

# APPROACH TO MANAGEMENT OF AN INTERNATIONAL RESEARCH AND DEVELOPMENT PROJECT

## A case study

Flavio Caretto, Antonio Donatelli, Giovanni Cannataro



Approach to management of an international Research and Development Project

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## Preface

This monographic work is designed and implemented to be a useful aid to those researchers and technologists who are involved as Coordinators in national and international research and development (R&D) projects.

The drafting of a research project includes the definition of a series of activities whose purpose is to indicate what the objectives of the project are and how it is intended to check its progress from birth to its completion. This information is commonly included in three different sections:

- Strategic Action Plan (SAP);
- Risk Management Plan (RMP);
- Monitoring and Evaluation Plan (M&EP).

In the present work, in a single volume and with the formula of the Case Study, it is intended to provide the Coordinator with a useful and practical reference for the methods of drafting the aforementioned sections, together with the obligations that must be fulfilled during the execution of the project. The implementation, risk management and monitoring plans will be described in detail with reference to a *hypothetic* research project, of pure fantasy, which in any case has all the characteristics of a real project coordinated by ENEA.

The idea that led to the preparation of this publication is that Strategic Action Plan, Risk Management Plan and Monitoring & Evaluation Plan referable to real R&D projects, are documents that are difficult to find because they report sensitive data both of the partners involved and of the technologies developed in the project and consequently they are classified as "confidential".

The work is structured in the three aforementioned fundamental parts, of which we see briefly the topics covered.

**Strategic Action Plan (SAP)** – SAP is a reference tool for all partners in the R&D project where all issues related to project management are dealt with. The roles of the figures involved and the related responsibilities in relation to the project management activities are described in the SAP. The plan summarizes the key information contained in the project agreement, the procedures for internal and external communication to the partnership, the explanation of the organizational structure of the consortium and the decision-making procedures, the roles and responsibilities and the document review process. The purpose of the SAP is to provide a clear and well-defined process for the periodic reporting of technical and scientific activities and to guarantee high quality final results to the Project Management activities.

**Risk Management Plan (RMP)** – In the execution of an R&D project, risk management is a continuous process that is implemented through the phases of: risk management planning, identification, analysis, monitoring and control. The RMP defines the policies and procedures for identifying and managing "risks", that is, all those unusual causes of project diversion that can compromise the objectives. The risk assessment must be updated periodically and throughout the project life cycle. The objective of the RMP is to reduce the likelihood and impact of adverse events on the project and, on the contrary, allow to exploit any event that could have a positive impact. RMP must allow, in an accurate and timely manner, to avoid unwanted risks and, if necessary, to apply corrective measures to control the potential negative effects of the project.

**Monitoring & Evaluation Plan (M&EP)** – The Monitoring and Evaluation Plan is a tool that helps to track and evaluate the results of a series of interventions carried out during a project. The M&EP mainly deals with ensuring that the project meets quality standards, through an adequate selection of the activities to be implemented. It is important to develop a Monitoring and Evaluation Plan before starting any project activity, so that there is clarity about which questions need to be answered. Its implementation provides useful and supportive elements to the people involved in the project, about the collection of data and the tracking of appropriate indicators, the analysis of the monitored data and their dissemination both internally to the work group, in order to improve the quality of the project, which externally, to anyone who can benefit from its activities. Ultimately, an adequate M&EP will help to ensure that the data of a project is used efficiently, in order to make it as effective as possible and to correctly report the results to its conclusion.

F. Caretto, A. Donatelli

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## Strategic Action Plan

The aim of the Strategic Action Plan is to describe the management roles, rights and duties of all parties and persons involved. It serves as a reference document for all project partners.

Indeed, this report summarises the key provisions in the Project Agreements, the procedures for periodic reporting, explanation of the consortium organisational structure and decision making procedures, roles and responsibilities and documents review process.

The scope of these activities is to ensure high quality deliverables and management of the project and to have a clear periodic process for reporting on activities, effort expenditure, as well as having a clear review procedure with defined phases.

The schedule of the project activities required for the periodic reporting to the ERA NewMaterials GmbH is in particular presented, specifying the contributions expected by all the partners in the REMAIN (REcycled MAterial for Italian Nanocomposite) consortium.

Moreover, the Strategic Action Plan is complemented by the definition of Key Performance Indicators in the scope of Task 1.3 “Monitoring and Evaluation” and are in particular described in the deliverable D1.2. They are used as an instrument for the evaluation of the project performances and their potential impact, at technical, economic and environmental level.

The Strategic Action Plan will be updated by the Project Coordinator in regular intervals.

## 1 Introduction

Nowadays automotive industry has the impelling need to reduce the vehicles weight in order to reduce the CO<sub>2</sub> emission due to fuel consumption [In Europe: emission target of 95 gCO<sub>2</sub>/km for 2020 and 75 gCO<sub>2</sub>/km for 2025]. Nano Fibres (NF) could be a possible solution, but the high cost limits their use to the luxury cars.

Contemporarily, due largely to growth in demand in the wind energy, aerospace, pressure vessel, and automotive industries, the most conservative estimates, about nano fiber demand, forecast a double-digit compound annual growth for the 2012–2018 period. A consequence is the considerable amount of waste containing nano fiber taken in landfill.<sup>1 2</sup>

---

<sup>1</sup> Global Nano fiber Composites Supply Chain Competitiveness Analysis-May 2016 - Clean Energy Manufacturing Analysis Center- Sulit Das et Al.

<sup>2</sup> Composites Market Report 2015 - The Global NRP Market – Thomas Braus, Michael Tuhnel (CNeV).

Therefore, a massive recycling of waste NFs is more and more an environmental need (reduction of the waste NFs destined to landfill) and a great opportunity (availability of a recycled high value material at low costs satisfying part of the growing demand of NFs).

Thanks to its economic sustainability and industrial scale technical feasibility, thermal treatment is the only recycling method implemented on industrial scale. Producing Recycled Nano Fiber (RNF) by thermal treatment requires only 1/10 of the energy as compared to new NF, eliminating the costs of nanofiber precursors, which represent about the 50% of the final new NF costs.

Nevertheless only negligible amount of waste NFs are actually recycled.

The main industrial barriers for a massive RNF use as reinforcement of composite materials are represented by the technical limits due to the RNF features resulting from thermal treatment.

***The commercial RNFs coming from thermal treatment have a lower value in comparison with their market potential and are sold only for low value applications.***

The high temperature reached during thermal treatment causes the burning of the original nanofiber coating (“sizing”). The consequences in the use of RNFs as reinforcement of thermoplastic compounds are:

- poor mechanical properties the RNFs provide to the final composite material, due to the lack of adequate stress transfer from the polymeric matrix to the reinforcement;
- difficulties in the processability during the compound manufacturing by extrusion.

Within the previous projects carried out by RICREA, ENEA and University of Sud Italy, a suitable RNF sizing treatment has been developed and optimized on laboratory scale (TRL5).

Mechanical tests revealed that the sizing procedure promotes the doubling of the interfacial strength for RNF/thermoplastic polymer.

Furthermore, the process improve the processability during the compound manufacturing, and increase the mechanical properties of virgin PA6 and PP based composite materials

**In this context, the REMAIN project aims to implement the scaling up of an innovative process for the surface modification of Recycled Nano Fibers (RNF) and the up-graded of thermoplastic compounds manufacturing for high performance eco-innovative RNF reinforced materials.**

**These new compounds will have properties similar to those of the virgin nano fibers reinforced compounds, but with 50% fiber cost saving and they will destined to the manufacturing of semi-structural automotive components.**

In compliance whit the European Directive ELV Dir. 2000/53/C, in REMAIN will be developed un mechanical recycling process for the End Of Life components made in the project.

Main targeted users of REMAIN are the European automotive Original Equipment Manufacturer (OEM). OEMs will have available a solution green and economic able to substitute traditional materials leading to a reduction of cars weight in view of an answer to the problem of CO<sub>2</sub> emissions.

**The consequences will be a wider use of NFs in automotive components, with a clear advantage in terms of automotive lightening and minimization of the pollution due to the NF manufacturing.**

## 1.1 REMAIN<sup>3</sup> in a nutshell

The goal of the project is the scaling up of the process for the Recycled Nano Fiber surface modification and thermoplastic compound manufacturing, thus leading to high performance eco-innovative composite materials. By the optimization of the surface modification process and of the compounding process, nanofiber reinforced thermoplastics will be available for the automotive market, having properties similar to those of the virgin nanofiber reinforced compounds, but with 50% fiber cost saving. The consequences will be a wider use of nanofibers in automotive components, with a clear advantage in terms of automotive lightening.



Figure 1: REMAIN in a nutshell

## 1.2 Purpose and scope of the document

The purpose of the Strategic Action Plan is to present all partner the approach to project monitoring, supervision, reporting and review. Procedures are provided for periodic reporting on activities and effort expenditure, to be applied by all partners for the provision of data to the Project Coordinator (PC) and for management and financial reports preparation. Instruments are developed with the aim to monitor the degree of completion of activities and expected deliverables. A review process with an approval procedure is defined with the aim to control the quality of the documents while they are being generated and to ensure that project intermediate objectives are met.

<sup>3</sup> Remain, the project described in this work, is of pure fantasy. Any reference to real people and things is purely coincidental.

Key Performance Indicators for the evaluation of the project performances and their potential impact are defined in the scope of Task 1.3 “Monitoring and Evaluation” and complement this report. They are in particular described in the deliverable D1.2.

The key provisions in the Project Agreements, together with an explanation of: consortium organisational structure and decision making procedures, roles and responsibilities, communication tools used, way the project is funded, are provided.

The manual also contains useful guidelines regarding the management of IPR, Gender equality and Ethics issues.

### **1.3 Structure of the document**

This document is structured by sections, as follows:

- Project Governance structure and decision making process: this section details the decision making procedure and the organisation of the consortium bodies in the project;
- Communication and Collaboration: section 3 presents the most relevant aspects regarding internal and external communication in REMAIN;
- Reporting: this section presents the approach and tools to support project monitoring, in terms of resources, project schedule and overall progress. The aim of this section is to provide guidelines for the periodical reporting activities to be applied by all partners for providing data to the Project Coordinator (PC), for management and financial reports preparation.
- Deliverable production: this section details the procedure required for review and formal approval of deliverables.
- Financial management: this section details the rules and procedures about the receiving financial contribution of the European Research Agency (ERA) to the REMAIN partners.
- Amendments management:
- Gender equality management: section 9 presents the measures take to promote equal opportunities between men and women in the implementation of REMAIN.
- Ethics issue management: this section introduces major ethical topics, and gives guidance on how they are managed within the REMAIN.

### **1.4 Inter linkages with other documents**

#### **1.4.1 Legal Framework**

- Project Agreement No. 12345;

- Framework Partnership Agreement No. [FPA 2016/ERA/ERA New Materials];
- Specific Grant Agreement No. [ERA/NEW MATERIALS/SGA2017/1];
- KIC NewMaterials Internal Agreement of 04 December 2015.

Framework Partnership Agreement, Specific Grant Agreement, Internal Agreement Framework, are named “the Umbrella Documents”.

ERA NewMaterials’s partners can find access to the Umbrella Documents, with the current state of signatures, by the link: <http://ERAnewmaterials.eu/partner-area>.

#### **1.4.2 Other Project documents**

Useful project documents (webinars, templates, presentations, etc.) can be found in Help Tab on ERA NewMaterials’s grant management system called *GreenBook*.

## 2 Project Governance structure and decision making process

The aim of the Project management is to guarantee that the objectives of the Project are achieved on time, on budget, and with high quality. The REMAIN Project will be managed with sound and efficient decision making, execution, and control and will maximize partner accountability, commitment, involvement, and prospects of success.

Clearly defined project management procedures and responsibilities are vital to ensure high quality project output and the timely delivery of work. This chapter describes the overall REMAIN project management procedures and shall serve as manual and guideline for all consortium partners.

	Participant organization name	Short name	Typology	Country
<u>P1</u> (Coordinator)	Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile	ENEA	RTO- IC core partner	IT
P2	Comité de l'énergie atomique	AEC	RTO- IC core partner	FR
P3	Szi enviroment	SZIE	SZIE IND- IC associate partner	EN
P4	Centro Ricerche per Energie Alternative	RICREA	RTO – Affiliated entity of ENEA	IT
TP1	Centro Ricerche Meccaniche avanzate	CRMA	RTO-Task partner	IT
TP2	University of Sud Italy	UNISUD	Academic- Task partner	IT

Table 1: The REMAIN Consortium

### 2.1 Description of the roles and responsibility in REMAIN

The organisational structure is based in particular on hierarchical management layers, whereas the coordination and management activities of the Project will be performed by the Project Coordinator (PC)<sup>4</sup> in cooperation with the Consortium Bodies.

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<sup>4</sup> The Project Partners have designated Agenzia Nazionale per le Nuove Tecnologie, l'Energia e lo Sviluppo Economico Sostenibile (ENEA) - Italian National agency for new technologies, energy and sustainable economic deve to be the project coordinator towards IC LE ("Project Coordinator"). Any notice or other communication made by the Project Coordinator to IC LE or delivered by IC LE to the Project Coordinator shall be deemed to have been made or received by all of the Project Partners. The Project Partners may, with the consent of IC LE (such consent not to be unreasonably withheld) attribute further rights and obligations to the Project Coordinator consistent with this Project Agreement. [Project Coordinator as defined in Section 13.3 of REMAIN's Project Agreement].

The Consortium Bodies of REMAIN are the **Project Management Committee (PMC)** and the **Scientific and Technical Committee (STC)**.

### 2.1.1 **Project Management Committee (PMC)**

The main roles and instruments comprising the Project management structure include:

- the **Project Management Committee**: it will consist of representatives of each organization participating in the consortium. It will constitute the highest decision board and its main task will be the Project governance. It will have the overall responsibility of all technical, financial, legal, administrative, ethical, and dissemination issues of the Project. It will monitor and assess the actual progress of the Project and make amendments, where necessary. *After the kick-off meeting, PMC will meet regularly each six months and at the end of the Project.*

It will encompass the following main roles:

- the **Project Coordinator (PC)** who will chair the PMC and will be responsible for the overall management, communication, and coordination of the entire Project. The Project Coordinator chairs all meetings of the GA (GA?), unless decided otherwise in a meeting of the GA:

*PC Flavio Caretto (ENEA).*

- the **Dissemination and Exploitation Manager (DEM)** who will be responsible for dissemination and communication (e.g. webpages, press releases, newsletters), for exploitation planning (support and liaising to companies, SMEs and industrials), continuous assessment of the market potential of the developed know-how in the Project:

*DEM Alessio Rossi (RICREA).*

- the **Risk Manager and Quality (RQM)**, the role of whom will be the early identification, assessment, and – along with the support of the PC – the management of administrative and technical risks:

*RQM Antonio Donatelli (ENEA).*

### 2.1.2 Scientific and Technical Committee (STC)

The **Scientific and Technical Committee**: under the control of and in compliance with the decision of PMC, the STC shall be responsible for the planning, execution and controlling of the Project, as regards issues of both scientific and technical nature. STC meetings planned every quarter, calls/video conferences shall be deemed as meetings.

From a technical point of view, the Project is broken down into a number of work packages, each of them addressing a specific area of work. The STC will encompass the following roles:

- the **Scientific and Technical Manager (STM)**, who will ensure that the S&T objectives of the Project are met with quality and time. STM is expected to lead the S&T activities undertaken within the Project and will be responsible for resolving any issues of S&T nature that might occur; STM chairs all the meetings of the STC:

*STM Annabella Astori (RICREA).*

- the **Work Packages Leaders (WPL)** of the Project who will be responsible for managing their work package as a self-contained entity. Their tasks include among others coordinating, monitoring, and assessing the progress of the WP to ensure that output performance, costs, and timelines are met.

*WP0L Annabella Astori (RICREA)*

*WP1L Flavio Caretto (ENEA)*

*WP2L Annabella Astori (RICREA)*

*WP3L Antonio Nervi (AEC)*

*WP4L Giovanni Cannataro (ENEA)*

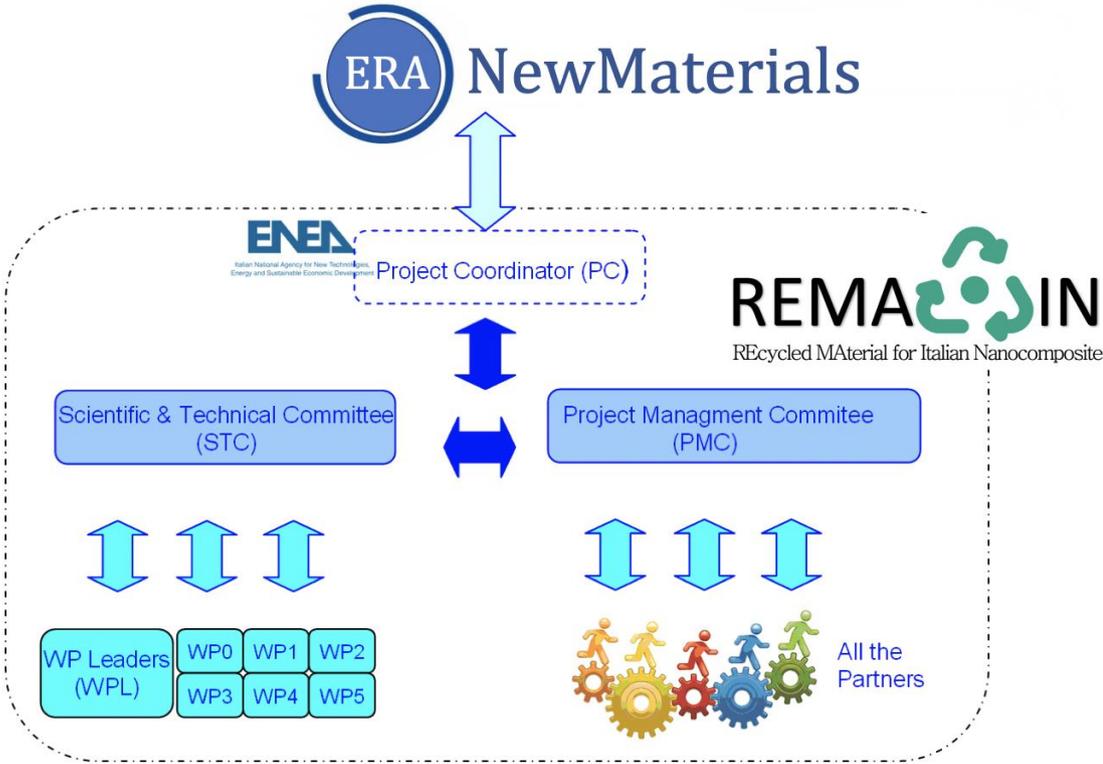
*WP5L Alessio Rossi (RICREA)*

- each WP is further subdivided into its large components tasks, which are allocated a **Task Leader** responsible for coordination.

