

# CEWASTE

Voluntary certification  
scheme for waste treatment

## THEORY OF CHANGE

### DELIVERABLE 1.2



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# 1 PURPOSE OF THIS DELIVERABLE

This report corresponds to Deliverable 1.2 of the CEWASTE project and presents the Theory of Change (TOC) defined for the project. It is a part of 'Work Package 1-Baseline and Gap Analysis' and explains the main objectives, activities and results of the project that will contribute to achieving the intended impact. The CEWASTE Theory of Change will be used for communication, monitoring and evaluation purposes along the implementation of the project. This document is intended to be a living document and an updated version of it will be submitted to the European Commission in a later stage.

## 2 EXECUTIVE SUMMARY

The current report on Theory of Change aims to establish a common understanding of the strategy of the CEWASTE project by highlighting the objectives, activities, outcomes, outputs and desired impact of the project. The CEWASTE project contributes to an improved recovery of valuable and critical raw materials (CRMs) from key types of waste, such as waste electrical and electronic equipment (WEEE) and batteries. The specific challenges that CEWASTE will address are to secure the sustainable access to CRMs for the EU economy as well as objectives set by the EU action plan for the Circular Economy, the issue of illegal trade of wastes within the EU and to non-EU countries, and the need to support the development of environmentally and socially sound recycling systems globally.

To address these challenges the project will develop, validate and launch a voluntary certification scheme for collection, transport and treatment facilities of key types of waste containing significant amounts of valuable and critical raw materials. This Theory of Change explains the vision of the project and defines the relationship between existing problems and challenges which are going to be addressed in the frame of the project, showing why and how change is needed.

## 3 INTRODUCTION

### 3.1 THE CEWASTE PROJECT

The CEWASTE project contributes to an improved recovery of valuable and critical raw materials (CRMs) from key types of waste, such as waste electrical and electronic equipment (WEEE) and batteries, through the auditing and certification of traceable and sustainable collection, transport and treatment processes. As such, CEWASTE will address the specific challenge to secure the sustainable access to CRMs for the EU economy as well as objectives set by the EU action plan for the Circular Economy, the issue of illegal trade of wastes within the EU and to non-EU countries, and the need to support the development of environmentally and socially sound recycling systems globally.

Specifically, the project will develop, validate and launch a voluntary certification scheme for collection, transport and treatment facilities of key types of waste containing potentially recoverable amounts of valuable and critical raw materials. To ensure a comprehensive approach and a robust result, the project will be developed along the following six specific objectives:

- **Objective 1:** Understand existing collection and recovery practices, standards and verification schemes related to valuable and critical raw materials and how these can be leveraged for CEWASTE.
- **Objective 2:** Leverage existing normative requirements to develop technical, sustainability and traceability requirements for the voluntary certification scheme.
- **Objective 3:** Develop an assurance system and related verification procedures that effectively ensure that facilities and raw material streams are compliant with technical, sustainability and traceability requirements.
- **Objective 4:** Validate the new voluntary scheme through pilots with selected and committed stakeholders of the value chain.
- **Objective 5:** Ensure long term sustainability of the scheme, reflecting on the needs from existing governance mechanisms, and resulting in a roadmap addressing the amendments of new requirements or mechanisms needed.
- **Objective 6:** Ensure a transparent stakeholder process that allows for broad acceptance and dissemination of the essentials of the scheme.

CEWASTE will deliver tangible results in the form of analysis reports, a set of normative requirements, related administrative and procedural mechanisms to ensure compliance with the rules, practical guidelines, and an implementation plan as outlined in detail in the work plan of the project's Grant Agreement. In addition, the project will produce a series of recommendations as part of these results. Face to face events, presentations, webinars, and publications will support project implementation, enabling stakeholder participation, communication, dissemination and the launch of the scheme.

