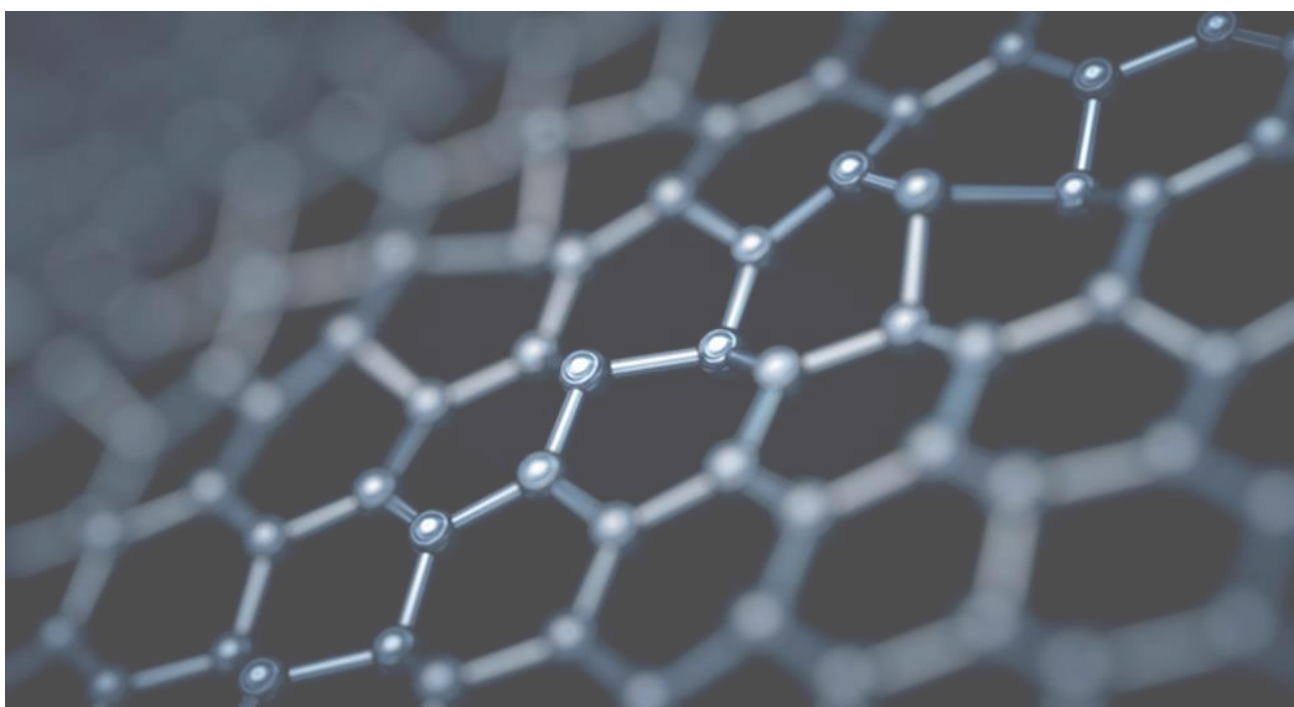


**Improving Recyclability of Thermoset Composite  
Materials through a Greener Recycling Technology  
based on Reversible Biobased Bonding Materials**

Research and Innovation Action (RIA)  
Grant Agreement 101023190

**D7.1 “Project Handbook and Quality Assurance Plan”  
Work Package 7  
Responsible Partner: AITIIP**



## D7.1: Project Handbook and Quality Assurance Plan

<b>Issued by:</b>	F. Javier de Vicente - AITIIP
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### Dissemination Level

<b>PU</b>	Public	<b>X</b>
<b>PP</b>	Restricted to other programme participants (including the EC Services)	
<b>RE</b>	Restricted to a group specified by the consortium (including the EC Services)	
<b>CO</b>	Confidential, only for members of the consortium (including the EC)	

### MAIN AUTHORS

Name	Organisation
F. Javier de Vicente	AITIIP

### QUALITY REVIEWERS

Name	Organisation
Marta Redrado Notivoli	AITIIP

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## Table of Contents

<b>1.</b>	<b>INTRODUCTION</b> .....	<b>4</b>
1.1	Aim of the deliverable.....	4
<b>2.</b>	<b>PROJECT MANAGEMENT</b> .....	<b>5</b>
2.1	Governance bodies .....	5
2.2	Procedures for Decision and Actuation .....	11
2.3	Consortium Contacts.....	12
2.4	Monitoring .....	22
<b>3.</b>	<b>FILE STORAGE AND SHARING</b> .....	<b>28</b>
3.1	Naming and Language.....	28
3.2	Collaborative Space.....	29
<b>4.</b>	<b>QUALITY ASSURANCE AND RISK MANAGEMENT</b> .....	<b>33</b>
4.1	Quality Assurance .....	33
4.2	Risk Management .....	36
<b>5.</b>	<b>CONCLUSIONS</b> .....	<b>41</b>
<b>6.</b>	<b>REFERENCES</b> .....	<b>42</b>

## List of Figures

<i>Figure 1. Key Governance Bodies in VIBES</i> .....	5
<i>Figure 2. Cyclical Quality Assurance</i> .....	22
<i>Figure 3. The VIBES repository. Highest level</i> .....	30
<i>Figure 4. The VIBES repository. Legal and Administrative level</i> .....	31
<i>Figure 5. The VIBES repository. WPs level</i> .....	32
<i>Figure 6. The three steps in Quality Assurance</i> .....	33

## List of Tables

<i>Table 1. Beneficiaries participating in VIBES and GA members</i>	7
<i>Table 2. Initial list of members, Stakeholders Board</i>	10
<i>Table 3. Periodicity of the meetings</i>	12
<i>Table 4. Work Packages</i>	13
<i>Table 5. WP leaders</i>	13
<i>Table 6. Mailing lists and purposes</i>	14
<i>Table 7. Contacts of the General mailing list</i>	14
<i>Table 8. Contacts of the Technical mailing list</i>	17
<i>Table 9. Contacts of the Admin. and Finance mailing list</i>	19
<i>Table 10. Contacts of the Dissemination mailing list</i>	21
<i>Table 11. Calendar for Activity and Periodic Reports (WP7), including other key deliverables</i>	24
<i>Table 12. Relative schedule for Activity and Periodic Reports</i>	25
<i>Table 13. Relative schedule for Technical Deliverables</i>	26
<i>Table 14. Unique code fields</i>	28
<i>Table 15. Types of Metrics</i>	34
<i>Table 16. Criteria for the measurement of (Qualitative) metrics</i>	34
<i>Table 17. An example of the Metrics Progress to be reported</i>	34
<i>Table 18. Recommendations</i>	36
<i>Table 19. Risks</i>	37

## 1. Introduction

The VIBES project presents an innovative solution to resolve different end-of-life issues of thermoset composites. It does that by developing new green processes focused on the controlled separation and recovery of composite material components by means of synthesizing customised biobased bonding materials (BBM).

BBM are biobased chemical moieties that can decompose under specific external conditions and/or stimuli (temperature, UV or electrical pulse), thus allowing the separation between the matrix and the reinforcing material, and facilitating the dissociation of the polymer chains of the resins. This favours their efficient processing and recycling through a green washing bath, recovering the monomers/oligomers and fibres for their upcycling into new products.

VIBES will study and combine three different chemical approaches to obtain BBM: vitrimers, Diels-Alder, and supramolecular architectures.

The VIBES project will directly contribute to SIRA's objectives in KPI1, KPI2, KPI5 and KPI8 and will show it is possible to decrease the amount of non-biodegradable polymers sent to disposal or discharged to the environment by at least 40%.

The VIBES consortium includes 13 partners (industrially driven): 4 RTD (AITIIP, LEITAT, ULIM and DITF), 7 SME (SP, BCIRC, F&D, ARCHA, Q-PLAN, IDEC and JUNO), 1 Large Companies (ACC), and 1 OTHER (PLATA) accounting to 3 BIC associated (AITIIP, LEITAT, and ULIM). The proposed 48-months of work will comprise a total estimated budget of 5,299,800 €; being the 20.3% covered by the consortium's own contribution and complemented by a 524,311€ in additional investments during the project implementation, and 9,385,000€ envisaged to upgrade TRL after the end of the project. Benefits will be significant in terms of the companies' growth (23.2%), new jobs (37 direct, 1800 indirect) and turnover (124M€) by promoting at least 2 new sector interconnections in the new created "Intrinsic Recyclable Thermoset Composites Value Chain"

### 1.1 Aim of the deliverable

The tasks to be performed in VIBES are distributed in a number of work packages, being WP7 the one dealing with the correct management and coordination of the project. The main objective of WP7 is to create an efficient governance structure and procedures that guarantee achieving the objectives of VIBES, deliver high-quality results within the given timeframe, while respecting the initial budget.

D7.1's aim is to clarify the quality framework for VIBES, including the composition of its governance structures, consortium contacts and relative calendars for reporting. D7.1 also includes a chapter on the VIBES intranet and an additional chapter on risk segmentation and management. The organisational structure and decision-taking mechanisms will support the consortium in its day-by-day activities. The information-sharing mechanisms are important as well since they ensure that the partners are aware of the project evolution, can contribute to the project and make the project results easily available.

