Report on the obstacles and drivers for EU ETV market uptake and recognition

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Keywords:
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EXPLANATION OF ACRONYMS & ABBREVIATIONS

Acronym	Full name
IETU	Institute for Ecology of Industrial Areas
CET	CETAQUA, Centro Tecnológico del Agua, Fundación Privada
EIT RM	EIT RawMaterials GmbH
ENEA	Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile
INSAV	INSAVALOR
IOS	Institute of Environmental Protection- National Research Institute
KA	KÖVET Egyesület a Fenntartható Gazdaságért
ZAG	Slovenian National Building and Civil Engineering Institute
AFT	Administrative and Financial Team
D X.x	Deliverable Action No. Deliverable No.
EC	European Commission
EEN	Enterprise Europe Network
EIP	European Innovation Partnership
ETV	Environmental Technology Verification
ETV Body	Environmental Technology Verification Body
ETV KC(s)	ETV Knowledge Centre(s)
ETV SG	ETV Steering Group
ETV TWG	ETV Technical Working Group
EU	European Union
ExC	Executive Committee
GA	Grant Agreement
GDPR	General Data Protection Regulation
GPP	Green Public Procurement
GVP	General Verification Protocol
H2020	Horizon 2020
ICLEI	Local Governments for Sustainability

KIC	Knowledge and Innovation Communities
KPI	Key Performance Indicators
LTS	Long-Term Climate Strategy
NAB	National Accreditation Bodies
NECP(s)	National Energy and Climate Plan(s)
OEFSR	Organisation Environmental Footprint Sector Rules
PA	Partnership Agreement
PEFCR	Product Environmental Footprint Category Rules
RTO(s)	Research Technology Organisation(s)
RTP	Replication and Transfer Plan
SME(s)	Small-Medium Enterprise(s)
SMS	Stakeholder Management Strategy
SoV	Statement of Verification
SPI	Specific Project Indicators
ToR	Terms of Reference
VB(s)	Verification Body(ies)
VES	Voluntary Environmental Scheme

1. OVERVIEW

The LIFproETV project plans to establish a strategic approach involving key stakeholders at EU and national level that will lead to a greater market acceptance and recognition of EU ETV. The strategic approach will identify and assess how and where changes can be made towards increasing the acceptance and recognition of the EU ETV programme in the EU market by overcoming the key obstacles and strengthening the drivers.

This report adds a practical perspective to the *Report on the potential for EU market acceptance and recognition opportunities for ETV* developed under the preparatory actions of LIFEproETV project (https://lifeproetv.eu/publications/). It has been developed on the observations and feedback received from of the ETV community of practitioners focusing on key obstacles and drivers for market acceptance and recognition of ETV.

It is aimed to aid development of a strategic approach to building ETV market acceptance and recognition that requires knowing and understanding the status quo of the ETV programme, the factors that boost the potential of ETV , engaging the key stakeholders, identifying obstacles and drivers, and establishing a shared vision and goals to be achieved through a set of actions to be included in a Roadmap for ETV market acceptance and recognition and design the ETV promotion and communication campaigns planned under LIFEproETV.

2. OBJECTIVES

The goal of the task was to define and characterise the real obstacles/ bottlenecks and drivers to enable wide market acceptance of ETV, using practical feedback from key stakeholders who have experience with ETV.

Identifying as many significant and objective ETV market recognition drivers and obstacles from the different perspectives requires reaching out various stakeholders who have knowledge and experience with ETV and obtaining feedback on their own experiences and insights related to ETV.

The characterisation of the obstacles and drivers through the identification of the factors influencing them (problems and triggers), the identification of the relevant stakeholders whose action can bring the expected results, as well as the definition of the required actions and the necessary capacities for these actions will outline the directions for increasing the recognition and uptake of ETV on the European market. Therefore, this task has been foreseen as an important contribution to the development of ETV roadmap.

A detailed characterisation of the obstacles and drivers will facilitate the development of a common vision, i.e. a common perception of the EU ETV programme and an understanding that it is destined to become a highly desirable, nationally and in the EU, recognized and accepted voluntary scheme for bringing new environmental technologies to the market.

3. METHODOLOGY FOR IDENTIFICATION OF DIVERS AND OBSTACLES

3.1.   ETV community of practitioners: the stakeholders involved

Identification of drivers and inhibitors of EU ETV use and increasing its market visibility was conducted among ETV stakeholders specifically identified for this task.

They belonged to different groups of ETV stakeholders who have experience with ETV aspects of their business. This selection of a group to support the task allowed the identification of drivers and obstacles from different perspectives, based on different experiences with ETV.

The stakeholder groups identified for support in this task included:

- All producers / providers of verified technology (so-called Statement of Verification holders) - 45 companies and institutions,
- All active Verification Bodies - CSTB, CEMC, ETA Denmark, Eurofins, RINA and BRE and the no longer active RESCOLL
- Experienced experts of the EU ETV Technical Working Group   - 6 selected TWG experts
- Steering Group members (7 countries) and Germany as observer country (contact data were extracted from the last ETV Steering Group meeting in 2019).
- Other experienced stakeholders:
  - Manuel Irun Molina – head of EIT,
  - EIT Manufacturing – implementing funding for ETV,
  - VITO and ICF – consultants who developed the EU ETV pilot programme evaluation.
  - National Fund for Environmental Protection and Water Management – as the owner of funding scheme supporting ETV in Poland.