### 2.1.3 Financial Controller (FC)

The **Financial controller** oversees all costs and provides to final accurates. Financial controllers are usually from accounting or finance department of partners organisation.

Figure 2 displays the organisational structure for the project, the interdependencies between consortium bodies and between them and the funding authority.



**Figure 2: Organizational structure for REMAIN**

Table 2 displays representatives in management [Project Coordinator(PC); Risk Manager and Quality (RM); Dissemination and Exploitation Manager (DEM); Scientific and Technical Manager (STM); Work Packages Leader (WPL); Financial Controller (FC)].

	Partner	Project Management Committee (PMC)	Scientific and Technical Committee (STC)	Financial Controller (FC)
P1	ENEA	F. Caretto, A. Donatelli (PC, RQM)	F. Caretto (WP1L) G. Cannataro (WP4L)	A. Diso
P2	AEC	G. Turcotte	G. Turcotte (WP3L)	R. Charette
P3	SZIA	V. Lamare	J. Hartmann	J. Hartman
P4	RICREA	A. Primera (DEM)	A. Primera (STM; WP0,2L) A.Torre (WP5L)	S. Rossale
TP1	CRMA	M. Livelli	RTO-Task partner	S. Migliore

**Table 2: Representatives in management**

## 2.2 Decision making process

### 2.2.1 Procedures related to the Project Management Committee and the Scientific and Technical Committee

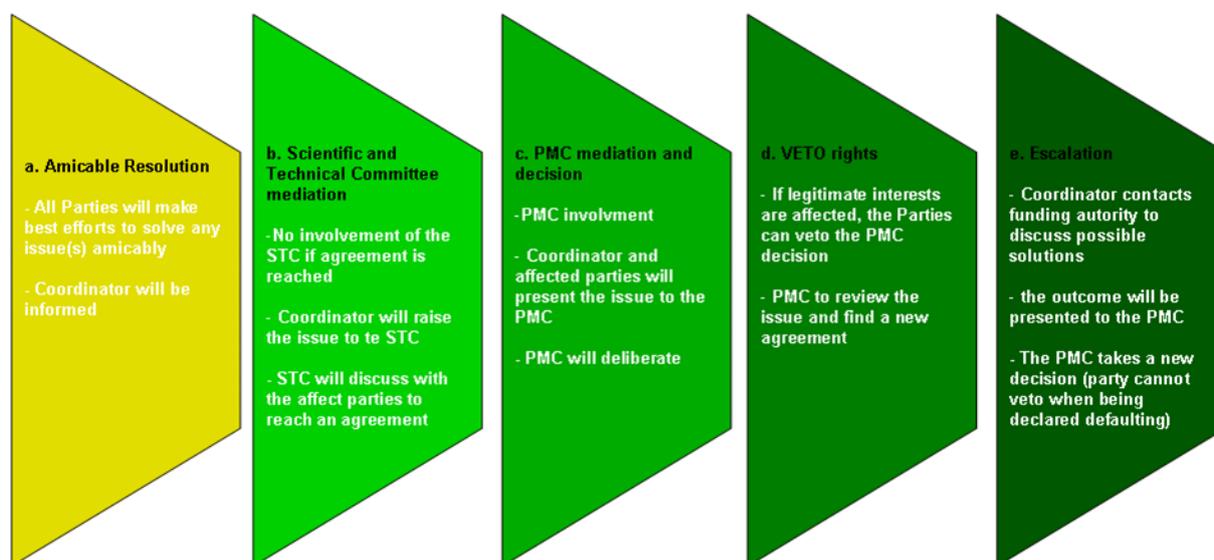
<p>Quorum</p>	<p>Each Consortium Body (PMC and STC) shall not deliberate or decide validly unless <b>two-thirds (2/3)</b> of its members are present physically or virtually or represented (quorum).</p> <p>If the quorum is not reached, the chairperson of the Consortium Body shall convene another ordinary meeting within 15 calendar days. If in this meeting the quorum is not reached once more, the chairperson shall convene an extraordinary meeting, which shall be entitled to decide even if less than the quorum of members are present or represented.</p>
<p>Decisions</p>	<p>Decisions shall be taken by a majority of two-thirds (2/3) of the votes cast.</p> <p>Each member of a Consortium Body present or represented in the meeting shall have one vote.</p> <p>Defaulting Parties<sup>5</sup> may not vote.</p>
<p>Veto rights</p>	<p>A member <b>which can show</b> that its own work, time for performance, costs, liabilities, intellectual property rights or other legitimate interests would be severely affected by a decision made by the Consortium Body may exercise a veto with respect to the corresponding decision or relevant part of the decision.</p> <p>When a decision has been taken on a new item which was added to the agenda before or during the meeting, a member may veto such decisions during the meeting and within 10 calendar days after the draft minutes of the meeting are sent.</p> <p><b>A Party may not veto decisions relating to its identification as a Defaulting Party.</b> The Defaulting Party may not veto decisions relating to its participation and termination in the consortium or the consequences of these decisions.</p>
<p>Minutes</p>	<p><b>The chairperson</b> of a Consortium Body <b>shall ensure written minutes</b> of each meeting are produced. This shall be the formal record of all decisions taken. The chairperson shall send the draft minutes to all members within 10 calendar days of the meeting.</p> <p>Members of the Consortium Body will be requested to contribute to the minutes to ensure that all the actions decided at the meeting are correctly recorded. <b>15 calendar days</b> will be given.</p>

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<sup>5</sup> Defaulting Party means a Party which the Project Management Committee has identified to be in breach of REMAIN's Project Agreement.

	<p>The minutes shall be considered as accepted if, within 15 calendar days from despatch, no member has sent any comments or objection in writing to the chairperson with respect to the accuracy of the draft of the minutes.</p> <p>The chairperson shall send the accepted minutes to all members of the Consortium Body and to the Project Manager, who shall safeguard them.</p>
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## 2.2.2 Conflicts Resolution



**Figure 3: Conflict Resolution**

Disputes among the partners regarding workflow, delivery of results, dissemination of information within and outside the consortium, IPR issues, etc. will be managed according to a pre-defined procedure laid down in the Project Agreement.

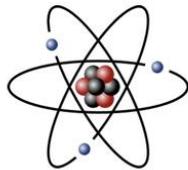
- At the first level, it shall be assumed that those involved in a dispute shall attempt to resolve the matter to their mutual satisfaction. If this is not possible, the dispute shall be referred in the first instance to the Project Coordinator, who shall keep a record of all interactions with all parties concerning the matter. The Project Coordinator will act as a mediator and attempt to resolve the dispute to the satisfaction of all, and in the best interests of the project.
- If the Project Coordinator deems that the seriousness of a dispute is negatively affecting the project, or appears likely to continue to a point that it will do so, the dispute shall then be considered to be a conflict.

- The Project Coordinator shall convene the STC to mediate. The STC shall act as impartially as possible, and will investigate the conflict and attempt to come to a mutually acceptable resolution within six weeks of its formation.
- If the Scientific and Technical Committee fails in its task, or in the case that the original dispute concerns a decision or action made ERA her by the STC, or Project Coordinator, the matter shall be referred directly to the Project Management Committee.

The logo for ENEA, consisting of the word "ENEA" in a bold, blue, sans-serif font.

Agenzia nazionale per le nuove tecnologie,  
l'energia e lo sviluppo economico sostenibile

### Comité de l'énergie Atomique



University of Sud Italy



### **3 Communication and Collaboration**

Communications management includes the processes required to ensure timely and appropriate generation, collection, dissemination and storage of project information. This section describes the communication mechanisms in use on the REMAIN project. The overall goal is to maintain an open communications environment throughout the project.

#### **3.1 Communication with the ERA NewMaterials**

The Project Coordinator (PC) acts as the intermediary for all communications between the beneficiaries and the ERA.

This task mainly involves correspondence with the Project Officer (PO) on matters revolving around:

- the preparation, completion and submission of periodic reports and Financial Statements (FS) for the consortium,
- the preparation, completion and submission of deliverables and
- project- and funding-related questions raised by the consortium that need explicit feedback from or agreement with the PO.

The first ERA contact point for all the issues related to REMAIN is the Project Officer (PO), he supports the PC on his task of coordination and reporting. Furthermore, for any issue related to the technical aspects, the ERA contact point is the Thematic Officer (TO).

Additionally, the interaction between consortium, PC and PO is mainly handled through the ERA NewMaterials's grant management system called *GreenBook*. This web-based system is available at link: <https://GreenBook.ERAnewmaterials.eu>. During the project's runtime GreenBook fully supports the grant management related to the submission of deliverables and reports, to payment execution as well as to potential amendments. In GreenBook partners can also find the signed PDF version of the PA and an overview of relevant project information. The digital sealing of documents complements this paperless exchange through GreenBook, allowing digital signatures for most legal transactions.

By the link: <http://ERAnewmaterials.eu/partner-area/> the ERA NewMaterials's partner can find access to important legal documents such as the Framework Partnership Agreement (FPA), Specific Grant Agreement (SGA) or the Internal Agreement with the current state of signatures.

#### **3.2 Internal communication and collaboration**

Since its start in April 2017, the REMAIN project has relied on a collaboration tool suite that supports the organization and management of the project in an easy manner and has made the communication

among the partners most efficient. It comprises a number of dedicated mailing lists, a REMAIN event calendar as well as cloud-based storage solutions for the management and versioning of documents.

### **3.2.1 List of contacts**

A centralised contacts list is maintained by the PC and it will be periodically updated on input from partners. The contact list is organised according to the work plan structure (i.e. Tasks, Work packages, Scientific and Technical Committee, Project management Committee and Financial Controllers).

### **3.2.2 Project meetings**

After the kick-off meeting, each six months and at the end of the Project, the Consortium will hold a plenary meeting in which all members involved in the project meet and discuss ongoing work, achievements so far and next steps to take. Each meeting will be organized by another partner who is responsible for managing on time issues such as venue, agenda, co-located events like community meetups with stakeholders and/or invitations of external guests from other ERA-funded projects. Focus in these meetings is largely laid on the following aspects:

- summarize the project's achievements and lessons learned so far,
- define actions and measures to meet the project's objectives as well as review preparations,
- discuss the structure and organization of upcoming project work per partner and WP and especially define strategies to meet challenges identified at previous reviews or other events and
- outline relevant dissemination and management issues for the upcoming period

The partners will generally also meet in different subgroups to plan and discuss specific work and collaboration efforts with respect to their WPs and tasks. STC meetings planned every quarter, calls/video conferences shall be deemed as meetings

### **3.2.3 Video, Tele-Conference, E-meetings and Skype Calls**

A general calls/video conference is organized by the PC every first Tuesday of the quarter. At least one representative of each partner who is preferably the WP lead is required to participate or to be represented by its deputy. Apart from being displayed in the REMAIN event calendar, these calls are explicitly announced by the PC via email a week before. The PC drafts and sends the agenda to the consortium by two-to-three days in advance. Partners are invited to check the agenda and add items to be discussed. Likewise, every partner is expected to participate in these calls in an active and reliable

manner. If anyone is unable to be present, they ought to give prior notice to the PC and send feedback to relevant points raised in the agenda. The agenda usually focuses on the following areas of discussion:

- progress within each work package with a particular focus on due deliverables;
- recent and coming events attended by REMAIN members;
- dissemination, networking and community building efforts;
- management, reporting, organization of review and plenary meetings, etc.

Moreover, telephone and video conferences are scheduled on a regular basis for and among individual work packages. For instance, a technical call related to the development of a recycling process for the EOL components is organized by the WP4 team on a monthly basis. Further calls will be implemented with the start of the corresponding work packages. These calls are made known in the REMAIN calendar for every member and announced via email by the respective WP leads. Tools mostly used for these calls cover Adobe Connect, GoToMeeting or Skype.

### **3.2.4 Email communication and mailing lists**

Four mailing lists have been set up by the ENEA and are managed by the Project Coordinator.

- **REMAIN\_project** : This is the list of everyone involved in the project and is used for general announcements;
- **REMAIN\_tech**: For the technical partners including students, postdoctoral fellows, engineers and others. This list serves to discuss scientific and technical aspects of the project in a timely manner.
- **REMAIN\_STC**: This list includes the STC members and it is utilized for discussion between STC members.
- **REMAIN\_management**: This mailing list will be used to send information to the REMAIN partners who are mostly involved in the management aspects of the project. (e.g. PMC, FCs, legal and administrative personnel from all partners).

The aim of this proactive communication on many different levels is to create a supportive, collaborative culture giving rise to fewer mistakes, less redundancy, quicker problem solving, better decision making, reduced research and development costs.

It is the partners' responsibility to ensure that relevant personnel are included in the mailing lists and to communicate any changes to the Project Coordinator.

### 3.3 External communication

Within Task 1.4 Dissemination, a “Communication and Dissemination Plan” (Deliverable REMAIN\_WP[0]\_D[1.5]) produced outlining the target audiences, key messages, communication channels, tools and timelines for REMAIN Project. The Plan also describes the roles and responsibilities of partners and the conditions ensuring proper dissemination of the generated knowledge, related to confidentiality, publication and protection of IPR.

The **REMAIN website** <https://document.remain.com> also developed in Task 1.4 (Deliverable REMAIN\_WP[1]\_D[1.6]), is the main means through which the results achieved in the project are communicated to external stakeholders. It not only introduces the project itself (objectives, outputs, etc.) but also present the partners and their roles in the project. Additionally, it is used both for public and private communication with restricted access.

The website is a channel for announcing the latest news and promoting relevant events..

Through the website, REMAIN partners and stakeholders are able to communicate, exchange opinions and ideas and provide comments to the outputs generated by the project through the ‘blog’ facility.

Website is linked to the social network profiles and e-newsletter subscription is added as well.

REMAIN will be actively promoted on social media such as Twitter, LinkedIn and Slideshare in order to ensure a strong social media presence. It is the main goal of the REMAIN social media channels to create an engaged target audience.

All partners will use shared communication tools (logo, factsheet and brochure) to ensure a striking and common project promotion. The logo is been realised in order to best communicate the project’s ideas and objectives. The factsheet and brochure will be available for download from the REMAIN website.



Figure 4: REMAINS' logo

### **3.3.1 Dissemination activities tracking**

REMAIN partners involved in dissemination activities will proactively participate in communication and dissemination activities related to the REMAIN Project by exploiting their communication channels to reach the widest audience performed in a structured way, and all these activities will be tracked in this report and its updates. Each dissemination activity will be carried out by the partner who is the most expert in the specific area. For the tracking of the actions executed by REMAIN partners a set of tools for collection of inputs in regards to performed and planned activities has been developed:

- List of scientific publications table;
- List of dissemination events table;
- Detailed description of events already performed table;
- List of dissemination and communication activities table.

Each partner is required every six months to provide updated information about dissemination events and activities performed and planned by his organization. Partners need to provide to dissemination leader (RICREA) proofs about events participation (photos, agendas, presentations, videos, etc.) and also detailed information about the events (date, place, target audience, size of audience, type of dissemination such as ppt, brochure, poster, booth, etc.).

Project partners are also requested to provide updates about project progress and achievements in order REMAIN website can be kept up to date.

## 4 Reporting (financial and technical)

This section addresses the periods and means for reporting both technical and financial.

### 4.1 Official Reporting

Reporting to the ERA, ERA or any other competent EU body is a contractual obligation for all project partners. By signing the Project Agreement, all partners agreed to meet this obligation<sup>6</sup>.

All Reports shall be submitted by the Project Partners for (a) each Project Partner individually and (b) the Project Partners together on a consolidated basis. Both the individual and the consolidated collective reports shall be gathered by the PC before being sent by the latter to ERA. All Reports shall be drawn up in English, in a uniform manner acceptable to ERA and ERA and to be drawn up in accordance with sound reporting and accounting practices<sup>7</sup>.

The Project Partners shall, through the Project Coordinator, submit to ERA the following reports on the Project: Financial Reporting, Quarterly Reports (QR), Annual Report, Final Report<sup>8</sup>.

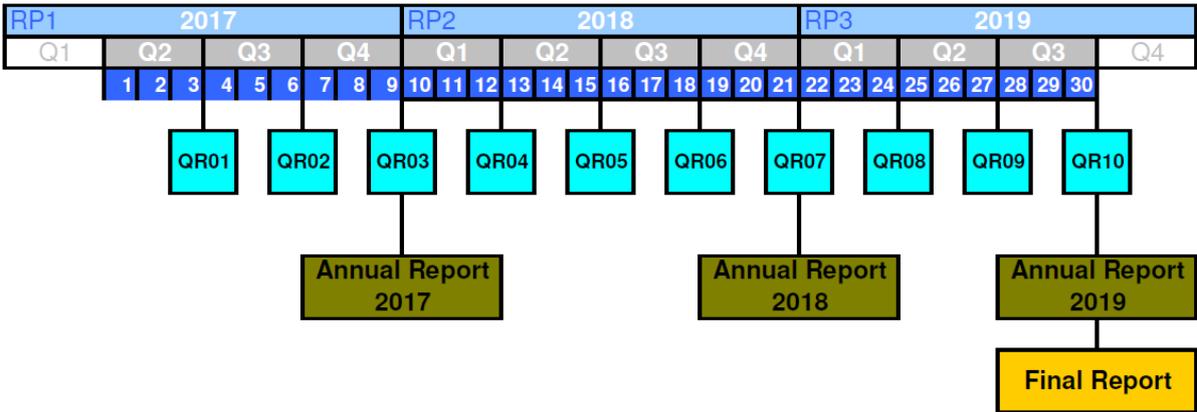


Figure 5: REMAIN Reporting Periods

<sup>6</sup> The Project Partners acknowledge and agree that monitoring, reporting and enabling checks, reviews, audits and investigations by ERA, the Commission and/or any other competent EU body in line with the Umbrella Documents is of the essence for the ERA grant system, this Agreement and the Funding hereunder [as established in Section 7.1 of REMAIN’s Project Agreement].

<sup>7</sup> Sections 7.2 and 7.3 of REMAIN’s Project Agreement.

<sup>8</sup> Schedule 5A of REMAIN’s Project Agreement.

#### 4.1.1 Quarterly Reports

The Project Partners shall provide the necessary information, allow for and facilitate a quarterly Project review by ERA, ERA or any other competent EU body.