## 3.2 THEORY OF CHANGE

The current report on Theory of Change corresponds to deliverable 1.2 of work package 1 and seeks to explain the vision of the project and its activities, expected outcomes and the desired impact from the implementation of activities. It establishes a common understanding of the strategy of the project and explains the relationship between existing problems and challenges which are going to be addressed in the frame of the project, showing why and how change is needed<sup>1</sup>.

A Theory of Change is normally considered as a dynamic document. It can be changed and adapted in response to issues that emerge during the implementation of the project. The CEWASTE project involves activities with research, analysis, testing and evaluation that can steer the direction of the activities. Moreover, definition of a Theory of Change for a project is a collaborative and consultative process. Based on the future stakeholder consultations, the original version can be reviewed and revised. The CEWASTE Theory of Change will be used for communication purposes along the implementation of the project, as well as for monitoring and evaluation purposes.

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<sup>1</sup> <http://www.open.edu/openlearncreate/course/view.php?id=2214>

# 4 CEWASTE THEORY OF CHANGE

Following the conventional format of a Theory of Change, the main elements explained here include challenges, resources, activities, outcomes, outputs, impact and target audience. Furthermore, the indicators for measuring the impact and the assumptions and risks are addressed. In addition to the narrative explanation, the main elements of the CEWASTE Theory of Change are illustrated in a chart (Figure 1) that can be more effectively used for communication purposes.

