as well as the compliance of the recycled product with the input specifications of the recovery stream, are parameters that can be verified in the ETV scheme. These results will allow the recycling rate to be evaluated and compared to the targets set by public policy on the basis of reliable and credible data.

Energy Efficiency policies

The Innovation Acceleration Strategy "Advanced Technologies for Energy Systems" aims to promote the development of a French new energy technology industry that will mainly contribute to meet current and future global demand for the increasing development of renewable energies. Energy production from waste is also a growing sector in France, in terms of developing more efficient methanation technologies or pyro-gasification technologies for biomass or residual waste. The ETV Programme can support the achievement of strategy goals by assessing the environmental impact and proving the effect of efficient energy production technologies.

Waste policies

Achieving the objectives of the Anti-waste law for a circular economy means improving waste collection and sorting in order to increase recycling rates. Local authorities, responsible for the management of municipal waste, will therefore have to increase efficiency in the collection, sorting and treatment of waste. They will have to apply new, emerging technological solutions that may have few implementations. Adding performance verification criteria for their proposed technologies in public procurement procedures would reduce the risk of not achieving the performance of the selected technical solution. The introduction of performance ETV verification criteria in public procurement can be based on the independent and rigorous European ETV standard, which also fulfils the recent obligation to introduce environmental criteria in public procurement.

Hungary

Air protection policies

The National Air Pollution Reduction Programme sets goals to reduce emissions from households, transport, agriculture and industry. New technologies that meet these targets, e.g., more efficient technologies for gas cleaning in industrial processes or heating technologies, and which have Statement of Verification, may have an advantage on the market due to the quality, reliability and independence of the ETV scheme.

Climate policies

According to the National Decarbonisation Roadmap, one of the directions for reducing greenhouse gas emissions is the use of CO₂ sequestration and storage technologies. Since this must be done with the least possible risk, it will be necessary to find and identify the best technological solutions. In this process, ETV can play an important role because of its unique characteristics. According to the NDR, low-energy and fertiliser-efficient technologies are to be used in agriculture, in the selection of which ETV can play a role. Vulnerable sectors, such as agriculture, will implement flexible and innovative adaptive technologies to minimise risks and increase productivity. To this end, research and innovation will be supported, where ETV can play a significant role because it is a reliable, credible way to verify the performance of an innovation.

Raw Materials policies

Multinational companies are already obliged to use environmentally friendly technologies for raw materials. In this case, ETV has great potential, as such companies can be more open to innovation, as well as having financial and administrative tools for new technologies.

Energy Efficiency policies

As stated in the National Energy Strategy, energy efficiency should be improved while increasing the share of renewable energy sources. The share of energy obtained from renewable sources should clearly increase, and technologies that are innovative and energy efficient could be targeted for ETV claims.

Waste policies

ETV Statement can help to prove that a given technology is either innovative and/or low waste technology. Technologies can benefit from the ETV Statement, which confirms through a third-party validation that their technology meets regulatory requirements, but also helps waste management companies identify technologies that meet their performance criteria. ETV technologies could also play a role in reducing and phasing out unsorted waste from landfills.

INNOVATION POLICIES AND PROGRAMMES MOST RELEVANT FOR ETV IN THE 6 LIFEPROETV FOCUS COUNTRIES

Poland

GreenEvo - Green Technology Accelerator

GreenEvo is a programme of the Ministry of Climate and Environment, designed to promote Polish green technologies. The core of the Programme is the support of Polish environmental technologies at home and abroad. Its main task is to help Polish small and medium-sized companies to establish international contacts, as well as to provide them with knowledge and tools enabling a dynamic development. Actions taken under the Programme comprehensively stimulate sustainable development and strengthen the position of innovative green technologies in the process of building a circular economy. Technologies that apply to the programme must undergo a detailed expert assessment evaluating the achieved performance and environmental parameters as well as the market potential of a given technology. ETV could replace the requirement of expert assessment and at the same time would give confidence to the programme operator that the confirmation of parameters is based on reliable and high quality data. The promotion of ETV-verified technologies outside Poland by GreenEvo would be more effective due to the EU and worldwide recognition of the system, especially of the ISO 14034 standard.

Research, Development and Innovation Programme, (FENG)

Within FENG programme, special attention should be given to the component "Greening enterprises". The aim of the support offered in this component is to transform enterprises towards sustainable development and the circular economy, including the development of new business models. The implementation of the module is intended to change the thinking of companies about the whole business, take into account its environmental aspects and switch it to a circular model: from the selection of contractors and resources, through the design of products and services, to the sustainable production and management of waste and the life cycle of products.

