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3. List of abbreviations

WP	Work Package
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4. Executive summary

Task 7.5 of the project focuses on certification, a key aspect of upPE-T's methodology. The initial findings from this task include:

- An examination of the current certification landscape, which highlights the advantages of certification for organizations, such as increased customer trust, improved operational efficiency, and reduced costs.
- A review of the steps involved in obtaining an industrial certification.
- The establishment of a foundational framework for the overall basis of a new certification, which is a primary project goal of Task 7.5.

As a part of the task activities, a preliminary contact with DIN certco in Germany and Eesti Standardikeskus (EVS) (Estonian Centre for Standardisation and Accreditation) has been made. A remote meeting is being planned for January 2024 to introduce the project and engage in discussions regarding the requirements for the new certification. Concurrently, DIGI and other upPE-T partners are outlining the pass criteria for key parameters related to processes like material sorting, recycling, packaging attributes, food shelf life extension, organic recovery, and environmental biodegradation. These criteria will be essential for certification. This pass level criteria and certification methodology will be captured within a cloud-based digital solution. This solution will streamline the certification process and make it more accessible to organizations.

5. Introduction

A certification scheme is a systematic and organised approach for assessing and verifying that a product, service or a process meets specific standards or requirements. Often, such a scheme can apply to individuals as well. Such schemes are commonly used in various industries and sectors to ensure that certain quality, safety, security criteria are met and corresponding compliance standards are maintained. Each certification scheme must have the following aspects to it:

- **Standards and requirements:** Every scheme is based on predefined industry standards and/or requirements that specify the criteria for certification. These standards can cover a wide range of areas, such as product quality, environmental sustainability, information security, occupational health and safety, and more.
- **Assessment and evaluation:** To obtain a certification, individuals, organizations, products, or services must undergo a thorough assessment and evaluation process. The process is conducted by a certification body and involves inspections, audits, testing, and/or examinations to determine whether they meet the specified standards.
- **Certification Body:** The certification body is mainly responsible for overseeing the certification process involving above mentioned assessment and evaluation. In some countries, it is also known as a certification authority or a certifying agency. These organizations are often independent third parties that are accredited to conduct assessments and grant certifications.
- **Compliance and continuous improvement:** Certification schemes promote compliance with established standards and encourage continuous improvement. Organizations or individuals that are certified are expected to maintain their adherence to the standards and strive for ongoing improvement in their performance. Sometimes, a certification is issued with limited duration. Then the organisations or individuals must undertake the updated assessment and evaluation process to obtain the certification again.
- **Recognition and trust:** Certification adds a level of credibility and trust to products, services, or individuals, as it demonstrates that they have been independently verified and meet certain quality or safety requirements. This recognition is a valuable asset in a commercial sphere as it allows businesses to differentiate themselves from competitors.
- **Consumer confidence:** Consumers (especially business consumers) often rely on certifications to make informed decisions.
- **Industry-specific:** Certification schemes are tailored to specific industries or sectors. For example, ISO 9001¹ is a certification scheme related to quality management systems, while LEED² is a certification scheme for green building practices.
- **Voluntary or regulatory:** Certification schemes can be voluntary, where organizations or individuals seek certification to demonstrate their commitment to

¹ <https://www.iso.org/iso-9001-quality-management.html>

² <https://support.usgbc.org/hc/en-us/articles/4404406912403-What-is-LEED-certification-#certification>

certain standards, or they can be regulatory, where certification is required by law or regulation to ensure public safety or environmental protection.

This deliverable reports an initial analysis performed by upPE-T partners regarding improving existing and creating new certification schemes in plastics upcycling.

5.1 Context

The overall methodology of the upPE-T project (depicted in **Figure 1**) includes certification as a part of its WP7 (Project sustainability assurance, Standardisation activities & Certification schemes). The goal behind this inclusion is to analyse the current landscape to understand the steps for obtaining a certification and define the baseline for future certification schemes facilitating the market acceptance of the novel upPE-T solutions. The WP7 therefore dedicates Task 7.5 to perform this analysis and work out the basis for future certification schemes.