## 2. Project Management

This section describes the project management elements, structure and procedures that aim at ensuring the successful completion of the project’s objectives. This chapter defines in detail the role of the different partners, establishes the contact details of the key consortium staff, and describes the model for monitoring the project by setting up auto-control mechanisms. The chapter also describes the documentation processes in terms of templates, flow of information, structure of the deliverables, and storage of the information.

### 2.1 Governance bodies

The management structure and procedures proposed for VIBES aim at facilitating cooperation between partners, supporting rapid decision-making mechanisms and maintaining a strict control of the project objectives. The Management Structure of VIBES is based on the DESCA H2020 Model and characterised by three principles:

- Principle of an Integrated Project Structure
- Principle of Leading Edge Management Instruments
- Principle of Binding of Decision Provisions and Agreements upon all Partners

The Grant Agreement and the Consortium Agreement regulate the governance bodies and their procedures. Inside the consortium, the key governance bodies and/or figures are:

- The Coordinator
- The General Assembly
- The Executive Board (EB)
- The Innovation Board (IB)
- The Stakeholders Board (SB)
- WP leaders
- Task leaders

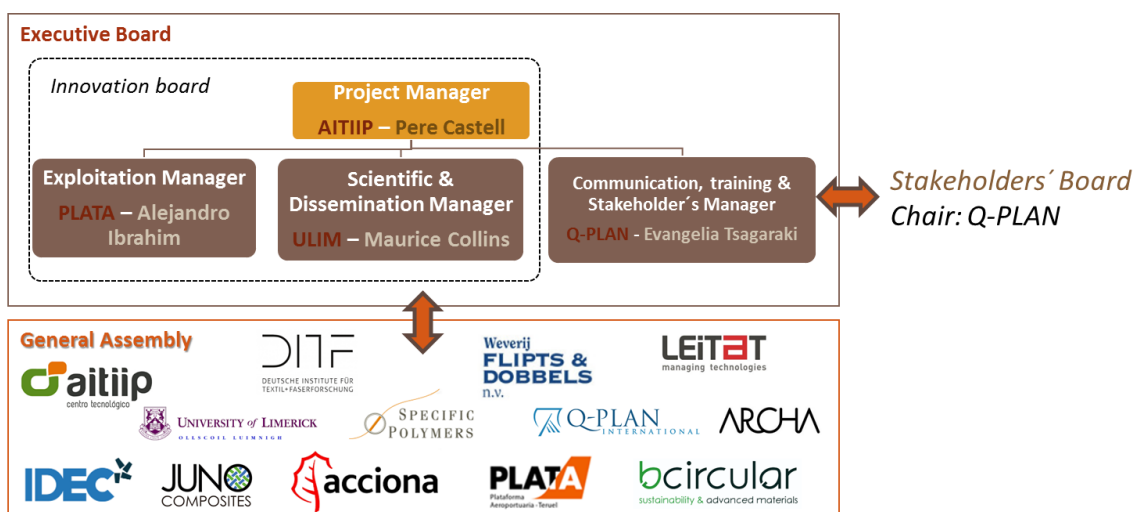


Figure 1. Key Governance Bodies in VIBES



## **The Coordinator**

The Coordinator, AITIIP, is the intermediary between the parties and the EC. The Primary Coordinator Contact is Mr. Pere Castell.

Mr. Pere Castell is the legal responsible person for the technical, financial and administrative management of VIBES, acting as the contact point between the consortium and the financial authorities, especially concerning the submission of deliverables, reports, potential amendments to the Grant Agreement, the up-to-date maintenance at the SyGMa web application with regards to the Grant Agreement Data, and the distribution of the financial contribution from the Community.

Mr. Pere Castell is a senior researcher with more than 20 years of experience in R&D. Pere Castell has participated in more than 30 R&D competitive funded projects and has been the principal investigator and coordinator in several including H2020, FP7 and other EU initiatives. Scientific contributions of Dr. Castell are collected in more than 50 articles (h index=19) published in journals indexed in SCI and more than 60 contributions to international conferences. Pere Castell is member of the Captech Materials group of the EDA and act as expert evaluator in several EU programmes.

Mr. Pere Castell, as Coordinator, is also responsible for facilitating, moderating and ensuring that the consortium fulfils the provisions in the Consortium Agreement, signed by all partners before the signature of the Grant Agreement.

In addition to the former, the Coordinator is responsible for the progress and outcomes of the project. Mr. Pere Castell will monitor VIBES, aided by the EB, for foreseeable risks; and together with the GA will promptly initiate contingency plans to lessen their negative effects. Decision-making in VIBES is done through a bottom-up and top-down communication flow among all the responsible partners, including discussion of internal milestones, risks, deliveries, external positioning, liaison of partners, key alliances, and sustainability of the project's results.

## **General Assembly**

The General Assembly (GA) represents the highest level of decision. It decides on everything that is fundamental for the development of the project. These items can include: changes in the management structure, changes in the composition of the consortium, changes in the work plan, major technical decisions, contingency plans and planning decisions that have an effect in the resources or the time for the implementation of the project, modifications to Attachment 1 in the Consortium Agreement ("Background Included"), entry or withdrawal of a Party, and the declaration of a Party to be a Defaulting Party. The Coordinator and the GA articulate the management of the project at the *strategic* level.

The members of the GA are AITIIP, for which again Mr. Pere Castell is chair, plus all the remaining partners. Every partner has one representative for the General Assembly, appointed at the Kick-Off Meeting.

**Table 1. Beneficiaries participating in VIBES and GA members**

No	Participant name and executive description	Participant Short Name	Type/ Country	GA Member
1	FUNDACIÓN AITIIP- coordinator, D-A, lab green washing & training	AITIIP	RTD/ES	Pere Castell
2	SPECIFIC POLYMERS – biobased vitrimers, BBM and resin production scale up, build-to-spec formulations	SP	SME/FR	Alain Graillot
3	LEITAT TECHNOLOGY CENTER - supramolecular, fibre surface activation and BBM pre-treatment technologies	LEITAT	RTD/ES	Francisco Julia
4	LIMERICK UNIVERSITY - developing BioCarbonFibres (lignin based) + toxicity analysis	ULIM	RTD/IE	Maurice N. Collins
5	GERMAN INSTITUTES OF TEXTILE AND FIBRE RESEARCH DENKENDORF – upscaling BioCarbonFibres to pilot scale – unwoven fabrics samples	DITF	RTD/DE	Erik Frank
6	FLIPS & DOBBELS – fibre flax woven & unwoven fabrics	FD	SME/BE	Caroline Flipts
7	BCIRCULAR – recycler, effective separation and recovery	BCIRC	SME /ES	Oriol Grau
8	Teruel International Airport- exploitation (dismantling area, waste manager), guidelines for collecting and directing wastes	PLATA	OTHER/ES	Alejandro Perera Ibrahim
9	ACCIONA – eco-design and construction product validator (demonstrate the potential for integrating the technology in the construction sector and replicate in the wind energy sector), EPR considerations, exploitation (construction industry).	ACC	LARGE/ES	Eva Martinez
10	IDEC – eco-design and aeronautical product validator (demonstrate the potential for integrating the technology in the	IDEC	SME/ES	José Luis León

	aeronautical sector), EPR considerations, exploitation (aeronautical industry).			
11	JUNOCOMPOSITES - eco-design and naval product validator (demonstrate the potential for integrating the technology in the naval sector), EPR considerations, exploitation (naval industry).	JUNO	SME/IE	Saul Buchanan
12	LABORATORI ARCHA SRL – LCA, S-LCA, LCC; Health & Safety, alignment to EU 2050 strategy	ARCHA	SME/IT	Francesca Braca
13	Q-PLAN – dissemination, communication and business plan support (chair the stakeholder’s board)	Q-PLAN	SME/HE	Eirini Efthymiadou

### Executive Board

The Executive Board (EB) is the supervisory body for the execution of the project which shall report to and be accountable to the General Assembly. The Executive Board (EB) supports the Coordinator and articulates the management of the project at the *operational* level. The composition for this board has been suitably agreed by all partners. The Executive Board (EB) is to meet – at least – quarterly, and comprises the following management figures:

- The **Project Manager (PM)**: (Mr. Pere Castell) as the contact point with the EC as well as to manage the networking with other European/national related initiatives and projects. The project Manager will count with the support of the European Projects Office at AITIIP, a management team created in 2010 to deal with the intrinsic issues associated to international research and innovation projects. The office is composed by professionals from legal, economic, social and administrative areas that provide support and management tools to the Project Manager.
- The **Exploitation Manager (EM)**: (Dr. Alejandro Ibrahim) will ensure the exploitation of results by means of effective management of all knowledge and Intellectual Property Right issues. Besides being leader of WP4, he supports the whole consortium in IPR aspects, market assessment and business strategies, and reports to the EB. The EM shall ensure that the project addresses the requirements of the end-users and has the expected impact, consistent with the perspectives of the industrial partners in the consortium. The EM shall be responsible for reporting the progress of the project concerning the exploitation tasks within the IB, EB and the GA, fostering a continuous dialogue among the innovation partners and the main industry forces inside and outside the consortium.
- The **Scientific & Dissemination Manager (SDM)**: (Maurice Collins) will promote the dissemination of results by means of effective data management. He will be in charge of coordinating the scientific and innovation activities among the technical partners. He will monitor the status and progress of all

R&I activities. The SDM shall also be responsible for reporting within the Innovation Board, Executive Board and the GA about the progress of the technical tasks and for identifying potential risks, discussing actions and following them up inside the technical WPs. In addition, he will support the Executive Board in the overall direction of the dissemination of results. The SDM will work in collaboration with the Exploitation Manager as part of the Innovation Board and will make sure that the desired project outcomes are clearly specified and delivered to the right audience.