The component includes support for ecodesign, environmental and product lifecycle assessments (such as ETV, PEF or LCA) and implementation of the recommendations and investment support for greening companies, including the implementation of R&D results.

Sixteen regional programs managed by regional governments

The programmes will be financed by the ERDF and the ESF+. The scope of the intervention is based on the Regional Development Strategy and is developed within the framework of working groups appointed by the provincial board, representing different sectors and stakeholders. The aim of individual contract negotiations is to best match programme interventions to the diagnosed needs and potentials of the regions. Regional programmes are subject to intervention among others in the operation and implementation of business R&D activities, support for SMEs, clusters, RES development, energy efficiency, adaptation to climate change, protection of areas valuable for nature, water retention, water and waste water management, waste water.

Including ETV verification costs into eligible costs for example in demonstration projects or in relation to green public procurement within this programme might significantly boost the ETV verifications market in various regions of Poland as well as the development of green technologies. Consultations of regional programmes will be carried out by Marshalls' Offices of particular regions, therefore implementing ETV scheme requires cooperation on regional level.

National Centre for Research and Development (NCBR) – innovation procurement programmes

Since 2020 National Centre for Research and Development (NCBR) is implementing a new way for financing R&D through a new portfolio of programmes based on innovative public procurement including three methods:

Method 1: Pre-Commercial Order (PCP)

NCBR determines the research challenge and orders technology. The results of the projects are developed technologies and built operating and implemented demonstrators on a 1:1 scale

Method 2: Innovation Partnership (PI)

NCBR together with the Partner determines the research challenge and orders the technology. The results of the projects are developed technologies and built operating and implemented demonstrators on a 1: 1 scale. The result of the project is also the first purchase of the technology / solution by the Partners.

Method 3: Great Challenges

NCBR determines the research challenge and orders technology. The result of the projects are prototypes of solutions ready for further development.

The new way of financing R+I includes at present such areas relevant to ETV as: energy technologies, water and wastewater treatment, heating and cooling, energy efficiency in construction.

NCBR is currently implementing various programmes within the innovative public procurement.

Including ETV in the innovation procurement process would be highly beneficial for both sides: procurers and suppliers. It would be a solid confirmation of environmental sustainability of proposed technologies and solutions. It would also confirm their viability for green public procurement. In the longer perspective such system would contribute to boosting the development and wide implementation of innovative, green technologies in Poland as well as create a strong national offer of green innovations with a potential to compete on global markets.

National Just Transition Programme

The programme is to support the implementation of the European Funds for Just Transition Programme. It includes a priority dedicated to pilot projects to test innovative solutions as an experimental approach to build systemic approaches to the identified problem areas related to the just transition process.

Spain

Eight Spanish policies and strategies related to innovation have been reviewed to identify its main characteristics, objectives and how ETV can contribute to these policies and programmes. Five out of the eight documents identified are at national level, whereas 3 of them correspond to regional governments

Spanish strategy for Science, Technology and innovation 2021-2027

The Spanish strategy for Science, Technology and innovation (2021-2027) is the main instrument to strengthen the science, technology and innovation system in the following years. It is managed by the Spanish Ministry of Science and Innovation. The strategy is not restricted to any technical area, rather it is a horizontal strategy for the innovation in both, private companies and public administration. In the first step, the strategy will focus on the investment in ecological transition and digitalisation, boosting research and through specific programmes. The second step, is aimed to implement the research and development as one of the pillars of Spanish economy. One of the specific objectives of the strategy is to boost new technologies, promoting a framework that enables the detection of innovative technologies and incentive their purchase by private companies or public administration. Specifically, the 8th objective of the strategy aims at promoting the innovation within companies mainly, SMEs. Within this framework, ETV could clearly be linked within the strategy as an instrument that allows to identify innovative technologies, through the list of ETV verified technologies, belonging to different technology areas that at the same time provide an environmental added value. The ETV verification of technologies will also contribute to facilitating the acquisition of these technologies by potential buyers (including both, companies and public administration) as it will guarantee the technical performance of the technology, reducing the risks for the purchasing companies related to the acquisition of innovative technologies. Furthermore, the verification of technologies under ETV could serve as a promoting instrument of innovative technologies increasing its visibility and facilitating its market uptake.

Spanish Strategy on Bioeconomy. Horizon 2030.