3.2. Feedback collection method

Collection of obstacles and drivers from stakeholders was conducted in two stages:

- **Stage 1:** a survey with a set of tables to collect stakeholders views on key drivers and obstacles on ETV market acceptance and recognition (Appendix 1).
- **Stage 2:** an on-line workshop summarising the data collected through the survey and deep-diving into specific findings to collect additional feedback for completing the analysis.
- **Stage 3:** supplementing the findings with existing studies on ETV incl. ETV pilot assessment reports

3.3. Results of the first stage of the study among stakeholders

In the first stage, the selected stakeholders were given a survey to identify obstacles and drivers. They were instructed about the purpose of the survey as well as what and how to describe. Additionally, they received one example of an identified and characterised obstacle and driver.

This phase was mainly to allow a preliminary gathering of the obstacles and drivers that stakeholders perceive from the point of view of their own activities and experience with ETV, so that ETV is widely recognised in the market. Stakeholders were asked to list up to 5 key obstacles and drivers and additionally to specify their nature e.g.: organisational, political, economic, financial and possibly a short characterisation of each proposed obstacle and driver. In the case of obstacles, the characterisation was to identify what they think is causing such situation/problem, who is responsible for making it change, and what they need to do about it. In the case of drivers, the stakeholders were to briefly describe why they think it will increase market uptake of ETV, who can contribute to the driver and what they need to do about it.

Finally, 15 completed questionnaires were received of which 4 were from Statements of Verification holders, 4 Verification Bodies, 3 ETV Steering Group members, 2 Technical Working Group experts and 2 other experienced stakeholders.

Statements of Verification holders identify the following obstacles and drivers:

Obstacles:

- ETV not included in the legislation (1 answer),
- Lack of knowledge (4 answers),
- Verification process is too long (1 answer),
- High total cost of the verification (1 answer),
- Lack of competitive advantage (2 answers),
- Verification process is too complex (1 answer),
- Small recognition by EU programmes (1 answer),
- ETV not recognised by stakeholders (1 answer),

Drivers:

- Include ETV in the legislation (1 answer),
- Launch dedicated grants for ETV process (1 answer),
- Governmental support for national verified technologies (1 answer),
- Marketing and communication of ETV (1 answer),
- Test protocols for technology groups (1 answer),
- Additional points awarded to project/grants applications (1 answer),

Verification Bodies identify the following obstacles and drivers:

Obstacles:

- Lack of ETV knowledge (2 answers),
- Verification process is too long (1 answer),

Drivers:

- Launch dedicated grants/funding schemes for ETV process (1 answer),
- ETV as eligible cost in national project/grants (1 answer),
- Tax deduction for technology manufacturers (1 answer),
- Additional scores in public tendering process (1 answer),
- Establishing synergies with other environmental schemes (1 answer),
- ETV support in EU programmes (2 answers),
- Awarding environmental innovative solutions (1 answer),

Steering Group members identify the following obstacles and drivers:

Obstacles:

- Lack of knowledge (1 answer),
- Verification process is too long (2 answers),
- High total cost of the verification (1 answer),
- Lack of competitive advantage (2 answers),

- Lack/low recognition by other EU level programmes supporting innovation/environmental technologies (1 answer),
- ETV disappointment by VBs (1 answer).

Drivers:

- ETV can support technologies performing beyond compliance objectives (1 answer),

TWG experts identify the following obstacles and drivers:

Obstacles

- ETV not included/reflected in national legislation (1 answer),
- High cost of the process (1 answer),
- Lack of ETV branding (1 answer),

Drivers:

- Showcase success stories (1 answer),
- Active support and engagement at the Member States level (1 answer),

Other experienced stakeholders identify the following obstacles and drivers:

Obstacles:

- Lack of ETV knowledge (1 answer),
- Verification process is too long (2 answers),
- High total cost of the verification (1 answer),
- Lack of a clear competitive advantage (1 answer),
- Verification process is too complex (1 answer),
- Insufficient financial capacity of start-ups to pay for ETV (1 answer),
- No ETV requirements in the investment process (1 answer),

Drivers:

- Showcase success stories (1 answer),
- Differentiate ETV/highlight the benefit of ETV from other existing Voluntary Environmental Schemes (1 answer),

As the first phase of collecting feedback on ETV obstacles and drivers from experienced stakeholders shows, the most frequently mentioned are the following:

Obstacles:

- Lack of ETV knowledge (8 answers),
- Verification process is too long (6 answers),
- Lack of competitive advantage provided by ETV (5 answers),

- High total cost of the verification (4 answers),

Drivers:

- Include ETV in the legislation (2 answers),
- Launch dedicated grants/funding schemes for ETV process (2 answers),
- Showcase success stories (2 answers),
- ETV support in other EU programmes (2 answers),

3.4.   Analysis of available external studies

To ensure that no previously identified obstacles and drivers were overlooked, an additional review of studies that may have analyses in this area was performed.

