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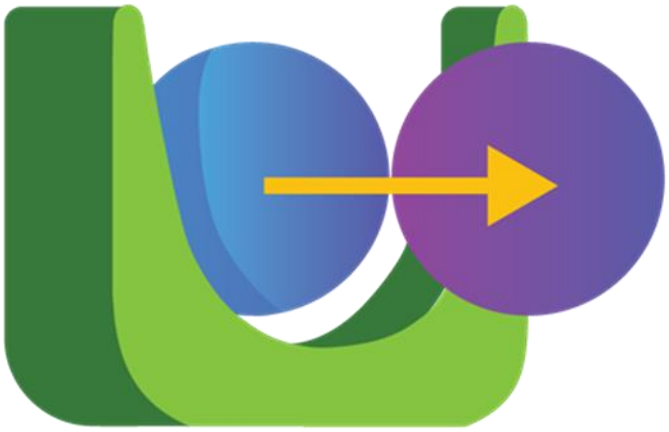

ARCHIMEDES

Trusted lifetime in operation for a circular economy

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1 Publishable Summary

ARCHIMEDES sets the path for a strong, autonomous, and resilient Europe through cutting-edge technologies in transport- and infrastructure industry.

The project builds trust in the new technologies and contributes to accelerating the energy transition, increase safety and security for the future society 5.0.

How ARCHIMEDES meets these goals is summarized in the following.

1.1 Three main pillars to advance cutting edge technologies

ARCHIMEDES builds on the collaboration of three main pillars, united in the ARCHIMEDES triangle (depicted in Figure 1):

(1) Quantification Procedures and Standards, aiming at assessing and establishing standards and qualifying to enable new technologies in new use cases;

(2) Tools and Controls, aiming at providing control solutions for ECS to meet the challenge of extended lifetime; and

(3) ECS and Simulation models, delivering ECS and services for lifetime extension.

The goal of the ARCHIMEDES project are the advances of these cutting-edge technologies - used in the semiconductor branch – that are expected to change the landscape of the automotive as well as in the aviation industries.

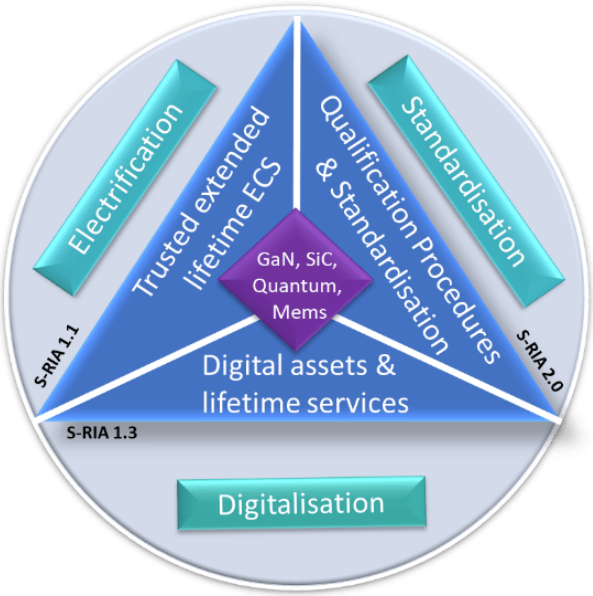


FIGURE 1: ARCHIMEDES TRIANGLE

1.2 Four main pillars to disrupt the semiconductor value chain

ARCHIMEDES will introduce new, innovative procedures. For example, within the project, monitoring during extended lifetime with a reference component with known and very limited degradation using Quantum Sensors will be performed.

Moreover, ARCHIMEDES will tackle state-of-the-art challenges related to optimizing the MTBF of GaN diodes (the estimation is that it will reach 10 years), the uncertainty of residual lifetime in GaN / SiC applications, and the uncertainty related to mission profiles.

In this way, ARCHIMEDES aims to disrupt the semiconductor value chain based on 4 core pillars (see Figure 2):

(1) **Electrification**, aiming at long-life GaN / SiC up to 120.000h of lifetime and trusted MTBF;

(2) **Standardization**, aiming at procedures for qualification of long-life GaN / SiC enabling economy of scale;

(3) **Digital Assets**, such as ECS behaviour models used in design, life-time and operation to provide value; and

(4) **Lifetime services**, aiming at monitoring lifetime providing trusted operation.

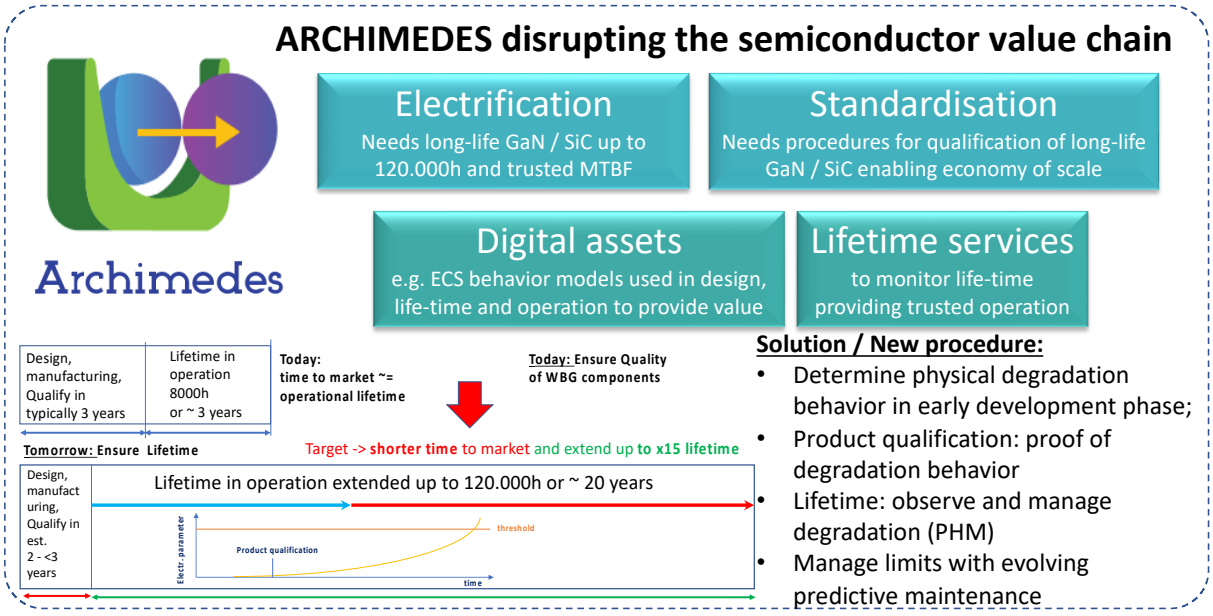


FIGURE 2: ARCHIMEDES - FOUR MAIN PILLARS TOWARDS DISRUPTING THE SEMICONDUCTOR VALUE CHAIN

Thus, ARCHIMEDES sets the path for a strong, autonomous and resilient Europe by breakthrough technologies in transportation and infrastructure industry that facilitate and accelerate the energy transition.

1.3 Final results

The expected final results and demonstrators are the following:

1. **Deliver 15x lifetime** (disruptive extended long lifetime from SOTA 8000h in automotive towards 120.000h as required in future EV´s as part in the energy infrastructure);

2. **Ensure quality in lifetime by prognostics and health management** (disruptive perception change to monitor and manage quality and state of health in operation);

3. **Half the time to market** by novel design cycles for new generations of consumer products that support the energy transition (fast introduction of technologies and products & disruptive qualification concepts for highly extended lifetime).

The expected results and technology developments shall lead to the following key impacts:

a) **Save billions of Euros of energy costs by smart use of renewable energies**

In brief: The ARCHIMEDES project will contribute to a better adaptation of the energy supply systems in Europe and to higher efficiencies in e-mobility charging using new semiconductor technologies. If this project meets all its ambitious goals, it will allow to contribute to economic savings of several hundreds of millions, maybe even billions of Euros.

b) **Improve efficiency of the installed power production systems**

In December 2019, the EU Green Deal - The European Green Deal (COM(2019) 640 final) -was adopted. Regarding Eurostat in May 2022, Germany had the highest level of net electricity generation in 2020 among the EU Member States, accounting for 20.5 % of the EU total, just ahead of France (19.1 %); Italy (10.2 %) was the only other Member State with a double-digit share. Despite many regional peculiarities, Germany and France have similar needs in terms of electric energy and available electric power.

c) **Improve efficiency of charging**

New wide bandgap (WBG) technologies will improve the efficiency of charging by around 2% compared to Si solutions. Considering a total used energy of 67.5 TWh, for 30 million cars, this technology will potentially contribute to savings of about 1.3 TWh needing in principle a power generation of about 150 MW installed power. For comparison: with a market price between 300 and 1000 EUR/MWh, this would save around 400 million to 1.3 billion Euro per year (just considering Germany). Implementing WBG charging systems is thus of highest economic and ecologic relevance.

d) **Support transition to Industry5.0**

For industry to continue to bring prosperity to Europe, it needs to adapt to tackle these ever-changing challenges, which is only possible through ongoing innovation. European industry can improve its efficiency at different places in the value chain even further, increase flexibility, agility and leanness of its production systems to cater to the quickly changing demands of the global consumer, and continue to be a global reference for quality. ARCHIMEDES will support the transition to Industry5.0.

e) **Maintaining competitiveness of European industry**

Preservation of competitiveness of European semiconductor, automotive, aviation, infrastructure equipment manufacturers through contribution and extension to existing qualification status based on

knowledge of failure mechanisms in SiC and GaN technologies, where significantly less experience on degradation is available compared to well-established Si devices.

2 Introduction & Scope

ARCHIMEDES is an extensive and ambitious project (see also section 1 of this handbook). An adequate management and quality assurance framework is required to maintain the desired quality of execution and timely delivery of the proposed project results.

ARCHIMEDES Vision: Be the first in lifetime from 8,000 towards 120,000h and in speed to market to accelerate the innovation cycles in energy efficiency and accelerated energy transition:

1. **Deliver 15x lifetime** (disruptive extended long lifetime from SotA 8000h in automotive towards 120.000h as required in future EV´s as part in the energy infrastructure)

2. **Ensure quality in lifetime by prognostics and health management** (disruptive perception change to monitor and manage quality and state of health in operation)

3. **Half the time to market** by novel design cycles and defined standards for new generations of consumer products that support the energy transition (fast introduction of technologies and products & disruptive qualification concepts for highly extended lifetime to enable economy of scale).

The project coordinator has the responsibility to provide the project handbook corresponding to best practices according to quality procedures, such as ISO 9001:2000. This project handbook defines management processes, rules and tools that shall be followed for a timely and high-quality execution of the ARCHIMEDES project.

In particular, the handbook is covering the following aspects:

- Detailed role definition and description of the management and decision making bodies
- Detailed role definition and description of Supply Chain, Work Package and Task leaders
- Project management and reporting rules as well as meeting organization
- Introduction of project management tools:
    - Communication tools/channels
    - Documentation and Data storage tools
    - Reporting tools and their usage
- Dissemination rules
- Quality assurance

The legal documents, *i.e.* Project Grant Agreement (PGA), National Grant Agreement (NGA, if applicable), Project Consortium Agreement (PCA), as well as this Project Handbook (PH) form the basis for the management of the ARCHIMEDES project. In case of any conflicts, the rules defined in the GA overrule any rules or recommended practices in the CA and/or PH. The CA only concerns the consortium internal obligations, while the PH complements the legal documents by defining and describing the overall project management process, rules and tools applied during the project execution. The PH is providing guidelines for the day-to-day execution of the ARCHIMEDES project from the management point of view. In particular, the PH is relevant for the administrative bodies in the project. Finally, the PH is supporting the Description of Action (Annex 1) of the PGA.

3 Management Bodies and their Roles

3.1 Organizational structure

To achieve the project objectives in a timely manner the project organization was carefully selected so that responsibilities are spread among different bodies and experts. The tracking of the corresponding project progress is ensured by the definition of project deliverables and milestones to be achieved during the three years of ARCHIMEDES. For the monitoring of project progress the following bodies are established:

- General Assembly (GA)
- Project Coordinator (PC)
- Project Management Team (PMT)
- Work Package Management Team (WPMT)
- Supply Chain Management Team (SCMT)
- Country Coordinators (CC)

In Figure 3, the interaction between GA, PC, PMT, WPMT, SCMT, CC and funding authorities is depicted for the ARCHIMEDES project.

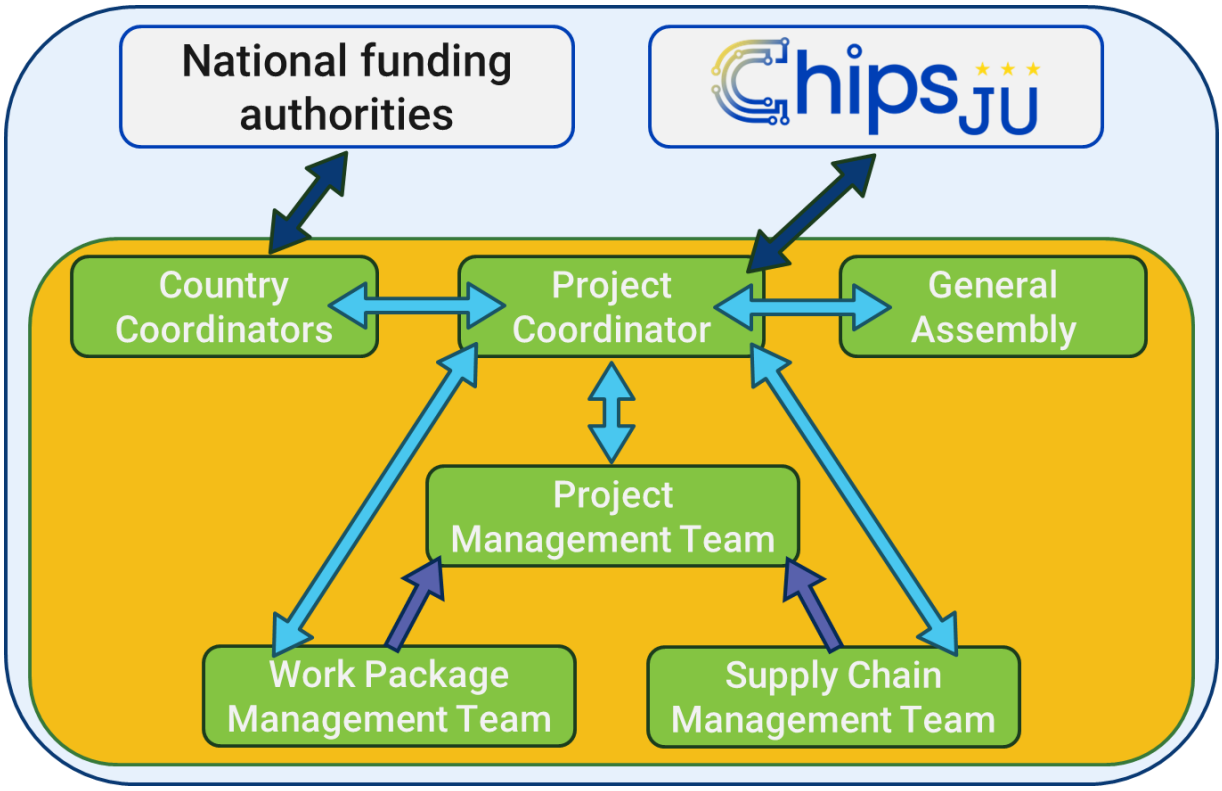


FIGURE 3: ARCHIMEDES PROJECT MANAGEMENT STRUCTURE.

The legal basis for the ARCHIMEDES management structure will be the PGA and PCA, defining the rules and regulations.

All defined bodies interact with each other on certain levels. Therefore, the management works on different levels:

- **Strategic level**: The GA decides about the overall strategy and major issues concerning the PCA, such as partner fluctuations.
- **Technical and operational level**: The PC, Supply Chain Leaders and Technical Experts are coordinating all technical activities and ensure qualitatively high results.
- **Day-to-day project operation**: The PC together with the PMT are responsible to take care of everyday project activities.

The CC are responsible for overseeing the national interests and to build the bridge between the project and the national finding authorities.

By project definition, the SCMT is responsible for the technical execution of the project by defining, developing, deploying and demonstrating the project results for SC1-SC5. This process follows the typical V-cycle model, in which the Work Packages are situated. Thus, the WPMT is responsible for overseeing the advancement of the activities and timely deliverable of Work Package specific results, i.e., the Work Package 1 is responsible for coordinating the gathering and consolidation of the requirements and specifications for the demonstrators and corresponding use cases for each SC. In addition, the PC and WPMT are managing the use of resources of the beneficiaries in the project.

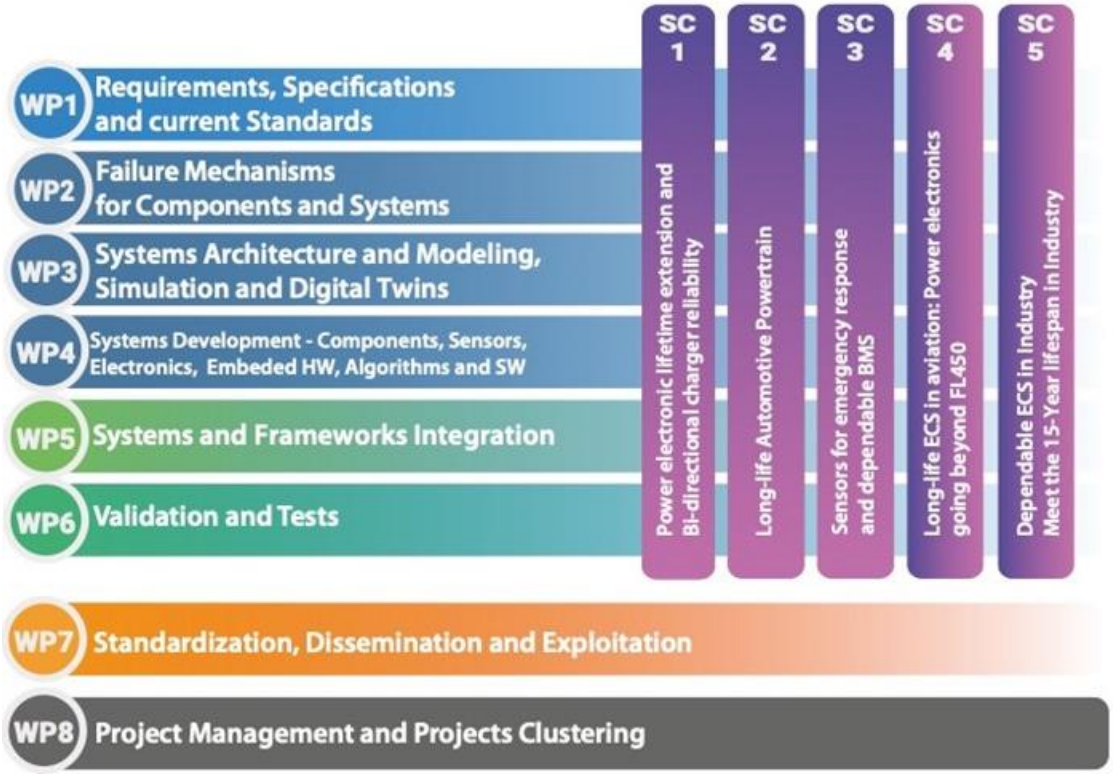


FIGURE 4: ARCHIMEDES WP AND SC MATRIX FOR SMOOTH PROJECT EXECUTION.