The Bioeconomy strategy implemented in 2015 aims at boosting economic activity and improving the competitiveness and sustainability of the productive sectors that are linked to the use of bio-based resources, promoting the generation of knowledge and its use for the development and application of technologies derived, through collaboration within the science and technology system and public and private Spanish entities. The strategy, managed by the Ministry of Economy and competitiveness, is focused on agricultural sector, energy (bioenergy) and the development of bioproducts. One of the expected results is the use of scientific research for the development of technologies and their incorporation into companies; existing ones, to reinforce their competitiveness, and those that may arise, to promote new economic

activities based on them. In order to boost the incorporation of innovative bioproducts related technologies or products into the market, the strategy encourages it through public procurement. In this scenario, ETV could be a tool facilitating the utilisation of public procurement for the promotion and acquisition of innovative technologies. For instance, the incorporation of ETV as a positive discriminatory factor under public procurement may help promote innovative technologies with an environmental added-value, facilitating the objective of the policy to use public procurement for the incorporation of innovative technologies under the framework of bioeconomy.

Strategy on sustainable, secure and connected mobility. 2030

The transport sector in Spain is under a big change era. The strategy on sustainable, secure and connected mobility 2030, is under development by the Ministry of Transport and Mobility, and is intended to cover three of the main challenges that mobility faces:

- Introduction of technology within the mobility
- Reduction of carbon emissions
- Concentration of people in cities and hence the challenges for the mobility in these environments and the related health effects.

The strategy reinforces the importance of a sustainable mobility, energetic efficiency and that contributes to the mitigation of climate change. Innovation and technologies will play a key role in contributing to these objectives. Specifically, the strategy highlights the need to enhance those technologies related to mobility that use green energy through boosting research and innovation activities. Furthermore, the strategy aims at the decarbonisation of the transport sector, by the incorporation of technologies that reduce emissions. In order to maximise the results of the research and innovation activities, ETV could be included within the eligible costs, that will help the market acquisition of the innovative technologies developed under research programs. Besides, ETV information on verified technologies could serve to identify those that use green energy and reduce their emissions contributing to the objective of decarbonisation of the transport sector.

Law of corporate Tax. Taxation and discounts for R & D & I activities

The law of corporate tax and discounts for R & D activities in force since 2014, which depends on the Ministry of Presidency is one of the instruments that public administration has to promote the company's innovation including tax incentives and deductions. This tax deductions are based on the realisation of research projects or the development of innovative technologies. This is a horizontal instrument as its application is general and free (it is not a competitive concurrence). Tax deductions are intended to incentivise innovation in the private sector without being restricted to any specific technology area. The policy mentions fiscal deductions for those activities related to innovation technologies. In order to be able to apply for this tax deduction there is a definition of what is considered innovative technology under this law (article 35). In order to shed light on the innovations that can apply for this deduction, ETV could be incorporated in the law as an example of a way to demonstrate that a technology is innovative and that it can apply for these deductions.

Spanish National Guide for public innovation procurement

The National Guide for public innovation procurement is aimed to be the reference framework for political, social and economic public entities, to achieve the objectives to promote innovation in order to transform the Spanish economy in one based on knowledge. This guidance is promoted by the Spanish Ministry of Innovation and Science to boost the innovation procurement in public administrations including both, PIP and PCP. The guidance provides recommendations related to the evaluation criteria, confidentiality, related to R+D and recommendations related to potential financing of the innovation offered.

The guidance mentions some criteria for the technologies or products to be incorporated under the innovation procurement and that also contribute positively to the environment, such as the acquisition of technologies or products with less energy or water consumption, decrease of emissions, reduce residues, etc. In order to demonstrate that a technology complies with these criteria, ETV Statement of Verification, could facilitate the demonstration of the environmental benefit of a given technology in a reliable manner. However, the document provides general recommendations, not mentioning specific criteria. But having ETV could facilitate accomplishment of the required criteria by technology providers.

Valencia plan for ecological production

The Valencia plan for ecological production is developed by the regional government of Valencia to promote ecological production within the agricultural sector. The second plan is under development. The plan defines the strategy to evolve the agricultural sector to practices that reduce the residues and contribute to mitigation of the climate change impact. It promotes the utilisation of agricultural practices that contribute to the reduction of water consumption and contamination and mitigate the desertification of the region.

Besides, it is also aimed at reducing contaminants in water and soil such as pesticides or nitrates that will help to improve the environment and environmental health. One of the key aspects to achieve these objectives is to promote the acquisition, by the agricultural sectors, of new environmentally friendly technologies to renew the old polluting ones as well as to boost research and development in this field. ETV could be used firstly under the research and development activities to demonstrate the development of innovative technologies for an eco-friendly agriculture production, that will demonstrate the environmental benefit of the developed technologies. Once verified under ETV, it would also contribute to the second aim of the plan intended to promote the acquisition of innovative technologies by the agricultural producers, as it will demonstrate both, the performance of the technology and its related environmental benefit.