The report "Detailed assessment of the market potential, and demand for, an EU ETV scheme[1]", which was carried out in 2011 even before the launch of the EU ETV Pilot Programme, was analysed.

The chapter "Achieving an effective and operationally efficient EU ETV scheme" points out the different mechanisms that will help drive the scheme during the pilot, what factors should be taken into account when implementing an ETV scheme to make it a success. These factors were identified during consultations with ETV stakeholders. Unfortunately, most of the proposals included in the report have not been implemented or on a much smaller scale than proposed.

These are the following drivers of the ETV system:

- Communication activities regarding the operational requirements of the ETV programme should be implemented on a large scale, while at the same time the verification procedure should be as simple and transparent as possible.
- Strong marketing of the ETV programme and developing a strong brand will be critical to achieving the widespread recognition and eventual uptake by technology developers and users. The report also suggests creating a dedicated EU ETV website, separate from that of the European Commission.
- Complementarity between ETV and existing certifications could yield benefits which could improve the delivery efficiency of an ETV scheme in sectors where there are existing testing and certification systems, both at Member State and EU level.
- Institutional support from environmental regulators across the EU.
- Affordability of the ETV scheme will be important for technology providers. ETV should be cost competitive compared to existing certification, testing and labelling mechanisms.
- Financial support mechanisms for ETV users should be available at EU and Member State level. At the EU level, ETVs overlap with major EU policy objectives, particularly for technologies and products aimed at reducing pollution and improving resource and energy efficiency.
- Verification assessment must be a key element of the ETV program development strategy. Evaluation can be used to increase the credibility of the overall ETV process and thus improve the potential acceptance by

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[1] DETAILED ASSESSMENT OF THE MARKET POTENTIAL, AND DEMAND FOR, AN EU ETV SCHEME, final report to the European Commission, DG Environment, EPEC June 2011

SMEs. This will require the introduction of key performance indicators (KPIs), including economic and environmental performance, to determine the value gained from each verification.

Subsequently, the report from the evaluation of the EU ETV Pilot Programme[2] from 2018 was analysed in this regard, which lists several obstacles and drivers that were identified and confirmed during the interviews with ETV stakeholders as part of the preparation of the aforementioned report.

Among the obstacles listed were:

- Lack of knowledge about ETV among technology buyers/users about ETV - technology buyers do not understand what the Statement of Verification contains
- The verification process is too complex, but it is difficult to see how it can be simplified without compromising quality.

Among the drivers listed are:
- Member States can also further contribute to the demand for EU ETV verification by including it in environmental legislation and by giving preference to verified technologies in public procurement.
- Develop a more comprehensive and targeted strategy for marketing the EU ETV scheme -demonstrating the need for ETV amongst end-users
- The Statement of Verification (SoV) needs to be adapted so that it provides more usable and accessible information for end-users and investors - the SoV requires modification so that it provides a shorter (1 page) and more succinct and intelligible account of the performance claims that have been verified.

As part of the evaluation of the ETV programme, ETV feasibility studies were also carried out for ETV use cases which could lead to a much higher use and recognition of ETV on the EU market. These includes:

1. **ETV as proof of performance for innovative environmental technologies in support of performance-based legislation.**

   The possibility of using ETV in the framework of Industrial Emission Directive (IED) was checked. Most stakeholders saw EU ETV as useful in support of the BREF process, particularly in identifying innovative/new technologies, validating their performance and assessing their market readiness. These aspects could contribute to determining the status of a technology (technique) as being a BAT or ET. In order to accomplish this, it was mentioned that the ETV process should not be too complex or expensive, particularly for SMEs. To link the ETV wit IED is necessary the engagement and consultation with regulators/ relevant authorities in all Member States, establishing communication channels between ETV TWG's and BREF TWG's, elaborate EU guidance to assist Member States in development and application of Emerging Techniques (ETs)

   Next the convergence of ETV with Construction Products Regulation was analysed. Stakeholders did not see a particular need for providing a system to verify the performance of construction products, arguing that such a system is already in place and that the take-up of ETV has been low.

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2. **ETV as proof of performance in the context of public procurement, in support of policies on Green Public Procurement (GPP) and Public Procurement for Innovative solutions (PPIS);**

Third party verification is needed by procurers, as a means to facilitate compliance checking. Currently, both labels on environmental performance and methods to 'proof' compliance of criteria for products and services are heavily reliant on self-declaration by producers. To implement such solutions the application processes and criteria for selection should be developed and implemented the same way in all Member States. The potential barriers to implement it are the need to have a verification protocol designed for the particular needs of a specific sector and short time of verification (maximum 6 months).