- The **Communication, training & Stakeholders Manager (CSM)**: (Ms. Evangelia Tsagaraki) will promote the project mission as well as the appropriate methods to communicate them to the public (including training activities). The CSM will identify opportunities in the media and develop content to be spread via communication channels. In addition, she will chair the stakeholder's board.

### **Innovation Board**

The Innovation Board (IB) will promote the effective innovation management inside VIBES. The IB should validate target levels to maximise the exploitability of the scientific results, to promote gender equity and to boost networking. The IB will be only composed by three members to make agile decisions:

- The Project Manager
- The Exploitation Manager
- The Scientific & Dissemination Manager

A particular task (T7.3) is devoted to Innovation Management. Its duties include:

- Coordinate and monitor the research progress and technical quality standards of the project.
- Drive the work of the technical WPs (esp. WP1-WP3) aided by the WP leaders, towards the goals and expectations of VIBES.
- Coordinate the presence of the project in relevant technical forums and assess the readiness of all innovative assets and their alignment with market trends.
- Remain in contact with the Exploitation and Dissemination leaders to provide all the necessary inputs for the exploitability of the former innovative assets.
- Directly report to and discuss with the Project Coordinator, and directly communicate in close contact with the CSM and the EM, through the EB mechanisms.
- Keep track of these processes in an executive periodic report (D7.3, D7.4, and D7.5; in M18, M36 and M48 respectively).

### **Stakeholders Board**

The Stakeholders Board (SB) will collaborate to effectively respond to market and social necessities, being industry-lead, while fostering public and private collaboration. It will span the whole value chain together with partner members and is chaired by the Communication & Stakeholders manager. The Stakeholders board will be formed by a minimum number of 10 representatives from:

**Table 2. Initial list of members, Stakeholders Board**

<b>Member: Entity/Project/Person</b>	<b>Related to</b>	<b>Activity (see WP6)</b>
<b>DGA – Aragonese Government</b>	Policy Maker	WS1+COMPOSIFORUM
<b>Cámara de Comercio de Zaragoza</b>	Industrial engagement in Aragón region	WS1, WS2, technological breakfast
<b>Aragón Exterior</b>	Policy maker: ARAGON CONTRACT PLAN coordinator (promotor on building VC, EPR)	WS1,WS2
<b>EURIF/ VEOLIA</b>	Railway EU association (end-user) + contact with SHIFT-to-RAIL PPP/ Train dismantling and recycler	WS2
<b>CAAR - Automotive Cluster of Aragon</b>	Automotive industry cluster (value chain engagement)	WS1, WS2
<b>ECODES/ LANDBEL</b>	EPR experts & certification expert (ISCC)	WS1
<b>Ms. Clara Arpa</b>	Expert in logistics solutions + SDG ( <i>head of CIS &amp; member of the United Nations Global Compact Board</i> )	WS1, WS2, technological breakfast
<b>Prof. J.A.Miravet</b>	Experts in composites plastic value chain	WS3+COMPOSIFORUM
<b>SAINT GOBAIN</b>	GF wool producer & sustainable insulation composites	WS1, WP2, WP3
<b>MAV- Cluster de Materials Avançats de Catalunya</b>	Advanced Materials. Experts in composites plastic VC	WS3
<b>ARKEMA, HEXEL,INNEOS</b>	Material developer	WS3
<b>HP Composites/LAUAK /AIRBUS/</b>	End-user Producers for: Wind Energy/ Automotive/Aircraft	WS1,WS2, WS3
<b>HELACS Project/ BIZENTE Project/ POLYNSPIRE Project/ LIFE RECISYTE</b>	EoL of Aircraft holistic processes - CLEANSKY PPP/ Enzymatic Biodegradation of Composite/ Dynamic Networks for Termoplastics, external irradiation treatments/ Green Composites Development - LIFE EU Programme	WS2, WS3

### **Additional entities**

Task Leaders (TL) are responsible for the execution and overall coordination of the tasks assigned to them in the Implementation Plan defined in the Grant Agreement. Task Leaders will have a frequent dialogue with the Work Package Leader and report periodically to them, at least once per month.

Work Package Leaders (WPL) combine both suitability for the work to be performed and previous experience in EU collaborative projects. Work Package Leaders are responsible for the overall management and coordination at WP level.

## **2.2 Procedures for Decision and Actuation**

Dwelling on the bottom-up and top-down communication flow in VIBES, let us stress that the GA at the start of the project has ratified a representative (person) of each WP leader (partner). Each WP leader is responsible for the WP and its tasks, including the planning for its deliverables, a sufficient effort/calendar control; and coordination, both internally and with other WPs. The WP leader shall review and proactively ensure the quality of the reports and the correct execution of tasks, and much importantly will monthly report to the EB on the outcomes and deviations of his/her WP. The EB or its relevant members, depending on the issue at stake, will then discuss with the WP leader any mitigation, continuation or fostering action that should be put in motion, and the WP leader is then responsible for articulating such actions inside the WP and following-up their results. This will be a circular approach. Whenever necessary the GA will decide on further measures, but in that case too it will be the EB the correct governance body to implement or communicate such procedures in a top-down manner. The GA shall be free to act on its own initiative to formulate proposals and take decisions in accordance with the procedures set out in the Consortium Agreement. This is standard procedure for all H2020 projects coordinated by AITIIP.

The Consortium Agreement, signed before the signature of the Grant Agreement, defines the rights and obligations of all contractors, detailing responsibilities, regulating IPR issues, stating policies for managing background, results and the disclosure of information, defining communication procedures and strategies for the resolution of conflicts, voting and representativeness. It is the reference document for the internal management of the consortium. The Consortium Agreement has been prepared following the DESCA H2020 model and adapted to VIBES, and as already introduced, has been signed before the beginning of the project. The Coordinator is responsible to ensure that all the contractual steps required for the implementation of the project are fulfilled as scheduled.

Internal Activity Reports will be used as an additional level of control to monitor both the technical activities and overall budget expenditures; and as requested in the Grant Agreement, Periodic Reports will be compiled and issued timely. Activity and Periodic reports will be populated by the WP Leaders, with the contribution of task leaders and the supervision of the Coordinator, every six months, in correspondence with the meetings of the GA. Progress will be monitored based on deliverable reports.

**Table 3. Periodicity of the meetings**

PERIODICITY OF THE MEETINGS			
	Ordinary Meeting	Extraordinary Meeting	Participants
General Assembly	At least four each year <ul style="list-style-type: none"> <li>▪ Two face-to-face meetings (biannual)</li> </ul> Two online meetings (biannual, alternate to the former)	At any time upon written request of the EB or 1/3 of the Members of the General Assembly	One representative person (at least) from each member
Executive Board	Minimum six meetings/year <ul style="list-style-type: none"> <li>▪ Quarterly (remotely)</li> <li>▪ Twice per year (face-to-face)</li> </ul> As requested/needed by the Coordinator	At any time upon written request of any member of the board	Project Manager + All thematic managers
Category Level 1	Category Level 1	Category Level 1	Category Level 1
Category Level 2	Category Level 2	Category Level 2	Category Level 2

The periodicity of the meetings is indicated in the table above. It applies to the General Assembly and the Executive Board.

Concerning voting rules, each Governance Body shall not deliberate and decide validly unless two-thirds (2/3) of its members are present or represented (quorum). This applies to the EB, the IB and the GA. Decisions shall be taken by a majority of two-thirds (2/3) of the votes cast.

If the quorum is not reached, the chairperson shall convene another ordinary meeting within 15 calendar days. If the quorum is not reached in this meeting, the chairperson shall convene an extraordinary meeting which shall be entitled to decide by majority even if less than the quorum of Members are present or represented.

### 2.3 Consortium Contacts

The tasks inside the VIBES project are distributed in seven work packages, as per the following table:

**Table 4. Work Packages**

WP No	Work Package title	Leader	PM	Start (M)	End (M)
WP1	Research on interphase approaches to design degradable BBM for composites	SP	93.5	1	24
WP2	Research on sustainable components for thermoset multilayer fibrous composites	ULIM	189	1	32
WP3	Design and develop inherent recyclable thermoset composites	AITIIP	127.5	24	40
WP4	Development of VIBES recycling technology for sustainable thermosets	BCIRC	125.5	29	48
WP5	Sustainability, exploitation & economical assessment	ARCHA	76.79	1	48
WP6	Communication, dissemination & training	Q-PLAN	74.5	1	48
WP7	Coordination and project management	AITIIP	46	1	48
WP8	Ethics requirements	AITIIP	-	1	48

For each of these WPs, a particular WP leader is in charge:

**Table 5. WP leaders**

WP No	WP leader	Partner
WP1	Marion Combre	SP
WP2	Maurice Collins	ULIM
WP3	Marta Redrado	AITIIP
WP4	Oriol Grau	BCIRC
WP5	Francesca Braca	ARCHA
WP6	Eirini Efthymiadou	Q-PLAN



<b>WP7</b>	Javier Vicente	AITIIP
<b>WP8</b>	Marta Redrado	AITIIP

WP Leaders are responsible for the full implementation of duties and coordination amongst the various tasks grouped in their respective WPs. However, task leaders are responsible for the technical follow-up of their specific tasks, and this includes not only performing their corresponding duties but also collecting any necessary input for completing any relevant deliverable, report or demonstrator that is indicated in the Grant Agreement under their particular task. WP leaders are responsible for the first approval of deliverables, while final approval corresponds to the Coordinator.