Euskadi plan for the science, technology and innovation, 2020

The Euskadi plan for the science, technology and innovation developed for the period between 2020-2030 is managed by the regional government of the Basque country. It is intended to promote Euskadi economy based on knowledge. The plan will implement an innovation policy promoting the scientific and technological products demand. The plan wants to incorporate new technologies in the production systems, in new products and process to incorporate added value to the products commercialised, overall, considering sustainable aspects contributing to improving the environmental quality. One of the main gaps identified in the plan is the transfer of the research results into market solutions applicable for public and private companies. To fill this gap, the strategy aims to enhance the resources provided to the research and development focused on the technological research (closer to the market solutions than the fundamental research). Here, ETV could be included as a tool to demonstrate the market readiness of a technology developed under a research activity. ETV costs may be financed under this plan facilitating its implementation and contributing to the objectives of technology transfer from research to applicable market solutions.

Madrid regional plan for the scientific research and technology innovation

The Regional plan for the scientific research and technology of Madrid is promoted by the regional government of Madrid. The plan defines a strategy of scientific research and technological innovation that allows for "positioning the Community of Madrid as a leader in research and innovation at the national and international levels".

The plan is structured around three areas: a) improving the capabilities of the R&D+I system, with a focus on the three aspects of strengthening research agencies and their scientific facilities, attracting and retaining both young and senior talent and promoting projects with exceptional prospects; b) promoting ways to more effectively take advantage of activity generated within the system through the realistic valuation of the results of R&D+I, the protection of these results and the creation of start-ups and spin-offs; and c) enhancing the coordination of R&D+I efforts with European, national and regional funds through the articulation of the entire system and its critical mass. The plan focuses on boosting the innovation within the Madrid region. The programme highlights promotion of the transfer of scientific results to the market and society. There, the plan describes actions to boost innovative technologies and results to increase their market uptake. In the action intended to help companies to introduce their products to the market, ETV verification of the developed technologies can contribute to increasing their market uptake providing a demonstration of their innovative, technological performance and environmental benefit. Besides, the inclusion of some innovative criterion to public procurement is mentioned in the plan, hence, ETV could be included as one of the positive discriminatory innovative criteria.

Italy

Innovation Policies and strategies in Italy are divided in three different levels such as: a) national; b) regional and c) inter-regional documents and agreements. They have been analysed in order to find out how ETV can be integrated and then contribute to boost innovation.

National policy: Strategy for technological innovation and digitalisation of the country 2025.

The strategy has its roots in sustainable development goals of the Agenda ONU 2030 and after an accurate analysis 3 challenges have been identified:

- Digitalisation of the country
- Innovation of the country
- Sustainable and ethical development of the society as a whole.

Each challenge has 3 objectives that are reached through concrete actions. An action plan has been drafted and it will be updated every 4 months in order to strictly monitor achievements and possible delays.

In this framework ETV could be a helpful tool for actions approaching challenges 2 and 3, thus an eventual inclusion during the definition phase would guide decision makers in better allocations.

The action plan foresees a collaboration with the institutions at local level, where the priorities will be defined. It is in this process that inclusion of ETV is possible and useful because it can steer choices and solution in an informed manner.

ETV could help in increasing the number of innovative and green technologies available on the market and in creating a competitive industrial system.

Regional Policies: Smart Specialisation Strategy – S3

The Smart Specialisation Strategy (S3), as part of POR FESR, is a regional strategy that provides the areas to which the innovation choices of companies should be directed, in close connection with the society challenges identified by the European Horizon 2020 funding programme.

With the new seven-year programming of structural funds (2021-2027), the Regions are called upon to align and update the S3. An integral part of the approval process is the consultation process which aims to collect comments and proposals for integration or revision of the document under discussion. This represents an opportunity for the integration of ETV in the revised and updated strategy.

As an example, the Emilia Romagna Region opened a group on the EROI platform to inform about the thematic areas on which the new S3 is oriented (with documents, materials and general consideration) and to collect all possible ideas, feedback and any other observations considered of interest for the strategy. The document in consultation identifies 15 priority thematic areas, aggregated into five discussions, to which it was possible to contribute until 21st of January 2021. In particular, the 2nd thematic area of the document is about Sustainable Transition and it is divided into five sub-areas. The first three sub-areas concerning Clean, safe and accessible energy, Circular Economy and Climate and natural resources (air, water and land), were considered of interest for the potential integration of ETV. Taking advantage of the consultation process, we left a comment in the relevant discussion to suggest the inclusion of the ETV tool within the strategy in order to support the implementation of the strategy and to support the SMEs in innovating and greening. In order to support the SMEs the costs for the verification of technology through the ETV tool should be made eligible in research/innovation/demonstration projects carried out by companies.

