



D8.2 – Dissemination and Exploitation Strategy (DES) Updates M15

SWITCHING-CELL-ARRAY-BASED POWER ELECTRONICS CONVERSION FOR FUTURE ELECTRIC VEHICLES

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Executive Summary

This deliverable presents a M15 update of SCAPE's Dissemination and Exploitation Strategy (DES) initially delivered at M3. The document offers a comprehensive overview of the Communication, Dissemination, and Exploitation activities carried out during the first year. It outlines the specific actions undertaken and the valuable insights gained, which have played a pivotal role in informing and enhancing the DES strategy. Building upon these experiences, including feedback and expectations collected from project partners, this deliverable also outlines the planned steps for the project's second year. These steps aim to further refine, implement, and monitor SCAPE's engagement with stakeholders in research and innovation, EV industry markets, and society at large.



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List of Acronyms and Abbreviations

AB	Advisory Board
DES	Dissemination and Exploitation Strategy
EB	Executive Board
EC	European Commission
EIB	Exploitation and Innovation Board
EV	Electric Vehicle
IPR	Intellectual Property Rights
WP	Work Packages



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1. Introduction

1.1. About SCAPE – Powering e-mobility

Towards the standardization, cost reduction, and increased performance of power electronics for next generation electric vehicles.

As a promising player in e-powering sustainable mobility and promoting zero-emission transport, SCAPE brings together nine expert and inspired partners for a 4-year leap in power electronics application to e-mobility. The ambitious project sets out to revolutionise the design and implementation of power converters for electric vehicles. Moving away from traditional approaches in powering e-mobility, SCAPE aims to build and validate a novel, standardisable, and modular design and architecture for the EVs' powertrain, coupled with an integration of advanced control systems.

SCAPE's challenge

In power electronics, the traditional design approach of power converters involves a range of power semiconductor devices with different ratings, optimized to operate at different conditions and with several requirements for ancillary circuitry and power circuit topologies. This dispersion in power devices and circuits leads to significant engineering efforts to ensure production and, thus, little resources left to improve performance at this level. In the electric vehicle (EV) market, this void translates into EV OEMs investing billions of euros to develop their own e-powering solutions to counter the lack of standardization on the EV power conversion system designs across the different models and types of vehicles available.

SCAPE's solutions

SCAPE sets out to address this structural inability to take full advantage of scale economies to reduce costs by developing a cost-efficient production chain in power converter development for next generation electric vehicles.

SCAPE's 3 in 1 multilevel approach involves:

- A new, standardizable, modular design for EV power converters,
- A highly compact and integrated building-block implementation architecture for EV power converters,
- intelligent modulations and control strategies with online diagnosis and digital twin for predictive maintenance combined with machine learning.

SCAPE's impact

A successful implementation of SCAPE's e-powering 'solutions' for the EV market will enable reducing costs for powertrain elements thanks to scale economies, while also improving its performance features (reliability, efficiency, power density, etc.), and enabling enhanced functionalities through advanced power-electronics integration techniques and advanced controls.

A win-win scenario starring:

Empowered OEMs – with access to a cost-efficient and quality-improved power converter production chain;

Happy Drivers – benefitting from more affordable and better performing zero-emission vehicles;



Cleaner Planet* – a greater penetration of the sustainable EV market and an accelerated up-take and acceptance of e-mobility will lead to reduced green-house gasses emission.

**An environmental impact assessment of the SCAPE process will be performed in a specific task within WP8.*

...and a Competitive European e-mobility market – pursuing independence, industry leadership and reputation in EV components' systems and emerging technologies.

Models, simulations, digital twins and prototypes will help SCAPE's team validate its approach and share project assets with the power electronics community, the EV components' industry and all climate-sensible long haul transport companies and vehicle drivers out there!

SCAPE will put substantial efforts in generating impact though a well-structured approach to communication, dissemination and exploitation to make sure any potential innovation, knowledge and tech transfer reaches all actors and market players involved in increasing the automotive value chain in the crucial field of electromobility.