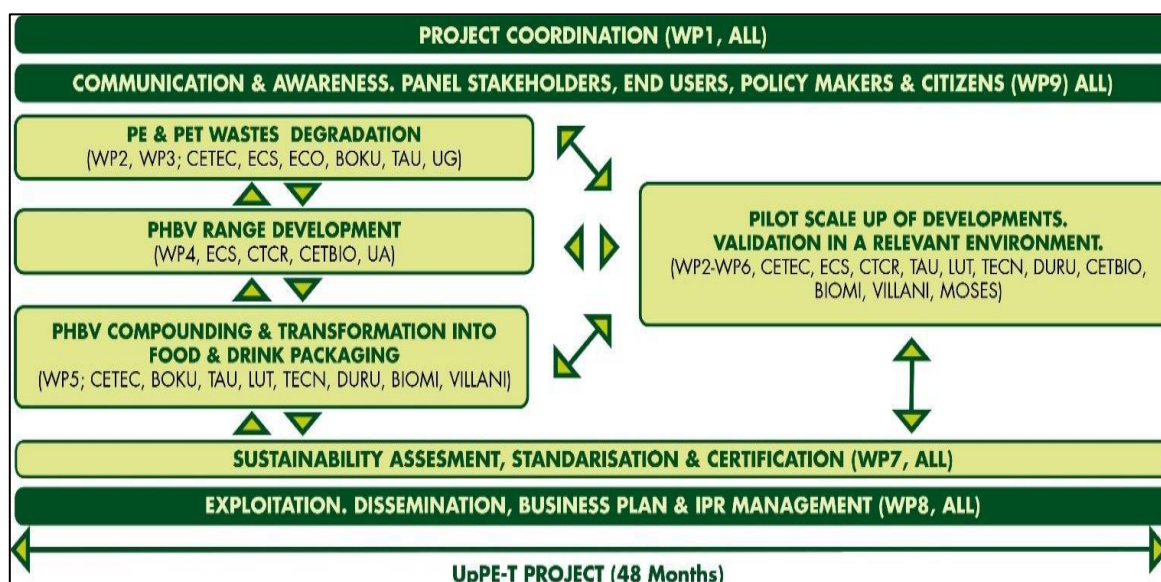


Figure 1 - upPE-T project methodology.

5.2 Structure of the deliverable

This deliverable reports the outcomes of the Task 7.5 until the end of Year 3 of the project. Section 6 reports steps for obtaining industrial certification which have been studied as a part of the current landscape. In addition to that, it also describes developing an overall basis of a new certification. The next steps of the task are then summarised. Section 7 concludes the deliverable.

6. Current landscape of relevant certification schemes

It is well known that industrial certification schemes for products and services are a type of conformity assessment process that verifies that they meet specific standards and/or requirements. These schemes are typically operated by independent third-party certification bodies and can be voluntary or mandatory. Obtaining a certification for a product or a service brings numerous advantages to an organization, including: (i) increased customer (especially B2B and B2G) confidence and trust, (ii) improved and state-of-the-art product and service quality on the offering, (iii) reduced risk of product liability, (iv) enhanced access when entering a new market, and (v) compliance with national, European, and or international regulatory requirements.

6.1 Steps for obtaining industrial certification

An analysis has been conducted to study the **methodology** and steps required to obtain certification. It is noted that the steps are widely different based on whether a product, or a service, or an individual is being assessed for a certification. Since upPE-T deals with physical products and processes, these deliverables summarises generic or common steps involved in obtaining an industrial certification.

- **Determine certification needs:** the first step revolves around identifying the need for certification, whether it is driven by legal requirements, industry standards, or market demand. Organizations should decide which certification scheme is applicable to their product or service. Often this is done by market and available certification research.
- **Select a certification agency:** When the needs are clear, the logical next step is to identify a certification agency or authority that is accredited and recognized in the relevant industry as well as the region (e.g., DIN Certo in Germany). This selection is crucial as it will conduct the evaluation and grant the certification.
- **Pre-assessment:** This is an optional step where some organizations can opt for a pre-assessment to identify areas that need improvement before the formal certification process begins. This step is not always required but can be helpful in preparing for the certification audit.
- **Documentation review:** In this step, the organisation is required to prepare and submit documentation related to its product or service, including policies, procedures, quality manuals, and other relevant information. The certifying

authority reviews these documents in detail to determine and ensure compliance with the certification criteria.

- **On-site audit:** Depending on the certification scheme, the certifying authority may conduct an on-site audit of the organisation's facilities, processes, and operations to assess whether the product or process meets the required standards.
- **Corrective actions:** If any non-conformities or deficiencies are identified during the audit, the organisation must take corrective actions to address them. This may involve making changes to the processes or products.
- **Certification decision:** After the audit and any necessary corrective actions, the certifying body will make a certification decision. If all the required standards are met, the certification is granted. If not, further assessments may be required.
- **Certification maintenance:** After certification, it is still needed to maintain compliance with the certification standards. This often involves regular monitoring audits to ensure ongoing adherence to the requirements.
- **Renewal:** It is a common practice to issue certifications with a limited validity period. One to three years of duration is most commonly observed. As a result, organisations must undergo a renewal process to keep the certification current. Often, it involves a recertification audit.

6.2 Existing certification schemes

In relation to the activities of upPE-T, several existing certification schemes have been identified. While specific ones vary by region and industry, this report refers to a **non-exhaustive** but widely recognized ones below.