It is conceivable to follow the same pattern for all the other regions consultation processes: Veneto, Lazio, Puglia, Tuscany and the Autonomous Province of Trento still have to begin the new programming, so that the procedure described and adopted for Emilia Romagna will be easily implementable.

Regional Policies: Regional Strategy for Sustainable Development

The Regional Strategy for Sustainable Development (SRSvS) aims to identify the main tools to contribute to the achievement of the objectives of the National Strategy for Sustainable Development (SNSvS) as well as the goals and targets contained in the "Agenda 2030 on Sustainable Development".

The Veneto region has already approved its Regional Strategy on 20th of July 2020. A mention to ETV could be included in the 7th chapter of the strategy where the six strategical macro-areas are described. In particular in the 2nd and the 5th macro-area, respectively "For 360-degree innovation: making the economy and the production system leading actors in global competition" and "For a reproduction of natural capital: reduce the pollution of air, water and earth". The integration of ETV tool in these chapters will be beneficial for the promotion of innovative and green technologies. Moreover, ETV is able to confirm the environmental sustainability of the technologies, fostering the transition towards a more sustainable development model.

The Toscana region has started the process to formulate the strategy and has set up the public forum which will be activated soon: this means that there is an opportunity to include ETV scheme into the strategy. Other regions have still not approved their regional strategy.

Inter-Regional Strategies and agreements: The Green City Network guidelines

The Green City Network involves different regions with more than 140 Italian cities all around the national territory. The most relevant document concerns the green cities guidelines, where the 4 general objectives of the network are described and subsequently articulated in 15 specific guidelines. The 4th objective "Promoting eco-innovation and the green economy and improving governance" is of interest for the integration of the ETV tool. In fact, ETV can provide significant help in selecting those technologies that, through an efficient use of resources or cutting emissions, could reduce the impact on the environment. This is true especially for measures following the objective related to eco-innovation. The introduction of ETV could be beneficial for both buyers (e.g., municipalities) and providers.

Inter-Regional Strategies and agreements: Creiamo PA

The CREIAMO PA (Competences and Networks for Environmental Integration and Improvement of the Public Administration Bodies) project is included in the strategy developed by the Italian Ministry of Environment, Land and Sea Protection to face the environmental issue in the implementation of public policies.

The project, aspires to provide significant environmental and technical skills to PA and to create networks to increase synergy, participation and shared knowledge between members.

With this aim, nine lines of intervention have been created and three of these are considered of interest for an eventual ETV inclusion:

- The Circular Economy Models and tools for the transition towards a circular economy (L3)
- Air Quality Procedures to limit atmospheric emissions from biomass burning for civil purposes. (L4)
- Climate Change and Capacity Building for adaptation to climate change (L5)

The L3 in particular is then articulated in three work packages:

- Sustainable and effective use of resources
- Environmental and energy management models
- Waste management and prevention

As this project mainly works with workshops, seminars, on the job coaching modules, training activities, and similar it was difficult to find a single document where to insert a reference to the ETV tool. However, it is conceivable to create a seminar to explain the functioning of the tool and the opportunities deriving from its implementation and to invite cities and regions to use it to design their policies and strategies, for example in the public procurement system for the promotion and adoption of green and innovative technologies.

PAES: Action Plan for Sustainable Energy

The Action Plan for Sustainable Energy is a document that defines the energy policies that a Municipality should have adopted to achieve the European CO₂ emissions reduction target within 2020. For example, the Municipality of Bologna adopted its current PAES in 2012.

A mention of ETV can be hypothesised in section 6 of Volume 1 of the current PAES (page. 64), under the entry "Instruments and in progress projects". Also considering that other LIFE+ projects are already mentioned in the cited paragraph, ETV can easily be added in the following way: "In order to limit the adverse effects of climate-altering emissions, the use of the ETV tool can help select those technologies that can actively contribute to the achievement of the 2030 targets and ultimately to carbon neutrality in 2050".

Slovenia

Smart specialisation

With the implementation of Slovenian smart specialisation strategy (S4), in force since 29.8.2014, Slovenia introduced a new model of development cooperation between key innovation stakeholders. The implementation of S4 represents one of the key tools for strengthening and upgrading the Slovenian innovation ecosystem. The implementation of S4 is based on a new model of development cooperation, which emphasises closer, institutionalised cooperation between the state, the economy, knowledge institutions and other relevant stakeholders in the field of research, development and innovation. In order to achieve high-productivity economy, nine priority domains with corresponding focus areas and technologies are defined and thus, 9 Strategic research and innovation partnerships (SRIP) were established in 2016. S4 remains one of the bases underpinning the implementation of Cohesion Policy in Slovenia in the period 2021-2027, where at least three SRIPs ("Circular economy SRIP", "SRIP Materials as end products" and "SRIP Food") are focused on developing green and innovative technologies in scope of ETV technology areas. As a help to the co-creation of innovative solutions between public and private research, ETV could serve as a good tool for identification of innovative technologies that are at same time environmentally friendly in use and can help new innovative technologies get to the market.