For a proper implementation of meetings, to-do's, deadlines and communications in general, AITIIP as project coordinator and Q-PLAN as WP6 leader have set up a number of mailing lists with specific themes of discussion. These are "General", "Dissemination", "Admin. & Finance" and "Technical"; and the consortium contacts follow:

**Table 6. Mailing lists and purposes**

List	Purpose
vibes_all@vibesproject.eu	Includes every participating member of VIBES consortium
vibes_technical@vibesproject.eu	Includes every member of VIBES consortium who is responsible for technical issues
vibes_administration@vibesproject.eu	Includes all members of VIBES consortium who are responsible for administrative issues
vibes_dissemination@vibesproject.eu	Includes all members of VIBES consortium who are responsible for the dissemination of the project

**Table 7. Contacts of the General mailing list**

General (All)	
<b>Eva Martinez</b>	ACCIONA
<b>Monica Sanchez</b>	ACCIONA
<b>Julio Vidal</b>	AITIIP

<b>Lidia García</b>	AITIIP
<b>Marta Redrado</b>	AITIIP
<b>Pere Castell</b>	AITIIP
<b>Benedetta Caggiano</b>	ARCHA
<b>Fabrizia Turchi</b>	ARCHA
<b>Francesca Braca</b>	ARCHA
<b>Sabrina Bartoli</b>	ARCHA
<b>DAVID QUINTANA</b>	BCIRCULAR
<b>FERRAN GRAU GARCIA</b>	BCIRCULAR
<b>Dr. Erik Frank</b>	DITF
<b>Marc Dölker</b>	DITF
<b>Peter Steiger</b>	DITF
<b>Philipp Kreis</b>	DITF
<b>Caroline Flipts</b>	Flipts & Dobbels NV
<b>Filip Vanhecket</b>	Flipts & Dobbels NV
<b>Diego Calderón</b>	IDEC
<b>Jesús Hinojal</b>	IDEC
<b>José Luis León</b>	IDEC
<b>Graeme Stewart</b>	Juno

<b>Saul Buchanan</b>	Juno
<b>Carles Ayats</b>	LEITAT
<b>Francisco Julia</b>	LEITAT
<b>Guillem Romero</b>	LEITAT
<b>Hector Linuesa</b>	LEITAT
<b>Lorenzo Bautista</b>	LEITAT
<b>M<sup>a</sup> Carmen Royo</b>	LEITAT
<b>Oriol Angurell</b>	LEITAT
<b>Paula Felix</b>	LEITAT
<b>Sandra Medel</b>	LEITAT
<b>Albert Company Huesca</b>	PLATA
<b>Alejandro Ibrahim Perera</b>	PLATA
<b>Carlos Chapinal Martínez</b>	PLATA
<b>Carlos Urmente Marco</b>	PLATA
<b>Cristina Pérez Fuertes</b>	PLATA
<b>Elena Navarro Soriano</b>	PLATA
<b>María José Asensio Pérez</b>	PLATA
<b>Marian Rabazas Moro</b>	PLATA
<b>Eirini Efthymiadou</b>	Q-PLAN

<b>Krina Kordatzaki</b>	Q-PLAN
<b>Alain Graillet</b>	SP
<b>Marion Combre</b>	SP
<b>Samuel Malburet</b>	SP
<b>Dr Cathal Linnane</b>	UL
<b>Dr Mario Culebras</b>	UL
<b>Dr Maurice N. Collins</b>	UL

**Table 8. Contacts of the Technical mailing list**

<b>Technical</b>	
<b>Eva Martinez</b>	ACCIONA
<b>Monica Sanchez</b>	ACCIONA
<b>Julio Vidal</b>	AITIIP
<b>Lidia García</b>	AITIIP
<b>Pere Castell</b>	AITIIP
<b>Marta Redrado</b>	AITIIP
<b>Francesca Braca</b>	ARCHA
<b>FERRAN GRAU GARCIA</b>	BCIRCULAR
<b>DAVID QUINTANA</b>	BCIRCULAR

<b>Dr. Erik Frank</b>	DITF
<b>Philipp Kreis</b>	DITF
<b>Caroline Flipts</b>	Flipts & Dobbels NV
<b>Filip Vanhecket</b>	Flipts & Dobbels NV
<b>José Luis León</b>	IDEC
<b>Diego Calderón</b>	IDEC
<b>Saul Buchanan</b>	Juno
<b>Graeme Stewart</b>	Juno
<b>Guillem Romero</b>	LEITAT
<b>Carles Ayats</b>	LEITAT
<b>Oriol Angurell</b>	LEITAT
<b>Sandra Medel</b>	LEITAT
<b>Hector Linuesa</b>	LEITAT
<b>Lorenzo Bautista</b>	LEITAT
<b>M<sup>a</sup> Carmen Royo</b>	LEITAT
<b>Paula Felix</b>	LEITAT
<b>Alejandro Ibrahim Perera</b>	PLATA
<b>Marian Rabazas Moro</b>	PLATA
<b>Albert Company Huesca</b>	PLATA

<b>Carlos Chapinal Martínez</b>	PLATA
<b>Elena Navarro Soriano</b>	PLATA
<b>Cristina Pérez Fuertes</b>	PLATA
<b>Carlos Urmente Marco</b>	PLATA
<b>María José Asensio Pérez</b>	PLATA
<b>Eirini Efthymiadou</b>	Q-PLAN
<b>Krina Kordatzaki</b>	Q-PLAN
<b>Samuel Malburet</b>	SP
<b>Alain Grailot</b>	SP
<b>Dr Maurice N Collins</b>	UL
<b>Dr Mario Culebras</b>	UL

**Table 9. Contacts of the Admin. and Finance mailing list**

<b>Admin. and Finance</b>	
<b>Eva Martinez</b>	ACCIONA
<b>Monica Sanchez</b>	ACCIONA
<b>Javier de Vicente</b>	AITIIP
<b>Marta Redrado</b>	AITIIP
<b>Francesca Braca</b>	ARCHA
<b>Fabrizia Turchi</b>	ARCHA

<b>Benedetta Caggiano</b>	ARCHA
<b>Sabrina Bartoli</b>	ARCHA
<b>ORIOI GRAU</b>	BCIRCULAR
<b>RUTH CASTELLAR</b>	BCIRCULAR
<b>Peter Steiger</b>	DITF
<b>Marc Dölker</b>	DITF
<b>Caroline Flipts</b>	Flipts & Dobbels NV
<b>Filip Vanhecket</b>	Flipts & Dobbels NV
<b>Jesús Hinojal</b>	IDEC
<b>Saul Buchanan</b>	Juno Composites Ltd
<b>Francisco Julia</b>	LEITAT
<b>Alejandro Ibrahim Perera</b>	PLATA
<b>Marian Rabazas Moro</b>	PLATA
<b>Eirini Efthymiadou</b>	Q-PLAN
<b>Krina Kordatzaki</b>	Q-PLAN
<b>Marion Combre</b>	SP
<b>Samuel Malburet</b>	SP
<b>Alain Grailot</b>	SP
<b>Dr Cathal Linnane</b>	UL

**Table 10. Contacts of the Dissemination mailing list**

<b>Dissemination</b>	
<b>Eva Martinez</b>	ACCIONA
<b>Mónica Sanchez</b>	ACCIONA
<b>Anurag Bansal</b>	ACCIONA
<b>Lara Escudero</b>	AITIIP
<b>Pilar Pérez</b>	AITIIP
<b>Francesca Braca</b>	ARCHA
<b>Fabrizia Turchi</b>	ARCHA
<b>ORIOL GRAU</b>	BCIRCULAR
<b>Dr. Erik Frank</b>	DITF
<b>Caroline Flipts</b>	Flipts & Dobbels V
<b>José Luis León</b>	IDEC
<b>Saul Buchanan</b>	Juno
<b>Guillem Romero</b>	LEITAT
<b>Lorenzo Bautista</b>	LEITAT
<b>Hector Linuesa</b>	LEITAT
<b>Alejandro Ibrahim Perera</b>	PLATA
<b>Eirini Efthymiadou</b>	Q-PLAN



<b>Krina Kordatzaki</b>	Q-PLAN
<b>Lucile Luttenauer</b>	SP
<b>Samuel Malburet</b>	SP
<b>Alain Grailot</b>	SP
<b>Dr Maurice N Collins</b>	UL

By sending an email or a calendar invitation to one of these mailing lists, such communication reaches all the email addresses above.