3. **ETV as an alternative to certification systems to verify the performance and quality of secondary raw materials, by-products and product parts (solid resources), in the context of the transition towards a circular economy**;

Future role of ETV can be aligned and harmonized in waste and product standards and legislation, including new and existing sectoral, regional, national and EU End of Waste criteria. ETV can be integrated as a complementary instrument for innovation on the interface of waste and product regulations and standards. The EU guidance on an integrated Designing-out-Waste concept for different product categories and waste materials should be elaborated and regulators in all Member States engaged.

4. **ETV turned into an Innovative Technology Verification (ITV) scheme by opening the scope of ETV to all innovative technologies**
The deployment of ITV is highly contingent on the success of an ETV. In the short term, in order for any expansion into ITV to occur, it would first be necessary for the EU ETV to fulfil its original vision and expand to provide coverage of the full suite of seven environmental Technology Areas (TAs).

5. **Expansion of the current EU ETV scheme**
To ensure the widest possibly take up of the EU ETV by proposers, the Programme should allow the full spectrum of environmental technologies to be verified. In some countries, based on the size of the supply side, there may well be sufficient domestic demand to justify establishing a VB infrastructure.

3.5. Results of the second stage of the study among stakeholders

Based on the inputs listed below and the experience of running the IETU verification body, a summary of obstacles and drivers was prepared, their nature determined, and analysed to characterise them.

Input for preparation and analysis of obstacles and drivers:

- drivers and obstacles proposed by experienced ETV stakeholders in the first phase of the study,
- extracted information from the reports of the preparatory tasks within the LIFEproETV project: Report on the potential for EU market acceptance and recognition opportunities for ETV
  PART I: The status quo of the ETV market acceptance and recognition
  and
  PART II: Boosting the ETV potential for market acceptance and recognition,
- Detailed Assessment of The Market Potential, and Demand for, an EU ETV Scheme
- Reports from the evaluation of the EU ETV Pilot Programme

All the identified obstacles and drivers were grouped, unified and described. Their nature was defined according to predefined concepts such as: organisational, political, legislative, economic, financial, economic. To characterise the identified obstacles and drivers, analyses were performed according to the following schemes:

For obstacles:

- What is the reason of the obstacle / bottleneck – what are the problems causing the obstacle (within the defined nature of the obstacle)?
- Who is responsible / has power to change the situation / eliminate the problem - Who should act?
- What needs to be done to change the situation / eliminate the problem?
- What capacities are required to change it - what they need to act?

For drivers

- Why this is a driver / trigger – why it will increase the market uptake of ETV
- Who can / who has power to trigger the driver - who should act?
- What needs to be done to trigger the driver?
- What capacities are required to trigger the driver - what do they need to act?

The characterised obstacles and drivers were presented in tabular form. Selected most relevant drivers and obstacles with their characteristics were presented and discussed during a workshop organized within the framework of the task. All stakeholders who received the drivers and obstacles questionnaire were invited to the workshop. The workshop consisted of short introductory presentations of all identified obstacles and drivers and the methodology of their analysis, followed by an interactive session with stakeholders. Each participant of the workshop had the opportunity to comment on the prepared characteristics, add their own proposals as well as new obstacles and drivers proposals. The feedback was also collected through the running chat module during the workshop.

Updated tables of obstacles and drivers incorporating the feedback from the workshop participants were sent to all experienced ETV stakeholders identified for support in this task with a request for possible comments. The feedback received was used to prepare the final version of the obstacles (Table 1) and drivers (Table 2) market acceptance and recognition of ETV.

Table 1. Obstacles of ETV market acceptance and recognition

	Description / definition of the obstacle	Nature of the problem	The reasons of the problem	Who should act?	What needs to be done? What do they need to act?
1.	**Limited accessibility of ETV for SMEs, startups, technology developers due to costs**	financial	Too high verification costs (primarily cost of testing in accredited testing bodies) Lack of ETV dedicated funding schemes Limited funding opportunities for ETV at EU innovation support programmes e.g., little knowledge of ETV in DG Research/institutions involved in calls preparation Eligibility of ETV costs not clearly expressed in calls/programmes Including demonstration component Uncertainty as for total verification costs vs fixed costs of other certification schemes makes planning of ETV difficult Lack of funding for verification bodies (i.e. hybrid funding schemes where VBs are subsidised when verifying technologies of the country of their origin, the proposers cover the testing costs)	Policy/decision makers responsible for innovation support funding policies and instruments at national level Policy/ decision makers/ agencies responsible for innovation support programmes, calls development, at EU level (DG RTD, European Innovation Fund, DG ENV) National experts involved in programming of calls (e.g., Horizon Europe) and development of strategic research and innovation agendas (e.g., technology platforms, innovation partnerships etc) Businesses/industries interested / most exposed to the need of implementing new technologies due to e.g., upcoming new regulations, specific challenges	Awareness about ETV, knowledge, skills and understanding of its use and how it may help in commercialising technologies Clear explanation/evidence how ETV should be included in funding schemes and what benefits it may deliver to maximise the impact of public funding of R&I Examples of good practices e.g., from other schemes e.g., South Korea where VBs receive financing / are subsidised A strategic ETV programme at national level (regional level if relevant) ETV based on which hybrid funding schemes for ETV could be set up e.g., they could be defined in combination with specific national priorities resulting from environmental / climate policies The subsides for VB would also help reduce to certain extend the cost uncertainty Members of Steering Group should support national contact points of Horizon Europe programme Members of Steering Group monitor the funding schemes resulting from / dedicated to implementation of EU Green Deal at national level