National Recovery and Resilience Plan (NRRP)

On 28th of April 2021, the Slovenian government adopted the National Recovery and Resilience Plan (NRRP), which will be the basis for using the available funds from the Recovery and Resilience Fund (RRF).

In its RRP, Slovenia has identified development areas and the related reforms and investments that will help mitigate the negative economic and social impacts of the COVID-19 epidemic and prepare the country for the challenges related to green and digital transition. The overall vision is to position Slovenia as a green, creative and smart economy in the international arena. It is intended to achieve this through measures aimed at improving Slovenia's position in high value-added segments (in global value chains) by attracting and supporting quality investments. Under Green Transition business entities will be able to apply for the funding available under calls for proposals for energy efficiency and renewable energy (the potential of

geothermal energy, hydro energy and solar energy), transition to circular economy models and adaptation to inevitable impacts of climate change. ETV could serve as tool for quality check of such investments as well as possible co-financing of ETV by RRF would facilitate the innovation and technology transfer from research to market uptake.

Ordinance on the Climate Change Funding Programme for the period 2021 – 2023

This document was published by the Ministry of the Environment and Spatial Planning and it is in force since 25th of June 2021. The document defines the co-financing of research, development and innovation projects (pilot and demonstration projects) in the fields of low-carbon technologies and services and adaptation to climate change. The funds are intended to support the introduction of the principles of the circular economy or the sustainable use of resources in all areas where this will contribute most to the decarbonisation of Slovenia. This programme might boost the ETV verifications market as well as the development of green technologies in Slovenia.

Programme "YOUNG ENTERPRISES"

The programme "YOUNG ENTERPRISES" was established by The Public Fund of Republic of Slovenia for Entrepreneurship or shortly The Slovene Enterprise Fund (SEF). Its purpose is to improve the development and business investments of SMEs and Start-ups in Slovenia. The programme "YOUNG ENTERPRISES" offers financial support provided for enterprises younger than 5 years, which due to the specifics of the development and no track record, have difficulties in obtaining the necessary financial resources on the market. For example, the scheme Start-up incentives is available to newly established enterprises and is currently being financed by European Cohesion Fund 2014-2020. One of the incentives is "Incentive for innovative startups" that supports start-up enterprises that develop innovative products, processes and services with high added value for a broader market. ETV verifications could be co-financed by SEF incentives and then can help green technologies reach the market uptake faster and enhance the market success of the start-ups.

The Public Agency for Entrepreneurship, Internationalization, Foreign Investments and Technology, SPIRIT Slovenia was established in 2012. It provides support to the Slovenian economy by featuring Slovenia's key competitive advantages in niche areas of the green economy, innovative products, and environmental technologies. SPIRIT agency is an important factor that improves the Slovenian ecosystem with their activities that are dedicated to promote "green" Slovenia and can enhance the usage of ETV verifications as a promoting tool for green technologies that are being developed in Slovenia.

France

Working for the Minister of the Economy, Finance and Recovery, the General Directorate for Enterprises (Direction Générale des Entreprises, DGE) implements French public policies to support innovative companies. For these missions, the DGE relies on State's operators (Bpifrance, INPI, ANR, Business France, France Brevets, etc.) and on various structures that it manages and leads:

- French Tech communities
- Competitiveness clusters
- Technology Transfer Accelerator Offices – (*Sociétés d'Accélération du Transfert de Technologies* SATT).
- Technological Research Institutes (*Instituts de Recherche Technologique*, IRT)

Through the Innovation Council, and in collaboration with the other ministries, the DGE draws up the overall strategy for supporting innovation, establishing the guidelines and major priorities for action, at both French and European level. It also prioritises emerging sectors of the future, and monitors the "Investissements for the Future Programme" (Programme d'Investissements d'Avenir, PIA) and European programmes in favour of research and innovation.