## 2.4 Monitoring

The Coordinator is the ultimate responsible person for the right monitoring and control of the project. This is done, as introduced, in a top-down bottom-up cyclical manner, by making use of the different governance bodies. This cyclical approach enables the consortium, especially the EB and the Project Coordinator, to monitor and control time, cost and quality in VIBES.

- *Time* means that deliverables, developed materials and demonstrators are available on time,
- *Costs* means that activities are completed within the budget assigned in Annex 2 of the Grant Agreement and,
- *Quality* means that the results reach the project objectives and standards

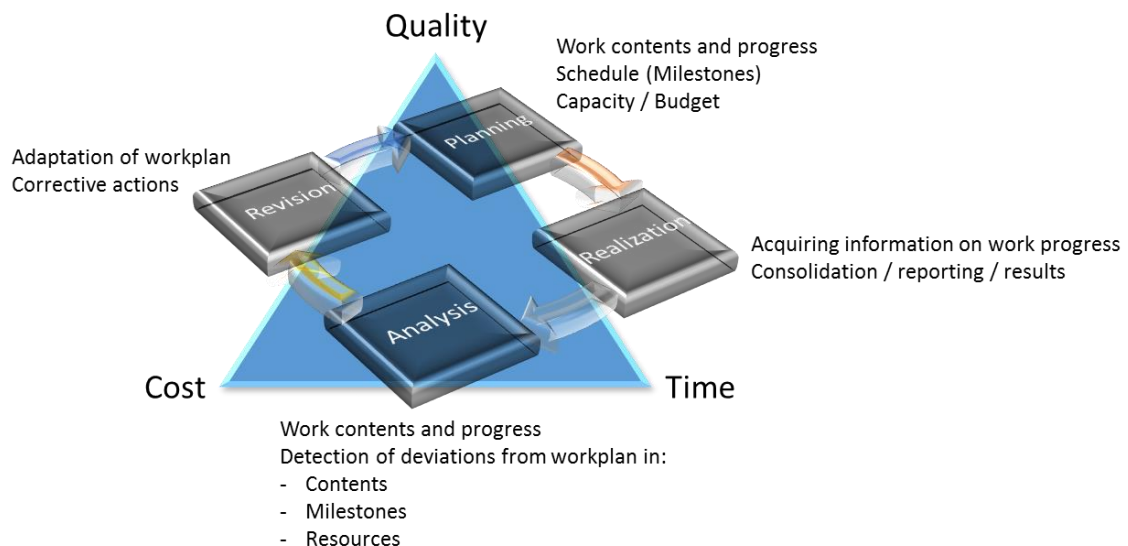


Figure 2. Cyclical Quality Assurance

## **Mechanism for Reporting Progress and Implementing Corrective Actions**

The mechanism for implementing corrective actions is based on the continuous reporting scheme implemented in H2020 and derives from work done at the task and WP level. Each WP leader is to report on the progress, risks and deviations of his/her WP and on the relevant milestones to the immediate level of decision, which is the EB and its representatives. This is done periodically in remote or physical meetings, as indicated in previous sub-chapters, but also by means of email and the VIBES deliverables and reports.

All corrective actions generate from meetings, reports and reviews either to the EB or – through the EB – to the GA. In principle, it is the EB who decides whether to involve the GA or not. These governance bodies delegate down any corrective action to an appropriate level for completion, and each corrective action is given a responsible partner and a target date when the responsible partner will confirm its completion to the right governance body. All major corrective actions shall be explained in the VIBES Activity and Periodic Reports.

Reporting progress in VIBES includes a number of processes that the Coordinator explained to the consortium during the Kick-off Meeting:

- Periodic Reporting
- Activity Reporting
- Technical Deliverables

The consortium must officially report the project's progress together with all eligible costs after each reporting period in its Periodic Report. Periods in VIBES are

- P1: from M1 to M24
- P2: from M25 to M48

Periodic Reports include a technical report and a financial report. Completing the technical part includes the following:

- Part A – Each partner will update the tables on an ongoing basis in the continuous reporting module. The information in the tables is then automatically compiled to create part A. AITIIP will coordinate this but all WP leaders may be required to contribute.
- Part B – Will be prepared outside the grant management tool, using the H2020 template. When done, it will be saved as a single PDF file and uploaded to the (Funding and Tenders portal) grant management system. Any beneficiary (not only the coordinator) can upload part B, but in our case there will be a master document and only AITIIP will upload the final one.

The financial report includes a financial statement, an explanation on the use of resources, and a request for payment. Completing the financial statement (FS) includes different steps:

- All beneficiaries – including the Coordinator – will fill in their own financial statement, electronically sign it and submit it to the Coordinator.
- Users who can fill in the statement include the Participant Contacts, Project Financial Signatories, Task Managers, but only the Project Financial Signatory (PFSIGN) can electronically sign and submit the statement. For this reason, all partners will make sure they have assigned an FSIGN user to VIBES in their organization.

The Coordinator may decide to submit the report without FS from certain partners (e.g. if a beneficiary cannot submit its individual FS on time) therefore those costs would not be considered for that particular interim payment. This was also made clear during the online Kick-off Meeting.

As previously introduced, all partners will contribute to the Coordinator with a number of internal reports (called *Activity Reports*) in which a non-binding approximation of effort and cost will be given to the Coordinator. Activity Reports will include a technical report (same format as with the Periodic Report), an explanation on the use of resources and an approximation on efforts and costs. Activity Reports in VIBES will be delivered each 6 months unless when other interim or periodic report is mandatory. Activity and Interim Reports will include similar chapters as those in the Periodic Reports and will help the consortium build the RP1 and RP2 Periodic Reports with consistency.

It is for these reasons that the Coordinator recommends the whole consortium to keep updated records of all costs, progress items and time records. This periodicity will enable a further level of monitoring.

**Table 11. Calendar for Activity and Periodic Reports (WP7), including other key deliverables**

Del. no.	Deliverable name	Delivery date	Lead short name	Type	Dissemination level
D7.1	Project Handbook and Quality Assurance Plan	M3	AITIIP	R	PU
D7.2	Project Collaborative Space	M3	AITIIP	R	CO
D7.6	KPI and Impact questionnaire – 2021	M4	AITIIP	R	CO
-	Activity Report M6	M6	AITIIP	R	(Internal)
-	Activity Report M12	M12	AITIIP	R	(Internal)
D7.10	Interim Technical Review	M12	AITIIP	R	CO
D7.7	KPI and Impact questionnaire – 2022	M16	AITIIP	R	CO
D7.3	Innovation plan	M18	ULIM	R	CO
-	Activity Report M18	M18	AITIIP	R	(Internal)
-	Periodic Report + FS	M24	AITIIP	R	CO
D7.8	KPI and Impact questionnaire – 2023	M28	AITIIP	R	CO

-	Activity Report M30	M30	AITIIP	R	(Internal)
D7.4	Innovation plan – Update 1	M36	ULIM	R	CO
-	Activity Report M36	M36	AITIIP	R	(Internal)
D7.9	KPI and Impact questionnaire – 2024	M40	AITIIP	R	CO
-	Activity Report M42	M42	AITIIP	R	(Internal)
-	Periodic Report + FS	M48	AITIIP	R	CO
D7.5	Innovation plan – Update 2	M48	ULIM	R	CO

The coordinator must submit a periodic report within 60 days following the end of each reporting period, and thus the following relative schedule has been developed for helping the consortium to deliver all the information timely:

**Table 12. Relative schedule for Activity and Periodic Reports**

RELATIVE SCHEDULE. Activity and Periodic Reports			
	Responsible(s)	Recipient(s)	Deadline
Table of Contents and assignments	Coordinator	All Partners	At least <u>30 days before</u> the official submission date
Final version of the Technical Part of the report	All partners	Coordinator	At least <u>10 days before</u> the official submission date.
Final version of the Financial Part of the report	All partners	Coordinator	<ul style="list-style-type: none"> <li>Option 1 (<u>Activity Reports</u>): Final version of the explanation on effort and cost. Non-binding. At least <u>10 days before</u> the official internal submission date.</li> <li>Option 2 (<u>Periodic Reports</u>): Final version of the Use of Resources and Financial Statements. Binding. Up to <u>30 days after</u> the official submission date. Non-delivering partners will be omitted from the request of funds.</li> </ul>

Technical deliverables are additional outputs that support the work that has been already done in one or more tasks. Deliverables in H2020 are a contractual obligation and all the relevant partners in VIBES must complete them.

The partner leading the task that produces the deliverable will provide such technical deliverable. This partner will be responsible for collecting any necessary inputs from other partners in the task. The WP leader, in any case, must remain informed of the process. Eventually, the WP leader will internally review the technical deliverable. This part of the process is iterative. In the end, the Coordinator will review it again and electronically submit the deliverable to the EC. The relative schedule and processes are summarized in the next table:

**Table 13. Relative schedule for Technical Deliverables**

RELATIVE SCHEDULE. Standard (technical) deliverable			
	Responsible(s)	Recipient(s)	Deadline
Table of Contents and assignments	Task leader	WP leader and task partners	At least <u>40 days before</u> the official submission date.
Final version, reviewed by the task leader	Task leader	WP leader	At least <u>15 days before</u> the official submission date.
Final version, reviewed and approved by the WP leader	WP leader	Coordinator	At least <u>5 days before</u> the official submission date.