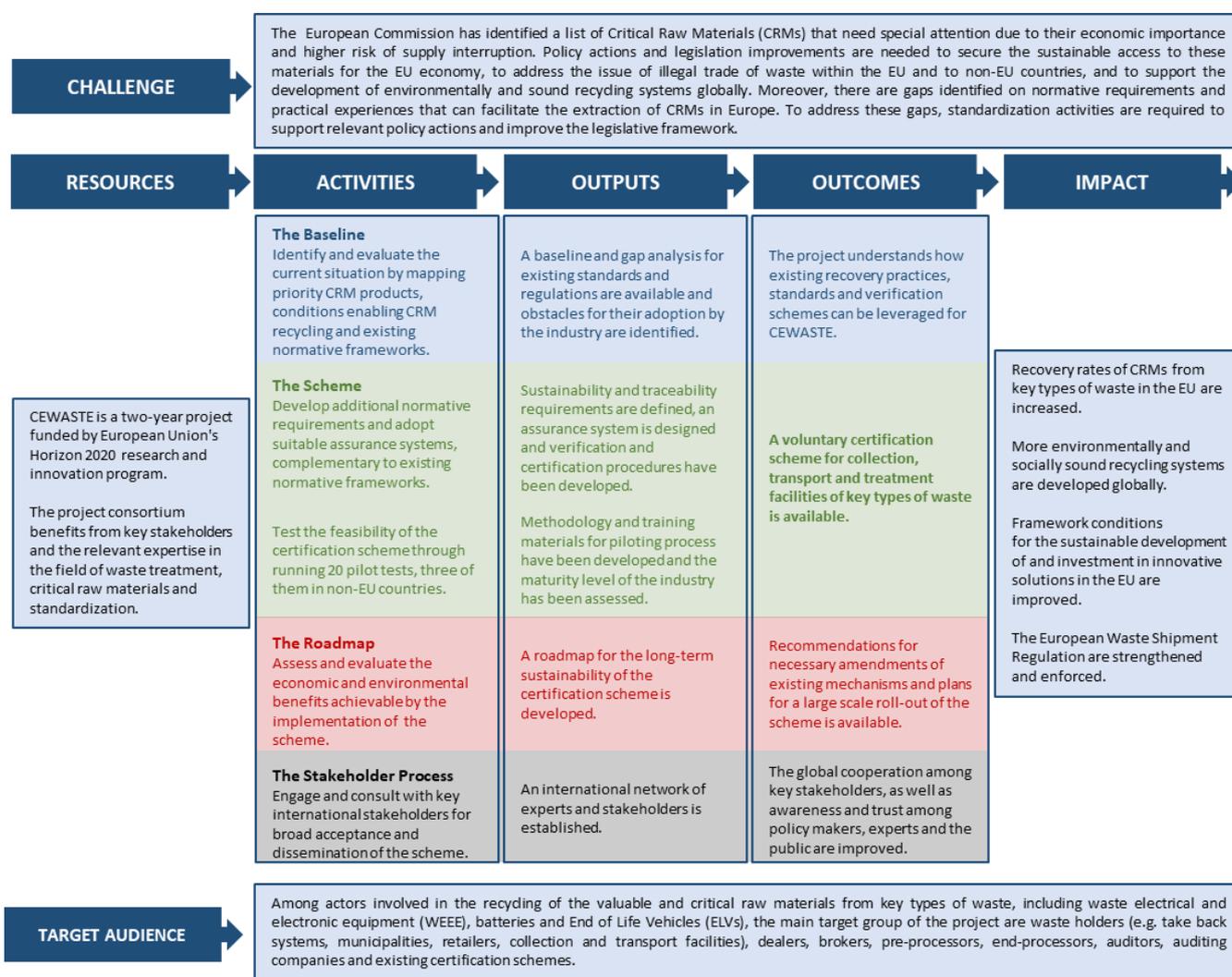


Figure 1. Main elements of the CEWASTE Theory of Change

## 4.1 SITUATION AND CHALLENGES

In its calls for Greening the economy, the H2020 work programme is focusing on moving to a greener, more resource efficient and climate-resilient economy with a strong commitment to supporting the UN's Sustainable Development Goals (SDGs). The focus of these calls is on two main domains, transition to a more circular economy model and achieving the objective and meeting the targets of the European Innovation Partnership (EIP) on Raw Materials, hosted and co-ordinated by the services of the European Commission. The EIP's Strategic Implementation Plan (SIP) aims at securing sustainable access to raw materials through reducing import dependency and to put Europe at the forefront in raw materials sector.

In view of the ambition for a more circular economy and sustainable access to primary and secondary raw materials and in particular to CRMs, the Commission put forward a background report and a Commission staff working document looking at criticality and circular economy in individual materials-related sectors. In this report, the European Commission identifies a list of CRMs that need special attention due to their economic importance and higher risk of supply interruption, which is of great concern since many of these raw materials are vital to the high tech and low-carbon industry in Europe. Moreover, the reports reveal that CRMs in the EU economy are far from being fully circular and there is an urgent need to tackle these challenges.

Policy actions and legislation improvements are needed to secure the sustainable access to these materials for the EU economy, to address the issue of illegal trade of waste within the EU and with non-EU countries, and to support the development of environmentally and sound recycling systems globally. Moreover, gaps have been identified on normative requirements and practical experiences that can facilitate the extraction of CRMs in Europe. To address these gaps, standardization activities are required to support relevant policy actions and improve the legislative framework.

CEWASTE is addressing these challenges by developing a voluntary certification scheme in the value chain of secondary raw materials from wastes containing relevant amounts of valuable and critical raw materials. By covering technical, sustainability and traceability requirements in the entire value chain, the project aims at identifying best practices in the sustainable recovery of secondary raw materials through recycling and reintroduction of these materials into the EU economy (Figure 2).