"Investments for the Future Programme" (Programme d'Investissements d'Avenir, PIA) and Acceleration strategies for innovation

The "Investments for the Future programme", steered by the Secrétariat Général pour l'Investissement (SGPI) and operated by the French Environment Agency (ADEME), was set up by the French State to finance innovative and promising investments, in order to enable France to increase its growth and employment potential. The fourth PIA has been launched in January 2021, and a large part of the new priority innovation strategies will be dedicated to ecological transition (transforming agricultural systems and equipment, decarbonising industry or supporting the transformation of cities so that they are more adapted and more resilient to climate change).

The "Innovation Competition i-Nov" is one of the funding tools from the PIA aiming at supporting innovative projects carried out by start-ups and SMEs in order to accelerate the emergence of leading companies in

their field with the potential to become world class. It enables the co-financing of research, development and innovation projects and contributes to accelerating the development and marketing of innovative solutions and technologies. The call for projects in the sixth wave of the competition closed in October 2020, focused on the following themes:

- Circular economy
- Environmental performance of buildings
- Adaptation to Climate Change
- Hydrogen

Since 2016, ETV-related costs (accompaniment during R&D stages + verification at the end of the demonstration phase) can be funded through the "Innovation Competition i-Nov" call. The objective is to take ETV's requirements into account right from the R&D phases in order to reduce the time and cost of verification, particularly in terms of requirements for experimental data to support future performance claims.

Acceleration strategies for innovation are at the heart of the fourth PIA. The objective is to define investment priorities and to drive real transformations in sectors or technologies of the future.

The "Decarbonised Hydrogen Strategy" has already been initiated by the government, and 12 acceleration strategies to accompany innovation are submitted for consultation with the main stakeholders, namely industrial sectors, higher education, research and innovation ecosystems and regional players. The strategies related to the ecological transition being developed are:

- Decarbonisation of industry
- Recycling and reincorporation of recycled materials
- Sustainable and healthy food
- Sustainable agricultural systems and equipment contributing to the ecological transition
- Sustainable city solutions and innovative buildings
- Digitalisation and decarbonisation of mobility
- Bio-based products and industrial biotechnologies – Sustainable fuels
- Advanced technologies for energy systems
- The environmental impact of digital technology

French Recovery Plan

In order to rapidly and sustainably revive the French economy, an exceptional €100 billion recovery plan is being deployed by the French government around three main areas: ecology, competitiveness and cohesion. The ecological transition is therefore a strategic objective of the French recovery plan.

As part of the "France Relance" recovery plan, the State has allocated €1.2 billion to ADEME, in collaboration with the Payment Services Agency, to support and accompany the reduction of greenhouse gas emissions from the industrial sector, by strengthening existing measures. The aid covers industrial investment in the fields of energy efficiency, electrification and process adaptation, which will reduce CO₂ emissions.

Among the actions of the French Recovery Plan, ADEME (French environment agency) has launched a call for projects to support the launch of innovative solutions "with positive externalities for the environment". This call for projects is aimed at companies whose eco-innovations are in the commercial launch phase. ETV-related activities (accompaniment of upstream verification and verification) are eligible for this call.

Moreover, the importance of public procurement is highlighted for the success of the recovery plan and the ecological transition.

Hungary

New National Research-development and Innovation Strategy

The New National Research-development and Innovation Strategy is under approval by the government. It will organically connect to the previous one (2013-2020). It will be a horizontal strategy, and vertical / sectoral elements will appear in the Smart Specialisation Strategy. According to official information, in the horizontal goals the "Creating a modern regulatory framework and business environment supportive of RDI" and "Promoting technological and non-technological innovation" will appear, which could provide a basis for the implementation of the ETV scheme.

Although the details are not revealed yet, this document is built on the basis of the former strategy, and no changes are expected in the main directions. The former National Research-development and

Innovation Strategy 2013-2020⁸ was aimed to build a new purposeful system according to three priority axes, from which the third one is *"companies that exploit intensively the results of modern science and technology"*. Although the strategy aimed to increase the performance of all actors in the innovation system through direct and indirect ways, it marked "key players" with the potential to have this spill-over effect. Among them we could find the "R&D intensive Hungarian medium-sized companies", "small companies (to use the jargon and David Birch's expression: the "gazelles)", "innovative supplier SMEs" and "innovative start-ups" but also the "public sector institutions performing R&D and exploiting innovation results".

The Strategy also focused on introducing innovations. Therefore, these fundamental values could serve as a joining point for the ETV scheme, i.e., these organisations can benefit from the marketing factor of it, especially in the case of SMEs, where the Strategy aimed to stimulate the entering of foreign markets and becoming higher-level suppliers, and where the ETV verification could be a competitive advantage.

Another important part of this document was where it is stated that the decision makers want to promote the innovative solutions by forming a "conscious public demand" with altering the public procurement system, which could urge the usage of ETV-like verifications.