				Support Programmes how and where to include ETV. Private investors/ industry to finance start-ups for verification process.
2	**ETV is not recognised as a brand** **The value of verification (ETV Statement of Verification) is not recognised by technology buyers/industry** **Lack of knowledge about ETV among all groups of ETV stakeholders**	Economic / financial	Lack of ETV branding strategy demonstrating ETV unique values/crafting distinctive ETV brand identities/ differentiating values vs other schemes with demonstration of the benefits to different target groups Too generic purpose and lack of an overall vision, mission and positioning for ETV at EU level Insufficient involvement of industrial/business stakeholders in ETV development and implementation leading to definition of an ETV business case Insufficient involvement of permitting and regulatory bodies who make decisions on which technologies can be implemented Lack of a clear ETV business case to promote the values of ETV Lack of sufficient funds dedicated to ETV brand building and promotion The governmental institutions supervising ETV at national level in countries participation in ETV pilot did not engage in	EIT/DG ENV / ETV steering group/ETV secretariat RTD/business support organisations more research on obstacles/challenges in commercialising environmental technologies involving viewpoints of different target groups to understand their aspirations, hopes, objectives and goals so as to finetune ETV as a scheme/service that they need and want National authorities to act towards permitting /regulatory bodies	ETV branding strategy based on ETV differentiating values and in conjunction e.g., with registering ETV as EU certification mark Involvement of industrial sector to define the vision, mission and purpose for ETV together with checking if the brand values proposed for ETV are valid for industries, regulatory and permitting bodies, policy makers Analysis, dialogue with permitting/regulatory bodies and guidance at national level how ETV may be used to demonstrate compliance/reduce administrative burden with permitting etc. A forum/platform for better understanding of ETV target audiences and their needs (start-ups, SMEs, technology buyers-private and public sector, clusters) to resonate ETV with these needs ETV messages appropriately and independently tailored for each ETV stakeholder group An ETV marketing strategy with prioritised awareness goals and brand tagline (e.g ETV the green guarantee) enabling to define how the ETV clients (technology buyers and providers) will learn about ETV

National Fund for Environmental Protection and Water Management

AGRÁRMINISZTÉRIUM

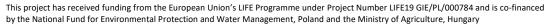|				
		promotional activities (except Denmark), the whole effort is shifted on VBs		Use all available communicational tools: websites, social media, webinars, physical events, show cases to create the dialogue with stakeholders. Build ETV success story based on similar success stories of ISO14001/ISO14040 series/EMAS Sufficient budget for awareness rising and promotional materials
3	**Lack of reference /strategies to use ETV as a supporting tool to solve challenges /priorities resulting from key environmental (Net-Zero), climate policies and strategies (national and EU level)** **Lack of ETV use in iterative approaches that demonstrate benefits in the context of an environmental change and the requirements for long-term adaptive management**	Political / legislative	Lack of mutual cooperation and dialogue between the department supervising ETV and ministries/departments that make policies on the environment, climate, and innovations Little or no knowledge of ETV among other departments /ministries Little funding and resources allocated to ETV in departments/agencies responsible for ETV supervision of ETV Staff involved in supervising have insufficient knowledge of ETV No reference and communication at EU level between ETV the EU Green Deal policies	The ministry/agency responsible for supervising ETV Policy makers responsible for policies on the environment, climate, and innovations	Identification of key national policy stakeholders for whom ETV may be relevant cooperation platform Establishing a forum/national platform (mirror group) for ETV at national level to define strategic approaches for ETV use Increase the efforts of ETV supervisor to cooperate with policy makers to present where and how ETV can support reaching environmental, climate and innovations goals Examples of using ETV to address a specific policy target/challenge with a high business potential e.g., U.S. EPA Advanced Septic System Nitrogen Sensor Challenge (problem: nitrogen release to water, 2,6 mln installations that may cause the problem, issues with on-site monitoring equipment approvals, maintenance, in-person sampling expensive etc)
4	**Weak governance, leadership and commitment to ETV uptake at national level**	Organisational /governance	Lack of mutual cooperation and dialogue between the department supervising ETV at national level, the verification bodies and other actors e.g., accreditation bodies, test bodies	EC DG ENV, EIT Policy makers supervising ETV at national level ETV Steering Group	EC DG ENV, EIT should mobilize the Steering Group members for better communication towards national policy makers SG members implement strategic overview of how the ministries/ecosytems for innovation, industry