The outcome of the review process will not be reflected in any formal document for the sake of avoiding any more bureaucratic burdens, but the partners involved in the process will take into account the following two criteria:

Scientific criteria

- **Relevance:** How relevant for the project are the topics included, and more specifically for the WP producing the deliverable? This question refers to relevance of contents according to the project’s and the WP’s specific objectives.
- **Completeness:** Have all the topics of the deliverable been properly covered? This question refers not only to the scope of the deliverable but also to relevant aspects according to the scientific and technical requirements from other WPs in VIBES that are susceptible to be affected by the contents of this deliverable.
- **Appropriate level of detail:** Is there an appropriate level of detail in the analysis of each element? This question refers to providing sufficient information so that all statements, claims, descriptions and conclusions are either self-evident or adequately and scientifically articulated. All information should have the depth needed for the purpose of the document.
- **Innovation:** To what extent the relevant contributions of the deliverable can be considered novel and innovative? Does the deliverable point out differences from related state-of-the-art issues? This

question refers to the way that new problems or new approaches have been set up by the deliverable – of course it cannot be applied to all deliverables in VIBES.

- **Soundness:** How well supported are the conclusions drawn? All pieces of information, statements, claims, descriptions and conclusions should be strongly substantiated, and should be verified or traced to the appropriate sources of reference.
- **Consistency:** Is the information included consistent with regards to other accepted statements, claims, descriptions and conclusions made elsewhere in VIBES or, more generally, in the wider scientific and technical community?
- **References:** Are the references adequate and necessary? This question refers to the appropriateness of the references used concerning the particular scope of the deliverable.

#### Format criteria

- **Readability:** Comfortable and easy reading, good use of vocabulary, grammar and orthography.
- **Terminology:** All specific terms are adequately explained, in order to provide an appropriate frame of reference for the reader; a glossary might be included.
- **Structure:** which should be coherent and clearly organize different items and issues, while grouping together any appropriate elements.
- **Appearance:** Formatting and physical distribution of images, tables and margins should be appealing and look professional. All deliverables will be generated according to the common template that is included in the project collaborative space and which has been used to write this deliverable as well.

Q-PLAN as WP6 leader has already provided the consortium with proper templates for the Technical deliverables (this very report, D7.1, follows such template). The consortium will follow the H2020 templates for filling in the Periodic Reports and Activity Reports. Q-PLAN has also distributed letterheads and PowerPoint presentation templates with the graphical identity of the project.

### 3. File Storage and Sharing

#### 3.1 Naming and Language

At the time of writing this deliverable, English is the official language in VIBES. All documents must be written in English. Nevertheless, there can be exceptions with some dissemination materials, such as press releases or even technical publications of national reach, which then can – if needed – be translated to other languages.

A unique code identifies each document, regardless of the filenames and referencing conventions that each partner is free to use for local archives. The aim of these codes is to give a one-look specific idea of what the document is and what the date is, at a glance. In VIBES, the document name code is structured as:

*Date\_Name\_Version\_(Status\_Partner)*

**Table 14. Unique code fields**

Fields	Description
Date	Following the ISO 8601 standard notation (i.e., four digit year, two digit month and two digit day of the month; for example: “20210930” for September 30 <sup>th</sup> , 2021)
Name	<p>A short and precise label decided by the author(s) that easily relates to the document’s content.</p> <p>In the case of a deliverable, the “Name” will be composed of two terms:</p> <ul style="list-style-type: none"> <li>• Deliverable number (DX.Y) according to the deliverable list contained in the Annex I, where X stands for the number of the work package and Y indicates the numeration within the work package.</li> <li>• The deliverable title according to the deliverable list contained in the Annex I, in case of project deliverable.</li> </ul>
Version	Will have the format “x.y”, where “x” can be 0 for initial, draft versions, and 1 onwards for subsequent versions in which a relevant change or section has been implemented; and “y” is a progressive number >0.
Status	<p>Indicates the status of the document:</p> <ul style="list-style-type: none"> <li>• ‘Draft’, refers to intermediate versions of the document.</li> <li>• ‘WP Review’ or ‘Internal Review’ refers to the version for internal (WP) review.</li> <li>• ‘Final’ refers to the version for official delivery.</li> </ul> <p>This section is optional.</p>

Fields	Description
Author	<p>Indicates the origin of the document, using the short name of the consortium partners.</p> <p>The final document sent to the PO will not contain this field, as the document is delivered on behalf of the consortium.</p> <p>This section is optional.</p>

References (Bibliography) shall follow the APA standard as in <https://apastyle.apa.org/>

### 3.2 Collaborative Space

All project-related documentation may be stored securely in the VIBES internal collaborative space, which will remain online until up to five years after the termination of the project. However, for the sake of simplicity, traceability and privacy, Coordination recommends the following documents to be stored in each partner’s own media (always in alignment with the provisions set in the Grant and Consortium Agreements). This list is not exhaustive:

- Email daily communications
- Preliminary sketches and ideas, or even results from other partners, concerning future deliverables not yet at draft-level
- Internal documentation related to cost justification such as, but not limited to, invoices, timesheets, contracts, offers and travel tickets or expenses
- Internal documentation related to legal matters of the project, such as, but not limited to, signed copies of the Consortium Agreement, financial ID, travel and subcontracting policies
- Documentation related to other partners individually which is exclusively needed for the sake of project management, in the case of the Coordinating party

On the other hand, Coordination recommends the following documents to be stored in the secure VIBES internal collaborative space:

- Draft and final versions of all deliverables, plus relevant contributions to those
- Legal and administrative documentation related to the common issues governing the project, such as a copy of the Grant Agreement, Consortium Agreement, mailing lists and contacts, or document templates
- Draft and final versions of all dissemination materials, including the project poster, leaflet, logo and videos
- All relevant information concerning project meetings, both online or face-to-face, including travel and accommodation directions, draft and final versions of all presentations, pictures, relevant materials, list of attendees and minutes

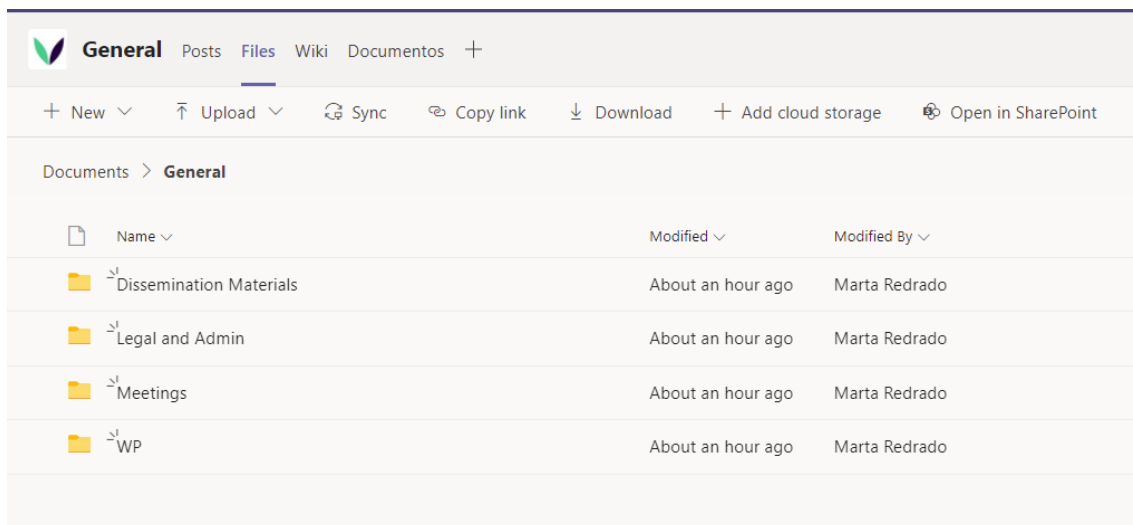


Project data is stored in one place created by a Microsoft TEAMS team with defined role-based access rights. All partners have at least one set of credentials to securely access, navigate, and edit file manager content. The collaborative space can be accessed from the project website.

This storage hosted in Microsoft 365 service is protected in Microsoft data centers, which cover Azure and Office 365 services, comply with the broadest set of international standards and specific location of the industry, such as ENISA IAF, ISO / IEC 27001, 27018, FedRAMP, SOC 1 and SOC 2, HIPAA, National Security Scheme / ENS or the AEPD, including 24-hour physical surveillance and strict access controls. AITIIP, as host of the data storage system, complies with and follows all the guidelines related to the GDPR (General Data Protection Regulation). Users can access, correct or delete their personal information through AITIIP email (lop@aitiip.com). If the information is related to the Project, special steps must be taken (defined in the Consortium Agreement).

Office 365 - Microsoft TEAMS aligns with industry standards such as Clause 14 of ISO / IEC27001-2013 and related security standards, guides and principles. This solution is based on combined layers of assurance consisting of newly enforced security features, best applied practices that are governed by policy, and the design itself validated by industry standard testing processes.