3.2 Summary of project management activities

In summary, the project management is bound to the following activities:

- Coordination of the scientific and technical activities of the project at the consortium level;
- Ensuring timely provision of high-quality project results and their further exploitation;
- Ensuring a smooth day-to-day operation of the project;

- Support an efficient financial and administrative execution;
- Provision of decision making, quality control and conflict resolution mechanisms to enable a smooth evolution of the project;
- Provide a platform enabling smooth communication and data exchange between the consortium members;
- Overseeing, coordinating and implementing any changes regarding activities and the consortium;
- Liaison with Chips JU, national authorities and other projects;
- Presenting the project at the regular and final review meetings;

The ARCHIMEDES partners agree that all issues concerning a successful implementation of the project that are not covered by the PGA are included in the principles of the projects' management. These principles are formalized in the PCA.

The defined management structure and its principles are necessary to make timely decisions about potential project bottle necks and to avoid potentially biased views.

3.3 Management bodies and procedures

Regarding the before defined organizational structure the detailed roles of the different bodies are explained in the following:

3.3.1 Project Coordinator (PC)

The Project Coordinator (PC) of ARCHIMEDES – AVL List GmbH – is the legal entity that is responsible for the appropriate, timely and efficient execution of the ARCHIMEDES project. Besides its responsibilities as a beneficiary, the PC is responsible for the tasks assigned to it within the PGA and PCA. Generally, the project management and its activities in ARCHIMEDES are laid out in WP8.

AVL as the PC has the following basic responsibilities:

- Organiser, chair and secretary of GA meetings
- Responsible for the execution of GA decisions
- Communication with the Chips JU office
- Liaison with other projects and organisations outside of ARCHIMEDES
- Day-to-day management of the project

In detail the PC is performing the following tasks during the project:

- Ensuring overall project coordination with timely execution, with the aim to meet the project objectives.
- Regular contact with the project partners.
- Encourage and maintain technical and scientific collaboration between the partners within the Work Packages as well as Supply Chains so that the project goals and deliverables are met in time.
- Organisation and chairmanship for the different project management bodies (i.e., GA, PMT, etc.).
- Monitoring of the beneficiary activities and their compliance with the obligations set forth in the PGA and PCA.

- Management of the PGA and its changes over time.
- Implementation of changes to the PGA, e.g., changes in the technical description of work, termination of parting partners, on-boarding and inclusion of new project partners etc.
- Management of the funds and distribution according to the PGA and PCA.
- Collection, consolidation and submission of project related reports and deliverables to the Chips JU.
- Provide an interface with the Program Officer (PO) assigned by the Chips JU.
- Organise and be the main representative of the consortium for the annual project review held by the Chips JU and the assigned project reviewers, including collection and consolidation of the periodic report, preparation of review documentation, advisory for the use of resources.
- Constant discussion with the PMT about the day-to-day operations in the project, risk assessment and definition of mitigation measures to prevent major project delays.
- Provide a platform for information, data and documentation sharing between the partner organisations.

3.3.2 General Assembly (GA)

The GA is structured in the following way:

- **Participants:** Project Coordinator and one authorized representative from each partner organisation
- **Chair:** Project Coordinator
- **Periodic meetings:** At least once a year or upon request by a participant

The GA consists of the representatives from all consortium partners including the PC. The GA is the highest decision making and conciliation body within the ARCHIMEDES project. It shall provide a platform where all partners are attending, discussing and deciding about actions required to be taken regarding strategic aspects on scientific issues as well as potential project management issues within the project.

The GA meets regularly once a year, starting with the project kick-off and the PC is chairing those meetings. In unusual circumstances and upon request by any PMT member, additional GA meetings can be organized between the regular ones. However, a reasonable justification by the requesting party must be presented to the PC, PMT as well as to the GA and the organisation of an irregular GA meeting must be subject to a voting decision.

The GA is addressing any scientific, management, contractual and financial issues. So, any high impact changes to the project are made within the GA. Examples may be changes in the consortium (be it partner termination or inclusion), changes in the Work Package and/or Supply Chain structure and content.

Decisions that are made based on a voting, have a positive result in case of a 2/3 majority vote in favour of the proposed action.

3.3.3 Project Management Team (PMT)

The Project Management Team consists of the PC, WP and SC leaders and any additional project member with special expertise that is significantly supporting the management of the ARCHIMEDES

project. The PMT is responsible for constant monitoring of project progress, risk assessment and definition of risk mitigation measures. Within the PMT potential project changes with respect to the technical description of work or beneficiary changes are discussed. With respect to the above-mentioned responsibilities the PMT is also responsible to take decisions about those matters. Following that, the PMT with the PC as their head consults with the GA about the decision to take final decisions based on the opinion of all partners in the consortium. In this way a transparent and smooth execution of the project is possible.

PMT activities during the project:

- Periodic discussion and alignment regarding project progress and timely execution of project tasks.
- Risk assessment and risk mitigation measure definition for timely execution of the project.
- Discussion and decision making about requested and/or required changes in the description of work of the project or the termination and/or addition of project partners.
- Support the PC with the organisation of project wide events and representation of the GA at those events (e.g., GA, review meetings, etc.).
- Management of technical and scientific collaboration between the partners within the Work Packages as well as Supply Chains so that the project goals and deliverables are met in time.
- Support the PC with appropriate and timely delivery of project Deliverables and Reports to the Chips JU.
- Analyse scientific results from all Work Packages as well as Supply Chains and make recommendations for new scientific tasks and collaborations and for best exploitation of results inside and outside the project.

3.3.4 Work Package Management Teams (WPMT)

The WPMT is structured in the following way:

- **Participants:** 1 WP leader plus Task leaders
- **Chair:** WP leader
- **Periodic meetings:** Monthly

In ARCHIMEDES the WPMTs are responsible for the organization, coordination and consolidation of the technical development from all relevant Supply Chains within the specified timeframe of the respective Work Package in the project. This means that the WPMTs are responsible for the timely provision of results that are required for a successful conclusion of Work Package related tasks, fulfillment of the Work Package objectives and the corresponding consolidation of results into project Deliverables. The task leaders are reporting their achievements to the WP leaders. The WP leaders report to the PMT. In the PMT, the WP leader reports the Work Package progress to the PC.

3.3.5 Supply Chain Management Teams (SCMT)

The SCMT is structured as follows:

- **Participants:** 1 SC leader plus Demonstrator leaders
- **Chair:** SC leader
- **Periodic meetings:** Monthly

The Supply Chains follow the V-Cycle and enables the development of the final results (demonstrators). SC1-SC4 are output enablers where the application and validation of results from technology enabler SCs is performed. **SC5-SC7 are technology providers** where fundamental technologies are developed as input for the output enabler SCs.
For the timely provision of results, the SCMT follows the proposed timeline of the ARCHIMEDES project execution plan in periodic meetings. In the SCMT meetings, the SC- and demonstrator leaders align on the status and make sure that the project timeline is met. Any potential risks are identified and mitigated on time. The SC leader reports to the PMT. In the PMT, the SC leader reports the supply chain progress to the PC.

3.3.6 Country Coordinators (CC)

Country Coordinators oversee the national interests and keep the project in touch with the national funding organizations, see Figure 3.

Country Coordinators operate in the following way:

- **Composition:** Project Coordinator, one authorized representative from each country (country coordinator)
- **Chair:** Project Coordinator
- **Periodic meetings:** At least once a year or upon request by participant

The Country Coordinators keep the contact between the PC and the national funding agencies. Thus, they play an important role, for instance when partners enter or leave the consortium, or in the quality control and reporting with respect to the national funding authorities. Each of the numerous countries represented in the ARCHIMEDES project sends one representative to the group of Country Coordinators.

Task list:

- Liaison to national funding authorities.
- Manage national partner changes.
- Monitor the adherence to national contracts and rules in the project.
- Solve country-specific issues like funding issues, dissemination and reporting.

3.4 Processes for decision making

Decision making processes as part of the overall management process should facilitate resolutions of technical and administrative issues and tasks with a minimal overhead in terms of effort and delay, while ensuring fair and impartial treatment of project partners. Escalation of issues to project management bodies that have more participants and convene less frequently should be avoided if possible.

Along the course of the project, IPR issues, non-performance of partners, etc., concerning the success of ARCHIMEDES could arise. To handle such situations, the following procedures will be undertaken.

As soon as a project member becomes aware of any issue or problem that could be related to the project, he or she will notify the PC. The PC will bring it to the attention of the GA when necessary, but after first trying to resolve the issue with the help of the partner and/or the CC and/or the WPL and/or the SCL. If necessary, a task force either within or discretionally outside the project will be nominated. The problem will be analyzed and solved as soon as possible.

The PC will be responsible for notifying on the progress of the task force. If no graceful solution can be found, the GA can, by majority vote, take appropriate actions, including the reduction of funds or the exclusion of a partner.

In general, ARCHIMEDES strives to reach a consensus on technical decisions, which is especially important for work package and supply chain internal decisions. When consensus decisions are not possible, the WP/SC leader is responsible for escalating the issue without further delay via the Project Coordinator (PC) to the Project Management Team (PMT).

3.4.1 Project management team (PMT) - decision making processes

The PMT will make decisions according to the following rules:

- **Decision making: consensus or live voting**
  - The PC may initiate a call for consensus during a meeting and ask for objections.
  - If there are no objections, the consensus can be recorded in the minutes.
  - The PC may alternatively initiate a live voting during a meeting.
  - Other PMT members may initiate a live voting during a meeting.
  - PMT decisions are made on a majority basis. For decision making at least 50% of the PMT members should give a vote.

- **Decision making: electronic voting**
  - The Project Coordinator may initiate an electronic voting (over email) at any time.
  - If anonymous electronic voting is chosen (votes not emailed to all PMT members), the PC keeps records on the votes to allow an oversight to JU.
  - Voting eligibility: all PMT members in attendance are eligible in decision making.

- **Meeting types: face-to-face (F2F) or teleconference (telco)**
  - F2F meetings are done by default alongside GA meetings and project wide events.
  - Teleconferences are done by default every third month.

- **Preparation: the PC announces arrangements and agenda 5 business days prior to the meeting**
  - For F2F meetings, a 10 business days lead time is needed.
  - The announcement is done over the PMT email reflector.
  - Recurring PMT meetings have default arrangements.
  - Other PMT members may also request the PC to set up additional meetings.

- Other PMT members may suggest a proposal for voting.
- The announcement of issues likely to result in voting should be mentioned.
- For complex decisions, the delivery of sufficient materials 5 business days prior to the meeting is strongly recommended.

- **Minutes: the PC is responsible for keeping minutes of all PMT meetings and decisions**
  - The PC must include meeting attendance records.
  - Draft minutes need to be distributed 5 business days after the meeting.
  - The distribution is done over the PMT email list and published via AVL Extranet Cloud, where all partners have access and thus can read the minutes.
  - Minutes need to be approved prior to or at the subsequent PMT meeting.

3.4.2 General Assembly (GA) - decision making processes

The GA will make decisions according to the following rules:

- **Decision making: consensus, live voting or electronic voting**
  - The PC may initiate a call for consensus during meeting and ask for objections.
  - If there are no objections, the consensus can be recorded in the minutes.
  - The PC may alternatively initiate a live or electronic voting during a meeting.
  - Other GA member may initiate a live voting during a GA meeting.
  - If anonymous electronic voting is chosen (votes not emailed to all GA members), the PC keeps records on the votes to allow an oversight to JU.
  - Voting eligibility: all project members in attendance are eligible in decision making.

- **Meeting types: face-to-face (F2F) or teleconference (telco) o F2F meetings are done by default once per year**
  - Teleconferences are intended only for urgent decisions.
  - Preparation: the PC announces arrangements and agenda 10 business days prior to the meeting.
  - For F2F meetings, a 1 month lead time is needed.
  - Materials need to be distributed 10 business days prior to meeting.
  - The announcement is done over the project email reflector.
  - The PC prepares meetings together with other PMT members.

- **Minutes: the PC is responsible for keeping minutes of all GA meetings and decisions**
  - The PC must include meeting attendance records.
  - Draft minutes need to be distributed 10 business days after the meeting.
  - The distribution is done over the GA email reflector or project website.
  - Minutes need to be approved prior to or at the subsequent GA meeting.

- **Deliverable submission**
  - The Task leader produces a deliverable "Table of Contents" to the PMT and to the PC two months before the due date.
  - PMT members suggest changes to the Task leader. The Task leader produces the deliverable draft to the PMT and to the PC one month before the due date.
  - WP leaders name an internal deliverable reviewer and monitor the review process.
  - WP leaders provide review comments to the Task leader and provide the Deliverable Responsible two weeks before the due date.
  - The Deliverable Responsible modifies the deliverable based on comments.
  - The Task leader provides the final deliverable to the WP leader 5 Working days before the due date.
  - The WP leader provides the final deliverable 3 working days before the due date to the PC, PMT and PC
  - The PC submits the final deliverable to JU.

- **Publication of project results**
  - A WP member identifies the need to publish project content.
  - The WP member drafts the content outline and informs the PC.
  - The PC distributes the proposed outline to all project partners.
  - Project partners indicate any concerns to the PC within two weeks.
  - The PC collects any concerns and anonymously provides them to the WP member.
  - The WP member prepares the publication or press release and sends it to the PC.
  - The PC distributes the proposed publication to all project partners.
  - Project partners indicate any objections to the PC within two weeks.
  - If there are no objections, the PC gives the permission to publish to the WP member.

- **Delay, change of content or technical conflict**
  - A WP member identifies a potential issue and immediately informs the WP leader.
  - WP leaders inform the PC and the PMT and decide together with the PC if the issue must be resolved within the WP or at project level.
  - The PMT may decide on impacts and remedial actions.
  - Otherwise, the PC presents the issue to the PMT.
  - The PMT determines impacts to WPs and remedial actions.
  - Affected WP leaders plan and re-allocate work with the other WP members.
  - The PC reminds the WP leaders of the needed Periodic activity report six weeks before due date.
  - WP leaders prepare and send WP Periodic activity reports two weeks before the due date to the PC.
  - The PC compiles and submits a Summary Periodic activity report to JU one working day before the due date.

- **Defaulting party**
  - Project partners provide a written report to the PC on contract breach.

- The PC determines the severity of the breach and informs the PMT.
- The PMT formulates a proposal to the General Assembly to decide on the defaulting party.
- The General Assembly decides on the defaulting party with a 75% majority.
- The General Assembly sends a notice to the defaulting party requesting it to remedy the default.
- If the default is not remedied within one month of notice, the contract is terminated.

It is essential that the participants, especially those involved in the same work packages, communicate on an almost daily basis.

3.5 Work package structure

The work plan has been designed according to the familiar V-cycle model, cf. Figure 5. After working out detailed requirements and failure mechanisms analysis in WPs 1 and 2, the main research and implementation work is conducted in WPs 3 and 4, before an integration phase in WP5 and the final validation and verification actions in WP6 are conducted. In parallel and over the whole duration of the project, WPs 7 and 8 cover dissemination, exploitation, standardization, and project management respectively.