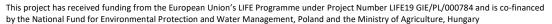|				
		Unclear division of responsibilities concerning ETV governance at national level (e.g., concerning such tasks as ETV financing, promotion, linking with policies, etc) Lack of governance and a clear national leadership result in lack of recognition and credibility of the scheme at national level Limited knowledge, skills and understanding on ETV among policy makers/staff responsible for ETV implementation at national level		and environment/ecological transition work at national level Examples/best practices on how to set up strong institutional frameworks for ETV involving key actors A strategic document setting up a national ETV programme that will determine the role of ETV at national level with a monitoring system for implementation, and a budget for programme maintenance, a clear link of ETV to environmental/ innovation priorities resulting from other programmes or strategic initiatives or market needs demonstrated by business stakeholders (e.g., in relation to deadlines for compliance to targets/ objectives of national policies) Training/education/communication/policy briefs materials for policy makers and staff involved in ETV supervision at ministry/national agency level
5.	**Lack of clear role and engagement in ETV governance by the EU ETV Steering Group**	Organisational / governance	Lack of sufficient knowledge and understanding of ETV among members of ETV Steering Group Lack of good practices/successes of ETV to share Lack of decision making power of the ETV Steering Group concerning scheme development, implementation	EIT/ EC National bodies supervising ETV	Training/capacity building for the use of ETV among policy makers Guidance on possible ETV use cases Definition of clear roles for members of ETV SG, and a feedback collection mechanism

6	Lack of interest from industry side to invest in new technologies with superior performance	Political / legislative	Risk aversion, regulatory requirements (some sectors are highly regulatory driven, especially in relation to large infrastructures) cause lack of interest in investments performing beyond the legal requirements	Policy makers responsible for policies on the environment, climate, innovations, GPP Funding scheme operators	Financial and other organizational incentives should be established to promote the selection of technologies that are more environmentally efficient than conventional technologies
7	High ETV costs	Financial / organisational	ETV procedures involve third party testing / test data generation which is the most expensive part There are no practices in performing combined testing for ETV and other schemes e.g. compliance The experience of a test body to perform testing of a specific technology could reduce the cost (routine) There is no guidance/ practices on how to perform testing for ETV under a demo project before ETV application e.g. under Horizon Europe	Networks of testing centers especially performing compliance testing (e.g., test-Net) Verification bodies could create own networks of "educated " test centers	Test bodies/ centers may need guidance on the needs of the testing protocols requirements / test data recognition requirements to be developed e.g. by ETV TWG
8	Lack of competitive advantage of ETV in public tendering	economic / legislation	Lack of reference to ETV as a tool for public procurement in EU documents and national strategy (particularly in GPP and IP) Lack of benefits/knowledge on the use of ETV in procurement/investments processes	DG ENV, national bodies responsible for procurement strategies, programmes and GPP	Guidance on the use of ETV in procurement, capacities and skills in drafting tender documents with the use of ETV Good practices/examples/pilots of ETV application in procurement where ETV could be an eligibility criterion. Such pilot would require implementation of a promotion campaign implemented with a 2-year advance prior to tenders in which ETV would be required in the investment process

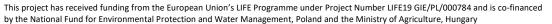| #					
					Communication on ETV, the status of verification bodies and the SoV in the light of legal acts relevant to public procurement towards consulting /engineering community/ utilities (technology users)
9	**Competition from other certification schemes**	Economic / organisational	Some voluntary schemes at EU or national level have established position on the market/sector, may be cheaper and easier to obtain but may be e.g., based on self-declarations The lack of knowledge of ETV advantages and differentiations from certification schemes	ETV Secretariat responsible for ETV branding to demonstrate the distinctive features of ETV vs other schemes Ministries/agencies responsible for ETV at national level,	Build strong branding of ETV based on distinctive ETV features. Increase ETV value perception among stakeholders Promotion of ETV among branch organisations
10	**ETV a lengthy process**	Organisational	The process of ETV is very lengthy, which is also associated with costs and uncertainty into the future The lengthy process is often due to the application phase and the time required to perform the relevant testing of technology	ETV Secretariat, ETV TWG National authorities responsible for ETV scheme, business support organisations	Ensuring better guidance to proposers prior to application Creating frameworks for verification of specific types of technologies including key performance criteria Launching national ETV support schemes by educated business support organisations. Provide guidance on how to perform testing for ETV under a demo project Communication towards interested companies on the individual steps/ aspects of the process

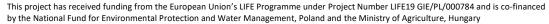| 11	**Lack of ETV use for permitting and regulatory purposes** **Lack of ETV links with demonstration of permit compliance (and importantly beyond compliance) if applicable**	Policy / governance	The use of ETV for permitting purposes or regulatory compliance demonstration is not explored except for the case of Denmark (agricultural technologies reference list) Lack of knowledge and understanding of ETV among regulatory and permitting bodies	National authorities responsible for ETV supervision	Involvement of permitting and regulatory bodies in ETV governance at national level Knowledge and understanding on how ETV can support permitting and help regulatory/permitting bodies understand a new technology and its performance
12	**Low integration of ETV into the EU Innovation landscape**	Organisational / policy	ETV not recognized as a tool to boost innovative technologies and accelerate market update	National innovation accelerators, ecosystems hubs, start-up/scale up programmes	Integrate ETV within the innovation support services for start-ups/scale-ups offered by Business Creation and Acceleration programmes (i.e. EIT Community)
13	**Lack of ETV links with education**	Organisational / policy	ETV business cases not visible within education programmes inspiring innovators and entrepreneurs	EU curricula, universities, business schools National authorities responsible for ETV scheme	Present ETV business cases to Education programmes within EIT Community Access to ETV knowledge materials