1.2. The Dissemination and Exploitation Strategy (DES)

This Dissemination and Exploitation Strategy (DES) document details **SCAPE's Communication, Dissemination and Exploitation approach**, including an account of its implementation through an activity plan. The DES also outlines an integrated **IP ownership evaluation** and features an **exploitation strategy** aimed at identifying needs and opportunities for in-project and post-projects activities to maximise the impact and transfer of project-generated innovation and outputs.

The document will cover in detail **WHAT** is being communicated, disseminated, and exploited (project assets), **WHO** are the desired receivers (target groups) and **HOW** each activity/measure is carried out (tools, channels, procedures, strategies, etc.). The overall goal behind the communication, dissemination and exploitation strategy is to create an **accessible, comprehensible and long-lasting echo for the project**, able to carry any exploitable results to (and well beyond) EV and power electronics market players, and within the larger EV community.

Key objectives and actions of SCAPE's DES include:

- **promote the SCAPE project widely and effectively** within Europe and internationally through a communication/dissemination plan involving all partners,
- develop and feed an attractive project **website**, lively **social media** profiles, and **stakeholder-specific channels**,
- identify **project stakeholders** and **primary target groups**,
- share project results at **conferences** and in targeted **scientific publications**, among public **media** and stakeholder-related media,
- **monitor the efficacy and impact** of communication and dissemination activities and identify strategic moves to **improve engagement**,
- **outline business strategies** identifying potential commercial opportunities for exploitation of project outputs,



- provide framework and support to partners involved in the **iterative patenting process** and **IPR Management** during the project (as addressed in detail in the Consortium Agreement),
- ensure that any knowledge, guidelines, recommendations, toolkits, and insights generated from the project are **fully transferred to relevant stakeholders**.

1.3. Deliverable purpose

As planned in the description of the work, the DES will be annually updated for the duration of the project and will perform as a living document to reflect the periodic assessment review of the activities performed. The strategy is regularly updated (with annual status analysis) to adjust to any changing outreach needs and requirements of the project and provide support to the project's tool development, collaboration network building, patenting issues and pathways to market. **The present D8.2 contains an update at M15.**

2. Communication activities

2.1. Reflection on the communication strategy – Year 1

Most of the tasks concerning the set-up for the core communication activities took place in the first 6 months of the project, in accordance with the outline and timing of activities defined in the previous version of this document ([D8.1](#)). Following the development of SCAPE's visual identity (logo and branding guidelines), the project's main communication channels, tools and products were delivered, including promotional materials, project website and social media profiles.

This first year was also an ice-breaking moment for project partners to get to know each other and open a productive dialogue. Establishing a seamless system of internal communication is always tricky when different types of actors are involved (industry partners, academia, consultancies, etc.), each with different interaction backgrounds and operational modes.

On top of building the SCAPE family, the first twelve months also gave the project the chance to meet and connect with other projects and initiatives; from reaching out to SCAPE's sibling projects (funded under the same call for Nextgeneration components) to joining larger, long-standing networks such as the [E-VOLVE](#) Cluster, which counts 14 present and past EU-funded projects covering a wide range of EVs components. Cluster members benefit from joint communication and dissemination activities with the aim of increasing the outreach of individual projects' workplans and results and enhancing the visibility of the cluster's activities in general. Coordination at this level, when everyone is busy with their work plans, requires some effort but has a strong potential to improve visibility for the whole extended family of electromobility research and development.

2.2. Communication overview for the first period

2.2.1. Activities performed

According to the tasks allocated, the following communication activities and actions were carried out:

- Design and delivery of SCAPE's visual identity (logo, branding guidelines, project claim, document and social media templates).



- Design, development, and management of a responsive template-based [Website](#).
- Design, development, and display/distribution of project [promotional materials](#) (leaflet, roll-up banner, editable core PPT presentation).
- Opening and feeding of the project's Social Media channels ([LinkedIn](#) and [Twitter](#)).
- Clustering activities involving regular meetings with the E-VOLVE Cluster and Nextgeneration EV components buddy projects to find synergies in work plans and join forces in communication and dissemination activities (including the submission of joint papers/posters at key mobility and power electronics conferences – i.e., TRA 2024).