- Recycled Content Certification verifies the percentage of recycled plastic content in a product.
 - Provided by organizations like SCS Global Service.
 - In Germany, Blue Angel Certification is used for products with recycled content.
- European Certification of Plastics Recycling³ (EuCertPlast) aims to encourage an environmentally friendly plastics recycling process by standardising it. The

³ <https://www.eucertplast.eu/>

standards and requirements examined during the EuCertPlast certification process are in line with those of the Blue Angel Eco-Label⁴.

- Quality Standards for Recycled Plastics is another category of certifications which ensure that recycled plastics meet specific quality and performance criteria. Two examples of such scheme include –
 - EN 15343:2007⁵ – It is an European standard for Plastics recycling traceability and assessment of conformity and recycled content.
 - ISO 15270⁶ – It is an international standard for determining the degree of disintegration of plastic materials under defined composting conditions.
- Certifications related to the environmental management facilities (that can be related to plastics upcycling as well) include –
 - ISO 14001⁷ - Certification for environmental management systems, which can be relevant for upcycling facilities.
 - scheme for environmental management and auditing.
- Our study has also discovered certifications focusing on broader aspects of sustainability and circular economy principles which are directly relevant for plastics upcycling. For example –
 - Cradle to Cradle (C2C) Certification⁸ - Assesses products and materials for their environmental and social impact, promoting circular design principles.
 - Green Seal Certification - Focuses on environmental sustainability and performance of products.
- There are also local and industry-specific certifications or labels applicable depending on the region and industry. For example, the Plastic Recyclers Europe (PRE) certification for plastic recyclers in Europe.

6.3 Summary of EN 15343:2007 scheme

It is chosen to study further because it is a European certification scheme that sets out specific requirements and guidelines for assessing the quality of recycled plastics. This certification is crucial for ensuring that recycled plastic materials meet established standards for use in various applications, promoting sustainability and resource efficiency which are of high relevance to the objectives of the upPE-T project.

The underlying standard defines a comprehensive framework for evaluating recycled plastics, covering aspects such as composition, contamination, and physical properties. It outlines procedures for sampling, testing, and reporting, offering a systematic approach to assessing the quality of recycled plastics. EN 15343:2007 also provides criteria for the classification of recycled plastics based on their characteristics, helping consumers, manufacturers, and regulators make informed decisions about the materials they use.

Key components of this certification include assessing the presence of impurities, ensuring the absence of harmful substances, and verifying the physical properties of the recycled plastics, such as melt flow index and mechanical strength. EN 15343:2007 aims to

⁴ <https://www.eucertplast.eu/blue-angel>

⁵ <https://standards.iteh.ai/catalog/standards/cen/a1a8ffaf-bf7d-4b1c-ba13-f8b368625569/en-15343-2007>

⁶ <https://www.iso.org/standard/45089.html>

⁷ <https://www.iso.org/standard/60857.html>

⁸ <https://c2ccertified.org/the-standard>

encourage the responsible use of recycled plastics in various industries, including packaging, construction, automotive, and more.

It is to be noted that by adopting this scheme, organizations can demonstrate their commitment to sustainable practices and environmental responsibility. These are two core principles of upPE-T activities and forms an integral part of the impacts that the project partners aim to collectively achieve by upcycling plastic materials.

6.4 Summary of European Certification of Plastics Recycling

The scheme has been developed as a part of a three-year project, co-financed by the European Commission, under the Eco-Innovation Programme. It addressed gaps among the varying standards across EU countries and the lack of transparency and traceability of plastic materials. It was created with the aim to recognize recyclers operating according to high standards and implementing best practices.

Its compliance scheme was designed in conjunction with the Blue Angel Eco-Label. This certification involves two key steps - EuCertPlast Certification Process and Blue Angel Eco-Label Requirements.

The first step comprises of five sub-steps –

- Auditor Selection: Recyclers must select an accredited EuCertPlast auditor listed in⁹.
- On-site Auditing: The recycling plant is inspected on-site by the chosen auditor.
- Information Exchange: There is an exchange of information between the recycler and the auditor related to the information relevant for compliance checks.
- Third-party Checks: These are conducted by an anonymous auditor to ensure uniformity and rigor in all new reports. Spot checks on monitoring reports are also included.
- Certification: After a successful audit, a 1-year valid certification is issued. The overall quality of the scheme is ensured by a certified and independent quality body which approves the auditors.

The second step for the eco-label requirements includes two sub-steps –

- The Blue Angel Eco-label is awarded to environmentally-friendly products and services. It sets specific standards that must be met in terms of environmental, health, and performance characteristics. These standards are reviewed every three to four years.
- For products made from recycled plastics, having the EuCertPlast certification is a prerequisite. According to the Blue Angel Eco-label criteria, the origin and composition of the plastic recycles used must be verified through a certificate (including a report) pursuant to the EuCertPlast certification scheme.