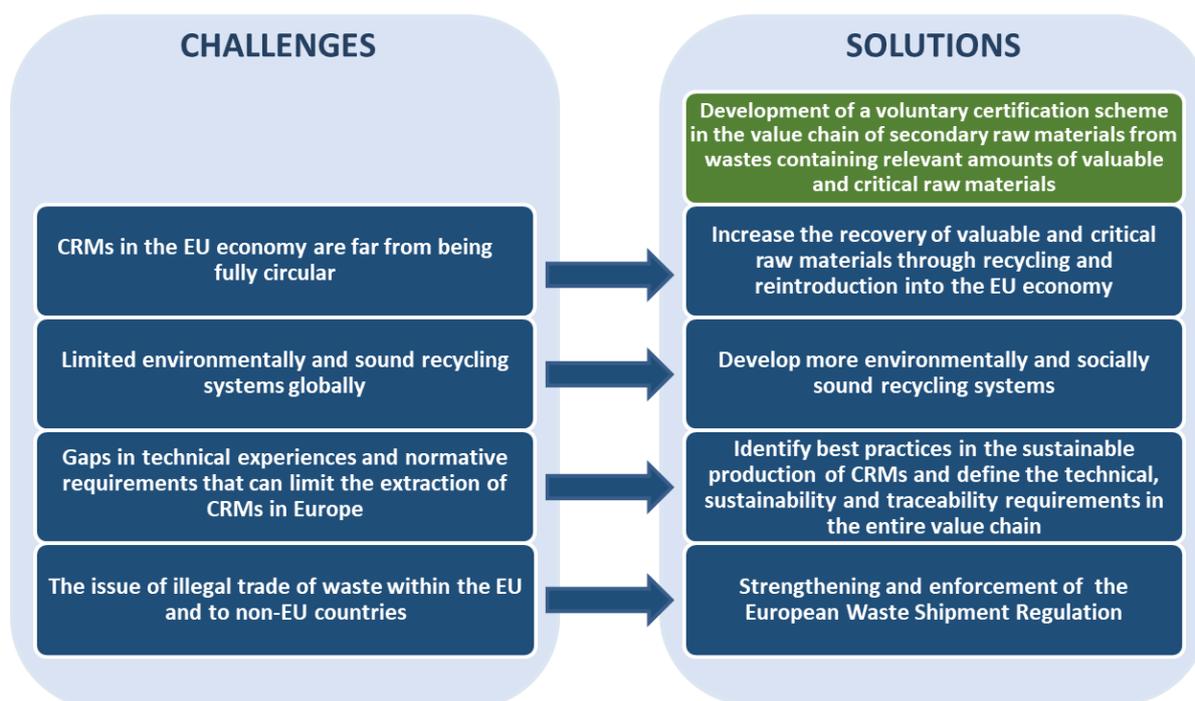


Figure 2. 'Challenge and Solution Tree' defined for the CEWASTE project

## 4.2 RESOURCES

CEWASTE is a two-year project funded by the European Union's Horizon 2020 research and innovation program.

The project consortium benefits from key stakeholders and the relevant expertise in the field of waste collection and treatment, critical raw materials and standardization. The well-balanced composition of the consortium and adjoint advisory board are one of the main resources that will lead the way to success and potentially concrete results in this project. Key consortium partners include the WEEE Forum, speaking for 36 producer responsibility organisations worldwide, and European Electronic Recyclers Association (EERA), who together with their members (as Linked Third Parties of the project) will be testing the feasibility of the certification scheme. Other partners, such as Austrian Standards International (ASI), the European Environmental Citizens' Organisation for Standardisation (ECOS) and the Société Générale de Surveillance (SGS) will ensure high level expertise on standardization and auditing processes. The consortium is complemented by internationally well-known experts in the area of e-waste management from Oeko Institute, Sofies, United Nations University (UNU) and the World Resources Forum Association.

CEWASTE has created a strong Advisory Board to ensure that key European and international stakeholders are included in the conversation. These include the French Environment and Energy Management Agency (ADEME), Aluminium Stewardship Initiative (ASI), European Committee for Electrical Standardization (CENELEC), International Union for Conservation of Nature (IUCN), DG Joint Research Centre (JRC) of the European Commission, OVAM, the Public Waste Agency of Flanders, Swiss Federal Institute for Material Sciences and Technology (Empa), German Environment Agency (UBA), the WEEELABEX Organisation and Eurometaux. By including international members such as the Colombian Institute of Technical Standards and Certification (ICONTEC), Regional Environmental Center Turkey (REC Turkey) and South African E-waste Alliance (SAEWA) the project will ensure that the social and environmental issues in developing countries are adequately addressed in the voluntary scheme. Furthermore, CEWASTE has engaged the Basel Convention in its Advisory Board to make sure that the specific issues for the international trade of secondary raw materials are appropriately covered.