Without prejudice to the generality of the foregoing, the Project Partners shall submit to ERA, not later than **within two (2) weeks from the end of each calendar quarter** a “Quarterly Report” (QR) on the status, progress and forecast of the Project using the GreenBook, with special emphasis being put on the Project being on time, on budget, in scope, and proactively reporting any other development, data or information which may be reasonably expected to be delivered as to enable ERA to evaluate the Project, its progress, achievements and prospects.

ERA shall have the right to request information in addition to the GreenBook, conduct Project reviews (including convening Project review meetings and tele-conferences) and take such other measures as it may reasonably deem fit to satisfy itself of the Project progress and compliance with applicable rules, regulations and budgets.

#### 4.1.2 Annual Reporting

The Project Partners shall submit, not later than within one (1) month from the end of each calendar year, a “Annual Report” on the status, progress and forecast of the Project.

REMAIN is divided into three following “Reporting Periods” (RP). Accordingly, the project will deliver three periodic reports:

- **1<sup>st</sup> periodic report** on the progress of work and use of resources D1.3.1 – issued by M10 and related to RP1 (from M1 to M9)
- **2<sup>nd</sup> periodic report** on the progress of work and use of resources D1.3.2 – issued by M22 and related to RP2 (from M10 to M21)
- **Final periodic report** on the progress of work and use of resources D1.4 – issued by M31 and related to RP3 (from M22 to M30)

There are two pillars of reporting for ERA: *performance reporting* and *financial reporting*.

The timelines and players for these two pillars are different, although the tool used is the same: GreenBook

Performance reporting	Financial reporting
<ul style="list-style-type: none"> <li>• 1 per Project</li> <li>• Project coordinator</li> </ul>	<ul style="list-style-type: none"> <li>• 1 per Partner</li> <li>• Partner financial controller –</li> <li>• <b>1 financial reporting tab per partner</b> → this means that if your organization designated more than one financial controller, all of you will have access to the partner financial reporting tab, and the way you organize/ split the work among yourselves is up to you.</li> </ul>
<ul style="list-style-type: none"> <li>• Green Book</li> <li>• Includes: <ul style="list-style-type: none"> <li>• Annex I - KAVAs</li> <li>• Annex II - KCAs</li> <li>• Annex IV - KPIs (to be updated for EITN KPI)</li> <li>• <b>Horizon 2020 Indicator</b></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Green Book</li> <li>• Includes: <ul style="list-style-type: none"> <li>• Annex III B) – partner level</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Can/Should start collecting information now</li> <li>• Requires input from costs report to complete</li> </ul>	<ul style="list-style-type: none"> <li>• Can only start after year/ quarterly end closing</li> <li>• Requires alignment with project coordinators</li> </ul>

**Figure 6: REMAIN Reporting Structure**

Therefore, each **Periodic Report** shall comprise:

a) *A Periodic Technical Report* containing:

- An explanation of the work carried out by the beneficiaries;
- An overview of the progress towards the objectives of the project (milestones, output and deliverables);

This report must include explanations justifying the differences between work expected to be carried out in accordance with Annex 1 and that actually carried out. The report must also detail the exploitation and dissemination of the results;

- A summary for publication ;
- The answers to a questionnaire, covering issues related to project implementation and economic and societal impact, notably in the context of the Horizon 2020 key performance indicators and the Horizon 2020 monitoring requirements.

b) *A Periodic Financial Report*<sup>9</sup> containing:

- An explanation of the use of resources and the information on subcontracting and in-kind contributions provided by third parties from each beneficiary, for the reporting period concerned.

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<sup>9</sup> ERA NMF *Financial Reporting Guidelines & Tips*. This ERA NewMaterials presentation can be found in Help Tab on GreenBook.

- An “Financial Statement” (FS) from each beneficiary, for the reporting period concerned. The individual financial statement must detail the eligible costs (actual costs, unit costs and flat-rate costs) for each budget category. Each beneficiary must **certify** that the information provided is full, reliable and true. The costs declared must be eligible and should be capable of substantiation by adequate records and supporting documentation.
- A “periodic summary financial statement” will be created automatically by the electronic exchange system, consolidating the individual financial statements for the reporting period concerned and including - except for the last reporting period – the request for interim payment.

#### **4.1.3 Final Reporting**

In addition to the Annual Report for the last reporting period, the Project Partners shall submit, not later than **within one (1) month from the end of the Project**, a “Final Report” (D1.4 – issued by M31 and related to RP1, RP2 and RP3 (from M1 to M30)) on the Project in line with the Umbrella Documents and/or as may be requested by ERA or ERA.

The Final Report must include the following:

- a) A *Final Technical Report* with a summary for publication containing:
  - An overview of the results and their exploitation and dissemination;
  - The conclusions of the project emanating from the project;
  - The socio-economic impact of the project emanating from the project.
- b) A *Final Financial Report* containing:
  - Final Summary Financial Statement;
  - Certificate on Financial Statement (if needed<sup>10</sup>).

#### **4.1.4 Overview of reporting requirements for the different roles in REMAIN**

As a general rule, each beneficiary is responsible also for its linked third parties, where applicable. In particular, the beneficiary submits the required periodic reports to the PC also for its linked third parties and keeps the originals of the Financial Statement (FS) and the Certificate of Financial Statements (NFS), being the interface with the PC. Although not reporting directly to the PC, the linked third parties must fulfill the general and specific rules for cost eligibility and reporting as if they were beneficiaries.

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<sup>10</sup> Certificate of Financial Statements (NFS): is applicable for partners who have funding above the 325K EUR threshold, there is an extra signature required in the statement.

Linked third parties are required to prepare and send separate, signed and original FS and NFS to the corresponding beneficiary in paper and digital form and to keep a record of the costs and efforts (PMs) as declared. The Beneficiary will keep the original statements.

## **4.2 Internal Progress Reporting**

For efficient project management purposes, **monitoring of the project work will be performed every quarter** at each STC meeting. Templates provided by the PC will be used and filled in by WPLs (with input from Task Leaders (TLs) and contributors to WP activities) and sent to the PC in good time before each STC meeting (at least ten days before).

With regards to the financial and budget issues, **cost monitoring** - including reports on incurred costs and use of resources (Person Months) per WP - will be carried out on a **six monthly basis** by each beneficiary and send to the PC.

Dedicated templates, prepared by the PC in accordance with the financial reporting, will be used for internal cost monitoring. Details are provided in the following sections.

All the templates will be made available also in the online REMAIN project teamwork platform. The online teamwork platform will be used as a working tool for the sharing of documents related to REMAIN and will consist of a private area, accessible online to the project partners, within the project website.

Templates and related level of details to be provided can be updated in the course of the project to the extent is needed.

### **4.2.1 Project Monitoring and Control**

#### **4.2.1.1 Progress monitoring**

The Gantt chart and Work Breakdown Structure below summarise the planned project activities and their expected start and end dates, with indication of responsible WPLs. As mentioned above, the project progress will be monitored by the PC through regular WP and Task reporting prior to every STC meeting on quarterly basis by using an appropriate template. The task reporting template, provided by the PC, will be the formal instruments to communicate specific issues associated to Tasks and WPs to the STC and are to be filled in by WPLs (with all the necessary inputs from TLs) and sent in good time to the PC prior to each STC. The excel file “REMAIN\_Task\_Deliverbale\_Reporting.xls” will summarise at a glance the status of each Task, progress made and planned actions, together with interdependencies with other Tasks/WPs and any relevant criticality and risk emergence. Figure 7 and Figure 8 below displays a screenshot of the provided template.

Task Reporting Template	
This template will be used by the PC to monitor the status of every task and to highlight criticalities if any. This will be the formal instrument for WP leaders (& Task Leaders) to communicate specific issues associated to tasks to the STEC	
Real Start Date	Input the real start date of task
Expected / Real End Date	Input the expected or real (if finalized) end date of task
Progress to date	Brief description of the main accomplishments of task to date
Upcoming Actions for next Reporting Period	Describe the upcoming actions for the next reporting period (i.e. next quarter)
Status	Explain current status of Task (5 options from drop-down list)
	<b>ALERT - Progress of task severely disrupted or stopped. Issue for Scientific and Technical Committee (STC) to resolve</b>
	<b>WARNING - Task delayed but progress ongoing with no critical issues to raise to the STC</b>
	<b>OK - Task ongoing and on schedule</b>
	<b>NOT STARTED - Task not started</b>
	<b>TASK FINISHED - Task finalized</b>
	<b>TASK RE-OPENED - Task re-opened due to requirement by KIC LE to reissue deliverable</b>
Criticalities	Please describe specific criticalities in Task that should be highlighted to Scientific and Technical Committee
Risks	Please describe potential relevant risks in task that could halt progress in respective task and to highlight to the STC

**Figure 7: Screenshot of the task reporting template**

Specifically, the column “STATUS” allows highlighting any deviation from the planned objectives and timeline according to the following:

- **ALERT:** critical issues rose in the task and need to be brought to the attention of the Executive Board for decision/resolution. Relevant obstacle has been encountered in the task that can jeopardise progress in the activity of the task and potentially impact the entire project. It is mandatory to submit the issue to the STC.
- **WARNING:** some issues within the task are causing delays, with no relevant need to be brought to the attention of the Executive Board for decision/resolution.
- **OK:** No relevant issues in the task. Task is ongoing and on schedule.
- **NOT STARTED:** Task not started.
- **TASK FINISHED:** Task finalised and all associated official deliverables uploaded in GreenBook system. **TASK RE-OPENED:** The task has been reopened. This will be the case if after the official review with the ERA, the ERA requests that certain deliverables be re-drafted.

In addition, a power point template, provided by the PC, will be filled in by WPLs (with all the necessary inputs from TLs and other partners) and used at the STC meetings every quarter.

Task No.	Task Title	Lead	Planned Start Date [M]	Real Start Date [M]	Planned End Date [M]	Expected / Real End Date	Delay [M]	Progress to date	Actions for next RP	Risk	Criticalities/ key notes with respect to other task/WP	STATUS Q1	Q2	Q3
<b>WP0: Feasibility study</b>		RICREA	<b>1</b>		<b>6</b>									
Task 0.1	Technical Feasibility	RICREA	1	1	6	7	1	Insert text	Insert text	NO	Insert text	OK - Task ongoing and on schedule		
Task 0.2	Economic viability and market assessment	CRMA	1	1	6	7	1				Insert text	OK - Task ongoing and on schedule		
Task 0.3	IPR Securing, Business Model and Plan	ENEA	4	4	6	7	1				Insert text	OK - Task ongoing and on schedule		
<b>WP1: Project management</b>		ENEA	<b>1</b>		<b>30</b>									
Task 1.1	Project organization and planning	ENEA	1	1	30	30	0			NO	Insert test	OK - Task ongoing and on schedule		
Task 1.2	Risk management	ENEA	1	1	30	30	0			NO	Insert test	OK - Task ongoing and on schedule		
Task 1.3	Monitoring and evaluation	ENEA	1	1	30	30	0			NO	Insert test	OK - Task ongoing and on schedule		
Task 1.4	Dissemination	RICREA	7	7	30	30	0			NO	Insert test	OK - Task ongoing and on schedule		
<b>WP2: RNF treatment process optimization and scaling-up</b>		RICREA	<b>7</b>		<b>18</b>									
Task 2.1	Verification of the RNF sizing process robustness	RICREA	7	7	12							NOT STARTED - Task not started		
Task 2.2	Verification of the RNF surface treatment process for recycled PP and PA6	SZIE	7	7	18							NOT STARTED - Task not started		
Task 2.3	RNF surface treatment up-scaling	RICREA	13		18							NOT STARTED - Task not started		
<b>WP3: Product chain closure: compounding and injection molding optimization</b>		AEC	<b>13</b>		<b>27</b>									
Task 3.1	Optimization of compounding process	AEC	13		18							NOT STARTED - Task not started		
Task 3.2	Characterization of thermoplastic compounds	AEC	16		21							NOT STARTED - Task not started		
Task 3.3	Design of the components	RICREA	19		27							NOT STARTED - Task not started		
Task 3.4	Prototype manufacturing by injection moulding	CRMA	25		27							NOT STARTED - Task not started		
<b>WP4: Development of a recycling process for the EOL components</b>		ENEA	<b>22</b>		<b>30</b>									
Task 4.1	Development of recycling process	ENEA	22		28							NOT STARTED - Task not started		
Task 4.2	Characterization of the recycled material and result analysis	ENEA	27		30							NOT STARTED - Task not started		
<b>WP5: Exploitation, economic and environmental validation</b>		RICREA	<b>13</b>		<b>30</b>									
Task 5.1	Exploitation activities	RICREA	13		30							NOT STARTED - Task not started		
Task 5.2	LCA	ENEA	25		30							NOT STARTED - Task not started		
Task 5.3	Final Business Plan	RICREA	25		30							NOT STARTED - Task not started		

Figure 8: Screenshot of the task reporting template - example of columns to fill in

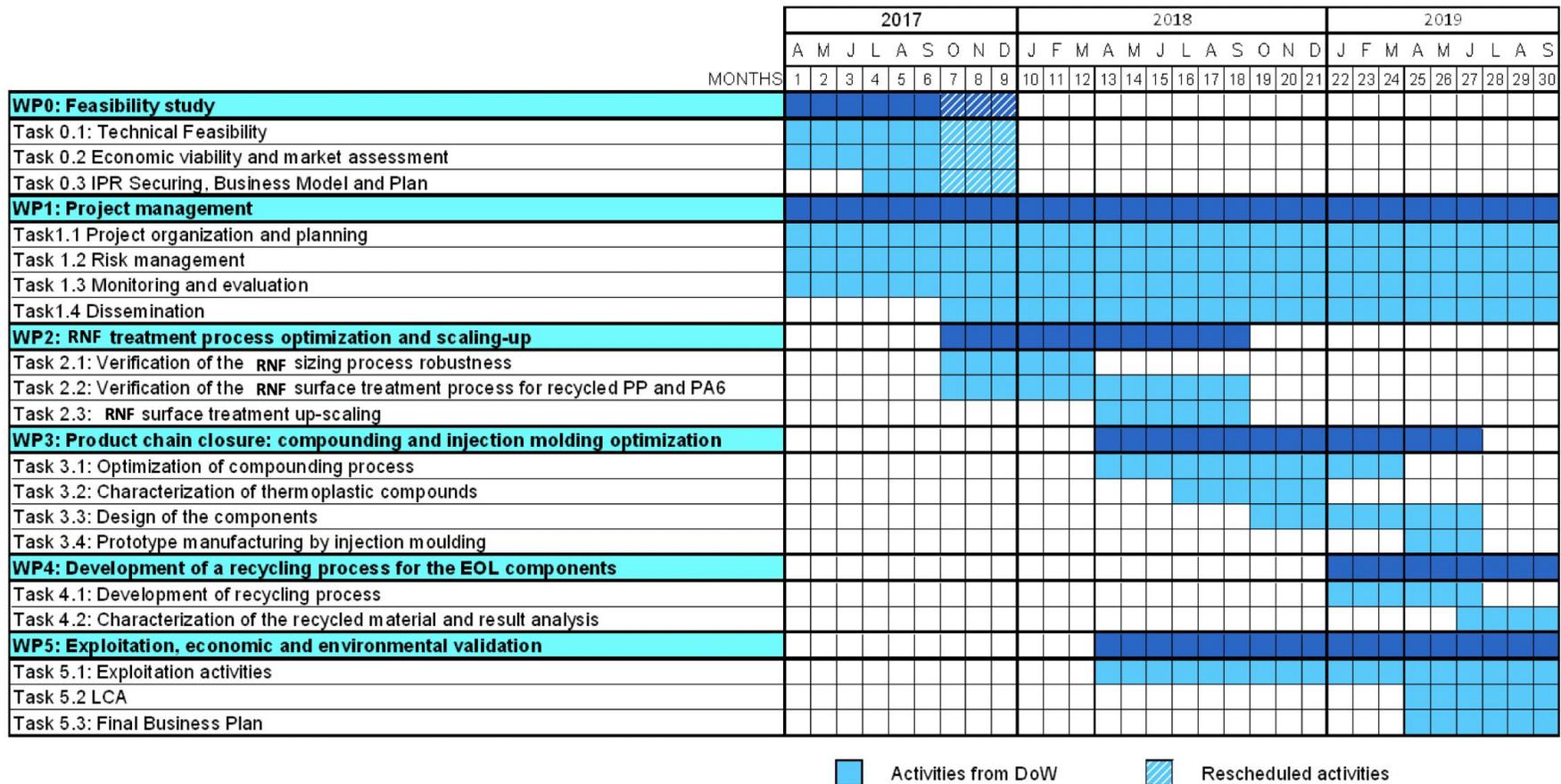


Figure 9: Project Gantt chart.

WP	Task	Title	CETMA	CETMA	CRMA	ENEA	SZEI	UNISUD
<b>0</b>	<b>Feasibility study</b>			L				
	Task 0.1	Technical Feasibility	X	L	X	X	X	X
	Task 0.2	Economic viability and market assessment	X	X	L	X	X	X
	Task 0.3	IPR Securing, Business Model and Plan	X	X	X	L	X	X
<b>1</b>	<b>Project management</b>					L		
	Task 1.1	Project organization and planning	X	X	X	L	X	X
	Task 1.2	Risk management	X	X	X	L	X	X
	Task 1.3	Monitoring and evaluation	X	X	X	L	X	X
	Task 1.4	Dissemination	X	L	X	X	X	X
<b>2</b>	<b>RNF treatment process optimization and scaling-up</b>			L				
	Task 2.1	Verification of the RNF sizing process robustness	X	L		X		
	Task 2.2	Verification of the RNF surface treatment process for recycled PP and PA6	X	X			L	
	Task 2.3	RNF surface treatment up-scaling		L				
<b>3</b>	<b>Product chain closure: compounding and injection molding optimization</b>		L					
	Task 3.1	Optimization of compounding process	L	X			X	
	Task 3.2	Characterization of thermoplastic compounds	L				X	
	Task 3.3	Design of the components	X	L				X
	Task 3.4	Prototype manufacturing by injection moulding	X	X	L		X	
<b>4</b>	<b>Development of a recycling process for the EOL components</b>					L		
	Task 4.1	Development of recycling process	X		X	L	X	
	Task 4.2	Characterization of the recycled material and result analysis				L		
<b>5</b>	<b>WP5: Exploitation, economic and environmental validation</b>			L				
	Task 5.1	Exploitation activities	X	L	X	X	X	
	Task 5.2	LCA	X	X	X	L	X	
	Task 5.3	Final Business Plan	X	L	X	X	X	

Figure 10: Work Breakdown Structure

### 4.2.1.2 Deliverables reporting templates

List of the project deliverables is provided below, with the indication of the expected delivery date and leading beneficiary, according to Project Proposal.