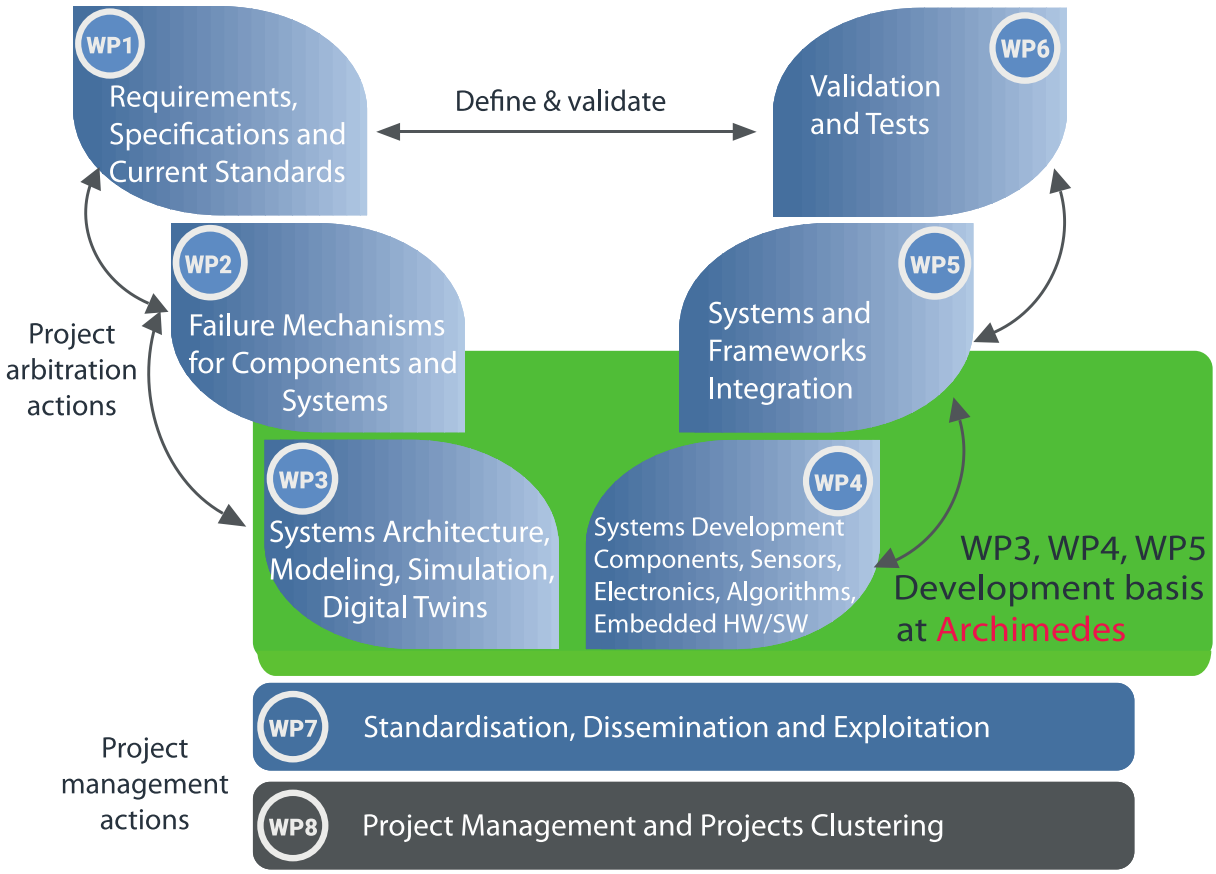


Figure 5 ARCHIMEDES work-packages structure

Besides WPs, ARCHIMEDES is also structured into SCs, yielding the matrix organization as shown in Figure 6. The idea of SCs is to group research activities around common topics. Put differently, each SC concentrates on the development of one sub-topic addressed by ARCHIMEDES. For doing so, each SC defines specific tasks in ARCHIMEDES' WPs. These tasks will be worked off according to the V-cycle model referred to above. This setup allows "locked, stepwise execution" between SCs and, hence, cross SC synchronization in each phase, e.g., when elaborating requirements or validating the project results with respect to the requirements and KPIs. At the same time, SCs improve the manageability of ARCHIMEDES as there are defined leaders for each sub-topic, that would not be available in a WP-only structure. Every SC starts with the definition of specifications and requirements derived from the project key targets with respect to the defined KPIs. Next, new technology is researched/developed based on these specifications and requirements. After the development and integration, the integrated (sub) systems are tested to verify their functionalities and their behaviour/performance is compared/validated according to the original specification and requirements. The benefits of this approach were already proved in previous projects, e.g., 3Ccar, AutoDrive or AI4CSM.

ARCHIMEDES comprises 5 SCs dedicated to several automotive, airspace and industrial applications of long-life semiconductors solutions.

A careful partitioning of work and the definition of clear interfaces between the different Work Packages (WPs) and SCs is required for the success of the ARCHIMEDES project. As discussed, the ARCHIMEDES project will provide an approach where WPs represent the R&D domains with a focus on technologies and methodology, while SCs represent real implementation, demonstrators, experimental work, and implementation efforts leading to the integration of the (sub)systems and their verification and validation. The relation of the SCs and the WPs is depicted in Figure 6, whereas the interrelation of the ARCHIMEDES WPs is shown in Figure 7.

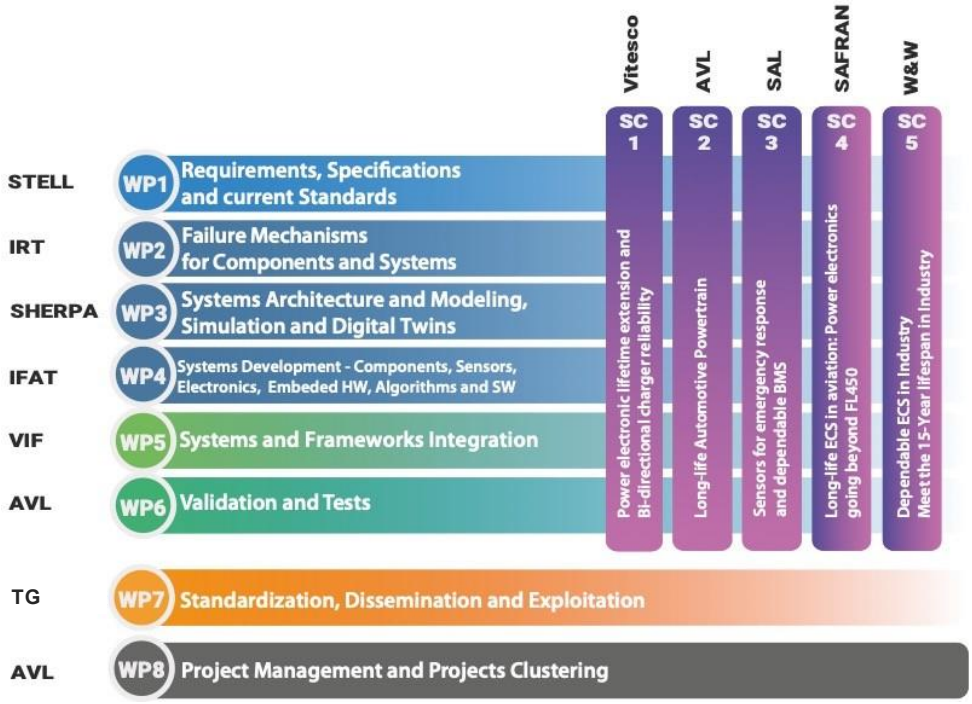


Figure 6 ARCHIMEDES matrix structure of WPs and SCs

WP1 defines the system requirements as well as the use cases and validation methodologies, also making sure research results of ARCHIMEDES are aligned with targets set by the Green Deal, Ethics guidelines, and relevant upcoming standards. WP2 is dedicated to analysis of failure mechanisms to obtain knowledge necessary to design long-life semiconductor components and system. WP3 is dedicated to the system level design based on modelling and simulation of architectures for individual technologies in SCs and components. WP4 will evaluate and design the semiconductor devices and modules for subsystems and systems to support the demonstrators in all SCs. WP4 also includes development of embedded HW and SW allowing control, diagnostics, and fault mitigation in long-life systems as well as qualification related topics especially stress conditions specific for automotive and industrial applications are considered.

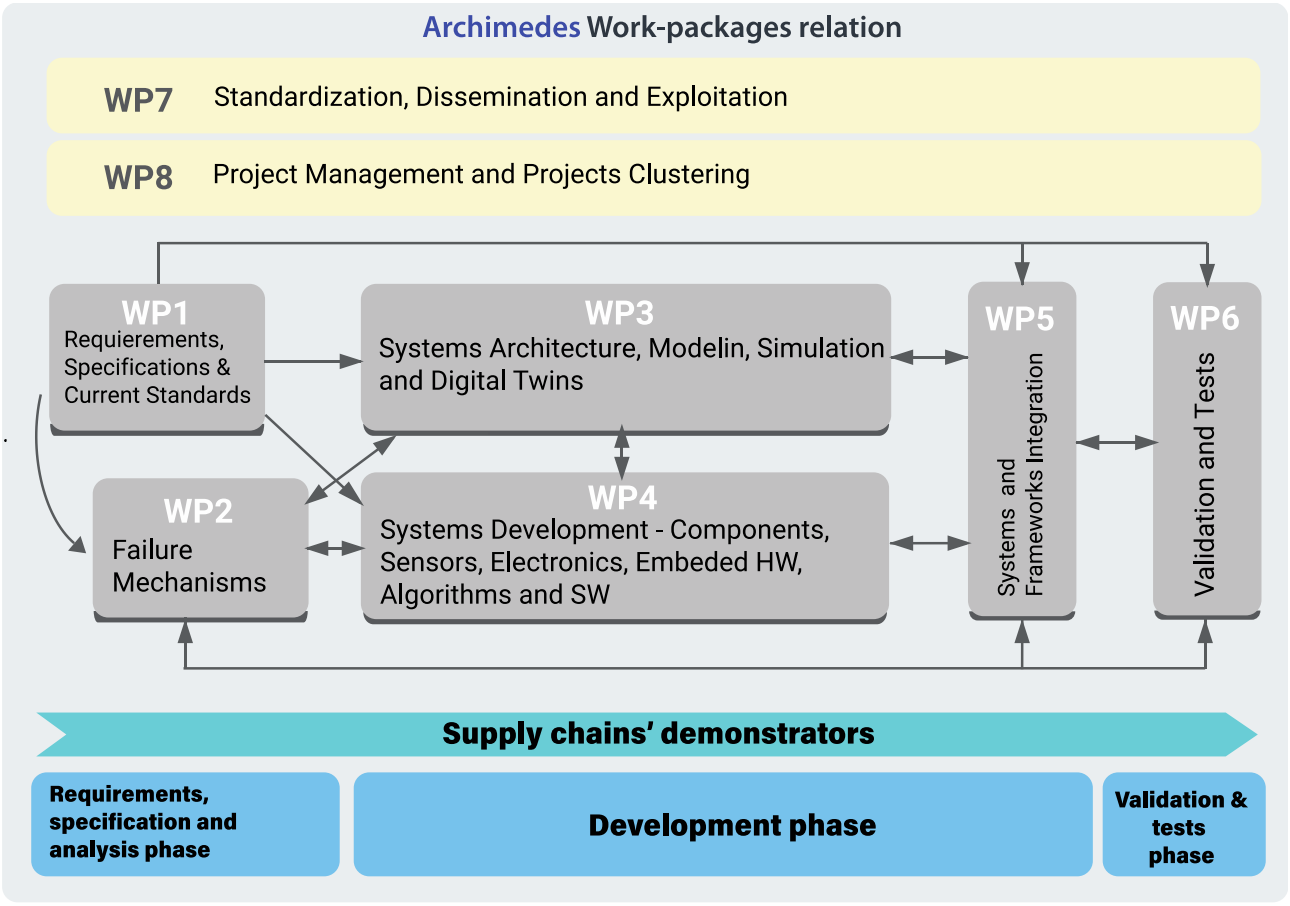


Figure 7 ARCHIMEDES work packages relations

WP5 cares about the system integration for each supply chain. Within the frame of WP6, validation and testing of the SC demonstrators takes place. It focuses on reliability validation of the developed subsystems with the goal to demonstrate the properties and performance of the developed solutions in relation to the requirements defined in WP1. WP7 covers exploitation, dissemination, standardization, and market trends monitoring to analyse the solutions developed by competitors. WP8 performs the overall project management, including monitoring and all financial & contractual aspects.

The project will benefit from a bi-directional flow of information between work-packages. Research running in a given work-package will use outputs supplied by earlier work-packages (stages of the V-cycle), but also provide feedback to these WPs, to correct possible problems in the designed solutions. For example, WP4 will respond to feedback from WP5 and WP6 to resolve possible problems during system integration and testing. The timing of the WPs contains significant time overlap of WPs with strong interrelations to allow efficient bidirectional flow of information and iterative development process as mentioned bellow. A Gantt chart of the project is provided in Table 6, Section 10.2.

In more detail, WP1 provides requirements and specifications for the analysis performed by WP2, and the development phase covered WP3 and WP4. These WPs also provide feedback to WP1 if some requirements or specifications need to be refined or extended. WP2 supports the development of models and electronics in WP3 and WP4 as well as initial steps of subsystems and systems integration in WP5 with knowledge on failure mechanisms. WP3 will provide additional simulations based on feedback from WP4 and WP5 if needed. WP5 integrates the components provided by WP4 and uses knowledge on failure modes from WP2 and simulation results from WP3 to build long-life subsystems and systems. In the case of unexpected problems with integration and commissioning of the subsystems and systems, feedback to WP3 and WP4 will allow the change of component designs to solve possible problems. Finally, the subsystems and systems are tested and validated in WP6 where conformance with specifications from WP1 will be checked.

A table describing the individual WPs is given in Section 10.3 of this document.

4 Management of Communication

4.1 Project internal communication

Effective communication is the key in all complex projects. Project decisions will be taken either at regular or extraordinary meetings, through email or teleconference voting. It is essential that the participants, especially those involved in the same work packages, communicate on a regular basis.

4.1.1 ARCHIMEDES contact & email lists

Mailing and contact lists for efficient communication among project partners were set-up. Part of a contact/email list shown in Table 1 as an example.

TABLE 1: ARCHIMEDES CONTACT & EMAIL LIST.

									SC				WP Leaders & Task respons.								WP participants							
Nr.	Company	Acronym	Type	Country	Contact Person	eMail	Phone number	Role	1	2	3	4	5	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
1	AVL List	AVL	LE	Austria	Darjan Kozic	darjan.kozic@avl.com	+43 316 787 5528	Coordinator/Technical contact		x	x								x		x								
1	AVL List	AVL	LE	Austria	Iskra Gasparic	iskra.gasparic@avl.com	+43 316 787 1462	Technical contact		x	x																		
1	AVL List	AVL	LE	Austria	Katrin Al Jezany	katrin.aljezany@avl.com	+43 316 787 8547	Coordinator/Technical contact		x	x								x		x								
1	AVL List	AVL	LE	Austria	Inigo Garcia	inigo.garciademadinabeitiamerino@avl.com	+43 316 787 3997	Main contact SC2		x																			
1	AVL List	AVL	LE	Austria	Mohamed Essam Ahmed	muhamedessam.ahmed@avl.com		Cotact SC2		x																			
1	AVL List	AVL	LE	Austria	Mihai Nica	mihai.nica@avl.com	+43 316 787 2124																						
1	AVL List	AVL	LE	Austria	Reiner John	reiner.john@avl.com	+43 316 787 2016	Coordinator/Technical contact			x										x								
1	AVL List	AVL	LE	Austria	Andreas Klug	Andreas.Klug@avl.com	+43 316 787 3474																						
1	AVL List	AVL	LE	Austria	Stefan Karanovic	Stefan.Karanovic@avl.com	+43 316 787 4109			x																			
2	Lionizers	LION	SME	Germany	Nils Löwe	nils@lionizers.com	+49 176 574 550 65				x																		
2	Lionizers	LION	SME	Germany	Merten Falk	merten@lionizers.com					x																		

In the ARCHIMEDES contact & e-mail list, the contact persons are sorted by company. Each company is assigned an individual number and an acronym (a list of project participants can also be found in

Section 10.1 of this document). For each person, the email address, phone number, project role, supply chain and work package responsibilities/affiliations as well as the information for the national coordination are provided. The full ARCHIMEDES contact and e-mail lists can be found here.

In the PMT Contact List, the work package leaders and supply chain leaders are listed. For each WP and SC leader, the company, country, email address and phone number are provided. Please see Table 2.

TABLE 2: ARCHIMEDES - PMT CONTACT LIST

								SC Lead					WP Lead							
Nr.	Company	Acronym	Type	Country	Contact Person	eMail	Phone number	1	2	3	4	5	1	2	3	4	5	6	7	8
1	AVL List	AVL	LE	Austria	Darjan Kozic	darjan.kozic@avl.com	+43 316 787 8528											x		x
1	AVL List	AVL	LE	Austria	Katrin Al Jezany	katrin.aljezany@avl.com	+43 316 787 8547											x		x
1	AVL List	AVL	LE	Austria	Inigo Garcia	inigo.garciademadinabeitiamerino@avl.com	+43 316 787 3997		x											
1	AVL List	AVL	LE	Austria	Mohamed Essam Ahmed	mohamedessam.ahmed@avl.com			x											
1	AVL List	AVL	LE	Austria	Reiner John	reiner.john@avl.com	+43 316 787 2016													
3	STMicroelectronics SA	ST-SA	LE	France	Jochen Langheim	jochen.langheim@st.com	+33 6 78465244													
4	Affiliated: STMicroelectronics Grenoble SAS	STGNB	LE	France	Denis Dutey	denis.dutey@st.com														
14	IRT St Exupery	IRT	RES	France	Fabio Coccetti	fabio.coccetti@irt-saintexupery.com								x						
14	IRT St Exupery	IRT	RES	France	Valeria Rustichelli	valeria.rustichelli@irt-saintexupery.com								x						
14	IRT St Exupery	IRT	RES	France	Marina Labalette	marina.labalette@irt-saintexupery.com								x						
18	Nextmove	NEXTM	RES	France	Geoffroy Martin	geoffroy.martin@nextmove.fr													x	
18	Nextmove	NEXTM	RES	France	Giulia Maifrini	giulia.maifrini@nextmove.fr													x	
18	Nextmove	NEXTM	RES	France	Blandine Flichy	blandine.flichy@nextmove.fr	+33 02 35 65 78 17												x	
20	Safran Electrical & Power	SAFRAN	LE	France	Jean-Francois Rideau	jean-francois.rideau@safrangroup.com					x									
20	Safran Electrical & Power	SAFRAN	LE	France	Florent Girard	florent.girard@safrangroup.com					x									
22	Sherpa Engineering	SHERPA	SME	France	Philippe Fiani	p.fiani@sherpa-eng.com										x				
25	Teraglobus	TG	SME	Lithuania	Urte Steikūniene	urte@teraglobus.lt													x	
25	Teraglobus	TG	SME	Lithuania	Gintare Marine	gintare@teraglobus.lt													x	
29	Vitesco TECHNOLOGIES FRANCE	VITESCO	LE	France	Dominique Martineau	dominique.martineau@vitesco.com		x												
29	Vitesco TECHNOLOGIES FRANCE	VITESCO	LE	France	Laurence Allirand	Laurence.Allirand@vitesco.com		x												
30	Watt and Well S.A.S	W&W	SME	France	Romain Beaume	romain.beaume@wattandwell.com						x								
30	Watt and Well S.A.S	W&W	SME	France	Ismail Elajouady	ismail.elajouady@wattandwell.com						x								
32	Infineon Technologies Austria AG	IFAT	LE	Austria	Hubert Pernull	Hubert.Pernull@infineon.com	+43 (676) 8205 6961									x				
32	Infineon Technologies Austria AG	IFAT	LE	Austria	Sabine Dullnig	Sabine.Dullnig@infineon.com	+43 676 82052097									x				
34	Silicon Austria Labs GmbH	SAL	RES	Austria	Cristina de Luca	Cristina.DeLuca@silicon-austria.com	+43 664 7873 5779			x										
34	Silicon Austria Labs GmbH	SAL	RES	Austria	Willibald Krenn	Willibald.Krenn@silicon-austria.com				x										
37	VIF	VIF	RES	Austria	Selim Solmaz	Selim.Solmaz@v2c2.at	+43 664 78517180											x		
37	VIF	VIF	RES	Austria	Pamela Innerwinkler	Pamela.Innerwinkler@v2c2.at												x		
45	Stellantis	STLA	LE	France	Jean-Jacques Alliez	jeanjacques.alliez@stellantis.com							x							
45	Stellantis	STLA	LE	France	Antonio Coutodacosta	antonio.coutodacosta@stellantis.com							x							
45	Stellantis	STLA	LE	France	Damien Pierre Sainflou	damienpierre.sainflou@stellantis.com							x							

4.1.2 Document management system AVL Extranet Cloud

To facilitate all project-internal communication, a centralized document management system based on AVL Extranet Cloud was set up and will be maintained throughout the project duration. All participants in the contact list (see Section 4.1.1) have received login data to the ARCHIMEDES cloud. The use of AVL Extranet Cloud is very intuitive and straight forward.