## 4.3 ACTIVITIES AND THEIR OUTPUTS

To ensure a comprehensive approach and a robust result, the project will be developed by performing the following activities:

### 4.3.1 THE BASELINE

**ACTIVITIES:** In the first step, the project identifies and evaluates the current situation by mapping priority CRM products, conditions enabling valuable and CRM recycling and existing normative frameworks. With this activity, the project aims to understand the challenges associated with the recycling of valuable and critical raw materials from key types of waste along the entire end-of-life chain including their collection, sorting, treatment, regulatory framework, illegal shipment/trade and, technical, economic and market limitations. Furthermore, by mapping the current normative requirements and verification mechanism, the project will understand their scope, objective and design and will show the gaps in the existing normative requirements with a focus on the requirements for the recovery of valuable and CRMs recovery.

**OUTPUT:** The tangible output of this activity is a report with a comprehensive baseline and gap analysis for existing standards and regulations. In this report, the areas and requirements

for collection and recovery of valuable and CRMs from priority products, which have not been taken into considerations or not sufficiently addressed in existing standards, will be identified. Moreover, the report will include an analysis of the reliability and conformity of existing certification and verification schemes with the requirements of ISEAL and the ISO 17000 series to assess their suitability for the planned CEWASTE certification scheme.

### 4.3.2 THE SCHEME

**ACTIVITIES:** Based on the baseline and gap analysis of existing practices, principles and standards, the project will define the necessary requirements for the various process steps in the collection and treatment on the environmental, social, technology and governance principles as well as the essential traceability requirements on management systems and responsibilities, procurement of services, product documentation and compliant claims. Where the existing guidelines and standards are not sufficient to meet all the project's objectives, new normative requirements will be developed. As the next activity, the project will develop an effective assurance system for the different collection and treatment steps including the consistency, rigour, competence, impartiality, transparency and accessibility principles. Based on this assurance system and the developed normative requirements, realistic verification procedures for the various requirements will be developed. These will be the main components of the voluntary certification scheme that the CEWASTE will develop.

To validate and test the feasibility of the proposed approach in the new voluntary certification scheme, the project will run 20 pilot tests. To ensure a wide applicability of the scheme, the selection of piloting partners will be based on criteria such as the step in the value chain, size and geographical location of operators or facilities. Based on the results of the pilot testing, the voluntary certification scheme will be validated and updated.

**OUTPUTS:** While developing the voluntary scheme, the project will deliver several outputs in the form of reports and manuals. The main reports will be on technical, sustainability and traceability requirements, design of the assurance system, verification and certification procedures. The manuals and training materials for the assurance and verification process, as well as pilot testing will be available.

### 4.3.3 THE ROADMAP

**ACTIVITIES:** Based on the learnings and feedback from baseline and piloting and the recommendations that will be received from the stakeholders through consultation process, the project will investigate and evaluate the economic and environmental benefits that can be achieved by implementing the scheme. Moreover, the legal, financial and operational requirements for sustainability of the voluntary scheme will be assessed.

**OUTPUTS:** The result of these activities is the development of a roadmap for the long-term sustainability of the scheme. This roadmap will include recommendations for the necessary amendments to existing mechanisms, recommendations for the financing mechanisms relevant to products, resources and waste, as well as economic and environmental benefits of the implementation of the voluntary scheme.

### 4.3.4 THE STAKEHOLDER PROCESS

**ACTIVITIES:** Developing a widely accepted and mature certification scheme requires a multi-stakeholder participation including key experts in a consultation process. Stakeholders will be identified along the entire value chain and will be invited to provide their feedback and comments to the project work and outcomes and to the draft version of the voluntary scheme. The ISEAL Assurance Code of Good Practice will form the basis of stakeholder participation activities. Moreover, CEWASTE will target the relevant stakeholders in its communication activities to involve them in the delivery and dissemination of the results of the project.