Deliverable ID	Deliverable title	Lead	Due Date [M]
<b>WP0: Feasibility study</b>		<b>RICREA</b>	
D0.1	Feasibility study	RICREA	6
<b>WP1: Project management</b>		<b>ENEA</b>	
D1.1	Strategic action Plan	ENEA	30
D1.2	Monitoring and evaluation Plan	ENEA	9
D1.3	Periodic reports	ENEA	12,24
D1.4	Final report	ENEA	30
D1.5	Dissemination plan	RICREA	9
D1.6	Website	RICREA	9
<b>WP2: treatment process optimization and scaling-up</b>		<b>RICREA</b>	
D2.1	Technical report containing the description of the optimized sizing procedure and parameters	RICREA	12
D2.2	Technical report containing the description of the optimized sizing procedure and parameters for destined to recycled matrices	SZIE	18
D2.3.1	Pilot line for sizing	RICREA	18
D2.3.2	Preliminary design of industrial equipment and relevant cost estimation	RICREA	18
<b>WP3: Product chain closure: compounding and injection molding optimization</b>		<b>AEC</b>	
D3.1.1	Up-graded pilot line for compounding process of virgin PP and PA6 reinforced with	AEC	18
D3.1.2	Up-graded pilot line for compounding process of recycled PP and PA6 reinforced with	SZIE	18
D3.1.3	About 50kg of samples of reinforced compounds with virgin PP, about 50kg of samples of reinforced compounds with virgin PA6.	AEC	18
D3.1.4	About 50kg of samples of reinforced compounds with recycled PP, about 50kg of samples of reinforced compounds with recycled PA6.	SZIE	18
D3.2	Technical report containing the results of all the characterisation tests and the result analysis	AEC	21

Deliverable ID	Deliverable title	Lead	Due Date [M]
D3.3.1	Design of at least 4 automotive components	RICREA	27
D3.3.2	Design of the moulds of the automotive components	AEC	27
D3.4	At least 10 prototypes of glove compartment for each of the following materials:	CRMA	27
<b>WP4: Development of a recycling process for the EOL components</b>		<b>ENEA</b>	<b>30</b>
D4.1.1	Technical report containing the results of the recycling process study	ENEA	28
D4.1.2	Samples of recycled material	ENEA	28
D4.2	Technical report containing the results of all the characterisation tests and the result analysis	ENEA	30
<b>WP5: Exploitation, economic and environmental validation</b>		<b>RICREA</b>	<b>30</b>
D5.1	Exploitation plan	RICREA	30
D5.2	LCA	ENEA	30
D5.3	Final Business Plan	RICREA	30

**Table 3: List of project deliverables**

A Deliverable Reporting Template (inside “REMAIN\_Task\_Deliverable\_Reporting.xls”) will be used by the PC to monitor the status of each deliverable and will be sent to PC by WPLs who will complete it every quarter. It will be the formal instrument for WPLs to communicate specific issues associated to deliverables to the STC. In particular, the status of each deliverable will be labelled by specifying the percentage of completion as follows:

% Completion	Description
0%	Not started
10%	Table of Contents defined
30%	Drafting of deliverable begun /Writing ongoing
60%	Draft ready for peer review
75%	Peer review completed (new draft under preparation for STC approval)
90%	Deliverable ready for STC approval
100%	Deliverable approved by STC and uploaded in the GreenBook
150%	Redrafting of deliverable following request by ERA after formal review
190%	2 <sup>nd</sup> version of deliverable ready for PMC approval
200%	2 <sup>nd</sup> version of deliverable approved and uploaded in GreenBook

**Table 4: Percentage of completion of project deliverables**

Table 5 displays a screenshot of the spreadsheet provided. Templates can be updated in the course of the project to the extent is needed.

Deliverable No.	Deliverable title	Lead	Type	Dissemination	Review partner	Due Date [M]	STATUS	Issue for STC	Criticalities/ key notes with respect to other task/WP	m1	m2	m3	m1	m2	m3
										Q1	Q2	Q3			
WP0: Feasibility study RICREA															
D0.1	Feasibility study	RICREA	R		All	7	APPROVED	-	-	100%					
WP1: Project management ENEA															
D1.1	Strategic action Plan	ENEA	R		All	30	ONGOING	-	-	90%					
D1.2	Monitoring and evaluation Plan	ENEA	R		All	9	ONGOING	-	-	90%					
D1.3	Periodic reports	ENEA	R		All	12,24	ONGOING	-	-	90%					
D1.4	Final report	ENEA	R		All	30	ONGOING	-	-	90%					
D1.5	Dissemination plan	RICREA	R		All	9	ONGOING	-	-	90%					
D1.6	Website	RICREA	Other	PU	All	9	ONGOING	-	-	90%					
WP2: RNF treatment process optimization and scaling-up RICREA															
D2.1	Technical report containing the description of the optimized RNF sizing procedure and parameters	RICREA	R		RICREA AEC	12	NOT STARTED	Insert text	Insert text						
D2.2	Technical report containing the description of the optimized sizing procedure and parameters for RNF		R		RICREA AEC	18	NOT STARTED	Insert text	Insert text						
D2.3.1	Pilot line for RNF sizing	RICREA	Other		/	18	NOT STARTED	Insert text	Insert text						
D2.3.2	Preliminary design of industrial equipment and relevant cost estimation	RICREA	R		/	18	NOT STARTED	Insert text	Insert text						
WP3: Product chain closure: compounding and injection molding optimization AEC RICREA AEC															
D3.1.1	Up-graded pilot line for compounding process of virgin PP and PA6 reinforced with RNF	AEC			RICREA SZIE	18	NOT STARTED								
D3.1.2	Up-graded pilot line for compounding process of recycled PP and PA6 reinforced with RNF	SZIE			RICREA AEC	18	NOT STARTED								
D3.1.3	about 50kg of samples of RNF reinforced compounds with virgin PP, about 50kg of samples of RNF reinforced	AEC			RICREA AEC	18	NOT STARTED								
D3.1.4	about 50kg of samples of RNF reinforced compounds with recycled PP, about 50kg of samples of RNF reinforced	SZIE			RICREA SZIE	18	NOT STARTED								
D3.2	Technical report containing the results of all the characterisation tests and the result analysis	AEC			RICREA AEC	21	NOT STARTED								
D3.3.1	Design of at least 4 automotive components	RICREA			RICREA AEC	27	NOT STARTED								
D3.3.2	Design of the moulds of the automotive components	AEC			RICREA AEC	27	NOT STARTED								
D3.4	At least 10 prototypes or glove compartment for each of the following materials:	CRMA			RICREA SZIE	27	NOT STARTED								
WP4: Development of a recycling process for the EOL components ENEA															
D4.1.1	Technical report containing the results of the recycling process study	ENEA			RICREA AEC	28	NOT STARTED								
D4.1.2	Samples of recycled material	ENEA			RICREA ENEA AEC	28	NOT STARTED								
D4.2	Technical report containing the results of all the characterisation tests and the result analysis	ENEA			/	30	NOT STARTED								
WP5: Exploitation, economic and environmental validation RICREA															
D5.1	Exploitation plan	RICREA			RICREA ENEA AEC	30	NOT STARTED								
D5.2	LCA	ENEA			ENEA	30	NOT STARTED								
D5.3	Final Business Plan	RICREA			ENEA RICREA	30	NOT STARTED								

Table 5: Screenshot of the deliverable reporting template

### 4.2.1.3 Milestones reporting templates

List of the project milestones is provided below, with the indication of the expected date and lead beneficiary, according to Project Proposal.

Milestone ID	Milestone name	Lead	Date
<b>WP0: Feasibility study</b>		<b>RICREA</b>	
M0.1	Feasibility study available	RICREA	M6
<b>WP1: Project management</b>		<b>ENEA</b>	
M1.1	Project website available	RICREA	M9
M1.2	Strategic action Plan approved by consortium	ENEA	M9
M1.3	Final report approved by consortium	ENEA	M32
<b>WP2: treatment process optimization and scaling-up</b>		<b>RICREA</b>	
M2.1	Availability of optimized pilot scale process parameters for treatment	RICREA	M12
<b>WP3: Product chain closure: compounding and injection molding optimization</b>		<b>AEC</b>	
M3.1.1	Up-graded pilot line for compounding process of virgin PP and PA6 reinforced with	AEC	M18
M3.1.2	Up-graded pilot line for compounding process of recycled PP and PA6 reinforced with	SZIE	M24
M3.2	About 50kg of samples of reinforced compounds with virgin PP, about 50kg of samples of reinforced compounds with virgin PA6.	ENEA	M24
M3.3	About 50kg of samples of reinforced compounds with recycled PP, about 50kg of samples of reinforced compounds with recycled PA6.	RICREA	M27
M3.4	Technical report containing the results of all the characterisation tests and the result analysis	CRMA	M27
<b>WP4: Development of a recycling process for the EOL components</b>		<b>ENEA</b>	
D4.1	Technical report containing the results of the recycling process study	ENEA	M30
<b>WP5: Exploitation, economic and environmental validation</b>		<b>RICREA</b>	
M5.1	Final Business Plan available	RICREA	M30

Table 6: List of project milestones

A Milestone Reporting Template (inside “REMAIN\_Task\_Deliverable\_Reporting.xls”) will be provided by the PC to WPLs to monitor the status of each milestone. WPLs will complete and communicate it to the PC every quarter, and will be the formal instrument for WPLs to communicate specific issues associated to milestones to the STC. A screenshot is provided below.

Milestone ID	Milestone name	Lead	Planned Due Date [M]	Expected by	Status	(to be) Verified by:	Dependencies with tasks	Key notes	Issue for STC
<b>WP0: Feasibility study</b>		RICREA							
M0.1	Feasibility study available	RICREA	6	7	ACHIVED	D0.1	T0.1, T0.2, T0.3	Insert text	Insert text
<b>WP1: Project management</b>		ENEA							
M1.1	Project website available	RICREA	9	9	OK	D1.6	T1.4	Insert test	Insert test
M1.2	Strategic action Plan approved by consortium	ENEA	9	9	OK	D1.1	T1.1, T1.2, T1.3	Insert test	Insert test
M1.3	Final report approved by consortium	ENEA	32		OK	D1.4	T1.1, T1.2, T1.4	Insert test	Insert test
<b>WP2: RNF treatment process optimization and scaling-up</b>		RICREA							
M2.1	Availability of optimized pilot scale process parameters for RNF treatment	RICREA	12		OK	D2.1, D2.2, D2.3.1, D2.3	T2.1, T2.2, T2.3		
<b>WP3: Product chain closure: compounding and injection molding optimization</b>		AEC							
M3.1.1	Up-graded pilot line for compounding process of virgin PP and PA6 reinforced with RNF	AEC	18		NOT STARTED				
M3.1.2	Up-graded pilot line for compounding process of recycled PP and PA6 reinforced with RNF	SZIE	24		NOT STARTED				
M3.2	About 50kg of samples of RNF reinforced compounds with virgin PP, about 50kg of samples of RNF reinforced	ENEA	24		NOT STARTED				
M3.3	About 50kg of samples of RNF reinforced compounds with recycled PP, about 50kg of samples of RNF reinforced	RICREA	27		NOT STARTED				
M3.4	Technical report containing the results of all the characterisation tests and the result analysis	CRMA	27		NOT STARTED				
<b>WP4: Development of a recycling process for the EOL components</b>		ENEA							
M4.1	Technical report containing the results of the recycling process	ENEA	30		NOT STARTED				
<b>WP5: Exploitation, economic and environmental validation</b>		RICREA							
Task 5.3	Final Business Plan available	RICREA	30		NOT STARTED				

Table 7: Screenshot of the milestone reporting template

In particular, the status of each milestone will be marked as follows:

<b>NOT STARTED - Task not started</b>	Milestone not scheduled in the current year according to the DoA
<b>OK - Task ongoing and on schedule</b>	Activities to reach the milestone ongoing with progress
<b>ONGOING with issue for the STC</b>	Activities to reach the milestone ongoing but there are relevant issues that might cause delay to be brought to the attention of the STC
<b>ACHIVED</b>	Milestone achieved
<b>DELAYED</b>	Delay in the activities to reach the milestone. Need to be brought to the attention of the EB for decision and solution.

Table 8: Status of the project milestone as from the milestone template

#### 4.2.1.4 Progress and cost reporting

According to the REMAIN Project Agreement, every **six (3) months**, partners will have to inform the PC of their relevant incurred costs<sup>11</sup> (both in terms of Person Months (PMs) and other costs incurred) for each WP (this includes explanation of the work carried out in the related Tasks). For this purpose a template for PM monitoring, provided by the PC, will be completed by each beneficiary (and linked third parties), and will show the following information:

- Person-Months specifying:
  - Actual cumulative person-months for the WP – no need to fill this cell; this is an automatic sum of the person-months reported in the subsequent semesters)
  - Total person-months for the WP (according to the Project Proposal) – *need to fill it*
  - Remaining total is calculated by the spreadsheet – no need to fill it
  - Person-months for the semester (1 to 8) – *need to fill it*
  - Actual person-months RP (1 to 3) – no need to fill it; this is an automatic sum of the person-months reported in the relevant semesters.
  - Forecast of PMs for the project for each RP (RP 1 to 3) – *need to fill it*; this is an estimation of the work to be carried out for the 3 reporting periods. It could be used by each partner to verify internally the consistency of PM consumptions in the RP with respect to the planned activities.
  - Remaining total in the relevant RP with respect to the forecast is calculated by the spreadsheet – no need to fill it.

Reporting Period	Quarter
RP1 April 2017 – December 2017	Q01: April 2017 – June 2017
	Q02: July 2017 – September 2017
	Q03: October 2017 – December 2018
RP2 January 2018 – December 2018	Q04: January 2018 – March 2018
	Q05: April 2018 – June 2018
	Q06: July 2018 – September 2018
	Q07: October 2018 – December 2018
RP3 January 2019 – September 2019	Q08: January 2019 – March 2019
	Q09: April 2019 – June 2019
	Q10: July 2019 – September 2019

**Table 9: Project quarter for internal progress and cost reporting**

<sup>11</sup> Schedule 5A-1.2 of REMAIN's Project Agreement.

- Description of activities with respect to declared PM in the relevant quarter (including identification and brief description of the activities performed). Corresponding tasks will be indicated by specifying the participation to the Task activities (Yes/No from the dropdown menu).

Table 10 displays a screenshot of the provided template for PM monitoring. Templates can be updated in the course of the project to the extent is needed.

WP No.	Title	SUMMARY			REPORTING PERIOD RP1								
		accum. total	planned total	Left total	A M J Person-Months Quarter 2	Description of activities	J A S Person-Months Quarter 3	Description of activities	O N D Person-Months Quarter 4	Description of activities	Left RP1	FY RP1 (please, fill in)	Actual RP1
WP0: Feasibility study		4.3	6.3	2.0	0	please describe the activities carried out in the relevant quarter	2	please describe the activities carried out in the relevant quarter	2.3	please describe the activities carried out in the relevant quarter	2	6.3	4.3
Task 0.1	Technical Feasibility		not need to fill in		YES	please describe the activities carried out in the relevant quarter	YES	please describe the activities carried out in the relevant quarter	YES	please describe the activities carried out in the relevant quarter	not need to fill in		
Task 0.2	Economic viability and market assessment				YES		YES		YES				
Task 0.3	IPR Securing, Business Model and Plan				NO		YES		YES				
WP1: Project management		3.5	9.0	5.5	1.5	please describe the activities carried out in the relevant quarter	1	please describe the activities carried out in the relevant quarter	1	please describe the activities carried out in the relevant quarter			
Task 1.1	Project organization and planning		not need to fill in		YES	please describe the activities carried out in the relevant quarter	YES	please describe the activities carried out in the relevant quarter	YES	please describe the activities carried out in the relevant quarter	not need to fill in		
Task 1.2	Risk management				YES		YES		YES				
Task 1.3	Monitoring and evaluation				YES		YES		YES				
Task 1.4	Dissemination				NO		NO		NO				
WP2: RNF treatment process optimization and scaling-up		1	2.0	1.0		please describe the activities carried out in the relevant quarter		please describe the activities carried out in the relevant quarter	1	please describe the activities carried out in the relevant quarter			
Task 2.1	Verification of the RNF sizing process robustness		not need to fill in		NO	please describe the activities carried out in the relevant quarter	NO	please describe the activities carried out in the relevant quarter	YES	please describe the activities carried out in the relevant quarter	not need to fill in		
Task 2.2	Verification of the RNF surface treatment process for recycled PP and PA6				NO		NO		YES				
Task 2.3	RNF surface treatment up-scaling				NO		NO						
WP3: Product chain closure: compounding and injection molding optimization		0	2.0	2.0		please describe the activities carried out in the relevant quarter		please describe the activities carried out in the relevant quarter		please describe the activities carried out in the relevant quarter			
Task 3.1	Optimization of compounding process		not need to fill in			please describe the activities carried out in the relevant quarter		please describe the activities carried out in the relevant quarter		please describe the activities carried out in the relevant quarter	not need to fill in		
Task 3.2	Characterization of thermoplastic compounds												
Task 3.3	Design of the components												
Task 3.4	Prototype manufacturing by injection moulding												
WP4: Development of a recycling process for the EDL components		0	9.0	9.0		please describe the activities carried out in the relevant quarter		please describe the activities carried out in the relevant quarter		please describe the activities carried out in the relevant quarter			
Task 4.1	Development of recycling process		not need to fill in			please describe the activities carried out in the relevant quarter		please describe the activities carried out in the relevant quarter		please describe the activities carried out in the relevant quarter	not need to fill in		
Task 4.2	Characterization of the recycled material and result analysis												
WP5: Exploitation, economic and environmental validation		0	2.5	2.5		please describe the activities carried out in the relevant quarter		please describe the activities carried out in the relevant quarter		please describe the activities carried out in the relevant quarter			
Task 5.1	Exploitation activities		not need to fill in			please describe the activities carried out in the relevant quarter		please describe the activities carried out in the relevant quarter		please describe the activities carried out in the relevant quarter	not need to fill in		
Task 5.2	LCA												
Task 5.3	Final Business Plan												

Table 10: Screenshot of the provided template for PM monitoring

Additionally, a **template for cost monitoring** has been provided by the PC according to the structure of the Individual Financial Statement and will be completed by each beneficiary (and linked third parties) every six months. It will show the costs incurred in the relevant semester and include the explanation of the use of subcontracting and in-kind contribution from third parties (if any). A screenshot of the template for overall cost monitoring is provided below

Reporting Period	Quarter	Period	DIRECT COSTS						Explaition of the other direct	TOTAL	SUBCONTRACT (subgranting)	Explanation of subgranting incurred	INDIRECT COSTS	Total Cost	EC Funding
			PERSONNEL		OTHER DIRECT COSTS										
			PM	Direct Personnel	Travel and subsistence	Equipment and ...	Other goods	ToTal OTHER DIRECT COST							
RP1 April 2017 – December 2017	Q1	Q01: April 2017 – June 2017		€ 18,500	€ 1,500			€ 1,500		€ 20,000		€ 5,000.00	€ 25,000.00	€ 25,000.00	
	Q2	Q02: July 2017 – September 2017						€ 0		€ 0		€ 0.00	€ 0.00	€ 0.00	
	Q3	Q03: October 2017 – December 2018						€ 0		€ 0		€ 0.00	€ 0.00	€ 0.00	
		ACTUAL	10	€ 18,500	€ 1,500	€ 0	€ 0	€ 1,500		€ 20,000	€ 0	€ 5,000	€ 25,000	€ 25,000	
		FORECASTED for RP1	80	€ 33,750	€ 1,500	€ 0	€ 3,750				€ 31,688	9750	€ 80,438	€ 80,438	
		Remaning	70	€ 15,250	€ 0	€ 0	€ 3,750	-€ 1,500		-€ 20,000	€ 31,688	€ 4,750	€ 55,438	€ 55,438	

**Table 11: Screenshot of the provided template for cost monitoring**

PM and costs monitoring templates provided by each partner will be aggregated by the PC in order to provide an update on the status of the project budget and person months to be discussed at each General Assembly.