4.1.2.1 AVL Extranet Cloud – use with an internet browser

4.1.2.1.1 Sign In to AVL Extranet Cloud

The use of AVL Extranet Cloud is very intuitive and straight forward:

First, start the browser and enter the AVL Extranet Cloud URL.

AVL Extranet Cloud – Home (sharepoint.com)

Then, please Sign In with the email address you were invited by your AVL contact person. You will be redirected to a login window.

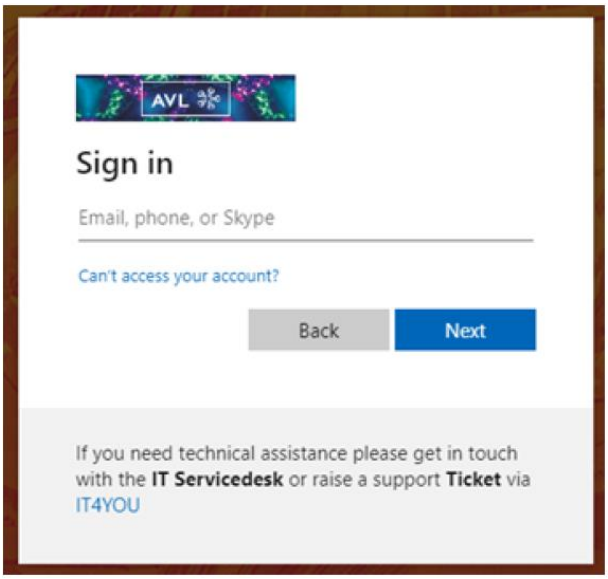


FIGURE 8: AVL EXTRANET CLOUD – SIGN-IN WINDOW

Enter your email address. If your account is a Microsoft account or a Microsoft 365 account use your corresponding password. Otherwise, you will receive a one time password by email for login.

PLEASE NOTE:
These are not the same credentials as you are using for the former AVL Extranet (projects.avl.com).
At your first login you must accept the Terms & Conditions of avl.sharepoint.com and to register for the 2-step authentication at AVL (please see **Activation of 2-step Authentication**).

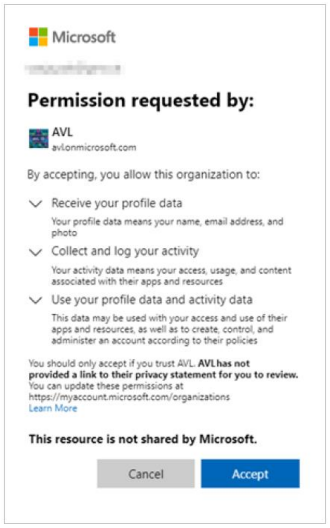


FIGURE 9: ACCEPTANCE WINDOW FOR TERMS AND CONDITIONS OF AVL EXTRANET CLOUD.

After the successful login you will be redirected to the AVL Extranet Cloud start page automatically. The section Your AVL Extranet Cloud sites shows a list of all sites you have access to.

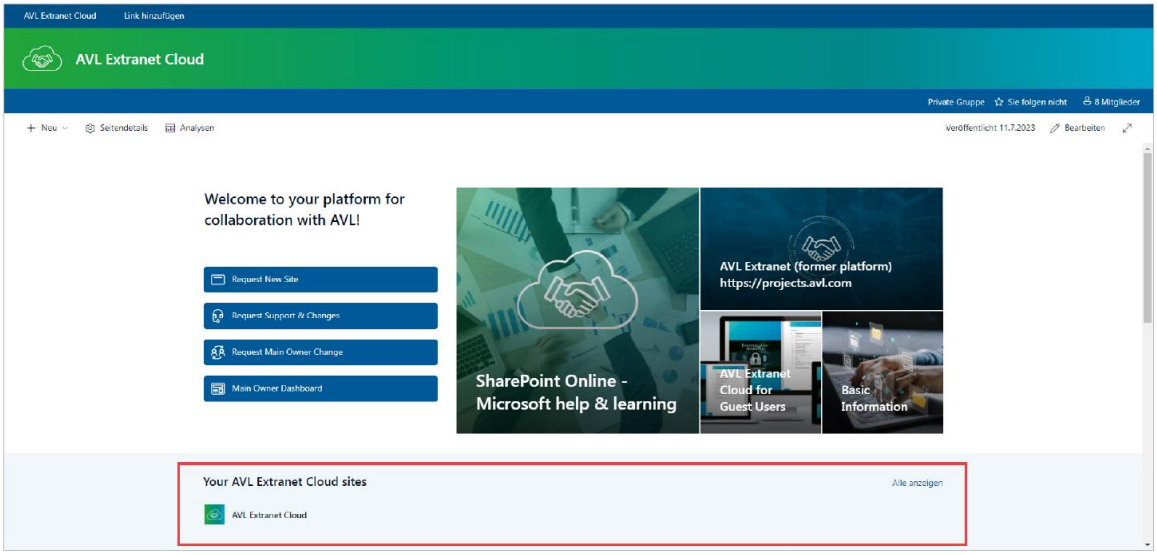


FIGURE 10: AVL EXTRANET CLOUD – WELCOME WINDOW.

Click on the title of any AVL Extranet Cloud site to open it. The folder structure of the ARCHIMEDES project is shown in Figure 11.

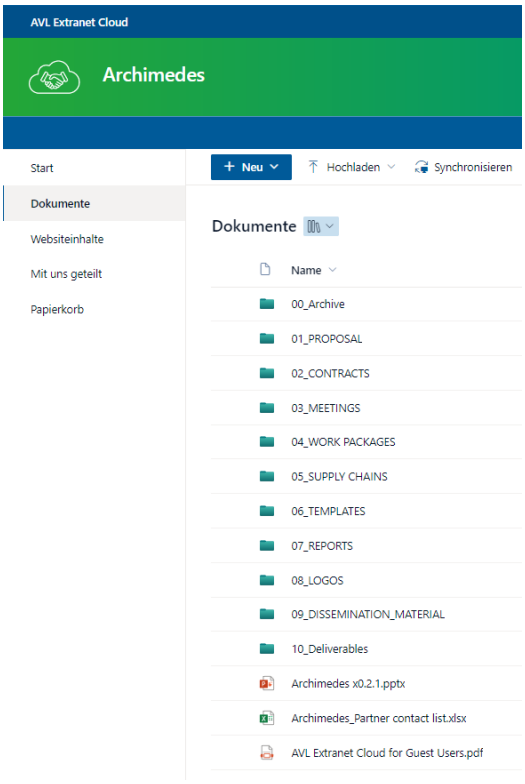


FIGURE 11: AVL EXTRANET CLOUD – ARCHIMEDES FOLDER STRUCTURE

4.1.2.1.2 Activation of 2-step Authentication at AVL

To access the AVL Extranet Cloud and its sites (URL starting with https://avl.sharepoint.com/sites/ext …) you must activate the 2-step authentication at AVL for your account. Please follow this guide to activate it.

At your first login an information box will pop up informing you that more information is required to access the AVL Extranet Cloud.

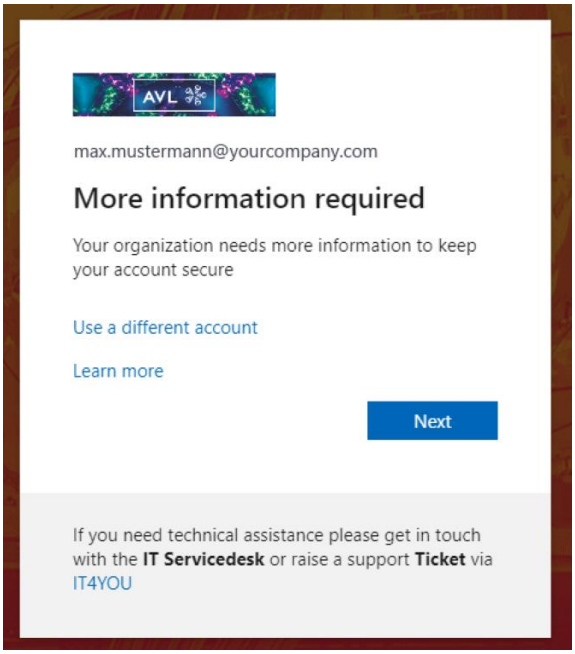


FIGURE 12: AVL EXTRANET CLOUD – INFORMATION BOX FOR 2 STEP AUTHENTICATION.

Please click on Next.

Follow the steps to activate the 2-step authentication for your account at AVL (Extranet Cloud).

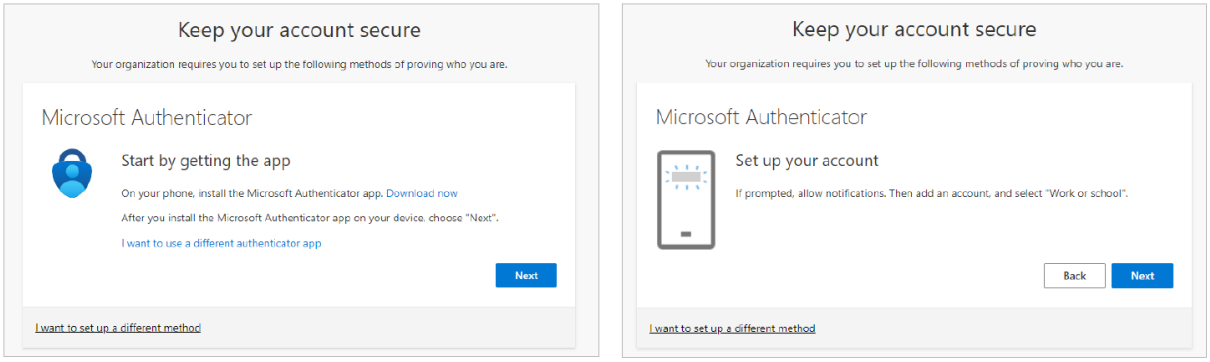


FIGURE 13: AVL EXTRANET CLOUD – ACCOUNT SECURITY.

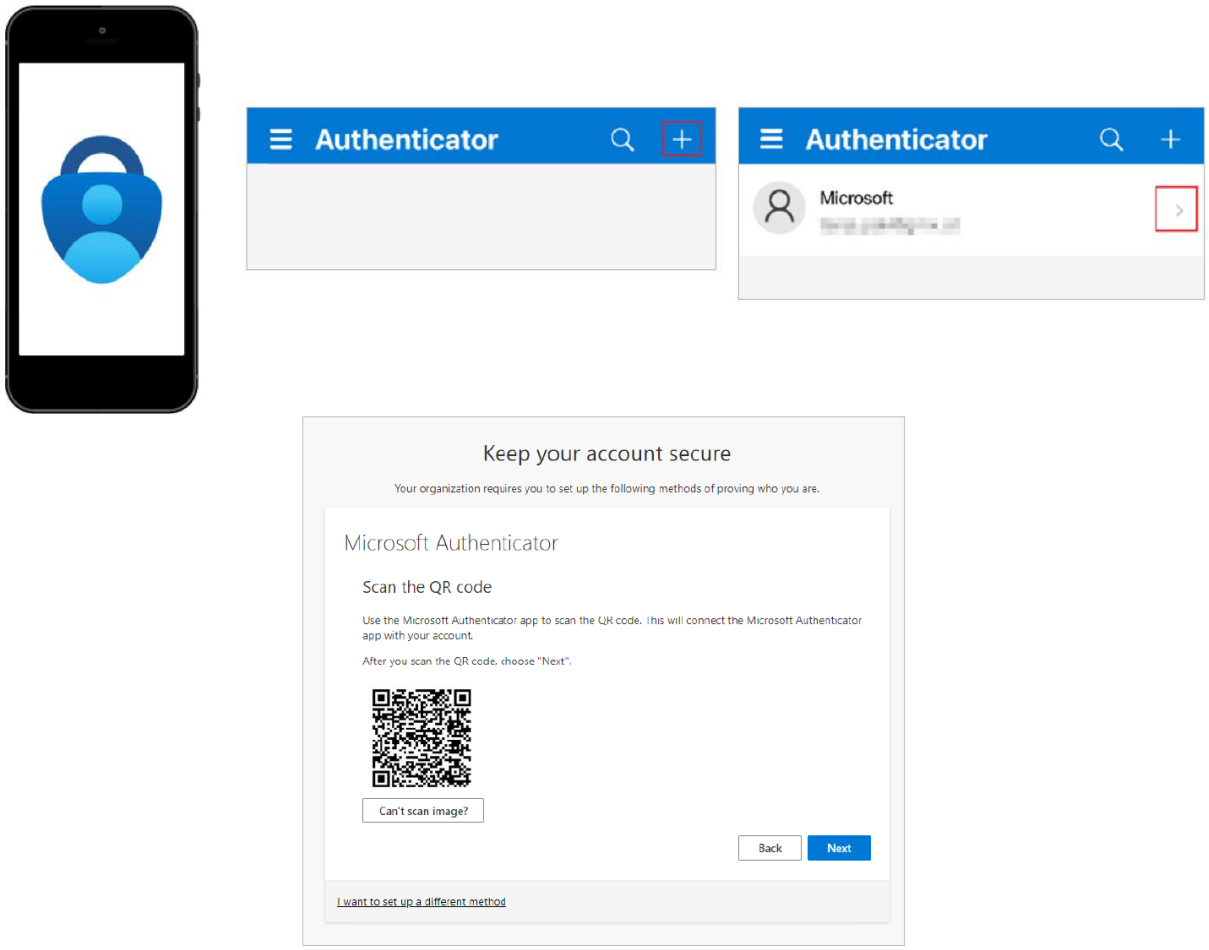


FIGURE 14: AVL EXTRANET CLOUD – ACCOUNT SECURITY.

Please open the app on your mobile phone after installing it and click on „+“ on the top right corner and select „Work or school“.

Scan the QR code with the help of the mobile phone and follow the steps on the screen.

After the successful activation of your 2-step authentication you will be redirected to the AVL Extranet Cloud automatically where you can proceed with the login.

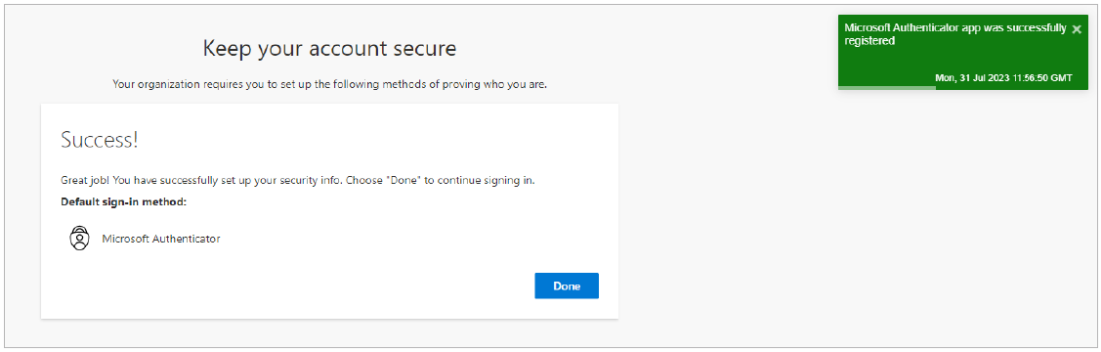


FIGURE 15: AVL EXTRANET CLOUD WINDOW – MICROSOFT AUTHENTICATOR APP SUCCESSFULLY REGISTERED.

4.1.3 ARCHIMEDES templates

Following the Technical Annex, ARCHIMEDES has developed report and presentation templates to ensure a coherent appearance of all project-related documentation. The project templates / slide master documents are in AVL Extranet Cloud:

06_TEMPLATES.

The folder contains templates for Word and Excel Files (*e.g.* Minutes of Meetings, Interim Reports and Deliverables).

4.1.4 Questions regarding AVL Extranet Cloud, contact & email list or project templates

Please address any question regarding the tools used for consortium internal communication to (Katrin Al Jezany, katrin.aljezany@avl.com).

4.2 Project meetings

ARCHIMEDES will make extensive use of electronically supported virtual meetings to ensure frequent updates and synchronization between all partners. The partners will be using virtual desktop and file share systems along with video and phone conferences, which have already been put in place during the ARCHIMEDES proposal preparation. It is envisaged that all project partners will meet at least once per year, however depending on overall requirements and progress. Work package meetings and task meetings will be more frequent, e.g. WP meetings will take place at least every month (virtual or physical).

4.2.1 Face-to-face communication

There will also be annual meetings with the General Assembly and the Advisory Board, where any participant may raise issues for discussion and resolution. As the WP and SC leaders have major common technical interests, additional communication and joint ownership of technical issues will be achieved. Finally, the leaders of each task and demonstrator will ensure the regular communication among the partners in each task. Emergency face-to-face meetings in case of unforeseen circumstances may be scheduled if the timeframe and availability of participants allows it. Otherwise, these shall take place in form of telephone conferences to allow a quick decision-making process.

4.2.2 Time schedule of management meetings

The following table (Table 3: Management meetings) provides an overview on the management meetings foreseen during the lifetime of the project.