**OUTPUTS:** An international network of stakeholders will be established. These stakeholders will contribute to improving the quality of the process and to transferring and raising awareness about the results of the project.

## 4.4 OUTCOMES

The activities and outputs of the project will result in the following outcomes:

- The project will understand how existing collection and recovery practices, standards and verification schemes can be leveraged for CEWASTE.
- A voluntary certification scheme for collection, transport and treatment facilities of key types of waste will be available.

- Recommendations for necessary amendments of existing mechanisms and plans for a large roll-out of the scheme will be available.
- The global cooperation among key stakeholders, as well as awareness and trust among policymakers, experts and the public will be improved.

## 4.5 DESIRED IMPACTS AND INDICATORS FOR MEASURING THE IMPACT

### **Desired Impact 1: Collection and recovery rates of key types of wastes (such as WEEE) containing valuable and CRMs in the EU are increased**

By addressing technical, sustainability and traceability requirements specific for CRMs in the entire value chain, the certification scheme aims at identifying best practices in the sustainable collection of products containing valuable and CRMs and the production of secondary valuable and CRMs. This will foster the creation of a level playing field in EU and creation of a favourable environment for investment in new collection and recovery technologies, particularly promoting the channelling of material flows to players able to recover valuable and CRMs, avoiding dissipation along the end-of-life chain. With this, the recovery rates of the target materials through collection and recycling and their reintroduction into the EU economy will be increased.

Indicators/Targets:

- Readiness of at least 20 companies and/or organizations (who volunteered for pilot tests) for implementation of the scheme will be increased,
- The overall recovery efficiency for selected valuable and CRMs through the voluntary scheme is increased

### **Desired Impact 2: More environmentally and socially sound recycling systems are developed globally.**

Definition of sustainability-related stipulations as part of the normative requirements of the scheme and associated assurance and verification system will have an impact on collection, transport and treatment facilities and will ensure that its value chain partners operate according to normative requirements. Such requirements will be identified (among others) for safe, healthy and suitable working conditions as well as for local community impacts and resilience. As a result, downstream partners of certified collection and treatment facilities will

have to comply with requirements that improve traceability and transparency of operations, which will consequently contribute towards environmentally and socially sound recovery systems globally.

Indicators/Targets:

- The amount in million metric tonnes (Mt) of CO<sub>2</sub> equivalent saved through the recovery of valuable and CRMs compared to primary mining with the adoption of the voluntary scheme by players agreeing to be part of the pilot will be assessed,
- Level of compliance with waste permits and auditing protocols is increased.

**Desired Impact 3: Framework conditions for the sustainable development of and investment in innovative solutions in the EU are improved.**

By developing criteria for a more level playing field, CEWASTE's voluntary scheme will contribute to a roadmap and conditions for a framework, where more security for investments in advanced valuable and CRM collection and recovery technologies, and into improved environmental and health & safety practices is guaranteed. The inclusion of technical, sustainability, traceability requirements into the scheme will support the improvement of framework conditions for sustainable development. In addition, requirements for the use of recycled CRM by producers will be crucial to further improve the transition to a more Circular Economy model. Moreover, in an international market and trade environment, where the political and public demand for more transparency in the secondary raw materials sector and related consumer products is increasing, operating according to standards will set the rules for fair competition, which in turn will impact positively on employment.

Indicators/Targets:

- Potentially 50 new jobs will be created across the EU with the adoption of the voluntary scheme across the players agreeing to be part of the pilot,
- Number of companies capable of improving the collection and recovery yield of the valuable and CRMs is increased.

**Desired Impact 4: The European Waste Shipment Regulation is strengthened and enforced.**

By increasing transparency in the value chain, the handling of illegally traded waste can be avoided. The training materials that will be developed in the frame of the project, will ensure that the scheme can be certified and audited by third parties. With this, the enforcement

authorities will have a tool to track down illegal or sub-standard practices in collection, transport and treatment. Port authorities will have traceable records and will be able to address illegally traded waste especially to or from developing countries, where environmental and social issues are typically lower than those in Europe.