The VIBES internal collaborative space will be reached from the project’s public website by using the aforementioned credentials, and it is easily organized by key conceptual areas and by the eight work packages of the project. Each folder contains a subfolder structure. Other required folders are present as well, including those concerning Legal and Administrative issues, Meetings and Dissemination materials.

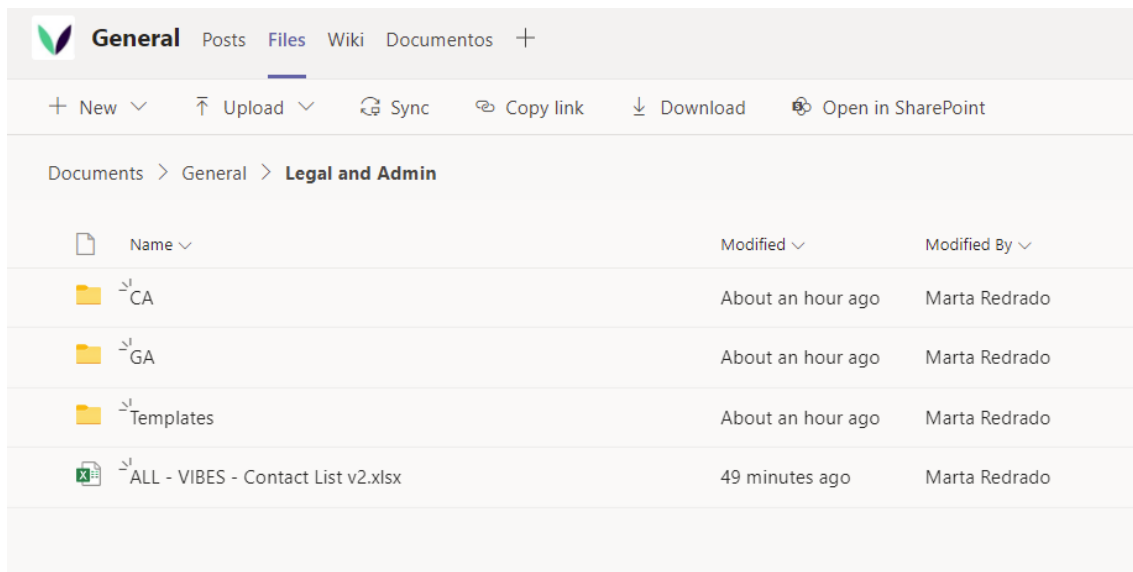


**Figure 3. The VIBES repository. Highest level**

The Legal and Administrative folder has a lower-level structure containing the key managerial elements:

- Consortium Agreement
- Deliverable Template
- Grant Agreement

- Contact List



**Figure 4. The VIBES repository. Legal and Administrative level**

Accordingly, other folders in the highest level are organized by corresponding lower-level folders. AITIIP is responsible for the general maintenance of the internal website. However, work package leaders are in charge of the document organisation concerning their WP. Deliverable editors are responsible for keeping updated versions of the corresponding deliverable, and all partners are responsible for supporting the documentation management process.

Official public deliverables (those which nature is labelled as “PU” in the list of deliverables of the DoA) will be also available at the project website in PDF format.

The following information from each meeting is kept in the project’s repository:

- List of attendees
- Minutes (interim versions and final version)
- All presentations (final versions as shown during the meeting), including other relevant support materials – e.g. videos.
- Photographs and dissemination materials
- Logistics

General Posts Files Wiki Documentos +

+ New Upload Sync Copy link Download Open in SharePoint

Documents > General > WP

Name	Modified	Modified By
WP1	About an hour ago	Marta Redrado
WP2	About an hour ago	Marta Redrado
WP3	About an hour ago	Marta Redrado
WP4	About an hour ago	Marta Redrado
WP5	A few seconds ago	Marta Redrado
WP6 C, D and T	A few seconds ago	Marta Redrado
WP7 Management	About an hour ago	Marta Redrado
WP8 Ethics	About a minute ago	Marta Redrado

Figure 5. The VIBES repository. WPs level

## 4. Quality Assurance and Risk Management

### 4.1 Quality Assurance

The Quality Assurance Plan is an iterative process that supports the consortium during the life of the project. Therefore, it must be revised periodically in order to determine deviations and the effectiveness of any taken measures.

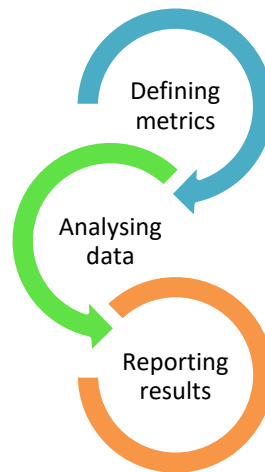


Figure 6. The three steps in Quality Assurance

Once the metrics of the project milestones and objectives are defined as per Annex I to the Grant Agreement, real project data must be collected and reported. This process will be performed internally in every Activity Report (every 6 months) and also officially in every corresponding Periodic Report, due:

- RP1: from M1 to M24
- RP2: from M25 to M48

Additional checks as commented will correspond to the dates of the Activity Reports (every six months).

The factual data collected after each of these 6-month periods is called “Actual Value” (Act.V). The Act.V is compared with the “Minimum Valid Value” (Min.VV). Generally speaking, the “Minimum Valid Value” should be proportional to the duration of the project at the time of the evaluation, but many times this will not be the case.

Accordingly, the VIBES metrics for some milestones and objectives cannot be measured only in quantitative terms. Qualitative measurements, and others, will be important just as well in order to give indications about the performance of the project. At least three types of metrics will be used to monitor the project:

**Table 15. Types of Metrics**

TYPES OF METRICS			
Code	Typology	Description	Example
<b>Qt</b>	Quantitative	Discrete quantitative indicators with a numerical nature.	Number of molecules, materials, length or percentage
<b>Ql</b>	Qualitative	This refers to a non-numerical subjective quality assessment.	Perceived quality or security
<b>Mi</b>	Mixed	This typology of measurement indicates that the success metric is partially quantitative and partially qualitative.	Levels of acceptance, satisfaction, influence

**Table 16. Criteria for the measurement of (Qualitative) metrics**

CRITERIA FOR MEASUREMENT			
Criteria	Formula	Possible Deviation Results	
Actual Value > Minimum Valid Value	$X \geq Y$	Green	
Minimum Valid Value $\geq$ Actual Value $\leq$ 80% Minimum Valid Value	$Y \geq X \leq 0.8 * Y$	Orange	
Actual Value < 80% Minimum Valid Value	$X < 0.8 * Y$	Red	

For each milestone and objective, a summary table with the Act.V., the Min.VV and their corresponding colour indicators will be provided by the WP leaders and collected by the Coordinator. A quick example follows, using MS2:

**Table 17. An example of the Metrics Progress to be reported**

METRICS PROGRESS (Example)						
Type	MS / OBJ	Name	Description	Minimum Value	Quality Indicators M36	
					WP2	
					Actual Value	Deviation
<b>Qt</b>	MS2	Achieving Kg level	Pre-requisite: <i>Design of adequate bonding materials</i>	<ul style="list-style-type: none"> <li>Batches of 1kg of TCA/TPU fibres using meltspinning at the lab scale facilities at ULIM</li> </ul>	<ul style="list-style-type: none"> <li>TRL 4</li> <li>All parameters studied</li> <li>Stabilization technology</li> </ul>	

		<p>amount of TPU-lignin based carbon fibres</p>	<p><i>for epoxy, vinylester and polyester thermoset resins and CF and GF.</i></p> <p><i>Developing the methodology with control matrix (SOA)</i></p> <p>Replicating the methodology for biobased alternatives (inc. TPU-lignin CF)</p> <p>Production of Develop safe and high quality European 100% biobased TPU-lignin carbon fibre products leading to opening of new markets (T2.2)</p> <p>Upscaling the production of 100% biobased TPU-lignin carbon fibre from gram scale to kg scale (reaching TRL5 – current TRL=3) (T2.5)</p>	<ul style="list-style-type: none"> <li>Parameters: various lignin:TPU ratios, varying holes diameter, capillary length, etc</li> <li>Various material formats: pellets / powder, polymer strands pelletized, filament, spool</li> <li>Characterisation of fibres (tensile tests, SEM analysis, DSC, TGA)</li> <li>Characterisation of the final CF (see T2.2 description in the GA)</li> <li>Coatings to improve the crosslinking behaviour of the fibres</li> <li>Upscaled material: Pellets will be melt-spun in a large-scale extruder with spinning head of 300-500 filaments</li> <li>Upscaled material tests: Raman microspectrometry, WAXS and mechanical testing for tensile strength, Young modulus, and elongation</li> <li>Upscaling: batches will be sent to WP3 partners at M24 and M32.</li> <li>A special reactor chamber will be developed to treat complete spools of the precursor and, after treatment, eliminate the excess of crosslinker</li> <li>A new environmentally friendly stabilization technology will be developed (energy reduced by 70%)</li> <li>Reaching TRL 5</li> </ul>	<p>reduced energy consumption by 50%</p> <ul style="list-style-type: none"> <li>Second bath not sent to partners yet</li> <li>Batches of 10 kg</li> </ul>	
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Milestones will be reported at the Continuous Reporting module of the Funding and Tenders portal. Eventually, these results are associated to comments and recommendations on the quality of the project results, following the next criteria. Also, deviations are easier to identify, prioritise and correct.