TABLE 3: MANAGEMENT MEETINGS

Meetings	Project Management Team	Advisory Board	General Assembly
Kick-off	X	X	X
Month 1	X		
Month 2	X		
Month 3	X		
Month 4	X		
Month 5	X		
Month 6	X		
Month 7	X		
Month 8	X		
Month 9	X		
Month 10	X	X	X
Month 11	X		
Month 12	X		
Month 13	X		
Month 14	X		
Month 15	X		
Month 16	X		
Month 17	X		
Month 18	X		
Month 19	X		
Month 20	X	X	X
Month 21	X		
Month 22	X		
Month 23	X		
Month 24	X		
Month 25	X		
Month 26	X		
Month 27	X		
Month 28	X		
Month 29	X		
Month 30	X	X	X
Month 31	X		
Month 32	X		
Month 33	X		
Month 34	X		
Month 35	X		
Month 36	X	X	X

Annual meetings and/or the final meeting will - if possible and feasible - take place at a location where demonstration activities will be carried out.

4.3 Project external communication

The strategy to communicate the project's achievement to the interested community and to the public is described in section 2.2.2 of the Technical Annex as well as in the dedicated *Deliverable D7.1 "Initial Dissemination, Communication and Exploitation Plan".* The rules are described in section 8.4 of the PCA, making reference to the confidentiality regulations in section 10 of the PCA.

4.3.1 Rules set in the PCA

For the avoidance of doubt, no contents of this document have impact on the confidentiality obligations set out in section 10 of the PCA.

4.3.1.1 Dissemination of Results

During the Project and for a period of 3 years after the end of the Project ("Dissemination Survival Period"), the Dissemination of own Results as well as jointly owned Results by one or several Parties including but not restricted to publications and presentations, shall be governed by the procedure of Article 17.4 of the Grant Agreement and its Annex 5, Section Dissemination, subject to the following provisions.

Prior written notice of any planned Dissemination shall be given to the other Parties at least 30 calendar days before submission of the publication to the publisher (not to be taken as the actual publication date. Any objection to the planned publication shall be made in accordance with the Grant Agreement by written notice to the Coordinator and to the Party or Parties proposing the Dissemination within 25 calendar days after receipt of the notice. If no objection is made within the time limit stated above, the publication is permitted, provided that no Confidential Information, unpublished Background or Results of other Parties is included in the publication.

An objection is justified if

a) a) the protection of the objecting Party's Results or Background would be adversely affected, or

b) the objecting Party's Legitimate Interests would be significantly harmed, or

c) the proposed publication includes Confidential Information of the objecting Party.

The objection has to include a precise request for necessary modifications.

If an objection has been raised the involved Parties shall discuss how to overcome the justified grounds for the objection on a timely basis (for example by amendment to the planned publication and/or by protecting information before publication) and the objecting Party shall not unreasonably continue the opposition if appropriate measures are taken following the discussion.

The objecting Party can request a publication delay of not more than 60 calendar days from the time it raises such an objection. After 60 calendar days the publication is permitted, provided that the objections of the objecting Party have been addressed.

4.3.1.1 Dissemination of another Party's unpublished Results or Background

A Party shall not include in any Dissemination activity another Party's Results, Background or Confidential Information even if such Results, Background or Confidential Information is amalgamated with Party´s Results without obtaining the owning Party's prior written approval.

For the avoidance of doubt, the mere absence of an objection according to 8.4.2.2 is not considered as an approval. Notwithstanding the foregoing, the Parties shall endeavor to cooperate and provide to the publishing Party, within a reasonable period of time, the confirmation of their objection to the dissemination of such objecting Party's Results, Background or Confidential Information.

4.3.1.2 Cooperation obligations

The Parties undertake to cooperate to allow the timely submission, examination, publication and defense of any dissertation or thesis for a degree that includes their Results, Background or Confidential Information subject to the confidentiality and publication provisions agreed in this Consortium Agreement. The disclosure of Confidential Information to the student's supervisor and supervising university not being part of the Consortium for the purpose of the respective supervision is permitted on a need to know basis as long as they are bound by a confidentiality obligation no less stringent than the terms and conditions as provided in Section 10.

4.3.1.3 Use of names, logos or trademarks

Nothing in this Consortium Agreement shall be construed as conferring rights to use in advertising, publicity or otherwise the name of the Parties or any of their logos or trademarks without their prior written approval.

4.3.2 Process handling the rules set in the PCA

Please note: The following dissemination process is compatible with the rules set in the consortium agreement. The rules are quite strict. The PMT has already started working on a suitable process to suit the needs of all partners (i.e. both from academia and from industry). This process description will be included in the next update of the project handbook.

4.3.2.1 How to disseminate the intended publication 30 days in advance to publication

The intended presentation/publication needs to be uploaded by the persons intending to publish to AVL Extranet Cloud into the folder „ 09_DISSEMINATION_MATERIAL/05_PUBLICATIONS“

05_PUBLICATIONS

Please make sure that the uploaded intended publication includes the name of the main contact person and the conference/journal where it shall be published.

4.3.2.2 Duties of the partner intending to publish

The partner having uploaded a new publication sends a notification email to Katrin Al Jezany and (Katrin.aljezany@avl.com) dissemination leader Urte Steikūniene (urte@teraglobus.lt).

This notification email shall include:

- Title of the publication
- Main author and email
- Intended conference/magazine and date
- Link to the publication file in AVL Extranet Cloud

The PC will forward the notification email to all partners via the members list (The full ARCHIMEDES contact and e-mail lists can be found here).

In case intervention is needed, the intervening ARCHIMEDES partner indicates his objections to the main author and in copy to the PC as soon as possible (in any case within four weeks after receiving the notice). If there are any objections, the publication or press release will be reworked by the partner intending to publish.

Both parties shall seek in good faith to agree a solution on a timely basis whereby such objection is resolved. The project management should be involved in this case.

If potential objections are resolved, the PC gives the partner intending to publish permission to go ahead. In cases where no solution can be found, the publication must not take place.

4.3.3 Patent applications

The rules for ownership of IPR are set in the PCA.

4.3.4 Acknowledgements

Any dissemination material (including publications) needs to include the following acknowledgment:

Acknowledgement

ARCHIMEDES receives funding within the Chips Joint Undertaking (Chips JU) – the Public-Private Partnership for research, development and innovation under Horizon Europe – and National Authorities under grant agreement n° 101112295.

When possible, dissemination activities and any material funded by the grant must acknowledge EU support and display the European flag (emblem) with funding statement and Chips JU logo.

Any communication or dissemination activity related to the action must use factually accurate information. Moreover, it must indicate the following disclaimer:

"Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the granting authority. Neither the European Union nor the granting authority can be held responsible for them."

5 Project Reporting

Reports are submitted electronically via the Participant Portal (SYGMA). In general, continuous reporting (e.g. deliverables) and periodic reporting (interim and periodic reports) need to be distinguished.

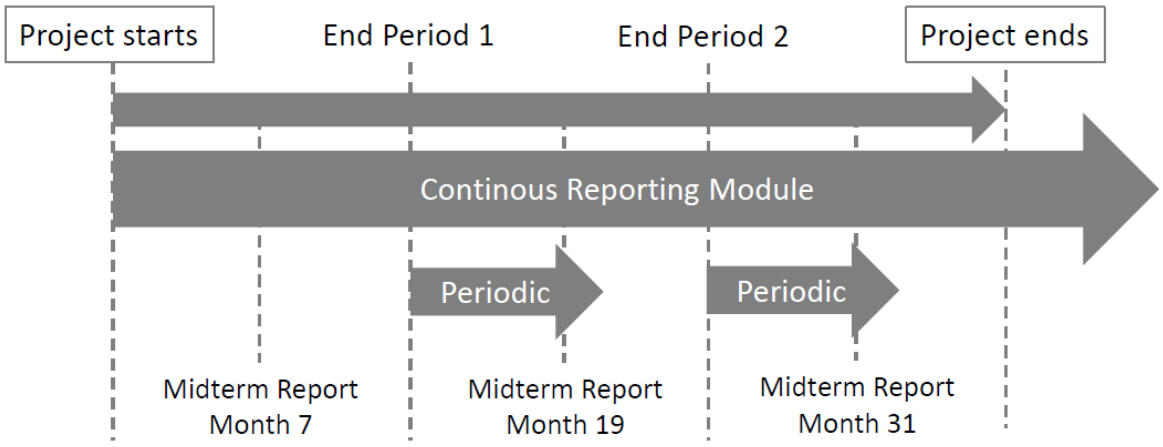


FIGURE 16:PROJECT REPORTING TIMELINE – CONTINUOUS REPORTING & PERIODIC REPORTING

5.1 Project reporting obligations

The following project reports are mandatory:

- Deliverables (as described in DoA, due according to date set in DoA)
- Interim report (see deliverables list)
- Periodic Report (within 60 days following the end of each reporting period)
  - Periodic technical report
  - Periodic financial report
- Final Report (in addition to the periodic report for the last reporting period)
  - Final technical report – summary for publication
  - Final financial report – CFSs

5.2 Project interim reporting

Progress reports will be provided on a half-yearly basis. Interim reports will cover the first 6 months of each reporting period (see schedule above). Reporting will be done as a combination of a participant portal (SYGMA) and a report core (WORD document).

The interim reports shall exclude resource and cost reporting. A template for the interim report core will be provided by the PC. This template will consider all CHIPS JU reporting requirements.

The intermediate reports shall be sufficiently smaller compared to the periodic reports. The focus will be on the progress reports provided by each of the WP leaders.

The intermediate reports are composed of two major parts:

- Publishable summary (SYGMA)
- Progress report (per work package, including dissemination and standardization)

5.3 Periodic project reporting

The periodic reports will cover both, progress documentation, resources and cost reporting. A template for the report core will be provided by the PC. This template will consider all CHIPS JU reporting requirements. Periodic reporting is done via the participant portal (SYGMA), while project progress needs to be explained in a core report (WORD). A template for the core report will be available via the participant portal.

The periodic reporting includes:

- Publishable summary (SYGMA)
- Submitted deliverables (SYGMA)
- Report progress in achieving milestones (WORD, report core)
- Follow-up critical risks (SYGMA)
- Questionnaire on horizontal issues
    - Publications (SYGMA)
    - Communication activities (SYGMA)
    - Rest of questionnaire on horizontal issues (SYGMA)

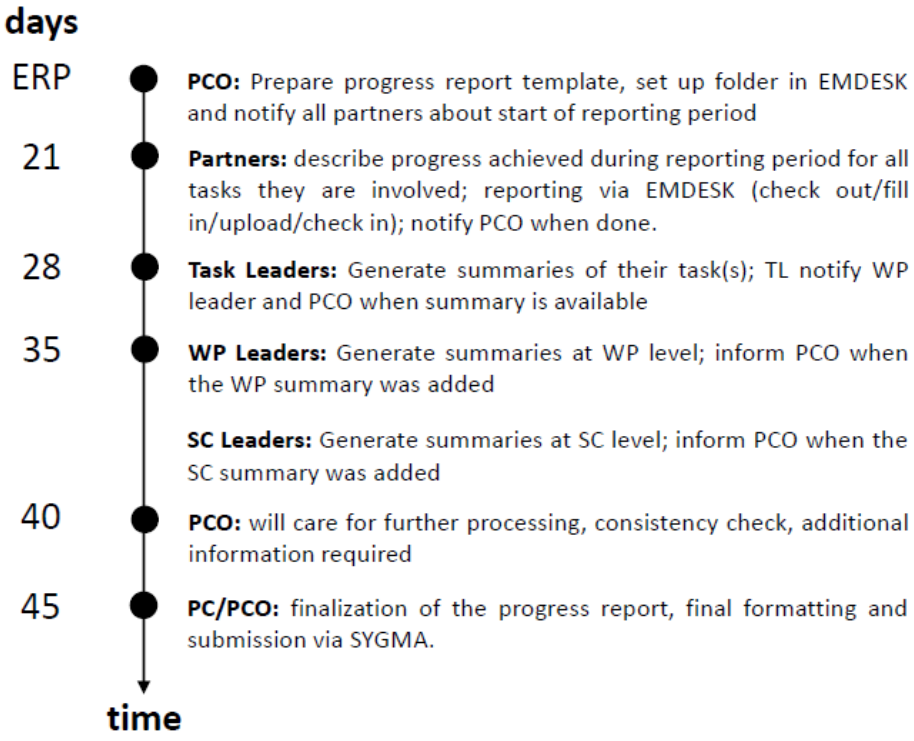
The periodic reports must be provided within 60 days after the end of each reporting period. The review meeting could then take place around the same timeframe. In many projects, the review meeting took place towards the end of the 60 days period, which led to the situation that the reporting needed to be performed in 45 days.

The following timeline is proposed for the periodic reporting (PPR = Periodic Project Report, ERP = End of Reporting Period):

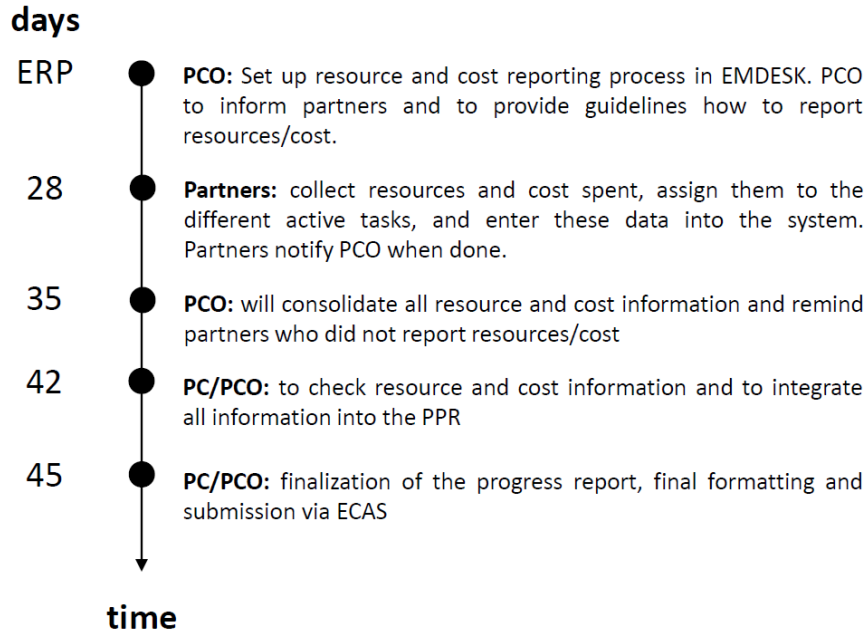
a. Part A: to be entered in SYGMA

- Project summary: To be written by PC and WP leaders (45 days after ERP)
- Project management and implementation: To be written by PC (45 days after ERP)
- Project pathways to impact: To be written by all beneficiaries (45 days after ERP)
- Dissemination and communication activities: PC, Dissemination leader and all beneficiaries (45 days after ERP)

b. Narrative Part: Progress report (WORD document according to CHIPS JU template)

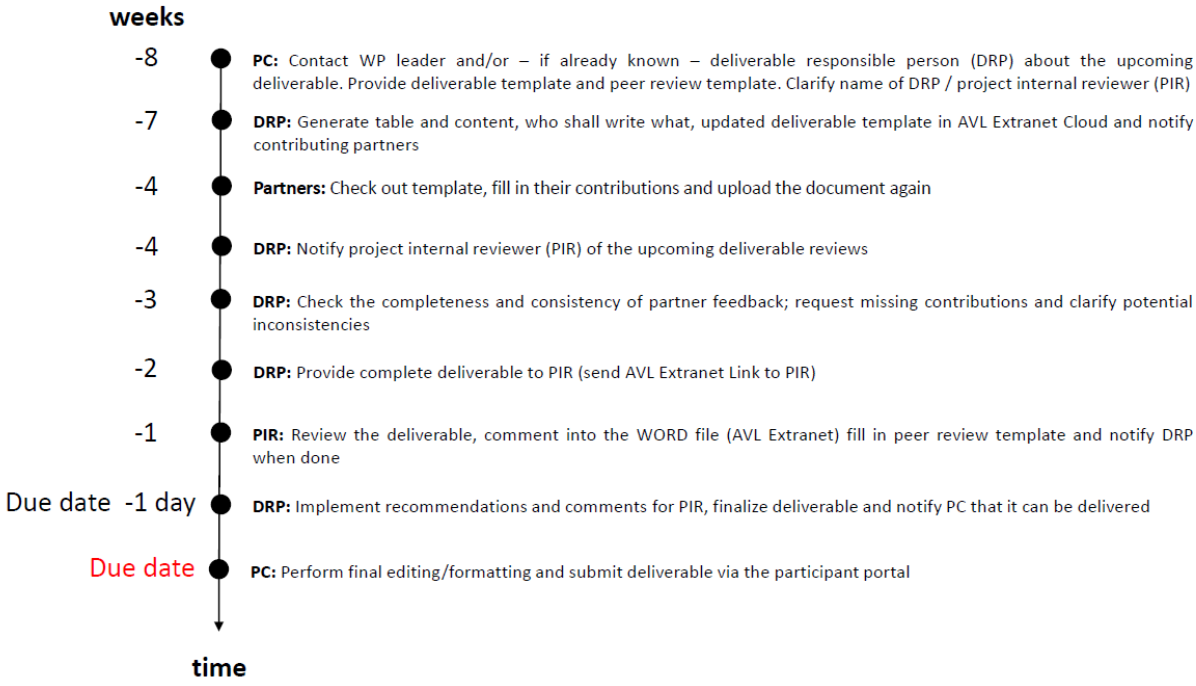


c. Management of resources: financial reporting (efforts and cost)



5.4 Writing project deliverables

Deliverables need to be submitted via the participant portal. The following time schedule shall be applied. Based on this schedule, the start of writing is recommended two months ahead of the due date. As mentioned above, this 2-months period is considered already in the project calendar.



8 weeks (2 months) before the due date: The deliverable responsible partner shall be reminded of the upcoming deliverable by the PC. The deliverable template and peer review document will be provided in a corresponding deliverable folder in AVL Extranet Cloud. If not yet available, the names of the deliverable responsible person (DRP) and the project internal reviewer (PIR) shall be clarified.

7 weeks before the due date: The table of contents including expected partner contributions (and their expected length) shall be added by the deliverable responsible person (DRP) and the adapted template shall be copied to AVL Extranet Cloud. The DRP must inform contributing partners to provide their input.

Latest 4 weeks before the due date: The partners have completed and filled in their contributions.

Latest 4 weeks before the due date: The deliverable responsible person informs the project internal reviewer (PIR) about the upcoming peer review.

Latest 3 weeks before the due date: The deliverable responsible person collects any missing partner contributions and checks for consistency (if necessary, the DRP clarifies inconsistencies with the contributing partners).