#### **4.2.2 Contact list: team monitoring and update**

A centralised contact list is maintained by the PC and it will be periodically updated on input from partners. The contact list is organised according to the work plan structure (i.e. Tasks, Work packages, Scientific and Technical Committee, Project management Committee and Financial Controllers).

## 5 Deliverables Production

Deliverables are main outputs of the REMAIN project to be issued according to the schedule included in the Project Proposal (the respect of the due date and expected technical and quality standards is contractually required). They are analysed by ERA reviewers and constitute a major basis for project assessment and financing approval by the ERA. In order to assure an effective and high technical and editorial quality production of project deliverable in good time, the project has identified the following main actors and responsibility in the document production.

Role/Responsibility	Responsibility
Author(s)	Write(s) the deliverable taking the necessary inputs and in coordination with contributors and participants in the relevant task/WP
Document Responsible (DR)	Manages the document production assuring internal coordination in the relevant task for the deliverable and nominates Author(s) (only one single DR can exist, usually one of the Authors). The DR, together with the WPL, plans the production of the document, taking into account the time needed for the review procedure and the due date. The DR is also responsible for organising and coordinating the review process. Before each review process starts, the DR warns the appointed reviewers and asks for voluntary reviewers, if any.
Reviewer(s) (RW)	Perform(s) the Review Procedure of the deliverable. There are either 'appointed' reviewers or 'voluntary' reviewers (self-appointed based on an interest to give contribution in the review activity). These partners are responsible for reviewing the deliverables before formal approval of the Executive Board.
Task Leader (TL)	Nominates the DR. TL and DR can be the same person
WP Leader (WPL)	WPL decides by agreement with DR, to put forward the deliverable for approval to the STC. Together with the DR, the WPL plans the production of the document, taking into account the time needed for the review procedure and the due date. The WPL informs the PC about the document production plan and is also responsible for putting forward the deliverable to the STC.
Scientific and Technical Committee (STC)	Formally approves the deliverable.
Project Coordinator (PC)	Formally issues the document: (i) uploading on the ERA participant portal; (ii) uploading on the project web portal for public documents

**Table 12: responsibility in the document production**

## **5.1 Review process for deliverables**

The review activity is performed as described in the following paragraph. Each partner is entitled to review and comment every deliverable in due time. However, for sake of good order, mandatory reviewers will be appointed and are in charge of performing the review when requested. The lists of reviewers can be modified in the course of the project.

### **5.1.1 Criteria and list of reviewers**

A minimum of two reviewers are required per deliverable. To the extent it is possible in consideration of the allocated participant effort in each WP and/or other relevant issues, the following criteria have been defined for the nomination of reviewers:

1. *Reviewers' activity should be balanced with the partners' involvement in the specific WP/Task:* it implies that in principle WP/task leaders should not act as appointed reviewers as well.
2. *Reviewers should have in their budget person months in the WP:* this is meant to assure cost eligibility and effort availability in the relevant WP.
3. *Reviewers' activities have to be balanced in the WP and in the overall Project:* the number of reviews assigned to the partners should be balanced and reasonable in consideration of the allocated effort of participants in the action
4. *Deliverable relevance* in consideration of WPs/tasks interdependences and expected impact of the deliverable results on the following relevant actions.

Based on the above mentioned criteria, a first list of official Reviewers will be proposed by the PC to better plan and optimise the partner work at the beginning of the project and will be discussed and approved at the first stc (at least for the first RP).

### **5.1.2 Details of the review process**

REMAIN has defined a formal review process with the goal to ensure high quality standard for the produced deliverables, while achieving the planned completion date.

### 5.1.2.1 Coding of deliverables

Within each phase of the writing of the deliverable, the history will be tracked following a correct completion of the REVISION HISTORY section of the deliverable, which will be included in every deliverable.

Version	Date	Author	Notes
v0.1			1 st draft
v0.1_rev_CARETTOF_ENEA			1 st draft reviewed by [Flavio Caretto of ENEA]
v0.2			2 nd draft of document prepared by DR (takes into account reviewer comments)
...			
V0.n			Version ready for approval by the Executive Board
<b>v1.0</b>			<b>Release.</b> Version approved by STC and (ready to) upload(ed) in GreenBook by the PC
v1.1			Drafting of 2 <sup>nd</sup> version of deliverable accounting for ERA requests (if any) <sup>12</sup>
...			...
v1.n			2 <sup>nd</sup> version of deliverable ready for approval by the STC
<b>v2.0</b>			<b>Release.</b> 2 <sup>nd</sup> version of deliverable approved by STC and uploaded in GreenBook

**Table 13: Deliverable coding**

The document will be named following these nomenclature rules:

- Naming of the deliverables (REMAIN\_D[Y.Y]\_Deliverable Title\_v[Z.Z][\_rev\_(LASTNameORGANIZATION)]\_(A/NA/AC)):
- D[Y.Y]: Deliverable Number
- v[Z.Z]: Version of document.
- [\_rev\_(LASTName-ORGANIZATION)]: revision of a specific version of deliverable & corresponding name of reviewer and organization.
- (A/NA/AC): code indicates the status of documents approval as better detailed below

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<sup>12</sup> Version coding necessary only in the case ERA requests some adjustments/modification after official review by the ERA.

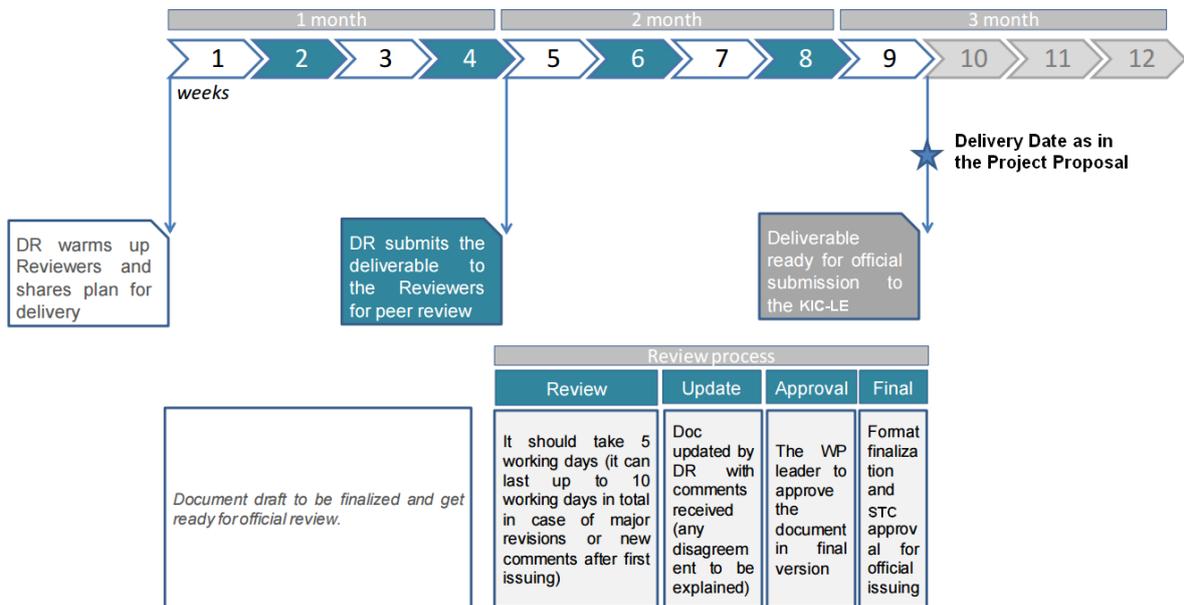
### **5.1.2.2 Timing of deliverables review**

The process for deliverable review is detailed below:

1. **9 weeks before document delivery date**, DR forewarns the appointed reviewers, asks for voluntary reviewers (if any) and prepares and share plans. During this time the document gets ready for official review and integrates last further comments from the task and deliverable contributors and the WP leader
2. **at least 5 weeks before document delivery date DR** submits documents to the RW for their review, keeping informed the PC and the WP leader; this is the minimum timeline set for sending the document to reviewers, however the production plan of the document should always consider holidays and leave accordingly enough timeline for the execution of the review process (e.g. the review process of a deliverable to be submitted by the end of January shall start not later than mid December).
3. **within 5 to 10 working days** the reviewers have to provide, if any, due comments to the documents in **track change mode** and send them to the DR with the following code at the end of the filename:
  - **A** = approved (good to be issued as final version)
  - **NA** = not approved (not acceptable and to be reissued)
  - **AC** = approved with comments (minor comments have to be implemented and then the document can be considered approved), providing that comments will be implemented.

In case the DR does not agree with comments, he can propose to reject them, explaining via email the reasons to the RW and asking them for confirmation. The revision history of the document shall be completed by RW. Review is targeted to take 5 working days. Extra working days might be required in case major revisions and new comments after first issuing. However, **the review process should be completed in no longer than 10 working days;**

4. **3 Weeks before delivery due date** the received and agreed comments are implemented by the document responsible, which is then sent to the WP leader for approval, keeping informed the PC. This activity can last maximum until 2 weeks before the official issuing date but it targeted to be shorter.
5. **2 Weeks before delivery due date**, WPL approves the document in its final version
6. **1 Week before delivery due date** the Document Responsible finalises format, issuing the document officially for approval to the STC.



**Figure 11: Review process and timeline**

## 6 Financial management

The ERA administers the financial contribution of the European Research Agency (ERA) to the project. That is, ERA transfers payments to the partners bank accounts not later than within 30 days from receipt from ERA and in conformity with the rules laid out in the Section 7 of the Internal Agreement and the relevant provisions of the other Umbrella Documents.<sup>13</sup>

The Task Patron make the payments to respective Task Partners based on their own agreed upon terms. Payment is made on an annual basis, with three different Project Agreement (PA) and three different Business Plan (BP2017, BP2018, BP2019). It is not allowed to transfer resources from one BP to another.

For each BP, the PC collects the bank details from all partners and reports them on Schedule 4 of PA. It is responsibility of partner informing ERA and PC if the bank information in the project agreement has changed and making payments to their respective Task Partners based on their own agreed upon terms. The tool used to keep partners informed of any payments made is GreenBook.

### 6.1 Pre-financing<sup>1415</sup>

For each Business Plan (BP) of REMAIN there are three batches (Pre-financing period) where pre-financing is made. For BP2017 the three batch have been:

Batch number	PA fully signed deadline	Pre-financing period (payment due)
1	30 April	1 May – 30 May
2	15 June	15 June – 15 July
3	15 September	15 September – 15 October

**Figure 12: Pre-financing period for BP2017**

Conditions for to obtain pre-financing are:

- For each BP one Project Agreement (PA) has to be fully signed by all partners. Only PA that have been fully signed and uploaded in GreenBook by the deadlines described above can receive pre-financing in any given batch
- No payments can be done outside the pre-financing periods
- If a PA is not fully signed by the last deadline, the project partners in this PA lose their right to pre-financing for relative BP.

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<sup>13</sup> SECTION 6 - PAYMENT of REMAIN's Project Agreement.

<sup>14</sup> *Kava payment guidelines –Business Plan 2017*. This ERA NewMaterials presentation can be found in Help Tab on GreenBook.

<sup>15</sup> *ERA NM Financial Reporting Guidelines & Tips*. This ERA NewMaterials presentation can be found in Help Tab on GreenBook.

Pre-financing details:

- For 2017, pre-financing has been of **60%** of Kava budget
- Payments are made to bank account indicated in Project Agreement Schedule 4, unless specifically specified by a partner in writing to *kava.payments@ERANewmaterials.eu*
- Bank reference for the 2017 pre-payment has been: “60%ERAFFPre-fin2017-PA12345” .

Once a payment has been made, this has reflected in GreenBook under the Project Agreement tab of REMAIN project:

Partner	Amount	Payment Date	Payment Type	BP Reference	Remarks
Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile	40.000,00 €	19/10/17	Pre-financing	2017	
Comité de l'énergie atomique	75.000,00 €	20/10/17	Pre-financing	2017	ERA Funding
Szi enviroment	45.000,00 €	21/10/17	Pre-financing	2017	
Centro Ricerche per Energie Alternative	30.000,00 €	22/10/17	Pre-financing	2017	
	<b>190.000,00 €</b>				

**Table 14: Overview of pre-financing payments to partners**

## 6.2 Balance payments & Return payments<sup>16</sup>

“Balance payments” will only be made once ERA has reviewed and approved the Grant Report submitted by partners and the balance payment amount will be calculated based on the actual eligible costs claimed by the project partner.

Management activities in this field will also largely focus on cost reports including the preparation, collection and review of partners’ Financial Statement and cost explanations that provides a more detailed explanation of individual cost items.

Costs can principally be claimed on the BP when they are incurred during the duration of the same BP, used for the sole purpose of the project and recorded in the accounts of the beneficiary.<sup>17</sup>

<sup>16</sup> *Kava payment guidelines –Business Plan 2017*. This ERA NewMaterials presentation can be found in Help Tab on GreenBook.

<sup>17</sup> More information on the in/eligibility of costs is laid in Section 6 -PAYMENTS of the PA.

The cost explanation is to justify these costs more specifically in terms of their project relation that helps the ERA to understand a partner's cost claim better.

The PC monitors the submission of Financial Statement and handles with PMC any kind of re-allocation of funding within the consortium.

For BP2017 the balance payment bank reference will be: "ERAF-Bce-2016-PA12345".

Balance payments will also be reflected in GreenBook, in the Project Agreement tab of the KAVA

Eventual "Return payments" will be requested via email by *kava.payments@ERAnewmaterials.eu* to project partner, with copy to the project coordinator and key account manager.

## Personnel costs

- Personnel costs can be based on ACTUALS or UNITS → the default is actuals; if you are reporting based on UNITS, you need to do it based on your company's policy and note that it is very likely that the certificate of the methodology will be requested
- **ACTUALS:**
  - Basis for calculation needs to be provided: 1720 fixed hours, individual annual productive hours, or standard annual productive hours
  - Identification of Staff is required – this information will be hashed to meet data privacy requirements.
  - Available for:
    - Employees under employment contract
    - Natural persons under direct contract
    - Seconded persons
  - A hash is given to each individual staff identified, so that several line items may refer to the same person, as long as the ID entered is exactly the same (John Smith and J. Smith are considered as 2 different individuals by the system)
- **UNITS:**
  - **Certificate of the Methodology (to be approved by EC)**
  - Available for:
    - Employees under employment contract
    - SME owner without salary
    - Beneficiaries which are natural persons without salary
  - Important to know that:
    - 1FTE = 1720 hours = 215 days = 43 weeks = 10.5 months

## Subgranting

- Beneficiary can be an organization (for example task partner) or an individual. In both cases, the details of the beneficiary need to be provided (**payment to be done by 100% of TP costs before 31/01/2018**)

## Travel

- It is important that the unique ID can be traced back to your books in case of an audit

## Equipment

- Leasing & depreciation start date cannot be later than 31/12/17

## Other goods & services

- You can group categories into one line item, but note that ERA may come back asking for more questions on one line item, and in that case you would have to provide all supporting documentation for each of the elements included in the grouping

## KCAs

- **KCA** annex combines project and financial elements. Project coordinators will enter the description, and financial controllers will update the figures
- Eligible KCA dates are **from 9/12/2014 to 31/12/2017** - no costs in the future can be claimed

## Funding

- The baseline for your reporting is what appear on BP2017 plus any project-specific funding transfers that the project coordinator may have made.
- The split between ERA funding and ERA Nmfunding (KIC funding), if any, is discretionary to ERA NewMaterials--> you cannot manually change these figures
- ERA expects a breakdown of the following funding sources:
  - ERA funding & ERA Nmfunding (grant funds either from ERA or from the KIC)
  - **Partner Co-funding:** Funding (in-kind or cash) a partner brings to a project. This refers to costs incurred for a particular KAVA, reported via GreenBook for which no ERA funding is foreseen.
  - **Other sources:** Partner co-funding has to be splitted in BB, so if the figure is actually a mix of sources (partner co-funding, national/regional, etc.) you should report accordingly
- You will see that funding split is automatically calculated in proportion to the original funding split based on the costs reported:
  - If you **underspent**, funding is proportionally reduced in each funding source
  - If you **overspent**, the report will be flagged to be analyzed by ERA N and the project coordinator, and funding for overspending cannot be guaranteed

Figure 13: Explanations for Financial Statement

Once all the information is completed, each partner will print out the financial statement for it to be signed by an authorized person in his organization and stamped. When finalized, each beneficiary enters their financial information into GreenBook as well as electronically signs their Financial Statement and submits them to the ERA.

During the cost reporting, the FC of lead partner will especially give guidance in the following ways:

- by facilitating the collection of financial figures for the relevant reporting period,
- by informing about required documents such as Certificates of the Financial Statement<sup>18</sup>
- by clarifying how to enter figures into GreenBook
- and by reviewing the cost explanations for consistency and completeness.

Advice will be offered via email and/or Adobe Connect.

Revisions requested by the ERA will be organized and submitted without delay via the PC.