2.2.2. Insights collected

Team-building

SCAPE's journey into generating the project's visual identity was also an ice-breaking journey into the Consortium and counts as SCAPE's first 'bonding' activity. The choice of logo, color palette and claim went through several rounds of revision with offline and online voting on a shortlist selection. By identifying the values powering the project and discussing the key messages SCAPE wanted to convey, partners came together in co-creation mode, 'owning' SCAPE as team and informing the design of the SCAPE 'brand'.

Although, in the interest of time and quality of graphic design (requirements in terms of shapes, colors, proportions, readability and other technical issues), the Communication team had the upper hand, collecting the partners' well-informed insights on the purpose of SCAPE's research fast-tracked WP8's (Communication, Dissemination and Exploitation) understanding of technical aspects and core messages.

Challenges of scientific communication

Highly technical projects such as SCAPE are always challenging to share with non-scientific audiences. It is not a matter of 'simplifying' the impact that certain innovations, such as novel approaches to building and integrating power converters, may have on society at large. It's about connecting the dots within the bigger picture towards a decarbonisation of the transport sector. For this reason, the approach taken in communicating SCAPE to stakeholders outside the power electronics and electromobility sector has been inspired by the framework of the *Towards zero emission road transport (2Zero)* EU-funded partnership aiming at accelerating the transition towards zero tailpipe emission road mobility across Europe. Under this large umbrella, there is the chance to spark a dialogue with the project at multiple levels: technical research level, industry and market-gear level and broader society awareness level.

Pulse of Social Media

An analysis of this first year of social media activity has provided useful trends to fine tune SCAPE's digital outreach strategy. Although it's too early to evaluate performance against KPIs, an initial screenshot of social media engagement across the project's channels is a good place to start. Channel wise, there is no doubt as to where interaction is higher: LinkedIn proves to be the 'place to be' to reach both the academia/research ecosystem and the industry/manufacturing audience. Given its attention to quality and detailed content, LinkedIn also allows high interaction with EC powered activities and frameworks. Also, it has proven more popular with project partners who all have personal and company profiles and interact in a regular way.



On the other hand, X (former Twitter) is having a harder time taking off. This microblogging social media calls for another type of content production which cannot come from a mere shortening of LinkedIn posts. Its real-time, media-oriented nature makes it harder to attract followers to project insights and requires a higher effort in terms of maintenance. Also, most project partners don't have company profiles on X and this influences the process.

Regardless of the platform, content wise, followers tend to have greater engagement (calculated by Clicks + Likes + Comments + Reposts + Follows/Impressions) with posts exploring EV market trends and policy visions rather than those presenting project news.

Content creation

The newsletters will debut during the project's second year. This timing coincides with SCAPE's growing audience and the completion of the tasks' screening phases in most work packages, transitioning into the action phases. The newsletter template is designed to provide a balanced selection of information, including updates on project activities, announcements of conferences and events related to power electronics and NextGen EV components, highlights of clustering activities, and glimpses into market trends.

Given the sensitivity of project data in this context, the newsletters will also draw from insights provided by the Exploitation team. This input will enrich the content with details on EV market trends, policy updates, and other valuable pieces of information. Additionally, clustering activities will serve as a source of content, and SCAPE's network of affiliations will help promote the project's newsletter, extending its reach.

2.3. Planned steps for Year 2

Taking on board the first-hand experiences collected up to now, during the project's second year the focus of communication efforts will be on:

- Drafting a social media editorial calendar which reflects the followers' preferences in terms of contents (based on the insights gathered from Social Media analysis), this includes enhancing the collaboration with the Exploitation outputs (SCAPE-to-Market reports) which provide relevant contents to spark dialogue on SCAPE-related research.
- Addressing the need for a different approach to build the X community, including asking for the partners' help in providing quick comments and positions on trending news in the electromobility sector.
- Considering the production of brief video pills (> 1 minute) explaining the basics of the project, either with animations/visuals or through 'elevator pitches' with project partners clarifying some of SCAPE's core concepts, such as the switching cell, etc. The pills could be shared via all project channels (social media, website and newsletter).
- Enhancing and structuring communications with project partners to make sure a designated person from each organization/WP is responsible for liaising with the project's communication staff (this will speed up certain processes tied to original content creation).
- Encourage partners to share updates, report events in their Countries, provide comments and share views to make SCAPE a knowledgeable source of information.
- Invite partners to regularly report their communication/dissemination activities in the tracker.