Latest 2 weeks before due date: The DRP will upload the complete and consistent deliverable into the predetermined AVL Extranet Cloud deliverable folder (10_DELIVERABLES). Further, the DRP will notify the PIR so that she/he can start with the peer review.

Latest 1 week before due date: The PIR will complete her/his peer review:

- Comments/corrections shall be made into the WORD deliverable document

- An overall view on the deliverable shall be provided by filling in the peer review document
- Both the commented WORD and the filled peer review document will be uploaded to AVL Extranet Cloud by the PIR
- The PIR will notify the DRP when the review is done

Latest one day before the due date, the DRP will have considered/implemented the comments and recommendations from the PIR. The deliverable will be finalized and prepared for submission. The final version of the deliverable needs to be uploaded to AVL Extranet Cloud into the corresponding deliverable folder. The DRP will notify the PC when done.

Due date: The PC will upload the PDF of the deliverable in SYGMA after some minor final editing/formatting, if needed.

6 Quality Management and Assurance

Quality management will be performed through review of project outcomes (deliverables) by the team. As a standard procedure, deliverables are to be reviewed by partners not involved in the generation of that deliverable. The Project Coordinator has the right to have deliverables checked by external experts where appropriate and after signature of a non-disclosure agreement.

A Quality Plan will be set up for the consortium identifying an appropriate workflow between consortium partners and the various roles designed for the project. The goal is to ensure the detection of deviations as early as possible in the project's life cycle and to provide measures how to handle such issues. This will enable the consortium to apply systematically corrective actions or contingency plans, if necessary.

The project progress and results will be assessed with several internal and external control procedures. Quality control and assurance will allow maximum flexibility while maintaining a clear distinction of roles and responsibilities of all partners involved. To this end, the project will establish appropriate mechanisms and procedures, which among others will be described in the Project Manual.

The Project Manual again, will be elaborated according to good practice quality procedures, e.g. ISO 9001:2000. It will carefully define all project tasks and corresponding schedules.

ARCHIMEDES is aiming at a high level of quality of its documents and other deliverables to fulfil the goals and milestone of the project. The scheduling of milestones and deliverables will allow for monitoring the project evolution, measuring the advancements made by qualitative and quantitative evaluations, defining priorities and optimizing project progress by corrective measures.

6.1 Tracking of progress and resource use

The regulations, goals and time schedules of ARCHIMEDES must be complied with. It is important to see whether the objectives will be met in due time and for which tasks extended time or resources will be required.

Therefore, progress and the use of resources in all work packages will be monitored by the Work Package Management Teams. At task level, the Task leaders will take care of it. At work package level, the relevant activities will be subjected to the monitoring through the WP leaders.

ARCHIMEDES is aiming at a high level of quality of its documents and other deliverables to fulfil the goals and milestones of the project. The scheduling of deliverables (see Table 8: List of deliverables) and milestones (see Table 4: List of milestones) will allow for continuous monitoring the project evolution, measuring the advancements made by qualitative and quantitative evaluations, defining priorities and optimizing the project progress by corrective measures.

Activities in ARCHIMEDES will be synchronized over a period of three years by fourteen milestones. With each milestone, the different work package teams with their tasks and partners will deliver individual results according to descriptions, rules and roadmaps. These key innovations from task level to work package level will be the basis for the others to continue with, until the next innovation marks a new milestone.

The Project Coordinator will generate and regularly update a project dashboard to track the project progress (GANTT chart and actual vs. planned deliverable availability) and resource use (Excel file comparing planned and actual person months spent). The project progress will be tracked at least on a half-yearly basis. Along with the progress and resource utilization, monitoring comprises also financial information. Tracking resource and budget data will be done on a yearly basis (in preparation of the review meetings).

As to the overall project, the Innovation and Technology Advisory Board, which is chaired by the Project Coordinator, will assess the general progress and advice on corrections or modifications in the project work. If necessary, it will suggest action items to be taken by the project.

The overall quality assurance and quality management of the project can be considered as a closed loop control, where a continuous project management performs actions to drive the project activities towards the desired objectives and impacts. The project monitoring acts as a feedback channel, ensuring that deviations of the results from the intended objectives are detected in time to enable the project management to perform corrective actions, if required. Main basis of the control process are the legal and contractual documents (at EU and national levels) that define both the required outputs (demonstrators, research results, deliverables, reports, etc.) and the conditions and resources of the work.

TABLE 4: LIST OF MILESTONES

Milestone number	Milestone name	Related work package(s)	Due date
M 8.1	Project kick-off	WP8 Contributing: All active WPs and SCs	m03
M 7.1	Launch of project website	WP7 Contributing: WP8	m03
M 1.1	Mid-Term RP1 technical activities closure	WP1 Contributing: WP2, WP3	m07
M 1.2	Requirements and specifications available; WP1 conclusion.	WP1 Contributing: WP2, WP3	m12
M 8.3	RP2 risk assessment	WP8 Contributing: All active WPs	m15
M 2.1	Initial description of failure mechanisms available	WP2 Contributing: WP3, WP4	m18

Milestone number	Milestone name	Related work package(s)	Due date
M 5	Mid-Term RP2 technical activities closure	WP5 Contributing: WP2, WP3, WP4	m19
M 8.5	RP3 risk assessment	WP8 Contributing: All active WPs	m28
M 3	Architectures and topologies available and verified in simulations; WP3 conclusion.	WP3 Contributing: WP5	m27
M 6.1	Mid-Term RP3 technical activities closure	WP6 Contributing: WP5	m31
M 2.2	Failure mechanisms analysis finalised including feedback loop adaptations.	WP2 Contributing: WP5, WP6	m30
M 4			m33

Milestone number	Milestone name	Related work package(s)	Due date
	Prototypes of components, circuits and implemented algorithms finalised and integrated in demonstrators	WP4 Contributing: WP5	
M 6.2	Validated demonstrators available	WP5, WP6	m36
M 7.2	Project Results Handbook	WP7 Contributing: All project beneficiaries	m36

6.2 Quality assurance bottom-up approach

Quality assurance in ARCHIMEDES will follow a bottom-up process:

- Quality assurance of any deliverable reports by means of the project internal review process (described in Section 5: Project Reporting).
- Regular monitoring of the progress of each individual task of each work package and supply chain in the WP and SC meetings (almost every three months); each presentation shall include the following:
    - A summary of the achieved results
    - A self-assessment (traffic light) of the status in each task compared to the plan (please find the detailed WP GANTT charts and Task leaders in the appendix of this document)
        - Green: all objectives can be achieved; delay of maximum one month compared to the plan; no fallback solutions required
        - Yellow: all objectives can still be achieved; delay between 1-3 months compared with the plan; minor changes required and fallback solutions in place
        - Red: major changes required or delay larger than 3 months compared to the plan
    - WP meeting minutes shall summarize the status of the work package including the individual tasks
    - SC meeting minutes shall summarize the status of the supply chain including the individual demonstrator status
- Regular monitoring of the ARCHIMEDES project progress as a whole by means of the intermediate progress reports and the periodic progress report (every 6 months)
- Regular monitoring of the project status within the frame of the General Assembly meetings (on yearly basis)

- Regular monitoring of the project progress (including all deliverables due in a reporting period) and the resources used within the technical reviews organized by Chips JU (on a yearly basis)
- Regular monitoring of the project progress (including all deliverables due in a reporting period) and the resources used within the technical reviews organized by CHIPS JU (on a yearly basis)

7 Risk Management & Project Implementation Risks

General and specific risks are inherent in the organization and execution of a project. For a project of the size of ARCHIMEDES, special care must be taken for risk management. Minor conflicts must be resolved at WP level, major issues at project level and details to be regulated in the consortium agreement.

The project set up a project-internal Risk Management to:

- Identify and proactively manage all risks related to the project (both internal and external)
- Track and continuously review all project risks in a risk register
- Implement and, if required, initiate suitable risk mitigation strategies

Once a risk is identified, it will be analyzed for further decision processing. The following definitions will be used to indicate the individual risk status:

  - Low: not expected to have serious impact
  - Medium: significant impact on tasks and/or work packages, but not expected to impact project milestones
  - High: major impact on the project and possible serious consequences to tasks, work packages and/or the entire project; likely to affect a milestone
  - Unacceptable: priority attention; no affected work package or task will be allowed to proceed, unless the WP leader or Project Coordinator manages to erase it or at least mitigate its potential impact or find a contingency plan

During the proposal preparation phase, several project risks were identified, which could influence the success of the project. These were transferred into SYGMA during the contract preparation phase (see “Critical Risks” tab). This list does not contain specific risks in the development processes within the different work packages and tasks. Those are associated with the appropriate milestones, where suitable decisions will be made. Nevertheless, any additional risk will be added to SYGMA within the frame of “continuous project reporting”.

As to the risk management, ARCHIMEDES will use a bottom-up approach:

- Task leaders collect a risk report for their activities after kick-off and two months prior to each GA meeting.

- The reports will be forwarded to the WP leaders who will discuss them with the PMT and compile a WP risk report, which is submitted to the PC two working weeks later.
- The PC collects the individual risk reports and presents them to the PMT one working week later.
- The PC schedules a phone conference with the PMT where the risk report is being discussed and remedial actions are being decided. The conclusions are collected by the PC and added to the risk report. The PC presents the risk report at the GA and at the annual Project Board meetings, where actions might be decided.

In case of failure to manage the consortium, resources will be reallocated to strengthen certain efforts, and a change of consortium partners will be considered. In case a partner resigns from the consortium for his own reasons, the coordinator will in advance prepare a list of potential qualified partners and respond promptly to recruit another partner together with the respective Country Coordinator of the resigning partner. The PC will monitor the performance of the partners. In collaboration with the Work Package Management Team, he will look for early signs of non-performance of any of the partners (i.e. he will check if partners fail to comply with their obligations to the consortium) and communicate the results with the respective Country Coordinator.

A list of critical risks can be found in Section 10.6 of this document, see also the list of deliverables provided in Section 10.6.

8 Conclusion

For a project with about 50 partners, and 8 work packages, the precise definition of processes is mandatory for stringent execution of a successful project.

Management processes, decision processes, project monitoring and controlling go hand in hand with suitable risk management and quality assurance mechanisms.

The processes described in this handbook show that ARCHIMEDES has developed suitable processes for successful project execution, risk assessment and quality assurance.

Also, it must be noted that this handbook is considered a living document. In case there is a need to define further processes or tools, the project handbook will be updated accordingly.

9 References

[1] Project Grant Agreement (PGA), Initial version, Project Grant Agreement, Annex 1, Part A (Administrative Data), Project Grant Agreement (PGA), Annex 1, Part B (Technical Annex), Effort table (per WP, per task, per partner, per period), Project Consortium Agreement, A-IQ Ready Reporting Procedures can all be accessed on ECAS and on AVL Extranet Cloud.

10 Appendix

10.1 List of participants

A list of the ARCHIMEDES Participants is shown in Table 5.

TABLE 5: LIST OF ARCHIMEDES PARTICIPANTS.

Participant No	Participant organisation name	Participant short name	Type	Country	National eligibility checked by participant (Y/N)
1	AVL List GmbH	AVL	LE	Austria	Y
2	Lionizers GmbH	LION	SME	Germany	Y
3	STMicroelectronics SA	ST-SA	LE	France	Y
3.1	Affiliated: STMicroelectronics SAS Grenoble	STGNB	LE	France	Y
3.2	Affiliated: STMicroelectronics SAS Rousset	STROU	LE	France	Y
4	STMicroelectronics SRL	ST-SRL	LE	Italy	Y
5	Mercedes-Benz AG	MBAG	LE	Germany	Y
6	Laboratoire de Génie Electrique de Grenoble	INP-GRE	RES	France	Y
6.1	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE	CNRS	RES	France	Y
6.2	UNIVERSITE GRENOBLE ALPES	UGA	RES	France	Y
7	Commissariat à l'énergie atomique et aux énergies alternatives	CEA	RES	France	Y
8	Université Gustave Eiffel	UNIEIFF	RES	France	Y
9	STMicroelectronics Silicon Carbide AB	ST-SE	LE	Sweden	Y
10	Ostbayerische Technische Hochschule Amberg-Weiden	OTH	RES	Germany	Y
11	IFP Énergies Nouvelles	IFPEN	RES	France	Y
12	IRT St Exupery	IRT	RES	France	Y
13	RWTH Aachen University	RWTH	RES	Germany	Y
14	Riga Technical University	RTU	RES	Latvia	Y
15	MURATA INTEGRATED PASSIVE SOLUTIONS	MURATA	LE	France	Y

16	*NextMove*	*NextMove*	*RES*	*France*	*Y*
17	*Renault s.a.s.*	*RENAULT*	*LE*	*France*	*Y*
18	*SAFRAN ELECTRICAL & POWER S.A.S*	*SAFRAN*	*LE*	*France*	*Y*
19	*Schneider Electric*	*SE*	*LE*	*France*	*Y*
20	*Sherpa Engineering*	*SHERPA*	*SME*	*France*	*Y*
21	*SOITEC SA*	*SOITEC*	*LE*	*France*	*Y*
22	*Vysoké učení technické v Brně*	*BUT*	*RES*	*Czech Republic*	*Y*
23	*Teraglobus*	*TG*	*SME*	*Lithuania*	*Y*
24	*Elektronikas un datorzinatnu instituts*	*EDI*	*RES*	*Latvia*	*Y*
25	*Valeo Systemes de Contrôle Moteur SaS*	*VALEO*	*LE*	*France*	*Y*
26	*Uberwatch GmbH*	*UW*	*SME*	*Germany*	*Y*
27	*Vitesco TECHNOLOGIES FRANCE*	*VITESCO*	*LE*	*France*	*Y*
28	*Watt and Well S.A.S*	*W&W*	*SME*	*France*	*Y*
29	*SafeTRANS e.V.*	*STRANS*	*RES*	*Germany*	*Y*
30	*Infineon Technologies Austria AG*	*IFAT*	*LE*	*Austria*	*Y*
31	*INFORMATION TECHNOLOGY FOR MARKET LEADERSHIP*	*ITML*	*SME*	*Greece*	*Y*
32	*Silicon Austria Labs GmbH*	*SAL*	*RES*	*Austria*	*Y*
33	*Tokyo Electron Europe Ltd (TEEAC)*	*TEL*	*LE*	*Ireland*	*Y*
34	*Institut mikroelektronických aplikací s.r.o.*	*IMA*	*LE*	*Czech Republic*	*Y*
35	*Virtual Vehicle Research GmbH*	*VIF*	*RES*	*Austria*	*Y*
36	*Universität Stuttgart*	*ILH*	*RES*	*Germany*	*Y*
37	*IDEAS & MOTION SRL*	*I&M*	*SME*	*Italy*	*Y*
38	*Montanuniversität Leoben*	*MUL*	*RES*	*Austria*	*Y*
39	*Technische Universitaet Graz*	*TUG*	*RES*	*Austria*	*Y*
40	*Harokopio University of Athens*	*HUA*	*RES*	*Greece*	*Y*
41	*TTTech Auto Germany*	*TADE*	*LE*	*Germany*	*Y*
42	*Advantec GmbH*	*ADVANTEC*	*SME*	*Germany*	*Y*
43	*PSA AUTOMOBILES SA (Stellantis)*	*STLA*	*LE*	*France*	*Y*

44	*FRIEDRICH-ALEXANDER-UNIVERSITAET ERLANGEN-NUERNBERG*	*FAU*	*RES*	*Germany*	*Y*
45	*iCTLab SRL*	*iCTLab*	*RES*	*Italy*	*Y*
46	*PUMACY Technologies AG*	*PUMACY*	*SME*	*Germany*	*Y*
47	*Flexible Elektrische Netze*	*FEN*	*SME*	*Germany*	*Y*
48	*AVL Software and Functions GmbH*	*AVL-SFR*	*LE*	*Germany*	*Y*
49	*INDUSTRIAL TECHNOLOGY RESEARCH INSTITUTE*	*ITRI*	*RES*	*Taiwan*	*Y*

10.2 GANTT chart of the project

A Gantt Chart of the ARCHIMEDES project is shown in Table 6.

TABLE 6: GANTT CHART OF THE ARCHIMEDES PROJECT.