## Timeline

- Submission of financial reports:
  - February 23rd, eob *(For partners subject to a CFS different, esp. earlier, deadlines might be agreed with E&Y)*
- Analysis by ERA NewMaterials
  - Until March 2nd
- Feedback/ Request from ERA NewMaterials towards partners for additional or updated information
  - March 5th
- Submission of updated information by partners
  - March 9th
- Feedback from ERA
  - Expected for April/ May
- Final approval for report BP 2017
  - Expected for July
- Feedback / Payments to partners
  - After approval of BP 2017 reporting



**Figure 14: Timeline to be followed for payments to be done by ERA to partners under BP 2017**

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<sup>18</sup> NFS statement: is applicable for partners who have funding above the 325K EUR threshold, there is an extra signature required in the statement.

### 6.3 Monitoring of Resource Expenditure

The allocation of resources is controlled on a quarter basis by the PC. Partners are asked to document the distribution of PMs (Person Months) for their organisation, which is reviewed by the PC mainly to see whether efforts are in line with as planned. To improve the quality assurance, a distribution of PMs per task was carried out by the partners. This planned allocation has been integrated into an overall spreadsheet designed by the PC for the consortium's reporting of PMs which the partners will need to complete with their actual use of resources. This data collection allows the PC to track the resource allocation per partner throughout the project and provides a detailed summary of planned versus actual resources for controlling purposes. Each partner will also be asked to justify any major over/underuse of resources to make sure that the deviations from the planned resources will not result in an overall delay of the project or otherwise jeopardize the project's objectives.

In general, budget can be transferred between cost categories, but with the necessary distinctions:

- if the impact is below 5% of the total project budget, there is no need to provide an explanation;
- if the figure reflects 5-10% of the budget a description of this change needs to be made;
- If the figure represents 10% or more of the budget, a detailed justification for such a change needs to be made.<sup>19</sup>

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<sup>19</sup> *Grant Reporting FAQs – BP2016*. This ERA NewMaterials presentation can be found in Help Tab on GreenBook.

## **7 Amendments management**

### **7.1 Project Agreement (PA)**

Amendments to PA (entry of new partners, changes in budget, partner withdrawal) shall require a separate written agreement to be signed between all project partner<sup>20</sup>.

Budget can be transferred between Project Partners and cost categories but a justification for such a change can be necessary (§6.3 above), instead it is not allowed to transfer resources from one Business Plan to another (§6 above).

### **7.2 Additional Project Partner Consortium Agreement**

Nothing contained in PA prevents the Project Partners from making additional agreements between themselves as to the implementation of the Project.

These agreements, named “Additional Project Partner Consortium Agreements” are subordinated to PA and a copy of any such Additional Project Partner Consortium Agreement must be submitted to ERA.

ERA has the right to veto any such Additional Project Partner Consortium Agreement in whole or in part if and to the extent it finds it to be inconsistent with the PA or substantially affecting otherwise the interests of the IC<sup>21</sup>.

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<sup>20</sup> Section 13.7 of REMAIN's Project Agreement.

<sup>21</sup> Section 13.3 of REMAIN's Project Agreement.

## **8 Gender equality management**

According to the **Article 39 - Gender equality** of the Framework Partnership Agreement (Framework Partnership Agreement NUMBER FPA2016/ERA/ERA NEW MATERIALS - FPA2016/ERA/ERA NEW MATERIALS):

### **Article 39.1 Obligation to aim for gender equality**

The IC Partners must take all measures to promote equal opportunities between men and women in the implementation of the Action. They must aim, to the extent possible, for a gender balance at all levels of personnel assigned to the Action, including at supervisory and managerial level.

### **Article 39.2 Consequences of non-compliance**

If a IC Partner breaches its obligations under this Article, the ERA may apply any of the measures described in Section 5 [of the Framework Partnership Agreement].

In order to ensure that Article 39 is fulfilled, the consortium has already defined the plans set out below. Gender monitoring will be carried out through a dedicated section of the Internal and Periodic Reports.

In order to address the gender gap, REMAIN will ensure:

An open and impartial selection procedure, as well as fair working conditions, to researchers recruited for work, in line with the Commission Recommendation of 11 March 2005 on the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers.

Women will be encouraged to take on decision-making roles. This is in order to address absence of diversity at management and policy-making levels, which has broad implications which the project will examine. This will also tackle the ‘generation effect’, by supporting women to take on leading roles, as a career development incentive.

As it stands, STM is woman and 2 out of 5 WP are coordinated by a woman.

## **Ethics issues management**

To projects developed within the Framework Partnership Agreement [FPA2016/ERA/ERA New Materials]<sup>22</sup> is required to explicitly address the ethical considerations of the project. It is therefore crucial to consider the ethical and legal implications of the project activities and address them in a manner that agrees with legal provisions and societal norms. This section introduces major ethical topics, and gives guidance on how they are managed within the REMAIN project.

### **8.1 Ethics Management in the REMAIN Project**

The REMAIN consortium is acutely aware of the necessity to ensure that it is adequately prepared and equipped to mitigate any potential ethical issue which may arise, irrespective of how remote this possibility is considered to be.

Therefore, in recognition of the importance of giving adequate consideration to ethics and ensuring that all project activities are carried out in a manner which is compliant with the highest ethical standards, the REMAIN consortium has designed an integrated ethics management framework within the wider project management structure.

The governance of ethics will occur within WP1-Project management, and specifically as part of “Task 1.1 Project organization and planning” and “Task 1.2 Risk Management” (which are covered in this deliverable report), within which all ethical considerations arise during the project will be considered.

The REMAIN Project Coordinator (also Risk Manager and Quality), under the guidance of the Project Management Committee (PMC) will have overall responsibility for the ethical management and oversight of the project. The PMC will oversee that the project partners adhere to the ethical and moral obligations in engaging with all types of stakeholders. The PC will monitor compliance to ethical rules and support in the undertaking of the project, with ethics considered at all stages in the development of the project outputs. This will be ensured through an ethics-by-design methodological approach, the implementation of which will be closely monitored by the PC.

The continued monitoring of ethical issues and the coordination of contingencies throughout the project implementation.

In the event of a REMAIN project partner/researcher having concerns on the topic of data protection, privacy or research conduct that needs further discussion, the partner/researcher should contact the PC as the first point of contact. The PC will inform the STC and, if necessary, the Project Officer, and seek

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<sup>22</sup> As established in Article 40 “Ethics” of the Framework Partnership Agreement NUMBER FPA2016/ERA/ERA NEW MATERIALS - FPA2016/ERA/ERA NEW MATERIALS.

guidance on mitigating the issue in a proper manner. If guidance on a specific issue is relevant to the consortium at large, then the coordinator will ensure that guidance notes are disseminated across all consortium partners.

Each WP lead should ensure that there are no ethical issues arising from the execution of the WP tasks.

## **8.2 Initial Ethics Considerations for the REMAIN Project**

When the REMAIN project was in the development stages, the project consortium was aware that, because of the importance of the ethics especially in relation to the execution of ERA projects, due regard must be given to ensuring that the REMAIN project and its outputs comply with the highest ethical standards.

However, it is important to note that as at the submission of the project proposal, the project consortium identified that there were no ethical issues with the REMAIN project, and reached a considered opinion **that there will be no ethical issues identified as the project progresses.**

## **8.3 Conducting research activities**

The project consortium is mindful of the nature and implications of project activities and that it is important to establish a project environment that stimulates responsible behaviour and a reflexive attitude in relation to ethical issues. Ethical considerations for conducting scientific research can be divided into two broad categories.

The first category deals with aspects related to research integrity within the academic community. This refers to honesty, fairness, accuracy and transparency on behalf of the individual researchers in their work.

Beside research integrity, ethical considerations with regard to the wider socio-ethical responsibility of the project are needed. This involves the responsibility towards society and in particular the well-being of research participants.

## 8.4 Research integrity

The REMAIN project will adopt the principles of the European Code of Conduct for Research Integrity<sup>23</sup>. This code was developed by the European Science Foundation in cooperation with All European Academies (ALLEA) and represents agreement across Europe on principles and priorities for self-regulation of the research community.

- The REMAIN consortium partners will acknowledge and respect the European Code of Conduct for Research Integrity in their research practices for the REMAIN project. This Code addresses good practice and bad conduct in science, offering a basis for trust and integrity across national borders in the European Union.
- The coordinator will provide a copy of the European Code of Conduct for Research Integrity to the consortium, and monitor and discuss its principles throughout the duration of the project with consortium partners.

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<sup>23</sup> The European Code of Conduct for Research Integrity of ALLEA (All European Academies) and ESF (European Science Foundation) of March 2011. Available at: <http://www.esf.org/activities/mo-fora/research-integrity.html>



# Risks management Plan

## 1 Introduction

Risk Management is a continuous process throughout the lifetime of a project and addresses the planning of risk management, identification, analysis, monitoring and control. This document outlines policies and procedures for identifying and handling uncommon causes of project deviations that may compromise objectives, i.e. risks.

Risk assessment will be updated throughout the project lifecycle as unexpected sources of risk can be identified at any time. It is the objective of the risk management plan to decrease the probability and impact of events adverse to the project. In contrast, any event that could have a positive impact should be exploited.

The REMAIN (Recycled Material for Italian Nanocomposite) project is characterized by consortium involving 6 beneficiaries coming from research and technology organizations, academia and industry in 2 European Countries.

Transparency and a good communication between the Project Management Committee (PMC), Scientific and Technical Committee (STC), Work Package Leaders (WPL) and the project members are key to avoid problems and conflicts before they arise. A good communication strategy will favour the cohesion among the participants, while giving a positive image of the project to the outside.

Some of the major perceived risks related to the project work plan are listed in Table 15 (The following table lists the Risk identified in the Annex A, which has been forecast by the Consortium before the beginning of the project), including a classification of their probability and a description of contingency measures envisaged by the consortium.

The goal of this document is to allow the Project Management Committee to accurately and timely try to avoid unwanted risks and, as necessary, take action in mitigating or applying corrective measures to control potential negative effects to the project.

## 2 Risk Management Process

The Project Coordinator working with the project team will ensure that risks are actively identified, analyzed, and managed throughout the life of the project. Risks will be identified as early as possible in the project so as to minimize their impact. As part of risk processing a risk register will be established and will be used as a tool to document to record all possible and realized risks to the project and any subsequent measures or actions required. The risk register will be placed on the teamwork project platform (REMAIN internal platform) and will be continually updated. The discussion of the risk register will be a fixed agenda item for every Scientific and Technical Committee (STC) taking place at least twice a year.

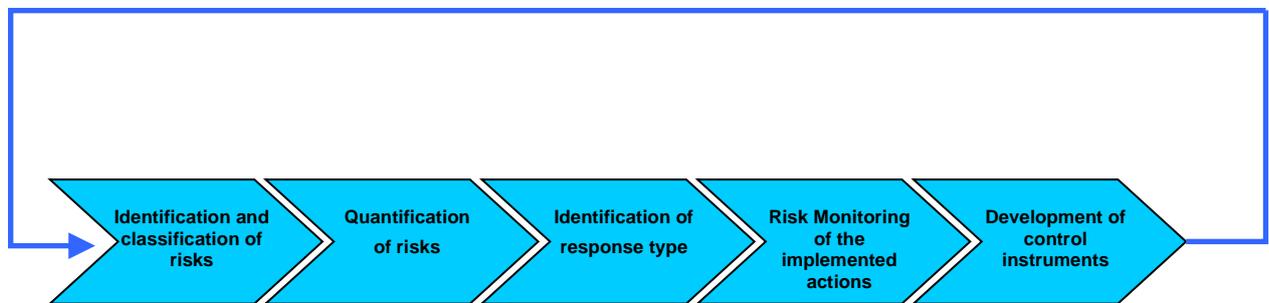


Figure 15: REMAIN Risk Management Process

### 2.1 Responsibility

Responsibility for risk management is carried by many contributors within the project and each contributor must be aware of risk warning signs throughout the project's lifetime.

Risk management is the responsibility of both Scientific and Technical Committee (STC) and the Project Management Committee (PMC), the former concerned mostly with the technical aspects while the latter has to monitor the global risks associated with REMAIN Project.

Representative roles and responsibilities within the project are defined as follows:

- Project Management Committee (PMC)
- Risk Management and Quality (RQM)
- Scientific and Technical Committee (STC)
- Work Package Leaders

### **Project Management Committee (PMC)**

The PMC is the ultimate decision-making body in the consortium, it is responsible for dealing with risks, issues affecting the realization of the project. The PMC supports the the RQM as follows:

- Approving and endorsing the risk register and quality assurance plan
- Supporting development and revision to the quality plan and the risk register; and
- Maintaining a list of risk and response strategies.

### **Risk Management and Quality**

Risk management and Quality is performed of the Project Coordinator, that in REMAIN is also Risk Manager and Quality (RQM), who is responsible for the following tasks:

- Allocating the required resources and time to execute the quality assurance plan within the scope of the project budget and schedule
- Developing, distributing and implementing the quality assurance plan
- Monitoring the project continually to identify any new or changing risks
- Developing and updating a risk register with the support of the Scientific and Technical Committee (STC) and incorporating it into the work plan
- Contributing to risk mitigation and contingency planning
- Coordinating with the risk owners to monitor risks and implement risk response strategies
- Managing quality control procedures on deliverables
- Continually monitoring of the effectiveness of the risk management strategies
- Reporting regularly to the Project Management Committee (PMC); and
- Making the final decision on risk actions, in co-ordination with the WP Leaders.

### **Scientific and Technical Committee (STC)**

STC responsibilities include:

- Developing and/or updating the risk response strategy
- Monitoring the assigned risks and informing the Project Coordinator of any threats or opportunities to the project
- Assessing the probability that a risk will occur and specifying the criteria used to assess the probability; and
- Assessing the impact of risks on project cost, time, scope, and quality objectives, and specifying the criteria used to assess the impact.

## **Work Package Leaders**

Work Package (WP) Leaders are responsible for the following tasks within their work package(s):

- Identifying and describing any risk
- Helping to identify the risk owners and assisting in developing the risk response strategies
- Performing the risk response steps assigned
- Reporting on the progress of the risk response to the Project Coordinator; and
- Assisting the Project Coordinator in activities associated with risk monitoring and control.

## **2.2 Identification and classification of risk**

Risk identification will be analysed throughout the life-cycle of the REMAIN project. Risk identification will be performed within work packages. WP leaders will report the risks and suggestions for the risk priority to the Scientific and Technical Committee (STC), which will agree on the final risk priority as well as on the respective response strategy. WP leaders will report the developed strategy to all WP partners and implement it.

The following issues are considered as tools and techniques for risk identification:

- Analysis of deliverable status
- Analysis of WP schedules and scopes
- Regular communication of the Project Management Committee (PMC) with the Scientific and Technical Committee (STC) and the WP leaders

### **Methods for Risk Identification**

Risk identification is done throughout the life-cycle of the project, with an emphasis on identifying risks as early as possible so effective response planning and subsequent monitoring can take place. The following are tools and techniques for risk identification:

- Analysis of high-level deliverables
- Analysis of WP schedules and scopes
- Analysis of project assumptions
- Project consortium input (interviews, brainstorming, etc.)
- Review performance and status reports

**Methods for Risk Classification**

The risks will be written down in a risk management register by the Project Coordinator. This register will be accessible to all members through the REMAIN project teamwork platform. The risk management register contains the following information:

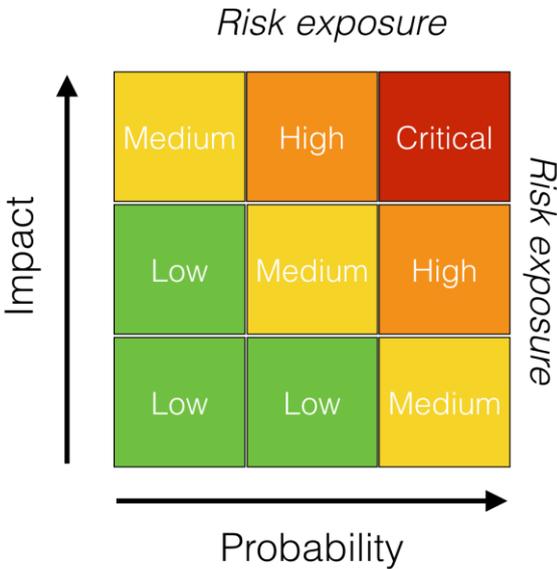
- Risk Number,
- Description,
- concerned WP
- Proposed risk-mitigation measures.

**2.3 Risk Analysis**

After a risk or group of risks has been identified and documented, it is important to assess the probability that the risk will occur and the impact of the risk, if it occurs.

Quality Assurance and Risk Management is an iterative process — following proactive response to a risk, the remaining risk should be reassessed to determine if further response is needed.

The exposure to a given risk is estimated using the risk matrix in Figure 16. Concerning each of the risks, the Project Coordinator, in collaboration with the STC will estimate the probability they could become problems (Low/Medium/High).



**Figure 16: Risk matrix**

**Qualitative Risk Analysis**

The probability and impact of occurrence for each identified risk will be assessed by the project manager, with input from the project team using the following approach:

**Risk Probability Definitions**

Probability Category	Description	Score
High	Risk event expected to occur	7-9
Medium	Risk event may or may not occur	4-6
Low	Risk event less likely than not to occur	1-3

**Figure 17: Risk Probability Definitions**

**Risk Impact Definitions**

The following chart shows risk impact definitions across each of the potentially impacted project areas (cost, schedule and performance). During risk analysis the potential impact of each risk is analyzed, and an appropriate impact level is assigned by selected a score from one 1 to 6 while entering the risk into the REMAIN Risk Register. The area(s) of impact is then selected and added to the risk entry.

Risk Impact	Low Score: 1-3	Medium Score: 4-5	High Score:5-6
Cost	< 10% cost impact	10-20% cost impact	> 40% cost impact
Schedule	< 5% schedule impact	5-10% schedule impact	> 20% schedule impact
Performance	Minor areas impacted	Major areas impacted	Impact unacceptable to EC

**Figure 18: Risk Impact Definitions**

**Risk Scoring and Thresholds**

In order to ensure that the impact and likelihood of individual risks occurring can be tracked and identified quickly and efficiently, all risks entered into the REMAIN Risk Register are scored in terms of probability and impact. The scores entered for each of these two factors (from 1 to 9 in order of severity) are then automatically combined to generate an overall risk score. This risk score then serves as clear indicator of which risks require immediate action. The risk score matrix provides vital threshold score ranges which allow the consortium to identify and prioritise risks.

Risk Level	Score Range	Action required
Low	1-20	No immediate action required
Medium	21-40	Action may be required soon and Work Package Leader responsible should be prepared
High	41-60	Action required immediately and Work Package Leader responsible should inform Project Manager of mitigation action taken
Extreme	61-81	Risk may jeopardise project: urgent and immediate action must be taken

**Figure 19: Risk Scoring and Thresholds**

### Quantitative Risk Analysis

Analysis of risk events that have been prioritized using the qualitative risk analysis process and their affect on project activities will be estimated, a numerical rating is applied to each risk based on quantitative analysis, and then documented in this section of the risk management plan.