The development of this strategy is under the supervision of the Ministry for Innovation and Technology.

Act LXXVI on Scientific Research, Development and Innovation

This act describes the governmental tasks and the organisational background in order to develop and execute the referring Strategy. Among others, it requires the establishment of the National Research, Development and Innovation Office (NKFIH) and the National Research, Development and Innovation Fund (RDI Fund), handled by the NKFIH, as a national strategic and funding agency. It is also an advisory body on RDI policies for the Hungarian Government. The Office and the Fund are also under the supervision of the Ministry for Innovation and Technology.

The NKFIH, in the role of a funding agency, regularly publishes calls for proposals in order to subsidise RDI-related activities in specific areas (e.g., pilot projects on energy management-related innovations and on carbon-neutral, innovative storage of surplus electricity). As part of the validation of the results obtained from the pilot technologies and their subsequent marketisation, ETV could play a key role. Therefore, ETV verification should be included as an eligible cost within the scope of NKFIH funding. Thus, NKFIH could play a key role in subsidising the implementation of ETV for the SMEs and could play a catalytic role, as an advisory body, to introduce the ETV scheme to decision makers.

National Research, Development and Innovation Fund Programme Strategy for the year 2021⁹

The RDI Fund Programme Strategy is regularly revised by creation of one-year strategies. These strategies consist of an innovation part and a research part. The innovation part focuses on SMEs and RDI programme support besides, for example, international programmes and marketing. The biggest amount of subsidy is provided for market-driven corporate research, development and innovation. This part of the strategy clearly has a potential for ETV as a tool to support entry into markets of innovative technologies (and products and services) which are targeted here. Marketing is also supported here, *"The aim of the programme is to support the market take-up activities of companies that already have a prototype and the validation of innovative ideas and technologies"* as it is also a goal of the programme.

⁸ Governmental decision 1414/2013. (VII.4.)

⁹ approved by the 1077/2021 (II.27) Governmental Decree

National Decarbonisation Roadmap

National Decarbonisation Roadmap (encompassed in the Second National Climate Change Strategy (2018-2030) with a perspective until 2050)¹⁰

The Second National Climate Change Strategy (NCCS-2) includes, among others, the National Decarbonisation Roadmap. Among the set areas of intervention the “Support for research, development, innovation and demonstration projects, in particular in the fields of material and energy saving technologies, the dissemination of renewable energy sources, the increase of the use of biomass as a renewable industrial raw material, environmentally friendly transport and agro-technologies, sustainable architecture, heat and power generation and CCS¹¹” the ETV can be used as a supportive instrument. There is an intersection between the areas marked for support in the roadmap and the seven ETV focus areas (e.g.: material and energy saving technologies, innovative environmental technologies, even in the field of the agricultural industry), especially in the case of the demonstration projects, in which the ETV can be successfully used to confirm achievement of project goals.

The Roadmap is implemented by the Ministry for Innovation and Technology.

National Hydrogen Strategy 2030¹²

This strategy is for the introduction of low-carbon and clean hydrogen technologies and for establishing a background infrastructure for the hydrogen industry. Comprehensive projects are planned during the implementation, from industrial decarbonisation to the development of green transportation systems and to the establishment of seasonal storage facilities (for storing surplus energy). In case of every project, the subsidy of RDI activities and also the promotion and demonstration of the legitimacy of such technologies are considered a priority measures like *“monitoring the development of new production technologies, developing international collaborations in order to employ market-ready solutions domestically as soon as possible”, “supporting the research and development of carbon-dioxide capture and utilisation solutions and testing within the framework of pilot programmes in the petrochemical and chemical industry” or “examining the possibility of introducing hydrogen to the natural gas infrastructure, implementing a pilot project”.* The implementation of ETV scheme could support the achievement of the Strategy goals.

The Ministry for Innovation and Technology is responsible for the implementation of the strategy.

The Economic Development and Innovation Operational Programme GINOP Plus

The successor of GINOP for the 2021-2027 period. The programme aims to stimulate the economies of the less developed regions in Hungary. One of its top priorities is to increase the competitiveness of SMEs by funding research and development of innovation and technology transfer. The most important area in GINOP Plus is *supporting the transfer to low-carbon emission economy, environment protection and resource efficiency.* The ETV scheme can support better performance of the GINOP programme by confirming the innovation features, environmental performance of the technologies and can increase market competitiveness of environmental technology developers.

¹⁰ approved by the Parliamentary Decree 23/2018. (X. 31.)

¹¹ CCS: Carbon Capture and Storage technologies

¹² approved by the 1372/2021. (VI.10.) Governmental Decree