Table 18. Recommendations

RECOMMENDATIONS ABOUT THE QUALITY		
Deviation result	Description	Recommendation
	The results are well in line with the objectives and expected metrics	The project can continue with high quality standards
	The results are mostly aligned with the objectives and expected metrics but full quality standards are not reached	<p>The partners must review part of the results and improve their quality. The project needs minor changes in its implementation to redirect its orientation and to ensure completeness and usefulness of the results.</p> <p>The consortium potentially needs to match users' needs and quality of the results again.</p>
	Results deviate from the objectives and expected metrics; they are clearly below quality standards and corrective actions must be put in place	<p>It is mandatory to develop a contingency plan to retake proper levels of quality.</p> <p>Depending on the impact of such deviations, different governance bodies must be involved.</p>

## 4.2 Risk Management

Risk Assessment in VIBES is based on the “Failure Mode and Effects Analysis” (FMEA) [1]. Though this method was initially developed for systems engineering back in the 1950s, it has proven to be sufficiently powerful for risk analysis in research projects to examine potential failures in products or processes. It is used to evaluate risk management priorities for mitigating known threat-vulnerabilities. FMEA helps select remedial actions that reduce cumulative impacts of life-cycle consequences (risks) from a system or process failure (fault). In VIBES we have incorporated this solely at WP level and, at this point, the main risks have been identified in the Grant Agreement.

However, a more detailed analysis of the risks must be carried out. It includes several phases:

- Identification
- Analysis of the impact and the probability
- Contingency action/corrective actions (recovery plan), including responsible partners and deadlines
- Follow up

The following pages dwell into the details of the *operational* risks of the project.

### **Risk Priority Number (RPN) and Operational Risks**

The result of this easy procedure is the so-called Risk Priority Number (RPN), via the following *reduced* parameters:

Probability (Value: 1-5)

- Low: very unlikely, but not impossible (Value: 1)
- Low-Medium: unlikely to occur (Value: 2)
- Medium: Quite possible (Value: 3)
- High: more likely to happen than not (Value: 4)
- Very High: very likely to happen (Value: 5)

Impact (Value: 1-3)

- WP-Specific: risk relating to a specific WP (Value: 1)
- Project level: risk, which is generated at project level and implicates different WPs of the project (but not the relationship between WPs) (Value: 2)
- Cross-WP: risk raised within a specific WP that may affect the project success or require actions to be taken in another WP (Value: 3)

Importance (Value: 1-5)

- Not very important means the project could satisfactorily deliver its results even if this risk occurs (Value: 1)
- Important means the project could deliver even if the risk occurs, however results would lose some non-significant value (Value: 2)
- Very important means the project could deliver even if the risk occurs, however it would lose significant value (Value: 3)
- Fundamental means the project could deliver even if the risk occurs, however results would lose much of their value (Value: 4)
- Very Fundamental means that the project could not deliver if this risk occurs (Value: 5)

The RPN in VIBES is generated with the following formula:

$$RPN = Importance \times Probability \times Impact$$

The Risk Priority Number (RPN) is a numeric assessment assigned to a process, as part of Failure Modes and Effects Analysis. The detected risks can be ranked according their respective RPN (highest to lowest) and then grouped according to this number.

- Group 3 contains the risks that are considered to be the most serious and therefore require the closest monitoring (RPN >= 50 and Red Label).
- Group 2 includes those that, while less serious than those in the first group, are deemed to be sufficiently important that constant monitoring is required (30>RPN<=50 and Orange Label).
- Finally there is Group 1 for risks that are of lowest priority (RPN<=30 and Green Label).

The RPN helps the consortium prioritise the monitoring activities, but nothing else. Monitoring and reviewing the existence of new risks will be performed periodically in all EB meetings, and on a daily basis at task and WP level. These are the current Operational Risks in VIBES, listed in order of RPN (values themselves not listed):

**Table 19. Risks**



Description of risk	Prob.	Impact	Importance	Mitigation measures
The developed bonding materials do not allow to recycle the composite material in targeting rates and times	M	H	H	Several reversible bond strategies will be considered and confronted (synergies) to allow the separation of the thermoset resin from the fibres and the dissolution of the resin under appropriate conditions. The density of debonding moieties can be increased in the composite components as well as the exposure timings to stimuli fine tuned (study on the kinetics)
The shear strengths of BBM materials is lower than 2MP	M	H	H	Each modification on BBM moieties will be selected to minimise the distortion on key functional groups on the initial polymer. Fibre surface will be activated to ensure BBM affinity and final material properties.
The development of 100% supramolecular BBM for different stimuli triggered is not feasible	M	H	H	All reagents, designed structures and reaction pathways will be selected based on both technical and chemical feasibility
Problems during the scaleup of BBM, resins and composite components from laboratory to pilot scale.	M	M	M	Synthesis and elaborations of BBM, resins and composites will be tested at maximum laboratory scale. Heat, mass transfer aspects will be taken into account. A sequential procedure of scale up will be envisaged to avoid problems of extreme quantities
Large scale spinning facilities are not suitable for lignin	M	M	M	Spinning facilities will be adapted for lignin. ULIM and DITF can provide process knowledge and previous experience in Lignin spinning
Stabilization or carbonisation of lignin/TPU failed	M	M	M	ULIM and DITF adjust chemical crosslinkers & carbonization parameters (optimisation of the process based on previous knowledge)

Developed bio resins do not meet the specifications required to reach same performances as control	M	M	M	Several renewable feedstocks are selected to reach the requirements and tune the final properties. (Applying knowledge and strategies from previous projects and experience)
The separation of each composite component is not enough efficient	M	M	M	A pretreatment will be applied to selectively separate each material prior to further recycling treatment. Positive debonding results coming from WP1. US vibration system and warm up to 70°C if kinetics are not favourable.
The recovered resin fractions cannot be valorized	L	H	M	Several markets and direct applications were already identified based on the suspected functionalities that will be reached after material recycling.
The collection of the data from small scale processes for technical, economic and social inputs, could lead to obtain high specific impacts	L	H	M	Collection of technical and economic data from pilot scale processes thanks to the upscaling phase, planned during the project during last tasks of WPs 1,2,3,4
Uncertainty/Updates on EU Green Deal and EU2050 strategy may vary the alignment selected indicators	L	H	M	Public information regarding Green Deal, SDG and EU2050 climate strategy will be checked (surveillance) when implementing the task to select the most adequate indicators.
Not reaching an agreement for the exploitation of key results	L	M	L	Organized extraordinary negotiation meetings between the affected partners and the innovation board
Disagreement between project partners on dissemination of project results.	L	M	L	Signature of a DESCA-based Consortium Agreement taking into account the dissemination of the project results.
Lack of impact of the activities on the target media	L	M	L	Since the beginning, strong relationships will be established with the adequate media.

Not reaching a sufficient amount of professionals and students for the training activities planned	L	M	L	The training activities will be planned well in advanced in the beginning of the project, by signing the content and steps required with University of Zaragoza through the preparation of the CATEDRA and the Chamber of Commerce. Promotion in newsletter, social media.
Accumulated delays in tasks/ WP cause delays in project expected progress	L	M	L	Strict control of the project management with in time delivery submission and milestones control
Partner withdrawal	L	M	L	Exhaustive control of activities, small consortium with agreed and negotiated tasks, meditated and measured tasks and efforts. In case of certain difficulties to continue in the consortium appeared, current partners may count on their third parties and collaborators to look for further resources (capacity or human resources) if necessary.

However crucial the first risks may appear, let us not forget that these have not materialized in VIBES. The higher the RPN, in any case, the more rigorous the tracing must be. The basic activities of such Risk Management are:

- Identification and Update:
  - Ongoing risk update at task and WP levels.
- Review
  - Comprehensive review in each project meeting. More specifically in all EB meetings, which will dedicate a specific slot to risk management; and again on a daily basis at task and WP level.
- Contingency, tracing and report
  - Studying the specific contingency plan to be activated
  - Assigning responsible partners and calendars.
  - Potential involvement of the GA. Based on the level of impact (see previous chapter), risk management will be carried out within the WP level, or at EB level. Project-level risks, these are, influencing the overall project, will be managed at General Assembly level.
  - The consortium will perform general reporting of the quality control mechanisms in place.

## 5. Conclusions

D7.1 has clarified the quality framework for VIBES, including the composition of its governance structures, consortium contacts and relative calendars. D7.1 also includes a chapter on the VIBES collaborative space and file storage system, and an additional chapter on risk segmentation and management. The organisational structure and decision-making mechanisms will support the consortium in its day-by-day activities and have been explained, just as the information-sharing mechanisms in place, which are critical as well since they ensure that the partners are aware of the project evolution, can contribute to the project and make the project results easily available.

## 6. References

[1] *Failure Mode and Effects Analysis (FMEA), a structured approach to discovering potential failures that may exist within the design of a product or process.* Retrieved from <http://quality-one.com/FMEA/>