Indicators/Targets:

- At least five external auditors will be trained on verification of the voluntary scheme,
- The availability of traceable records of wastes containing valuable and CRMs is increased,
- Readiness of at least 20 companies and/or organizations (who volunteered for pilot tests) for implementation of the scheme will be increased.

## 4.6 TARGET AUDIENCE

Among several actors involved in the collection and recycling of the valuable and critical raw materials from key types of waste, including waste electrical and electronic equipment (WEEE), batteries and End of Life Vehicles (ELVs), the main target audience (direct beneficiaries) of the CEWASTE project are waste holders, such as collectors, compliance schemes, municipalities, retailers, collection and transport facilities, as well as dealers, brokers, pre-processors, end-processors, auditors and auditing companies. To ensure that the applicability of the scheme will cover the needs and requirements of all these beneficiary groups, the project will involve the representatives of all steps of the value chain in the consultation process and in the pilot testing.

The other important beneficiaries of the CEWASTE project are the existing certification schemes. In the roadmap that will be developed by the project, recommendations for amending the existing mechanisms (legislation, guidelines, standards, and initiatives) with the new requirements will be presented. These group of beneficiaries will be involved in the consultation process.

In a broader scope the project will engage with more stakeholders including product producers, retailers, secondary raw materials suppliers, waste management companies, public authorities (at local, regional and national level), standard organizations, enforcement authorities (e.g. national environment agencies, port authorities), civil society organizations (including consumer groups, environmental organizations and trade unions), social

enterprises, as well as other related projects. This group of beneficiaries will be targeted for stakeholder's consultation process and will be involved in the dissemination activities.

## 4.7 ASSUMPTIONS AND RISKS

The main project outcome is the development and launch of a voluntary scheme aiming at ensuring the collection and recovery of valuable and CRMs across the EU. Irrespective of the level of adoption of the scheme and its supporting tools, the full exploitation of its potential depends on a few key assumptions and interlinked chain of events and associated risks. The key assumptions and risks can be categorised in three types: causality, implementation and external factors<sup>2</sup>.

### 4.7.1 CAUSALITY

#### **Key assumptions**

A theory of change explains how a certain activity is expected to lead to a specific change. This causality explains what leads to what and through which mechanisms. The key causal assumptions in the project are the expected impacts associated with the implementation of a voluntary certification scheme for collection, transport and treatment facilities of key types of waste containing potentially recoverable amounts of valuable and critical raw materials. The four expected impacts are described in Section 4.5 and the activities that will result in these impacts are described in section 4.3. It is envisioned that the implementation of a voluntary certification will contribute to these impacts, but it has been considered that the project cannot control all the factors that are required to achieve the envisioned impacts.

#### **Risks**

##### *Limitations in the design of the project*

There is a risk that the project will not contribute to the envisioned impacts, because of limitations in the design of the project. To ensure the project design will contribute to the envisioned impacts, the activities/ 'mechanisms' of the certification will be based on extensive research, evaluation and stakeholder discussions that will be ongoing during the project.

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<sup>2</sup> UNDG (2014) Theory of Change Guidance. <https://undg.org/wp-content/uploads/2017/06/UNDG-UNDAF-Companion-Pieces-7-Theory-of-Change.pdf>

## 4.7.2 IMPLEMENTATION

### Key assumptions

The assumptions for the implementation relate to the capability of the partners and their resources to meet the project objectives.

The CEWASTE consortium has been created involving partners with key and complementary expertise and proven track record in developing standards and verification systems. In addition to that, the role of the Advisory Board in the development process will facilitate the inclusion of different perspectives as well as the piloting phase, aiming at integrating feedback from stakeholders that are supposed to comply with the requirements in the future. The resources are described in section 4.2.

### Risks

Examples of implementation risks and how the project aims to mitigate them include:

*1. Low competency and availability of partner*

Vote to remove partner, transfer of tasks and budget to another competent partner, selection of a new partner.