			Year 1				Year 2				Year 3			
WP1	**Requirements, Specifications and Current Standards**	**m01-m12**	m01			m12								
Tasks	***Title***	***Task duration***	*1-3*	*4-6*	*7-9*	*10-12*	*13-15*	*16-18*	*19-21*	*22-24*	*25-27*	*28-30*	*31-33*	*34-36*
Task 1.1 [SC1]	Requirements and specifications for on-board charger and HVLV DCDC	m01 - m12	m01			m12								
Task 1.2 [SC2]	Requirements and specifications for long-life automotive powertrain	m01 - m12	m01			m12								
Task 1.3 [SC3]	Requirements, specifications and current standards for emergency response, perception and energy storage device management systems	m01 - m12	m01			m12								
Task 1.4 [SC4]	Requirements, specifications and current standards for power module used in aerospace propulsion application	m01 - m12	m01			m12								
Task 1.5 [SC5]	Requirements, specifications and current standards for long-life ECS in industrial applications	m01 - m12	m01			m12								
WP2	**Failure Mechanisms for Components and Systems**	**m03-m30**	m03									m30		
Tasks	***Title***	***Task duration***	*3*	*4-6*	*7-9*	*10-12*	*13-15*	*16-18*	*19-21*	*22*	*25-27*	*28-30*	*31-33*	*34-36*
Task 2.1 [SC1]	Analysis of failure mechanisms in on-board chargers and HVLV DCDC	m03-m30	m03					m18				m30		
Task 2.2 [SC2]	Analysis of failure mechanisms and operation time limits in automotive powertrain and related components	m03-m30	m03					m18				m30		
Task 2.3 [SC3]	Failure mechanism assessment for energy response, perception and energy storage device management systems	m03-m30	m03					m18				m30		
Task 2.4 [SC4]	Failure mechanism assessment for power module used in aerospace propulsion application	m03-m30	m03					m18				m30		
Task 2.5 [SC5]	Failure mechanism assessment for long-life ECS in industrial applications	m03-m30	m03					m18				m30		
WP3	**Systems Architecture and Modelling, Simulation and Digital Twins**	**m03-m27**	m03								m27			
Tasks	***Title***	***Task duration***	*3*	*4-6*	*7-9*	*10-12*	*13-15*	*16-18*	*19-21*	*22-24*	*25-27*	*28-30*	*31-33*	*34-36*
Task 3.1 [SC1]	On-board charger topology, reliability modelling and simulation	m03-m27	m03						m20		m27			
Task 3.2 [SC2]	Topologies, architectures and simulation tools for long-life automotive powertrain	m03-m27	m03						m20		m27			
Task 3.3 [SC3]	Architectures, simulations, and digital twins of systems for emergency response, perception and energy storage device management	m03-m27	m03						m20		m27			
Task 3.4 [SC4]	Architectures, simulations and digital twins for power module used in aerospace propulsion application	m03-m27	m03						m20		m27			
Task 3.5 [SC5]	Architectures, simulations, and digital twins of long-life ECS in industrial applications	m03-m27	m03						m20		m27			
WP4	**Systems Development – Components, Sensors, Electronics, Embedded HW, Algorithms and SW**	**m10-m33**				m10							m33	
Tasks	***Title***	***Task duration***	*1-3*	*4-6*	*7-9*	*10-12*	*13-15*	*16-18*	*19-21*	*22-24*	*25-27*	*28-30*	*31-33*	*34-36*
Task 4.1 [SC1]	Design of control of on-board charger, electronics prototyping	m10-m33				m10				m24			m33	
Task 4.2 [SC2]	Development of components, electronics and algorithms for long-life automotive powertrain	m10-m33				m10				m24			m33	
Task 4.3 [SC3]	Development of sensors, electronic components and software components for emergency response, perception and energy storage device management systems	m10-m33				m10				m24			m33	
Task 4.4 [SC5]	Design of off-board charging prototype, its control, the software for long-life ECS in industrial applications	m10-m33				m10				m24			m33	
WP5	**Systems and Frameworks Integration**	**m12-m36**				m12								m36
Tasks	***Title***	***Task duration***	*1-3*	*4-6*	*7-9*	*10-12*	*13-15*	*16-18*	*19-21*	*22-24*	*25-27*	*28-30*	*31-33*	*34-36*
Task 5.1 [SC1]	Integration and commissioning of on-board charger with increased life	m12-m36				m12							m33	m36
Task 5.2 [SC2]	Integration and commissioning of automotive powertrain with increased life-time	m12-m36				m12							m33	m36
Task 5.3 [SC3]	Integration of hardware and software components for emergency response, perception, and energy storage device management systems	m12-m36				m12							m33	m36
Task 5.4 [SC5]	Integration of hardware and software components for long-life ECS in industrial applications	m12-m36				m12							m33	m36
WP6	**Validation and Tests**	**m25-m36**									m25			m36
Tasks	***Title***	***Task duration***	*1-3*	*4-6*	*7-9*	*10-12*	*13-15*	*16-18*	*19-21*	*22-24*	*25-27*	*28-30*	*31-33*	*34-36*
Task 6.1 [SC1]	Validation and tests of on-board charger and HVLV DCDC with increased life-time	m25-m36									m25			m36
Task 6.2 [SC2]	Validation and tests of automotive powertrain with increased life	m25-m36									m25			m36
Task 6.3 [SC3]	Test and validation of systems for emergency response, perception and energy storage device management	m25-m36									m25			m36
Task 6.4 [SC5]	Test and validation of systems for long-life ECS in industrial applications	m25-m36									m25			m36
WP7	**Standardisation, Dissemination and Exploitation**	**m01-m36**	m01											m36
Tasks	***Title***	***Task duration***	*1-3*	*4-6*	*7-9*	*10-12*	*13-15*	*16-18*	*19-21*	*22-24*	*25-27*	*28-30*	*31-33*	*34-36*
Task 7.1 [all SCs]	Strategies for impact via wide engagement, requirements for viable business cases and adaptation of use cases and technologies	m01-m36	m03			m12				m24				m36
Task 7.2 [all SCs]	Results dissemination and communication	m01-m36	m03		m06	m12				m24				m36
Task 7.3 [all SCs]	Project results exploitation	m01-m36	m03					m18						m36
Task 7.4 [all SCs]	Standardization, certification, and ethical aspects	m01-m36	m01			m12				m22				m36
WP8	**Project Management and Projects Clustering**	**m01-m36**	m01											m36
Tasks	***Title***	***Task duration***	*1-3*	*4-6*	*7-9*	*10-12*	*13-15*	*16-18*	*19-21*	*22-24*	*25-27*	*28-30*	*31-33*	*34-36*
Task 8.1	Consortium, contracts and legal management	m01-m36	m01	m06	m07				m19				m31	m36
Task 8.2	Operational Project Management, administrative and financial coordination	m01-m36		m06	m07				m19				m31	m36
Task 8.3	Quality and Change Management – continuous risk Assessment	m01-m36		m06										m36
Task 8.4	Management of intellectual property rights	m01-m36	m01											m36
Task 8.5	Liaison with other projects – project clustering and partner-project interfaces	m01-m36								m24				m36

Deliverable

Task titles are shortened, see full titles in WPs description

10.3 Work package description

TABLE 7: WORK PACKAGE DESCRIPTION.

Work package No	Work Package Title	Lead Participant No	Lead Participant Short Name	Person-Months	Start Month	End Month
1	Requirements, Specifications and Current Standards	45	STLA	259.1	m01	m12
2	Failure Mechanisms for Components and Systems	14	IRT	774	m03	m30
3	Systems Architecture and Modelling, Simulation and Digital Twins	22	SHERPA	574.7	m03	m27
4	Systems Development – Components, Sensors, Electronics, Embedded HW, Algorithms and SW	32	IFAT	952.25	m10	m33
5	Systems and Frameworks Integration	37	VIF	450	m12	m36
6	Validation and Tests	1	AVL	479.1	m25	m36
7	Standardisation, Dissemination and Exploitation	18	NEXTMOVE	320.1	m01	m36
8	Project Management and Projects Clustering	1	AVL	93.1	m01	m36
			Total	**3902.35**		

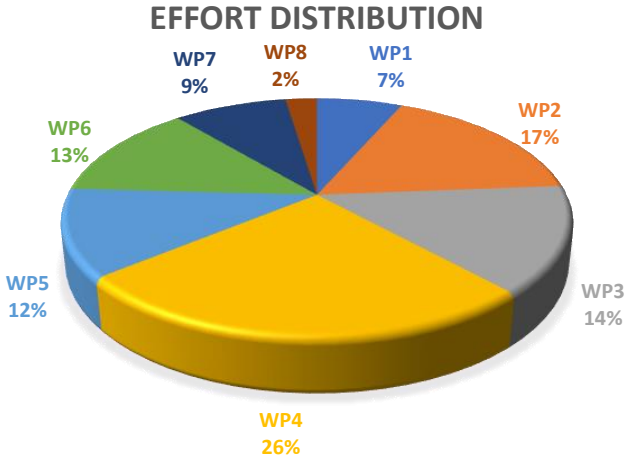


FIGURE 17: WORK PACKAGE EFFORT DISTRIBUTION.

10.4 List of deliverables

TABLE 8: LIST OF DELIVERABLES

Task Reference	Deliverable Number	Deliverable name / Short Description	Work Package	Short name of lead participant	Type	Dissemination Level	Delivery date (in months)
T1.1	D1.1.1	Report on Requirements, Specifications and Current Standards for On-Board Charger Considering different use cases of on-board charger, requirements on its operating conditions, functionality, reliability, and testing scenarios will be provided in this report.	WP1	RENAULT	R	SEN	m12
T1.2	D1.2.1	Report on Requirements, Specifications and Current Standards for Long-Life Automotive Powertrain This report provides the requirements on components of automotive powertrain, on powertrain itself, and on testing procedures with the goal to extend its lifetime.	WP1	AVL	R	SEN	m12
T1.3	D1.3.1	Report on Requirements, Specifications and Current Standards for Emergency Response, Perception and Energy Storage Management Systems The aim of this report is to provide requirements and specifications for the use-cases defined in SC3, i.e., on emergency response robotic dog, on failure mode description, and on critical parameters for battery cells and module.	WP1	IFAT	R	SEN	m12
T1.4	D1.4.1	Report on Requirements, Specifications and Current Standards for Power Modules in Aerospace Propulsion Applications Based on requirements coming from the analysis of different mission profiles of the commercial aircraft, requirements on propulsion system down to SiC device will be provided.	WP1	SAFRAN	R	SEN	m12
T1.5	D1.5.1	Report on Requirements, Specifications and Current Standards for Long-Life ECS in Industrial Applications Report describing requirements on the design of off-board charger and industrial applications equipped with long-life ECS.	WP1	SE	R	SEN	m12

Task Reference	Deliverable Number	Deliverable name / Short Description	Work Package	Short name of lead participant	Type	Dissemination Level	Delivery date (in months)
T2.1	D2.1.1	Interim Report on Analysis of Failure Mechanisms in On-Board Chargers Intermediate description of failure mechanisms of power and cooling systems linked with WBG technologies. Initial investigation of ageing indicators and failure mechanisms.	WP2	IRT	R	SEN	m18
T2.1	D2.1.2	Final Report on Analysis of Failure Mechanisms in On-Board Chargers Final report on description of failure mechanisms of power and cooling systems linked with WBG technologies and on investigation of ageing indicators and failure mechanisms.	WP2	IRT	R	SEN	m30
T2.2	D2.2.1	Interim Report on Analysis of Failure Mechanisms and Operation Time Limits in Automotive Powertrain and Related Components The report analysing main physical causes of the failure of automotive powertrains with the emphasis on WBG components failures.	WP2	CEA	R	SEN	m18
T2.2	D2.2.2	Final Report on Analysis of Failure Mechanisms and Operation Time Limits in Automotive Powertrain and Related Components This report will summarize proposed test procedures for accelerated lifetime testing of powertrains and their components.	WP2	CEA	R	SEN	m30
T2.3	D2.3.1	Interim Report on Failure Mechanism Assessment for Energy Response, Perception and Energy Storage Device Management Systems This deliverable will analyse mechanisms and processes that cause failures in MEMS devices and in battery packs.	WP2	ST-SRL	R	SEN	m18
T2.3	D2.3.2	Final Report on Failure Mechanism Assessment for Energy Response, Perception and Energy Storage Device Management Systems	WP2	ST-SRL	R	SEN	m30

Task Reference	Deliverable Number	Deliverable name / Short Description	Work Package	Short name of lead participant	Type	Dissemination Level	Delivery date (in months)
		The report summarizing identified failures in MEMS devices for perception, in battery packs and in communication systems.					
T2.4	D2.4.1	Interim Report on Failure Mechanism Assessment for Power Module Used in Aerospace Propulsion Application Analysis of the physics of failure of SiC devices and power modules at high altitudes.	WP2	IRT	R	SEN	m18
T2.4	D2.4.2	Final Report on Failure Mechanism Assessment for Power Module Used in Aerospace Propulsion Application Proposed set of tests that will enable to capture aging mechanism and permit lifetime estimations of existing SiC devices and power modules.	WP2	IRT	R	SEN	m30
T2.5	D2.5.1	Interim Report on Failure Mechanism Assessment for Long-Life ECS in Industrial Applications Analysis of specific failures of passive cooled GaN converter in the application of the off-board charger and in industrial applications.	WP2	ST-SRL	R	SEN	m18
T2.5	D2.5.2	Final Report on Failure Mechanism Assessment for Long-Life ECS in Industrial Applications The report outlining the understanding of ageing processes in GaN converters and the evolution of identified failures.	WP2	ST-SRL	R	SEN	m30
T3.1	D3.1.1	Models for Simulation of On-Board Charger The deliverable consists of set of models of on-board charger to be used for charger topology simulation	WP3	VITESCO	OTHER	SEN	m20
T3.1	D3.1.2	Report on Topologies, Modelling and Simulation of On-Board Chargers Report describing development process of on-board charger and design and properties of simulation models	WP3	VITESCO	R	SEN	m27
T3.2	D3.2.1	Models for Simulation of Automotive Powertrain	WP3	IFPEN		SEN	m20

Task Reference	Deliverable Number	Deliverable name / Short Description	Work Package	Short name of lead participant	Type	Dissemination Level	Delivery date (in months)
		Set of models for study of faulty powertrain behaviour and design of fault mitigation strategies.			OTHER		
T3.2	D3.2.2	Report on Topologies, Modelling and Simulation of Automotive Powertrain Report describing fault detection system architecture and development process of powertrain models	WP3	IFPEN	R	SEN	m27
T3.3	D3.3.1	Models for Simulation of Systems for Emergency Response, Perception and Energy Storage Set of simulation models for model-based design of perception systems	WP3	ICTLAB	OTHER	SEN	m20
T3.3	D3.3.2	Report on Topologies, Modelling and Simulation of Systems for Emergency Response, Perception and Energy Storage Report describing topologies of long-life sensor and perception systems and their modelling and simulation	WP3	ICTLAB	R	SEN	m27
T3.4	D3.4.1	Reliability Models for Power Modules in Aerospace Propulsion Application Report describing higher-level modelling of SiC power modules comprising the effect of aging and degradation.	WP3	ST-SA	OTHER	SEN	m20
T3.4	D3.4.2	Report on Architecture, Models and Simulation of Power Modules in Aerospace Propulsion Application Continuation of D3.4.1 in the direction of analysing weak points of SiC power modules and the proposal for their improvement.	WP3	ST-SA	R	SEN	m27
T3.5	D3.5.1	Models of Long-Life ECS in Industrial Applications Description of developed thermal simulation models with integrated failure mechanisms.	WP3	IFPEN	OTHER	SEN	m20
T3.5	D3.5.2	Report on Architectures, Modelling and Simulation of Long-Life ECS in Industrial Applications This report will describe prepared thermal models, for system level 0D/1D modelling and for 3D simulations. The decision about the lifetime of the design is the goal.	WP3	IFPEN	R	SEN	m27

Task Reference	Deliverable Number	Deliverable name / Short Description	Work Package	Short name of lead participant	Type	Dissemination Level	Delivery date (in months)
T4.1	D4.1.1	Prototypes of Components and Electronics for On-board Charger Demonstrator showing prototyped circuit boards for the on-board charger.	WP4	IFPEN	DEM	PU	m24
T4.1	D4.1.2	Control and Diagnostic SW for On-Board Charger First iteration of the software for OBC control, health monitoring and predictive reliability will be available, including OBC digital twin for RUL monitoring.	WP4	INP-GRE	OTHER	SEN	m24
T4.1	D4.1.3	Report on Development of Components, Electronics and SW for On-board Charger The report on designed on-board charger utilizing WBG electronic components, both, from hardware and software point of view.	WP4	IFPEN	R	SEN	m33
T4.2	D4.2.1	Prototypes of Machine and Electronics Demonstrator will proof the existence of e-machine and the inverter for long-life automotive powertrain.	WP4	AVL	DEM	PU	m24
T4.2	D4.2.2	Software for Powertrain Control and Diagnostics Set of software modules for powertrain control, motor, SiC module and inverter diagnostics.	WP4	BUT	OTHER	SEN	m24
T4.2	D4.2.3	Report on Development of Components, Electronics and SW for Long-Life Powertrain The report on development of new generation SiC devices, on their integration in the inverter for long-live operation and on software modules developed in this task.	WP4	BUT	R	SEN	m33
T4.3	D4.3.1	Prototypes of Components, Sensors and Electronics for Emergency Response, Perception and Energy Storage Demonstration of new hardware components for predictive maintenance and monitoring of the emergency response and perception systems for the robotic rescue dog.	WP4	FAU	DEM	PU	m24

Task Reference	Deliverable Number	Deliverable name / Short Description	Work Package	Short name of lead participant	Type	Dissemination Level	Delivery date (in months)
T4.3	D4.3.2	Algorithms and SW for Control and Diagnostic Systems for Emergency Response, Perception and Energy Storage Availability of the software for on-the-fly data compression, for interfacing quantum sensor, AI sensor data analysis and for other topics solved in T4.3.	WP4	EDI	OTHER	SEN	m24
T4.3	D4.3.3	Report on Development of Components, Electronics and SW for Emergency Response, Perception and Energy Storage The report giving the summary on development of the systems for emergency response, perception, and energy storage device management.	WP4	IFAT	R	SEN	m33
T4.4	D4.4.1	Prototypes of Components and Electronics for Off-Board Charger Demonstration of prototype boards for off-board charging system and industrial sector, being equipped with GaN components.	WP4	W&W	DEM	PU	m24
T4.4	D4.4.2	Control and Diagnostic SW for Off-Board Charger At this point, the basic software for off-board chargers and for predictive maintenance of industrial processes will be prepared for further enhancement.	WP4	HUA	OTHER	SEN	m24
T4.4	D4.4.3	Report on Development of Components, Electronics and SW for Off-Board Charger Report on the development of hardware and software for off-board charger with long-life ECS.	WP4	W&W	R	SEN	m33
T5.1	D5.1.1	Demonstrator of On-Board Charger with Increased Lifetime Integrated experimental system of on-board charger demonstrator including necessary instrumentation for its tests.	WP5	IRT	DEM	PU	m33
T5.1	D5.1.2	Report on Integration and Commissioning of the On-Board Charger Report describing design, development and commissioning of the on-board charger demonstrator,	WP5	IRT	R	SEN	m36

Task Reference	Deliverable Number	Deliverable name / Short Description	Work Package	Short name of lead participant	Type	Dissemination Level	Delivery date (in months)
		its interfaces and instrumentation setup for demonstrator tests.					
T5.2	D5.2.1	Demonstrator of Automotive Powertrain with Increased Lifetime Integrated experimental system of automotive powertrain demonstrator including necessary instrumentation for its tests.	WP5	AVL	DEM	PU	m33
T5.2	D5.2.2	Report on Integration and Commissioning of Automotive Powertrain with Increased Lifetime Report describing design, development and commissioning of the automotive powertrain demonstrator, its interfaces and instrumentation setup for demonstrator tests.	WP5	AVL	R	SEN	m36
T5.3	D5.3.1	Set of Demonstrators of Emergency Response, Perception and Energy Storage Integrated experimental systems of emergency response, perception and energy storage demonstrators including necessary instrumentation for its tests.	WP5	VIF	DEM	SEN	m33
T5.3	D5.3.2	Report on Integration and Commissioning of systems for Emergency Response, Perception and Energy Storage Report describing design, development and commissioning of the emergency response, perception and energy storage demonstrators, their interfaces and instrumentation setup for demonstrators tests.	WP5	VIF	R	CO	m36
T5.4	D5.4.1	Demonstrator of Long-Life ECS in Industrial Application Integrated experimental system of bi-directional charger demonstrator including necessary instrumentation for its tests.	WP5	W&W	DEM	PU	m33
T5.4	D5.4.2	Report on Integration and Commissioning of Long-life ECS in Industrial Application Report describing design, development and commissioning of the bi-directional charger	WP5	W&W	R	SEN	m36