Table 2. Drivers of ETV market acceptance and recognition

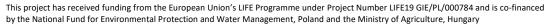|	Description / definition of the driver	Nature of the driver	Why this is a trigger?	Who should act?	What needs to be done? What do they need to act?
1	**ETV may provide a basis for standardising the testing methods to demonstrate technical/functional and environmental performance of technologies for tendering procedures**	Financial / economic	ETV provides a framework enabling development of testing protocols that could be used for verification and benchmarking of performance of a defined type of technologies in view of their performance related to e.g., environmental policy objectives	Policy/decision makers responsible for environmental policies/permitting, public procurement at national level (if to be recognised at national level) or EU level (if the aim is to create an EU level playing field), regulatory bodies, technology buyers and providers, professional bodies/sectoral organisations	Knowledge about ETV, presentation of good practices e.g., provincial regulation in Ontario on the procedures for procurement of stormwater systems Decisions/dialogue with decision makers at national level supervising the ETV scheme, environmental policies and procurement procedures Testing centers who have capacities to test technologies according to the protocol Joint discussion between technology providers, users and policy makers on the needs and expectations concerning specific types of technologies
2	**Establish appropriate incentives targeting producers/providers/ buyers/users of verified technologies (e.g., tax deductions/reliefs; additional score in the public tendering scoring model, facilitation of permitting process, additional points when apply for funding in some national founding**	Legislative / political	The investment cost for verification process / purchasing of verified technology instead of conventional can be quickly reclaimed. ETV can improve the innovation level of economy/companies	Group 1. DG ENV, ETV Secretariat, decision makers at national level supervising the ETV scheme Group2. Policy makers such as fiscal, financial, environmental, public procurement (national and EU level), local authorities, funding schemes operators,	Dialogue and cooperation between both groups Educational materials, promotion and communication towards permitting bodies and regulators Involvement of permitting bodies in national ETV stakeholder groups Group 2 policy makers need to receive appropriate knowledge about ETV and its

	schemes/grants aimed pro-environmental projects)			regulatory bodies responsible for innovation	opportunities / wide application possibilities to act
3	Establishing synergies with other environmental schemes	Organisational / political	e.g., Technologies verified under ETV Program and applied to projects aimed to reduce to GHG emissions, could simplify the process of verification and claim of the carbon credits Synergies may lower time and cost for ETV and improve recognition both schemes	DG Env, ETV Secretariat Carbon crediting schemes Owners and EU Other VES owners	Joint discussion between European Authority and Carbon crediting schemes Owners (e.g., UNFCCC, VERRA) Establishing common approach to implement solutions. Promotion toward involved stakeholders
4	Creating a strong institutional collaborative framework at the national level	Organisational / political	Strong institutional framework can build trust and certainty of the programme at national level for all stakeholders Increase the interest and knowledge about ETV	Mainly decision makers at national level supervising the ETV scheme Other ETV stakeholders included in institutional framework	decision makers at national level supervising the ETV scheme: cooperate, communicate with the stakeholders, and maintain institutional framework e.g., by organizing seminars, meetings, etc.
5	Use of ETV as performance assessment scheme for derisking investments in new environmental technologies	Policy/ financial	ETV could be used as an element for risk assessment for clean-tech/green-tech investors, banking sector providing funding for environmental technology related investments, as a part supporting ESG assessment or aiding technical due diligence procedures for start-ups offering innovative green technologies	DG ENV/ EIT, Cleantech/ Greentech capital providers (e.g., Cleantech Europe), banking sector EC Innovation Procurement support services National authorities	Examples of good practices, guidance materials for capital providers
6	Build ETV in innovation support programmes with environmental objectives at EU and national/regional level or dedicated to acceleration of new technologies e.g., European Innovation Fund, Aspire projects	Policy/ financial	ETV could be used as an obligatory element of national/EU funding programmes ensuring higher market success of the developed technologies under the funded project and increase the market uptake these technologies to ensure efficient spending of public funds	EU and national policy makers responsible for R&D&I and environment sector, National and EU Funding Scheme Operators	Knowledge about ETV, dialog with ETV Secretariat, decision makers at national level supervising the ETV scheme

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4. CONCLUSIONS

The performed analysis of the obstacles and drivers lead to the identification of 13 key obstacles and 6 drivers that should be addressed in the Roadmap for ETV market acceptance and recognition. The vast majority of obstacles and drivers have double nature. In the case of obstacles, the majority had an organizational nature, followed by policy and governmental nature.