*2. Inter-partner conflicts*

Open and regular communications, quick response to possible problems, material availability, involvement of the partners in management, management structure for resolution of disputes.

*3. Poor respect for the original timing in progress and reporting*

Intervention by the strong management structure, reporting actions, regular internal reporting, regular inter-WP meetings via videoconference, payment against performance.

*4. A lack of required resources to meet the project objectives*

The project partners have developed a detailed plan of the required resources for the project to mitigate any risk related to the resources. This based on experiences with past projects (see also section 4.2).

## 4.7.3 EXTERNAL FACTORS

### Key assumptions

With the development of the project it is assumed that certain external factors can influence the project and its results:

1. *Capability of generating enough "traction" from volunteers and early adopters to generate impact on the system (e.g. Commitment of WEEE Forum Members to implement the CENELEC EN 50625 series requirements or any new requirements with collection, transport and treatment partners in their countries).*

The CEWASTE consortium comprises key players at EU level that are annually responsible for managing 2.1 Mt of e-waste (the producer responsibility organisations of the WEEE Forum) and treating more than 2.2 Mt across the EU (EERA), with a footprint covering almost all EU Member States. This will ensure an initial pool of potential early adopters that will generate a critical mass able to generate positive momentum. In addition to that, all other consortium members will actively contribute to the dissemination and promotion of the scheme through their network.

2. *Capability of bridging the voluntary approach to a legally binding status to exploit its full potential (e.g. making the CENELEC EN 50625 series of standards legally binding through, for example, an Implementing Act and via the Eco-design Directive)*

Ultimately, the full exploitation of the environmental and economic benefits of the scheme can only be achieved if Member States are willing to implement the requirements of the voluntary scheme or to approve an Implementing Act making them mandatory. An example of such an approach already practiced in the EU is the harmonized standard used in the context of the producers' conformity declaration of the RoHS Directive. This event can potentially occur in a timeframe of 3-5 years after the end of the project. The CEWASTE consortium already includes representatives of Member State authorities as consortium partners and in the Advisory Board to test during the project how the roadmap for adoption might look like and be implemented.

### Risks

Example(s) of external factor risks and how the project aims to mitigate the risk(s):

1. *Low initial interest for the activity in general from stakeholders*

This risk will be mitigated by participatory and flexible approach; broad consortium, comprising key and well-known players in respective areas; open, inviting and targeted communication process with relevant stakeholders and partners with close relationships to key actors in relevant parts of the value chain.

*2. Low initial interest in the activity due to geographical scope and/or issues to be addressed*

This risk will be mitigated by adequate analysis and involvement of relevant activities in other regions of the world (pilot tests in three developing countries); involvement of all relevant (groups of) stakeholders and avoiding a too narrow focus on EU standardisation agendas and issues.

*3. Project outcomes appealing to only specific stakeholders, hence not accepted by others*

This risk will be mitigated by the strong involvement of the key stakeholders, coming from different sectors of the value chain, in the consultation process. Using the ISEAL Alliance Code of Conduct with public consultation of project results should lead to broad dissemination and acceptance. The other approach towards mitigating risk is a strict and clear project management and consortium composition to achieve the production of balanced project outcomes, whereby scientific approaches and outputs lay the foundations for simple, practical, and hands-on activities and planning, with value for all stakeholders involved. Consortium partners with long-standing involvement in EU public policy development of relevance will ensure a broad scope for the outcomes.

## 5 COMMUNICATION OF CEWASTE TOC

The Theory of Change will be used for communication purposes along the implementation of the project to provide a clear and concise explanation of the vision, objectives and activities of the project for a broader group of the stakeholders, including the general public. An infographic will be developed that simplifies the Theory of Change further and presents it in an eye-catching manner in the context of the flow of work through the project from start to finish, highlighting the different stages of the Theory of Change. This will be used primarily on the CEWASTE website (<https://cewaste.eu/>) but will also be used elsewhere, such as in presentations, leaflets and banners, to promote the project. The infographic is currently being developed.