6.5 Developing new certification schemes

New certification schemes are developed through a complex process that involves defining standards, criteria, and assessment processes for a particular product, service, or industry. Task 7.5 has identified the following general steps that the upPE-T partners need to undertake to develop a new certification scheme.

⁹ <https://www.eucertplast.eu/certification>

- **The need for a new certification scheme is identified.** This could be driven by regulatory requirements, industry demand, consumer safety concerns, or market differentiation. The specific objectives and goals of the certification are understood.
- **Relevant stakeholders are engaged.** This includes industry experts, regulatory authorities, consumers, and potential certifying bodies. Their input is crucial in shaping the certification scheme and gaining industry acceptance.
- **The scope and objectives of the certification scheme are defined.** This includes identifying the product or service that the scheme will cover and the desired outcomes or benefits. The purpose and goals of certification are clarified.
- **Technical standards or criteria are developed that products or services must meet to be certified.** These standards should be clear, specific, and measurable. They should also align with industry best practices and any applicable regulations.
- **The certification process is designed.** This includes developing application procedures, document reviews, on-site audits, and assessment methodologies. The roles and responsibilities of certifying bodies and auditors are specified.
- **Accreditation or recognition is sought for the certification scheme from relevant authorities or accreditation bodies.** This step is essential to ensure the credibility and acceptance of the certification.
- **A pilot test is conducted with a select group of organizations or individuals before the certification scheme is officially launched.** This helps to identify any potential issues or challenges in the process and criteria.
- **Comprehensive documentation is prepared,** including certification manuals, guidelines, and application forms, to guide applicants and certifying bodies through the certification process.
- **Auditors are trained and certified to conduct assessments.** They should be knowledgeable about the certification criteria and assessment process.
- **The certification scheme is officially launched and promoted to the target audience.** The benefits of certification are communicated to encourage participation.
- **Applicants are assessed according to the established criteria and processes.** Those who meet the standards are certified.
- **The certification scheme is continuously monitored and reviewed.** Feedback from stakeholders is gathered, performance is tracked, and necessary improvements are made to keep the scheme relevant and effective.
- **The certification standards and processes are periodically reviewed and updated.** It ensures that they remain aligned with industry developments, regulations, and best practices.
- **A mechanism is established for handling complaints** and appeals from applicants who may dispute certification decisions.
- **Transparency is maintained in the certification process** by providing clear information to stakeholders and regularly reporting on the scheme's performance and impact.
- **The requirements and process for recertification or renewal of certifications are determined.** This is required as many certifications have limited validity periods.

6.6 Analysis and next steps

Our analysis does not reveal any certification scheme applicable directly to upcycled plastic products. Therefore, from Task 7.5, upPE-T proposes a new certification scheme for upcycled content certification specifically for upcycled plastic products. Its main goal will be to assess and certify the percentage of upcycled plastic content in a product.

Due to the research nature of the project, ensuring all of the above steps listed in Section 6.5 are out of scope. However, the rest of Task 7.5 will concentrate on (a) zeroing down on the requirements for the proposed scheme, (b) defining its scope, (c) enumerate the pass levels of key parameters for procedures required for obtaining the certification, (d) encapsulate the methodology for certification in a cloud based digital solution (hosted by DIGI), and (e) contact national and EU certification bodies (e.g., DIN certco in Germany) to conduct one meeting addressing the certification requirements and methodologies during the last year of the project. The digital solution will be prepared as soon as steps (a)–(c) are complete and is anticipated to be completed by March 2024.

7. Conclusion

This deliverable reports the initial outcomes performed as a part of Task 7.5. The outcomes cover a study of the current certification landscape to understand the benefits of obtaining a certification for an organization and steps for obtaining an industrial certification. Thereafter, the Task concentrated on enumerating how to develop the overall basis of a new certification which is one of the goals of this project and an integral part of the methodology. An important milestone of this Task is to establish a contact with the national and EU certification bodies to discuss the requirements and processes of proposing such a certification to them. While DIGI has established a preliminary contact with DIN certco in Germany¹⁰ and Eesti Standardikeskus (EVS)¹¹, a remote meeting introducing the project and discussing the requirements of the proposed certification scheme will be performed by mid January 2024. In parallel to that, we shall enumerate the pass levels of key parameters for obtaining the certification, and encapsulate the methodology for the certification in a cloud based digital solution.

¹⁰ <https://www.dincertco.de/din-certco/en/>

¹¹ It is a non-profit association that is recognized by the Government of Estonia as the national standards and accreditation body for Estonia.