Task Reference	Deliverable Number	Deliverable name / Short Description	Work Package	Short name of lead participant	Type	Dissemination Level	Delivery date (in months)
		demonstrator, its interfaces and instrumentation setup for demonstrator tests.					
T6.1	D6.1.1	Report on Validation and Tests of On-Board Charger with Increased Lifetime The report will present results of validation and testing of on-board charger including comparison with requirements from WP1	WP6	IRT	R	PU	m36
T6.2	D6.2.1	Report on Validation and Tests of Automotive Powertrain with Increased Lifetime The report will present results of validation and testing of diagnostic system for long-life powertrain including comparison with requirements from WP1	WP6	MBAG	R	PU	m36
T6.3	D6.3.1	Report on Validation and Tests of Systems for Emergency Response, Perception and Energy Storage Management The report will present results of validation and testing of sensor and perception systems including comparison with requirements from WP1	WP6	PUMACY	R	PU	m36
T6.4	D6.4.1	Report in Validation and Test of Systems for Long-Life ECS in Industrial Applications The report will present results of validation and testing of long-life bi-directional charger in industrial environmentq including comparison with requirements from WP1	WP6	W&W	R	PU	m36
T7.1, T7.2, T7.3	D7.1.1	Initial Dissemination, Communication and Exploitation Plan Broad strategies for stakeholder engagement	WP7	NEXTMOVE	R	PU	m3
T7.2	D7.2.2	Communication Channels and Project Website Project website, communication channels including social networks	WP7	TG	DEC	PU	m3
T7.1, T7.2	D7.3.1	Annual Dissemination Reports & Plan Updates – Year 1	WP7	NEXTMOVE	R	PU	m12

Task Reference	Deliverable Number	Deliverable name / Short Description	Work Package	Short name of lead participant	Type	Dissemination Level	Delivery date (in months)
		Reports on lessons-learned during dissemination activities and update of D&C plans according to improved use-cases					
T7.1, T7.2	D7.3.2	Annual Dissemination Reports & Plan Updates – Year 2 Reports on lessons-learned during dissemination activities and update of D&C plans according to improved use-cases	WP7	NEXTMOVE	R	PU	m24
T7.1, T7.2	D7.3.3	Annual Dissemination Reports & Plan Updates – Year 3 Reports on lessons-learned during dissemination activities and update of D&C plans according to improved use-cases	WP7	NEXTMOVE	R	PU	m36
T7.3	D7.4.1	Updated Exploitation Plans Including Individual Plans The exploitation plan will be set up, giving details about the main exploitable knowledge, products or measures, the timetable for commercial use and the possibilities for IPR protection.	WP7	TG	R	CO	m18
T7.3	D7.4.2	Final Exploitation Plans Including Individual Plans The exploitation plan will be set up, giving details about the main exploitable knowledge, products or measures, the timetable for commercial use and the possibilities for IPR protection.	WP7	TG	R	CO	m36
T7.4	D7.5.1	Standardization State-of-the-Art and Analysis of Gaps Standardization state-of-the-art in close relation with technical WPs and added value provided by analysis of gaps.	WP7	ST-SA	R	PU	m12
T7.4	D7.5.2	Standards and Processes in Relation to *ARCHIMEDES*' Chosen Scenarios, Life Cycle Assessment and Approach Reports on collaborations with relevant industrial initiatives and standardization bodies.	WP7	STGNB	R	PU	m22
T7.4	D7.5.3	Standardisation Proposals Based on Identified *ARCHIMEDES* Demonstrators	WP7	STROU	R	PU	m36

Task Reference	Deliverable Number	Deliverable name / Short Description	Work Package	Short name of lead participant	Type	Dissemination Level	Delivery date (in months)
		Standardisation proposals to ensure uptake of *ARCHIMEDES* solutions in different industrial sectors					
T8.1, T8.4	D8.1.1	Project Handbook This deliverable presents the procedures related to the project management and communication.	WP8	AVL	R	PU	m01
T8.1, T8.2	D8.2.1	Data Management Plan This deliverable presents the envisioned Data Management Plan.	WP8	AVL	DMP	PU	m06
T8.3	D8.3.1	Risk Mitigation Plan A Risk Mitigation Plan is set up.	WP8	AVL	R	SEN	m06
T8.5	D8.4.1	Report on Project Clustering and Synergies Report describing cooperation with other projects and relations to light-house initiatives.	WP8	AVL	R	PU	m24
T8.1, T8.2	D8.5.1	Mid Term Report M06 Regular Report towards the KDT JU is submitted.	WP8	AVL	R	SEN	m07
T8.1, T8.2	D8.5.2	Mid Term Report M18 Regular Report towards the KDT JU is submitted.	WP8	AVL	R	SEN	m19
T8.1, T8.2	D8.5.2	Mid Term Report M30 Regular Report towards the KDT JU is submitted.	WP8	AVL	R	SEN	m31

10.5 List of milestones and criteria

TABLE 9: LIST OF MILESTONES

Milestone number	Milestone name	Related work package(s)	Due date	Means of verification
M 8.1	Project kick-off	WP8 Contributing: All active WPs and SCs	m03	Project Handbook defined. Project Management Team (PMT) established and operations started. Project kick-off with consortium undertaken. Work Package and Supply Chain responsibilities and partner allocations clear. WP1, WP7 activities started. PMT aligns with Project Officer on listed activities.
M 7.1	Launch of project website	WP7 Contributing: WP8	m03	Website available.
M 1.1	Mid-Term RP1 technical activities closure	WP1 Contributing: WP2, WP3	m07	Activities in WP1, WP2, WP3 started and on track. Initial component requirements and specifications adopted in system design, general description of system failure mechanisms established. Mid-Term report for RP1 submitted and aligned with PO.
M 1.2	Requirements and specifications available; WP1 conclusion.	WP1 Contributing: WP2, WP3	m12	All WP1 activities with the definition of requirements and specifications concluded and translated to system design. WP1 conclusion supported by the submission of all required deliverables, acknowledged by WP leader.

Milestone number	Milestone name	Related work package(s)	Due date	Means of verification
M 8.3	RP2 risk assessment	WP8 Contributing: All active WPs	m15	Reassessment of the technical project risks and adjustmend of the risk mittigation plan if required.
M 2.1	Initial description of failure mechanisms available	WP2 Contributing: WP3, WP4	m18	Initial failure analysis established and aligned with the design, initial development activities of the different components in the project. Documented in deliverables D2.1.1, D2.2.1, D2.3.1, D2.4.1, D2.5.1 submitted, acknowledged by WP leader, and supported by WP2 deliverables.
M 5	Mid-Term RP2 technical activities closure	WP5 Contributing: WP2, WP3, WP4	m19	Activities in WP5 started and ongoing: Initial integration and functionality tests performed, component design verified and design update activities ongoing. Mid-Term report for RP2 submitted and aligned with PO.
M 8.5	RP3 risk assessment	WP8 Contributing: All active WPs	m28	Reassessment of the technical project risks and adjustmend of the risk mittigation plan if required.
M 3	Architectures and topologies available and verified in simulations; WP3 conclusion.	WP3 Contributing: WP5	m27	Establishment of final system design and simulations, verification in functional integration tests concluded. All WP3 activities conscluded and documented in the finalized deliverables, acknowledged by WP leader and supported by WP3 deliverables.
M 6.1	Mid-Term RP3 technical activities closure	WP6 Contributing: WP5	m31	Activities in WP6 started and ongoing: Integration of system components in finalization and full system functionality verified, validation and testing of the fully integrated systems ongoing. Mid-Term report for RP3 submitted and aligned with PO.

Milestone number	Milestone name	Related work package(s)	Due date	Means of verification
M 2.2	Failure mechanisms analysis finalised including feedback loop adaptations.	WP2 Contributing: WP5, WP6	m30	Systems design finalized, component development in finalization. All component failure mechanisms - including adaptations - considered for component development and verified in initial tests. All remaining WP2 deliverables submitted, acknowledged by WP leader, and supported by WP2 deliverables.
M 4	Prototypes of components, circuits and implemented algorithms finalised and integrated in demonstrators	WP4 Contributing: WP5	m33	All WP4 deliverables available and submitted, D5.1.1, D5.2.1, D5.3.1, D5.4.1 demonstrators finalised. Acknowledged by WP leaders and supported by WP4 and WP5 deliverables.
M 6.2	Validated demonstrators available	WP5, WP6	m36	All WP5 and WP6 deliverables submitted, project results validated and demonstrated, acknowledged by WP leaders, and supported by WP5 and WP6 deliverables.
M 7.2	Project Results Handbook	WP7 Contributing: All project beneficiaries	m36	Description of project demonstration dissemination and exploitation results.

10.6 List of critical risks for implementation

TABLE 10: LIST OF CRITICAL RISKS

Description of risk (i) likelihood, (ii) severity	Work package(s) involved	Proposed risk-mitigation measures
Harmonised the realistic requirements towards Vehicle to Grid and to Home towards the different electric infrastructure providers missing. (i) medium (ii) medium	WP1 (SC1)	A survey will be done towards the infrastructure provider to create realistic mission profile requirements.
Fail in defining the preliminary specifications of the system. (i) medium (ii) medium	WP1 (SC2, SC3)	An iterative methodology for the development of the different components will be followed to maximize the outcome of the overall solutions. Preliminary specifications will be thus revised and optimized throughout the project until the final integration and validation.
Requirements on the digital twin of the object detection system are affected by use case complexity and customer acceptance. (i) medium (ii) medium	WP1 (SC3)	Involvement of industrial customers with system development partners, early stakeholder consultation, feasibility study, workshops.
Delay of requirements due to the complexity of the project. (i) low (ii) medium	WP1 (SC2, SC3)	The involvement of industrial together with research partners reduces the probability of this risk.
Missing one or several key requirements (i) low (ii) medium	WP1 (SC4)	Going through scale 1 demonstration program that enable to capture the global impact of a non-compliance on a HVDC electrical system Perform design rules modification to counter the non-compliance impact
Limited long-term experience with the GaN technology, limited knowledge from the scientific community that could lead to not cover all failure mechanisms (i) medium (ii) medium	WP2 (SC1, SC2)	The mitigation of the risk will be supported by the actual GANRET project lessons learned.
Delay in the functional safety analysis of specific components . (i) high (ii) low	WP2 (SC3)	Due to lower TRL levels, the functional safety concept and analysis will be planned to be completed at the end of the project, which should

Description of risk (i) likelihood, (ii) severity	Work package(s) involved	Proposed risk-mitigation measures
		allow sufficient time to achieve the expected result.
Sensor components digital characterization with respect to embedding into digital system models. (i) low (ii) high	WP3 (SC3)	Sensor supplier analysis and selection, sensor characteristics analysis, communication with supplier.
Missing one failure mechanism that would then lead to a reduce reliability at component level (i) low (ii) medium	WP2 (SC4)	Adapt power electronic architecture to counter reduce component reliability and / or take margin in the Design phase to trigger a lack of reliability at component level
Capability to define On-Board Charger topology capable to reproduce the different failure mechanism link to Vehicle to Grid and Vehicle to Home. (i) low (ii) low	WP3 (SC1)	To mitigate the risk, the intention of the project is to limit demonstrator at function level of the On-Board charger, such as Power factor corrector of the On-Board Charger (Not to the complete On-Board Charger)
Models, modelling methods or system designs are not available on time. (i) medium (ii) medium	WP3 (SC2, SC3)	Partly usage of state-of-the-art models, methods, simulation frameworks and simulated data to minimize a delay.
Non representativity of the modelling (i) low (ii) medium	WP3 (SC4)	Going through several demonstration program that provide quick feedback on different modelling
Ability to get the results of the modelling in order to understand the failure mechanisms & to take them fully into account for the design (i) low (ii) low	WP3 (SC5)	The risk will be mitigated as the design done within the project will be focused on the Power Factor Corrector of the off-board charger. It is the most important part to work on as it is connected to the grid, loads or local grids.
Availability of the needed components for the prototypes (i) medium (ii) medium	WP4 (SC1)	The anticipation of the need very early in the project timing
As a result of high computational complexity, the pre-processing and useful data extraction from the quantum sensor may not be implemented in digital logic, which would reduce the efficiency and performance. (i) medium (ii) medium	WP4 (SC2, SC3)	Fall-back solution of implementation of data extraction and pre-processing using the processor system (instead of an FPGA) of the demonstrator system's SoC.

Description of risk (i) likelihood, (ii) severity	Work package(s) involved	Proposed risk-mitigation measures
Potential delays in completing sensor and drive components with the planned modifications and developments. (i) medium (ii) high	WP4 (SC2, SC3)	Use of over-the-shelf products, where possible and start the developments early on in the project. When newly developed sensor (i.e., quantum sensor) is delayed, shift focus more on conventional components based on MEMs.
Supply chain shortages for components, not only on the most innovative GaN components, but on whole BOM needed (i) medium (ii) high	WP4 (SC5)	Early definition of the needed components & selection with suppliers of the most fitted & available components to meet the timeline objectives
Complete On-board Charger will not be created a prototype, only sub functions. This will limit the control function development. (i) medium (ii) medium	WP6 (SC1)	Simulation of prototypes.
Software not running in the demonstrators due to hardware incompatibilities. (i) low (ii) medium	WP5 (SC2, SC3)	Close collaboration between software function developers and demonstrator developers. Risk mitigation by using common prototyping environment.
Potential delays in integration of demonstrators. (i) medium (ii) high	WP5 (SC2, SC3)	Assignment of demonstrator leader early on in the project and preparation of the detailed time plan for tracking the integration status on time.
Missing to reach some qualification / validation requirement (i) low (ii) high	WP6 (SC1)	Taking margin in the design process and taking into account during the process the gap identified
Remaining lifetime prediction cannot be validated in final demonstrator due lack of ageing and deterioration (i) high (ii) low	WP6 (SC2)	Demonstrate the functionality of the software by arbitrary fault emulation
Demonstrators not running due to EMC incompatibilities. (i) low (ii) medium	WP6 (SC2, SC3)	Early EMC investigations on sub-component level to assure correct function. Validation tests in limited operation areas.
Potential delays in validation and testing of the demonstrators. (i) high (ii) medium	WP6 (SC2, SC3)	Upon the start of the integration phase, get the demonstrator leaders to prepare a detailed validation and test plan with an achievable time-plan,

Description of risk (i) likelihood, (ii) severity	Work package(s) involved	Proposed risk-mitigation measures
		which shall be used to keep track of the progress.
Missing to reach some qualification / validation requirement (i) high (ii) high	WP6 (SC4)	Adapt power electronic architecture to reach qualification/validation requirement and take margin in the design process and take into account during the process the gap identified
Some qualification, or some requirements may not be reached (i) low (ii) high	WP6 (SC5)	Planning a design lead time allowing for several R&D iterations to take into account that both use cases & components technologies are novel within this project
Inability to operate for extended periods of time at full power with a pure passive cooling system (i) medium, (ii) low	WP6 (SC5)	An intermittent use of an external fan (e.g.<15% of time) would be a back-up option to enhance dissipation while maintaining the long lifetime objective
Insufficient publications and dissemination (i) low (ii) low	WP7	The partners will be encouraged to cooperate towards generating publishable results from early on in the project, and will be requested to achieve clearly defined dissemination goals.
Communication and dissemination plan not enough detailed. Project will not achieve its full potential impact. (i) low (ii) high	WP7	A detailed and well thought- out plan for use and dissemination of the foreground to be prepared in the first half-year of the project; an experienced communication and dissemination manager leading the WP7.
Insufficient number of open-access publications resulting from the research and development. Project will not provide planned number of publications. (i) low (ii) medium	WP7	Guidance for partners on open-access publishing prepared and distributed at the beginning of the project. Reminders and discussions about publications included in agenda for each partners' meeting.
Failure to materialise technological findings that could provide a meaningful contribution to the applicable standardization activities. Weak	WP7	Encouraging the development of lessons learned and active feedback.

Description of risk (i) likelihood, (ii) severity	Work package(s) involved	Proposed risk-mitigation measures
contribution to standardization. (i) medium (ii) medium		
global risk of a pandemic is not predictable and can have different impact on involved parties. The project will not achieve sufficient amount of dissemination activities. (i) medium (ii) medium	WP7	Instead of scheduled live meetings and project presentations, opportunities will be sought to do so online virtually, using a wider range of social media channels, using a variety of tools and methods such as videos, possibly live broadcasts, virtual workshop series and other.
Partner are not exploitation oriented. An insufficient number of exploitable results are apparent from the project. (i) low (ii) high	WP7 All WPs	WP7 leader will start periodic questionnaires and interviews with partners to collect information about exploitable results starting from month 12. Consortium will be informed on how to report about exploitable results without prejudice to confidentiality of their companies' product and market information.
Designed solution turns out to be too expensive. Additional research to decrease costs will be needed. (i) medium (ii) medium	WP8	Identify the more important exploitable results; in case yes proceed with cost down research. Amendment.
Results of the WPs relevant inputs from previous WPs come too late. Milestones has to be shifted. (i) medium (ii) medium	WP8	Close interaction / between WPs and tracking milestones, Inform Coordinator, Start Amendment.
Withdrawal of a key partner form the consortium. Proposed work in tasks or overall goals of the project cannot be fulfilled. (i) low (ii) high	WP8	Assign task to other partners or find replacement by a new partner; start amendment process.

10.7 Abbreviations

A list of the abbreviations used in this document can be found in Table 11. A list of participants and their company affiliation (legal company name and company short name used in the ARCHIMEDES project) can be found in Table 11: Abbreviations.

TABLE 11: ABBREVIATIONS

Abbreviation	Meaning
PCA	Project Consortium Agreement
PGA	Project Grant Agreement
PMT	Project Management Team
PC	Project Coordinator
GA	General Assembly
WP	Work Package
SC	Supply Chain
WPMT	Work Package Management Team
SCMT	Supply Chain Management Team
CC	Country Coordinators
HW	Hardware
SW	Software

11 List of Figures

12 List of Tables

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