## 2.4 Risk Response Planning

During risk response planning, strategies and plans are developed to minimise the effects of the risk to a point where it can be controlled and managed. During response planning, higher priority risks should receive more attention than lower priority risks. Every risk that poses a threat should be assigned to a responsible party (owner) during response planning.

The results of response planning will be documented and entered into a risk register with the following details:

- Proposed action/risk management strategy to be implemented
- Individual/group responsible for implementing the response planning
- Date of implementation

### Risk Management Strategies

There are several methods of risk response. In all cases (except for “Accept”) following implementation of the strategy the risk should be reassessed to determine if any threat to REMAIN remains.

- **Avoid** – Risk avoidance involves changing aspects of the overall project plan to eliminate the threat, isolating project objectives from the risk’s impact, or relaxing the objectives that are threatened (e.g. extending the schedule or reducing the scope). Risks that are identified early in

the project can be avoided by clarifying requirements, obtaining more information, improving communications, or obtaining expertise.

- **Transfer** – Risk transference involves shifting the negative impact of a threat to a third party. Risk transference does not eliminate a threat; it simply makes another party responsible for managing it.
- **Mitigation** – Risk mitigation involves reducing the probability and/or the impact of a risk to an acceptable level. Taking early and proactive action against a risk is often more effective than attempting to repair the damage a realised risk has caused. Contingency planning is an example of risk mitigation.
- **Accept** – Acceptance is often taken as a risk strategy since it is very difficult to plan responses for every identified risk. Risk acceptance should normally only be utilised for low-priority risks. Risk acceptance can be passive, where no action is taken at all, or active. The most common active approach to risk acceptance is to develop a cost and/or schedule revision to accommodate known (or unknown) threats. Utilising a risk acceptance approach determines that the risk should be monitored rather than reassessed.

## **2.5 Risk Monitoring, Controlling, And Reporting**

The Quality Assurance and Risk Management process will occur in conjunction with the Scientific and Technical Committee meetings/conference calls. Following this interval, reporting will flow from the Scientific and Technical Committee to the Project Management Committee.

Each Work Package Leader is responsible for the Risk Management and Quality Assurance within their Work Package. Each project partner is highly encouraged to communicate and discuss any (possible) risks and response planning with their Work Package Leader.

It is vital that open communication continues and all project partners are encouraged to be attentive to and report on quality and risk issues throughout the project's lifetime.

The results of monitoring and control will be documented and entered into a risk register with the following details:

- Date of risk reassessment;
- Evaluation of the action taken;
- Further action required;
- Date of resolution of risk.

### REMAIN Risk Register: Probability and Impact Matrix and associated contingency plans

REMAIN risks are registered within the Risk Register which is accessible to all partners. The consortium has been instructed that the Risk Register is a living document which should be updated continuously throughout the project lifetime.

REMAIN risks are registered within the Risk Register presented below, which will be available in the REMAIN internal platform and updated at least at the end of each reporting period by all partners.

The table contains three different sections: (i) Foreseen risks i.e., those risks, which have been identified at the proposal stage; (ii) Unforeseen risks, which have been identified since the beginning of the project; (iii) Risk mitigating measures that have been taken during the project.

#### Foreseen risks

The REMAIN consortium has already identified a number of risks that could affect the Project during any its development stages and that could lead to problematic situations. Therefore, significant risks categories are presented below.

Risk ID	Description of risk: technical	Level of likelihood	WP(s) involved	Proposed risk-mitigation measures
R1	Technical impossibility to develop a robust process for RNF sizing: the need to change the sizing process parameters depending on the RNF supplier will occur.	Low	2	This aspect will not involve the need to review the project activities. The partners should only pay attention to the traceability of the RNF (the origin of the RNF have always to be known).
R2	Lack of compliance of RNF reinforced composites properties with the requirements of the automotive components chosen in the WPO.	Low	2,3	This lack of compliance could occur in particular for the lower performance polymeric material (e.g. recycled PP). A review of the chosen components can be done in order to match the specific mechanical properties of the developed materials.
R3	Scarce mechanical properties of the prototypes manufactured by injection moulding, in particular with the lower performing material (recycled PP based compound)	Medium	3	For the exploitation activities purpose the prototypes made with the materials that show a sufficient level of mechanical strength will be used (e.g. PA6 based compounds).

R4	Very low mechanical and physical properties of the recycled materials, which make these recycled materials not competitive with similar commercial recycled thermoplastic compounds.	Low	4	The properties of the recycled material can be increased and adjusted envisaging the addition of a percentage of virgin polymeric material.
	<b>Description of risk: management and exploitation</b>	<b>Level of likelihood</b>	<b>Work package(s) involved</b>	<b>Proposed risk-mitigation measures</b>
R5	Partner leaves Consortium	High	1	Redistribution of the tasks among the other partners
R6	Key staff illness / leave during critical phases	Medium	3	All partners have experienced staff that may replace and take over the work assigned to the leaving member, either temporarily or permanently.
R7	Disputes over ownership of IPR amongst consortium partners	Medium	5	Standard IPR and access rights clauses will be included in the CA, which will be signed before work starts in order to avoid future disputes.
R8	Lack of interest on the REMAIN project by external stakeholders	Medium	5	The partners will manage a continuous operation on communication channels in order to keep in touch

**Table 15: Foreseen risks**

## Unforeseen risks

The following table lists new risks arisen after the project start.

Risk ID	Description of risk	Level of likelihood	WP (s) involved	Proposed risk-mitigation measures
R9	Unexpected leave of the Project Coordinator	Low	All the WPs	Mitigation will be ensure as follows: the PMC will be supplemented from ENEA forces taken from within partner 1.

Table 16: Unforeseen risks

## State of the Play for Risk Mitigation

Risk ID	Period	Did you apply risk mitigation measures?	Did your risk materialise?	Comments
R9	2	[YES]	[YES]	This did actually happen as the Project Coordinator was away from work for 2 months, due to sickness leave. Should this happen again, mitigation will be ensure as follows: the PMC will be supplemented from ENEA forces taken from within partner 1.
Rx	1	[YES]	[YES]	[Insert comment if needed; <b>mandatory</b> if the risk mitigation have <b>NOT</b> been applied.]

Table 17: Risk Mitigation



# Monitoring and Evaluation plan

## 1 Introduction

Main target of REMAIN Project is the scaling up of sizing for Recycled Nano Fiber (RNFs), in order to allow adequate fibres slipping and wettability during impregnation step with a polymeric matrix, and therefore increasing the interfacial shear strength between fibres and matrix. In this way, s coming from wasted composite materials, could be used in place of virgin nano fibres (VNFs), with up to 75% of cost saving, or in place of glass fibres (GFs), reducing the weight of vehicles and, therefore, the CO<sub>2</sub> emissions per km.

To support the achievement of the aforementioned goals and other key objectives, REMAIN will develop a **Monitoring and Evaluation (M&E)** plan, that is a document that helps to track and assess the results of the interventions throughout the life of a program. M&E for REMAIN is primarily about ensuring that the program delivers quality activities through appropriate selection of activities.

It is important to develop an M&E plan before beginning any monitoring activities so that there is a clear plan for what questions about the program need to be answered. It will help program staff decide how they are going to collect data to track indicators, how monitoring data will be analysed, and how the results of data collection will be disseminated both to the donor and internally among staff members for program improvement. A M&E plan will help make sure data is being used efficiently to make programs as effective as possible and to be able to report on results at the end of the program.

Given these premises, the present document illustrates the plan for the M&E of REMAIN Project, throughout the following basic key activities:

- a properly individuation and interpretation of the impacts that the Project will entail, together with their effects. This will be done through accurate key indicators;
- monitoring of the activities in order to properly assess the adopted process.

Next chapters will be devoted to establish an Evaluation Framework, to illustrate how the Project activities and the process evaluation will be monitored and, at last, what are the expected impacts of REMAIN.

## 2 Evaluation Framework

Evaluation of a Project helps understanding how and to what extent a Project is successful and, in addition, how the policy can affect project actions and similar actions in future activities. This is why Evaluation needs to be planned and managed accurately.

An evaluation plan needs to provide a description of who will do what, when and how? For instance, who will:

- Communicate the evaluation plan;
- Carry out literature reviews/collect background information;
- Develop tools, instruments, and consent procedures;
- Collect, enter and analyse data;
- Write-up and disseminate results.

In addition, an evaluation plan needs to provide information about the timeline of the evaluation. In setting up the timeline for evaluation, consider:

- When the evaluation needs to begin;
- An evaluation framework - useful in providing an overview of tasks that need to be completed in order to obtain the information needed for the evaluation;
- Due dates for feedback and reports;
- When the evaluation needs to end.

Due to these considerations, there is no doubt that without a proper evaluation plan the impact of project work would be lower than that it would be otherwise.

### 2.1 Evaluation Typologies

In REMAIN Project, three different kind of evaluation will be performed:

i. Monitoring of project activities and process evaluation

Understanding **how** and **why** the main results have (or not) been attained in a Project, represents the Process evaluation. In REMAIN Project a Process evaluation will be performed, in order to help current stakeholders, together with future parts interested in similar areas to REMAIN, to understand the rationale behind the achievement of the project results. In particular, the activities and the outputs of the REMAIN Project will be continuously monitored, with the aim to be aware of the state of the project and observe any changes, if they occur.

ii. Impact evaluation

Impact evaluation refers to observing **if** and **to what extent** certain results have been attained. This can be carried out through the identification of appropriate performance indicators which permit a measure of the results obtained.

The proper analysis of impact requires a counterfactual of what those outcomes would have been in the absence of the intervention. At the same time, this evaluation allows a direct comparison of the project results with the foreseen ones prior to project start.

iii. Policy evaluation

Policy evaluation applies evaluation principles and methods to examine the content, implementation or impact of a policy. Policy is a law, regulation, procedure, administrative action, incentive or voluntary practice of governments and other institutions.

In REMAIN Project, a Policy evaluation will be performed, with the aim of understanding the evaluation of the effects of the European and national policies on project results, together with their evaluation in terms of necessity, efficiency, validity, etc. to improve the planning and implementation process.

## **2.2 Activities to evaluate within REMAIN**

The targeted REMAIN outputs are the scaling up of a sizing treatment already developed on lab scale by partners involved in the Project (RICREA, ENEA, University of Sud Italy), together with thermoplastic compound manufacturing, thus leading to high performance eco-innovative composite materials.

Then, in terms of technical focus, the following activities have been identified:

1. Sizing treatment on s in order to increase the **interfacial bond strength** between nanofibres and matrix in s reinforced composites;
2. Manufacturing of **s reinforced thermoplastic compounds** having a **reduced cost** with respect to those **reinforced with virgin nanofibres**;
3. Manufacturing of **s reinforced thermoplastic compounds** having an **increased strength/weight ratio** with respect to those **reinforced with glass fibres (GFs)** or metal counterparts;
4. Some preliminary analysis performed within the Technical Feasibility study of this Project revealed that polymers reinforced with 12% in weight of RNFs for a potential candidat
5. e for the final application shows similar mechanical properties of polymers reinforced with 30% in weight of GFs, which represent the current solution for the same component. The proposed solution is characterized by a higher price but a lower weigh with respect to the current one. A further activity is the manufacturing of RNFs **reinforced thermoplastic**

**compounds** having a **cost increase in the range 5 – 6 € per kg of lightening of the vehicle.**

For car makers this value is in the range of acceptability of price increase.

### 3 Monitoring of project activities and process evaluation

Identified project activities can be monitored by means of tailored specific objectives and main outputs (see Table 18). The state of objectives and outputs will be reported and shared with ERA throughout the lifetime of the Project and reported on Final Report (D1.4).

WP	Objective	REMAIN Outputs	Monitoring of results in the period (M1– M30)
2	Sizing process robustness	Repeatable process of sizing for nanofibres coming from different suppliers.	Assess the improvement of processability (nanofibre dispersion / homogeneity) and the fibres-matrix adhesion (hence mechanical properties).
	surface treatments for recycled PP an PA6	Optimized sizing procedure and parameters for destined to recycled PP and PA6	Checking of mechanical properties (tensile and/or shear test) of manufactured compounds made with /recycled PP or /recycled PA6.
	Upscaling of surface treatment	Preliminary design of industrial equipment for handling, moving and sizing application for chopped s. Design of a pilot plant for surface modification by proper sizing treatment.	Physical, geometrical and energy requirements: what are physical and geometrical parameters? What are the energy required for treatment in industrial scale?
3	Compounding process with both virgin and recycled PP and PA6	Optimized compounding process of treated on pilot scale.	What are the matrix degradation, the fibre dispersion, the homogeneity, the nanofibres length in final compound? Mechanical characterization (tensile test, impact test), density and thermal conductivity of composite materials obtained by injection moulding.
	Demonstration of product chain closure	Prototypes of different automotive components in news compounds	Designs of automotive components in reinforced composite. Optimized parameters for the injection moulding process.
4	Development of a recycling process for end-of-life (EoL) components produced in REMAIN	Production procedure of recycled compounds by extrusion of milled and sieved end-of-life (EoL) components.	Quality check of milling and sieving step. Comparison of mechanical performance with respect to compound manufactured in WP2.

**Table 18: REMAIN Monitoring**

The activities of the project could be impeded by problems or could be particularly effective that other parties might involve them in similar future activities. Therefore, beside the monitoring step, a proper process evaluation of REMAIN should take place, in order to highlight what works particularly well and what was wrong within the lifetime of the project.

ENEA will coordinate the monitoring and evaluation plan, in collaboration with all involved partners which must reply to any necessary requirement.

The output listed in Table 18: will be examined, and eventually tailored, throughout the lifetime of the project, and in particular when meetings and/or workshop occur.

## 4 Expected Impacts of REMAIN

The main expected impacts of REMAIN can be summarized in three points:

1. Creation of a new effective value chain for RNFs, directly involving the partners of REMAIN and opening new possibilities for all the Companies;
2. Increasing the use of nanofibres by re-introducing RNFs in automotive market for non-critical applications;
3. lightening of vehicles, resulting in decreasing of CO<sub>2</sub> emissions associated with a reduction of fuel consumption.

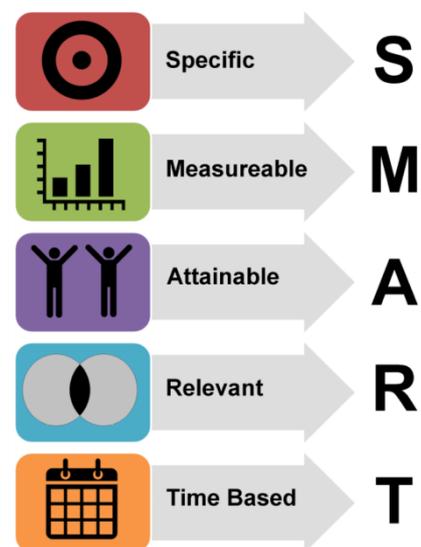
The first two points will be investigated within the project impact evaluation, whilst the third can be assessed in the project policy evaluation, because it includes issues related to ecological and environmental aspects, government policies, EU target for emissions in the next years.

### 4.1 Impact evaluation and performance indicators

The progress of the impact evaluation can be monitored by means of carefully chosen key performance indicators (KPIs). Their purpose is to support effectiveness throughout the full spectrum of results-based management. In addition, KPIs may be used at any point along the results chain of inputs, activities, outputs, outcomes and impacts.

They may relate to the actual achievement of the result (*target*), to the current situation the partners are trying to change (*baseline*) or to the progress of process (*annual targets*, *intermediary benchmarks*).

Only with measurable performance indicators will be possible to evaluate and quantify the impacts of a project. Together with the possibility of been measurable, the performance indicators must be chosen keeping in mind other features. Commonly the *S.M.A.R.T. criteria* is employed in choosing KPIs, that is to say that they must meet the following requirements.



<b>Specific</b>	Impact should be clear and specific, otherwise you will not be able to focus your efforts or feel truly motivated to achieve it. Therefore, specific KPIs mean being able to ask questions like <i>“What has to be done?”</i> and <i>“What outcomes will there be?”</i>
<b>Measurable</b>	The KPIs must have the capacity to be counted, observed, analysed, tested, or challenged. If one cannot measure an indicator, then progress cannot be determined. How will one know if the outcome has been achieved? Once an indicator is clear and specific, they can be measured in numerous ways; almost any indicator is in one way or another, measurable.
<b>Attainable</b>	Your goal also needs to be realistic and attainable to be successful. In other words, it should stretch your abilities but still remain possible. It will be possible to answer questions such <i>“How can I accomplish this goal?”</i> or <i>“How realistic is the goal, based on other constraints, such as financial factors?”</i> . When you set an achievable goal, you may be able to identify previously.
<b>Relevant</b>	An indicator is relevant to the extent that it captures or measures a facet of the outcome that it is intended to measure. There is no reason to create an indicator which does not relate to the larger outcome. The indicator should be meaningful and important to the outcome to certify that the results are actually showing a related impact.
<b>Time Based</b>	Every goal needs a target date, so that we have a deadline to focus on and something to work toward. This part of the SMART goal criteria helps to prevent everyday tasks from taking priority over your longer-term goals. A time-bound goal will usually answer questions such <i>“When?”</i> , <i>“What can I do six months from now?”</i> , etc...

**Table 19: S.M.A.R.T. criteria**

The European Research Agency, (ERA) uses KPIs to assess the performances of each IC, encloses New Material IC. These KPIs are called **ERA Core KPIs**.

In addition, New Material IC defined a further set of KPIs to better encapsulate their societal challenge. The further set of KPIs are known as the **New Material-IC KPIs**, or in shorthand **IC KPIs**.

In Table 20 and Table 21, both the sets of ERA Core KPIs and IC KPIs are highlighted for years 2017 and 2018.