Key Obstacles:
- ETV is not recognised as a brand,
- The value of verification is not recognised by technology buyers/industry,
- Lack of knowledge about ETV among all groups of ETV stakeholders,
- Limited accessibility of ETV for SMEs, startups, technology developers due to costs,
- Weak governance, leadership and commitment to ETV uptake at national level,
- Lack of references to ETV in national and EU environmental, climate and innovation policies and strategies,
- ETV is a lengthy process.

Key Drivers:
- Creating a strong institutional collaborative framework at the national level,
- Use of ETV as performance assessment scheme for derisking investments in new environmental technologies,
- Establish appropriate incentives targeting producers/providers/ buyers/users of verified technologies.

Key actions to undertake :
- Build ETV branding strategy,
- Build ETV success story,
- Establishing an ETV forum/platform on EU and national levels,
- Development a strategic ETV programme at national level which set up funding schemes for ETV,
- National authorities responsible for ETV supervision need to closely cooperate with the ministries for innovation, industry, environment and climate to include ETV into legislation and strategies,
- Involvement of permitting and regulatory bodies in ETV governance at national level is needed,
- Include ETV into EU and national programmes supporting innovation, environmental protection and climate change mitigation.

Key Actors to act:
- National authorities responsible for ETV supervision,
- National policy makers responsible for policies on the environment, climate, and innovation programmes/strategies,
- DG Environment,
- ETV Secretariat,
- EIT as successor of the EU ETV programme,
- ETV Steering Group.

Key capacities needed:

- Dialogue, discussion and cooperation between all key actors, ETV stakeholders,
- Training and capacity building for the use of ETV among policy makers and authorities responsible for ETV supervision,
- Various guidance documents available for all ETV stakeholders to increase awareness, knowledge, skills and understanding of ETV and considering their needs,
- ETV branding and promotional strategies,
- Sufficient budget for awareness rising, promotional materials and building strong ETV branding.

Appendix 1 - Survey: Defining ETV market acceptance and recognition drivers and obstacles

The www.LIFEproETV project is aimed to build a strong market acceptance and recognition of the EU ETV scheme. You have received this e-mail because you are a stakeholder of our effort. With this short survey we want to get first-hand information from stakeholders about your experience with ETV. Whether a Verification Body, a holder of an ETV Statement of verification, a buyer of a verified technology or a decision maker involved in ETV at national level, we encourage you to have a say and tell us what in your opinion does and what does not work with ETV market acceptance and recognition.

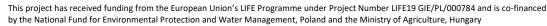**Please fill in and return the completed questionnaire by email before 26th April to:**

Bartosz Malowaniec, Institute for Ecology of Industrial Areas, Task Leader,
e-mail: b.malowaniec@ietu.pl,

If you have any observations or questions please contact me by phone: +48 506 304 777

Name:	
Institution	

Please provide a maximum of 5 drivers and 5 obstacles key in your opinion to build a strong ETV market acceptance and recognition. Indicate the nature of these drivers and obstacles for example: financial/economic, organizational, policy.   We would appreciate it if you would add information describing the cause of the problem/trigger, who should act and what they should do.
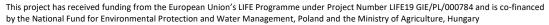
KEY OBSTACLES

Name the problem	Define its nature of the problem (e.g financial/economic, organisational, policy)	What is the reason of the problem (may be more than 1)	Who should act?	What do they need to act?
EXAMPLE				
Lack of dedicated ETV funding schemes at national level.	Financial/economic	Lack of knowledge about ETV among funding scheme owners.	Policy/decision makers responsible for innovation support funding policies and instruments. Associations of startups/SMEs involving technology providers (could be sectoral organisations).	Knowledge, skills and awareness about ETV, a clear explanation how ETV could be included in funding schemes and what benefits it will deliver. Decisions/dialogue with decision makers at national level supervising the ETV scheme.
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KEY DRIVERS

Name the trigger	Define its nature of the trigger (e.g financial/economic organisational, policy)	What is the reason of the trigger (may be more than 1)	Who should act?	What do they need to act?
EXAMPLE				
ETV may provide a basis for standardising the testing methods to demonstrate technical/functional and environmental performance of technologies for tendering procedures.	Financial/economic	ETV provides a framework enabling development of testing protocols that could be used for verification and benchmarking of performance of a defined type of technologies in view of their performance related to e.g environmental policy objectives.	Policy/decision makers responsible for environmental policies/permitting, public procurement at national level (if to be recognised at national level) or EU level (if the aim is to create an EU level playing field), regulatory bodies, technology buyers and providers, professional bodies/sectoral organisations.	Knowledge about ETV, presentation of good practices e.g provincial regulation in Ontario on the procedures for procurement of stormwater systems. Decisions/dialogue with decision makers at national level supervising the ETV scheme, environmental policies and procurement procedures. Testing centers who have capacities to test technologies according to the protocol Joint discussion between technology providers, users and policy makers on the needs and expectations concerning specific types of technologies.
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