Year	ERA Core KPI Code	Target Value	Target Value N+1	Target Value N+2	Remarks	Plan	KPI	Definition
2017	–	–	–	–	–	–	–	–
2018	ERAN03	0	0	1	N°1: Innovative process for surface modification by proper sizing treatment – with improved properties.	–	# products (good or services) or processes launched to market	Number of innovations introduced to the market during the KAVA duration or within three years after completion thereof. By innovations we mean new or significantly improved products (good or services) and processes sold. Innovations should be reported in the year when they were introduced on the market (but not later three years after completion of the KAVA).
2019	ERAN07	1	0	0	Creation of a new effective value chain for , directly involving the partners of REMAIN project and opening new possibilities for all the companies		# success stories submitted to and accepted by ERA	Good practises or success stories presented by ICs to the ERA according to a specific format and accepted by the ERA including eligible nominees for the ERA awards.
	ERAN03	4	0	0	N°4: - reinforced PP compounds – reinforced PA6 compounds – reinforced recycled PP compounds – reinforced recycled PA6 compounds.	–	# products (good or services) or processes launched to market	Number of innovations introduced to the market during the KAVA duration or within three years after completion thereof. By innovations we mean new or significantly improved products (good or services) and processes sold. Innovations should be reported in the year when they were introduced on the market (but not later three years after completion of the KAVA).
2020	ERAN03	6	0	0	- At least N°2 Recycled materials reinforced by coming from the EoL vehicles. - At least N°4 automotive components manufactured with ecoinnovative high performances materials.	–	# products (good or services) or processes launched to market	Number of innovations introduced to the market during the KAVA duration or within three years after completion thereof. By innovations we mean new or significantly improved products (good or services) and processes sold. Innovations should be reported in the year when they were introduced on the market (but not later three years after completion of the KAVA).

**Table 20: ERA Core KPIs**

Year	IC KPI Code	Target Value N	Target Value N+1	Target Value N+2	Remarks	KPI Definition
2017	KPI02.01	3	1	0	N°3 : SZIE, AEC and ENEA N°1 : CRMA in 2018 will become ERA NMpartner	Number of IC partners taking part in up-scaling projects
	KPI06.03	1	1	1	N°1: At least one student per year will be involved in the project through thesis by UNISUD	Number of professionals educated
2018	KPI02.01	1	0	0	N°1 : CRMA	Number of IC partners taking part in up-scaling projects
	KPI02.04	3	0	0	N°2 Companies producing by pyrolysis (KARBOREK, ELG) which will provide the for the REMAIN project activities and will receive benefits from the project outcomes. N°1 equipment producer which will provide a quotation of the industrial line for the surface treatment.	Number of SME participating in projects.
	KPI06.03	1	1	0	N°1: At least one student per year will be involved in the project through thesis by UNISUD	Number of professionals educated
	KPI07.01	1	0	0	N°1 Equipment manufacturer which will have the availability of a preliminary project for the surface treatment equipment, ensuring cost saving during the time-to-market of very innovative and promising equipment (e.g. COMEC, MAE).	Number of entrepreneurs assisted
	KPI03.01	1	8	0	N°1 pilot plant for surface modification by proper sizing treatment. N°4 pre-series of compounds made with: PP, PA6, recycled PP and recycled PA6 (2019). N°4 prototypes of one component made by injection moulding with the 4 different materials studied in the project (2019).	Number of new demonstration and pilot plants/prototypes that result from IC projects.
	KPI06.01	3	0	0	N°3 UNISUD committed to propose a Ph.D topic related to the project activities. UNISUD provides a master degree in Materials Engineering and nanotechnology.	Number of Ph.D graduates generated
2019	KPI03.01	8	0	0	N°4 pre-series of reinforced compounds made with: PP, PA6, recycled PP and recycled PA6 N°4 prototypes of one component made by injection moulding with the 4 different materials studied in the project.	Number of new demonstration and pilot plants/prototypes that result from IC projects.
	KPI06.03	1	0	0	N°1: At least one student per year will be involved in the project through thesis by UNISUD	Number of professionals educated
2020	–	–	–	–	–	–

**Table 21: IC KPIs**

In addition, and based on the previous features, the following KPIs have been chosen to quantify the above listed expected impacts of the project and, therefore, to assess whether the activities carried out are in line with the planned objectives of the project.

Impact	Key performance indicators	Required inputs
Creation of a new effective value chain for RNFs, directly involving the partners of REMAIN and opening new possibilities for all the Companies.	V <sub>1</sub> : Volume of RNFs reinforced compounds sold by REMAIN partners.	<ul style="list-style-type: none"> <li>▪ Number of types of new compounds;</li> <li>▪ Volume of manufactured new compounds per type [tons].</li> </ul>
Increasing the use of nano fibres by re-introducing RNFs in automotive market for non-critical applications	V <sub>2</sub> : Volume of automotive components manufactured with REMAIN eco-innovative high performances materials.	<ul style="list-style-type: none"> <li>▪ Number of manufactured cars employing RP components;</li> <li>▪ Number of RP components per car.</li> </ul>

**Table 22: Impact and KPIs**

The choice of KPIs has been made on the basis of the following considerations.

**Volume of s reinforced compounds sold by REMAIN partners**

The demand of virgin NFs usually surpasses the supply-capacity and in order to overpass this distance RNFs could be re-introduced in the market for non-critical applications. It is clear that turning NFRP waste into a valuable resource and closing the loop in the NFRP life is vital for the continued use of the material in some applications Therefore, the creation of a new effective value chain for RNFs could represent a valuable way that they could get a new life.

If the proposed value chain for RNFs does work well, selling of RNFs reinforced compounds will be expected, not only in automotive market. Accordingly to this, the volume of RNFs reinforced compounds sold by REMAIN partners can represent a tailored KPI, and it can be calculated as follows:

$$V_1 = N \text{ of types of new compounds} \times \text{volume of manufactured new compounds per type}$$

where it is:

V<sub>1</sub>= volume of s reinforced compounds sold by REMAIN partners [tons].

## **Volume of automotive components manufactured with REMAIN eco-innovative high performances materials**

Recent European legislation is enforcing a strict control of composite disposal. The responsibility of disposing EoL composites is now on the component's manufacturer, legal landfilling of NFRP is limited, and for instance it is required that automotive vehicles disposed after 2015 are 85% recyclable (EU 1999/31/EC; EU 2000/53/EC). In addition, disposing of NFRP by landfilling, where not illegal, can cost approximately 0.20 £/kg; recycling instead would convert an expensive waste disposal into a profitable reusable material.

In this framework increasing the use of nano fibres in automotive market for non-critical applications by re-introducing s from EoL components, could represent a compelling and efficient proposal to face with the aforementioned issues. The volume of automotive components manufactured with eco-innovative high performances materials is a yardstick to measure this impact and data required for this estimation are the number of manufactured cars employing RP components and the number of RP components per car:

$$V_2 = N \text{ of cars employing } RNFRP \times N \text{ of } RNFRP \text{ components per car}$$

where it is:

$V_2$  = volume of automotive components manufactured with RNFRP

In particular, partners involved in the Project are asked to provide the required input above specified.

### **4.2 Baseline and Targets**

Key performance indicators help REMAIN partners and team researcher to monitor the evolution of the project, by comparing their values at the start of the work (baseline) with the ones achieved throughout the lifetime of the project (targets). In this way, at the end of the project the achieved results will be compared with those targeted and they will be reported in Final Report D1.4.

Of course, at the beginning of the Project (2017), neither components nor any type of compounds realized with REMAIN eco-innovative material are present, then baseline values for both  $V_1$  and  $V_2$  are zero.

Target values for both the KPIs in the years from 2023 to 2030 are obtained on the basis of preliminary Business Plan<sup>24</sup> in which some hypothesis on market penetration of a potential candidate for final applications are reported. In task 0.2 of REMAIN project (Economic viability and market assessment)

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<sup>24</sup> see D 0.1 REMAIN – Feasibility Study

$V_2$  is calculated has been calculated (more detail are reported in D0.1 – Feasibility Study), whilst conservative values for  $V_2$  have been estimated, considering as compound only that employed in the same market area (FCA vehicles). Of course, higher values for  $V_2$  are expected if other market segments will be interested to RNFs based polymers.

In Table 23, baseline and target for the KPIs above listed are reported.

KPI	Baseline	Target							
	2017	2023	2024	2025	2026	2027	2028	2029	2030
$V_1$ (tons)	0	579	579	1158	1158	4632	4632	6948	9264
$V_2$ ( $\times 10^3$ )	0	150	150	300	300	1200	1200	1800	2400

**Table 23: Baseline and Target values for the KPIs**

## 5 Policy evaluation

The political and economic framework in which the project is carried out, the nature of legislation, standards and directives present in the EU, can significantly influence the success of REMAIN. A proper policy evaluation is, therefore, the way by means both enabling factors and barriers to the introduction of RNFRP can be carefully addressed.

The aim of this paragraph is to assess the policy framework concerning the management of the EoL composite materials reinforced with nano fibres, and the use of Recycled Nano Fiber, with their implications in terms of environmental impact.

EU waste legislation impacts only the collection of the composite waste but not the commercialization of RNF as they are secondary new materials.

Increasing pressure onto European automotive industry to meet several requirements in a pre-fixed medium term period (2018-2020) is in place: higher fuel efficiency, environmental targets imposed by normative dispositions and international agreements. All these faces of the same medal contribute to firmly stick European car-maker Companies to reach European standards.

As an effect of this, a massive employment of composite compounds reinforced with NFs in the industrial sector of transport media has already been accomplished, particularly for environmental aspects which call for a further cut by 2020 of CO<sub>2</sub> emissions to 20% below the 1990 levels [EU-28].

Although the possibility of reintroduction of RNFs from EoL components is encountering some problems or barriers which must be faced, it cannot be neglected that their use is strongly supported by several EU directives and legislation which encourage solutions for increase sustainability and circular economy approaches. It is therefore very useful to highlight what are the policy targets of REMAIN that will face the political and economic barriers and are in compliance with EU legislation (Table 24).

Problem/Barriers	Related EU legislation	REMAIN policy targets
<p>The global NF demand is expected to grow at an annual rate of 10%, reaching 89 kton in 2020. About 30% of the NF manufactured becomes industrial scrap. This involves the production of 27 kton of wasted NFs in 2020.</p>	<p><b>EU Landfill directive 99/31/EC:</b> increasing onerous legislation regarding the disposal of composite manufacturing and EoL waste (ELG NANO, EU LEX).</p> <p><b>EU ELV legislation 2000/53/EC:</b> Since 1<sup>st</sup> January 2015, 85% of every vehicle must be reused or recycled, and 95% recovered (EUR LEX). OEMs are therefore forced to modify their production chains, making it easier to recycle their mechanical components.</p>	<p>Make available cheap and high performance secondary new material destined to automotive market, enabling a substantial reduction of landfill waste.</p> <p>In addition, REMAIN aims to produce NFRPs that are recyclable at the end of their life. Indeed, the thermoplastic nature of matrix employed for the manufacturing of new components make them recyclable by mechanical processes, without the need to separate the RNF from the matrix.</p>
<p>At today, GFRPs are the material of choice for approximately 95% of all composites, but the European GRP market is not growing as rapidly as the composite industry in other regions of the world (i.e USA, Japan and China). In the global market Europe is destined to decline. Some stringent necessity are prevailing on the GRP market<sup>25</sup>.</p> <p>It is therefore necessary to replace GFRPs with material which can assure both low environmental impact, with less CO<sub>2</sub> and greenhouse gas emission released in the atmosphere, and reducing at the same time the necessity of primary sources,</p>	<p><b>Regulation 510/2011</b> foresees a limit fleet average CO<sub>2</sub> emission from new light commercial vehicles to 175 g/Kg for the period 2014-2017 and 147 g/kg up to 2020. More specifically the EU CO<sub>2</sub> regulation imposes the limits of 130 g CO<sub>2</sub>/km (y-2015), 95 g CO<sub>2</sub>/km (y-2020) and 20 g CO<sub>2</sub>/km (y-2050).</p> <p>For gaseous air pollutants, the most recent Euro 6 standard normative referred to light vehicles (&lt; 1305 Kg) foresees the 0.5 g/Kg for CO, 0.08 g/Kg for NO<sub>x</sub>, 0.17 g/Kg for NO<sub>x</sub>+HC in diesel, and for petrol vehicles 1.0, 0.060 and 0 g/Kg, respectively (<b>Regulation 715/2007/EC</b>).</p> <p><b>EU regulation by 2021:</b> fleet average of all new cars 95 g CO<sub>2</sub>/km. Penalties for those falling short on those targets could be significant: € 95/g of exceedance onwards (<a href="#">EU Climate Action</a>).</p>	<p>Target of REMAIN is a wider use of RNFs in automotive components, which allow a clear advantage in terms of automotive lightening, also with respect to GFs. The lightening of car will clearly contribute to reduce fuel consumption and, therefore, CO<sub>2</sub> emissions. It has been estimated that every 10% of weight saving will bring to 3 – 5% of fuel economy.</p> <p>In particular, preliminary analysis performed within REMAIN revealed that polymers reinforced with 12% in weight of RNFs for a potential candidate for the final application (<i>front-end system</i>) shows similar mechanical properties of polymers reinforced with 30% in weight of GFs, which represent the current solution for the same component.</p> <p>The proposed solution shows higher price but lower weight with respect to the current one. By comparing weight and cost, the RNFs reinforced thermoplastic compounds proposed have a cost increase in the range 5 – 6 € per kg</p>

<sup>25</sup> June 2017 High - Performance Fibres Market - Segmented by Type, End-User Industry and Geography - Trends and Forecasts (2016 - 2021).

Problem/Barriers	Related EU legislation	REMAIN policy targets
maintaining high quality levels.		<p>of lightening of the vehicle. For car makers this value is in the range of acceptability of price increase.</p> <p>In addition and assuming that from 2023 the proposed solution will be adopted on 150,000 vehicles (10% of foreseen FCA cars applying high quality dashboard), the lightening that would result would allow the reduction of CO<sub>2</sub> emissions by a value of 268 tons per year, in Europe.</p>
<p>At today only few SMEs in the world (three in Europe) produce RNFs by pyrolysis, but they meet strong difficulties in market penetration, due to a combination of causes (poor education, disruption of established supply chains, need for credible demonstrations of waste-to-reuse process viability)</p>	<p>Despite strong difficulties in market penetration, the need of production of RNFs by pyrolysis is stringent to comply with the following European directive:</p> <p><b>Directive 2008/98/EC</b> of the European Parliament and of the Council of 19 November 2008. This Directive lays down measures to protect the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste and by reducing overall impacts of resource use and improving the efficiency of such use.</p> <p><b>EU Landfill directive 99/31/EC:</b> the objective of this Directive is to prevent or reduce as far as possible negative effects on the environment, in particular on surface water, groundwater, soil, air, and on human health from the landfilling of different typologies of waste, including composite manufacturing and EoL waste.</p>	<p>Demonstrate that the re-introduction of RNFs by pyrolysis of EoL components, and their use in manufacturing new compounds, is a valid path in waste-to-reuse process. It meets the large demand of lightweight components made with composites (replacing metals), and limits the dependence on imported virgin nano fibres, establishing also the basis of new paths in industrial symbiosis and new products for the circular economy, that can take place at national and EU level. Therefore there is wide potential for benefits to many of the EU countries involved in ERA NewMaterials, and international relationships with other automotive manufacturers in the four corners of the globe, complying the concepts of “closing the materials loops”, “designing solutions”, “securing new materials supply”.</p>

**Table 24: Policy barriers and REMAIN targets**

## 5.1 Successful measures criteria

In order to pinpoint whether the adopted measure can be considered successful, a set of 6 criteria for the policy evaluation has been defined. For each of the 6 criteria, a qualitative and/or quantitative evaluation will be performed during the lifetime of REMAIN and by means of a graduate scale ranging from 1 (worst) to 5 (best). The score will help us to identify whether the measure is worth performing or it is considered to have a lower impact on the project. The list reported in Table 25 is non exhaustive and will be tailored depending from available information in the course of the project lifetime.

Criteria	Description	Score
Environmental impact	Amount of CO <sub>2</sub> emissions reduction when the measure is applied.	1 – very low impact 2 – low impact 3 – medium impact 4 – high impact 5 – very high impact
Increase Sustainability versus cost for implementer	Relation between increment of sustainability (by limiting the dependence on virgin nano fibres) and cost for implementing	1 – very low increase 2 – low increase 3 – medium increase 4 – high increase 5 – very high increase
Cost efficiency for the implementer/necessary administrative support	Relation of energy savings achieved and necessary costs for the implementer/amount of administrative support necessary to implement a measure, i.e. extent of the administrative barrier to implement a measure.	1 – not-cost effective at all 2 – low cost-effective 3 – neutral 4 – high cost-effective 5 – very high cost-effective
Persistency of the savings induced by the measure	How lasting is the impact of the measure in terms of time.	1 – very low persistency 2 – low persistency 3 – medium persistent 4 – persistent 5 – very persistent
Support of positive side-effects	Positive side-effects or co-benefits of a measure are e.g.: <ul style="list-style-type: none"> <li>▪ Higher economic growth, improved competitiveness and productivity;</li> <li>▪ Creation of new jobs, improved work environment;</li> <li>▪ Improvement of energy security, health etc.</li> </ul>	1 – very low support of positive side-effects 2 – low support of positive side-effects 3 – medium support of positive side-effects 4 – high support of positive side-effects 5 – very high support of positive side-effects
Ease of acceptance by relevant stakeholders	Will the measure be easily accepted by the relevant stakeholders or is a strong opposition to be expected (e.g. by industry, consumer associations, market operators, etc.)?	1 – very low degree of acceptance 2 – low degree of acceptance 3 – medium degree of acceptance 4 – high degree of acceptance 5 – very high degree of acceptance

**Table 25: Successful measures criteria**



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## Appendix

### 1 Consortium

Organization	Short name	Country
Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile	ENEA	Italy
Comité de l'énergie atomique	AEC	France
Szi enviroment	SZIE	England
Centro Ricerche per Energie Alternative	RICREA	Italy
Centro Ricerche Meccaniche avanzate	CRMA	Italy
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### 3 Acronyms and abbreviations

<b>Acronym</b>	<b>Full Name</b>
REMAIN	Recycled Material for Italian Nanocomposite
NFRP	Nano fibres reinforced polymer
DEM	Dissemination and Exploitation Manager
ERA	European Research Agency
EoL	End-of-Life
FC	Financial Controller
FS	Financial Statement
GF	Glass fibres
IC	Innovation Community
ERA	ERA NewMaterials GmbH
KPI	Key performance indicator
M&E	Monitoring and Evaluation
PA	Project Agreement
PA6	Polyamide 6
PC	Project Coordinator
PM	Person Month
PMC	Project Management Committee
PO	Project Officer
PP	Polypropylene
RNF	Recycled Nano Fiber
RNFRP	Recycled Nano Fiber reinforced polymer
NM	New Material
RP	Reporting Period
RQM	Risk Manager and Quality
SME	Small and medium-sized enterprise
STC	Scientific and Technical Committee
STM	Scientific and Technical Manager
TO	Thematic Officer
VNF	Virgin nano fibres
WP	Work Packages
WPL	Work Packages Leader

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