3. Dissemination activities

3.1. Reflection on the dissemination strategy – Year 1

As the project has only been running for one year and tasks are in progress, dissemination activities have been limited. In terms of editorial activities, SCAPE’s partners have already submitted journal articles and conference papers and others are in the pipeline.

In addition, project partners have presented SCAPE and its research during academic events and workshops and the project is taking part in dissemination activities led by the E-VOLVE cluster.

Finally, last summer (July 2023) SCAPE hosted its first dissemination workshop (35 attendees) during which technical partners had a chance to share their approach to power converter design with a stakeholder audience.

3.2. Dissemination overview for the first period

3.2.1. Activities performed

- Scientific publications submitted:
 - Conference paper – 18th Conference on Sustainable Development of Energy, Water and Environment Systems (SDEWES).
 - Conference paper: *Capacitor Voltage Balancing of Four-Level ANPC and π -type Converters Based on Simplified Virtual Vector PWM* (ESARS-ITEC 2023).
 - Conference paper: *Design Optimization of a Three-level Neutral-Point-Clamped Traction Inverter for Electric Vehicles based on Switching-Cell Arrays* (EPE-ECCE 2023)
 - Conference paper: *Optimized Modular Design of Neutral-Point-Clamped Traction Inverters for Multiple Electric Vehicles* (AEIT 2023)
 - Conference paper: *Thermo-Electrical Modelling of Multilevel Switching-Cell-Array-Based Power Converters* (ISIE 2023)
 - Journal article: *Inherently Decoupled Dc-Link Capacitor Voltage Control of Multilevel Neutral-Point-Clamped Converters* (IEEE Transactions on Industrial Electronics).
 - Journal article: *Active Thermal Control in Neutral-Point-Clamped Multilevel Converters based on Switching-Cell Arrays* (MDPI Electronics)
- Dissemination events
 - SCAPE’s first workshop (*Modular and Scalable EV Power Converter Design: Unlocking the future of reliable, lightweight and affordable EVs?*) took place on July 19th, 2023 in Modena, within the framework of the [AIET AUTOMOTIVE 2023](#) Conference.

3.2.2. Insights collected

The power of knowledge-sharing and peer review

Although SCAPE’s dissemination workshop came early in the project, at a stage in which results are not available yet, the event was extremely useful for SCAPE to “stress-test” its research approach. Given the well-informed and responsive participants of the Workshop (held as a parallel event of the AIET AUTOMOTIVE conference) the project team collected several knowledgeable inputs which will lead SCAPE to consider new angles to its proposed technology. Challenging perspectives on fault diagnosis, cost evaluation of power semiconductor devices and approach to industry/market in terms of opting for a more ‘familiar’ three-phase traction inverter prototype, have contributed to informing SCAPE’s research.



Constructive criticism is an asset for a successful approach to research and innovation. Along with fine tuning certain processes, it has also proven useful to make the case for SCAPE's disruptive approach by highlighting the need to clearly explain its advantages in enabling a very fast assembling of new conversion systems for new products with a varying range of voltage and current ratings.

Clarifying SCAPE's concept of "scalability"

One of the core concepts at the heart of SCAPE's innovative approach is "scalability." In the context of the project, scalability refers to the development of a modular powertrain architecture that can effectively reduce costs through economies of scale. When SCAPE describes its system as "scalable," it means that it can easily adapt to different conditions, such as varying converter voltage and current ratings, by employing multilevel converter technologies. This adaptability optimizes its usage in various scenarios.

However, during the SCAPE Workshop, attended also by experts in microelectronics, there was a misunderstanding of the term "scalability." In this context, the audience interpreted "scalability" as the ability to achieve a higher level of "integration scale." Integration scale, in this sense, refers to the number of transistors that can be accommodated within a fixed chip area.

This confusion regarding the interpretation of "scalability" has provided valuable insights to SCAPE on the importance of terminology and how it can have different meanings in various sectors, such as electronics and economics. SCAPE recognizes the need for clearer communication in future dissemination events to ensure that the intended message is accurately conveyed to diverse audiences.

3.3. Planned steps for Year 2

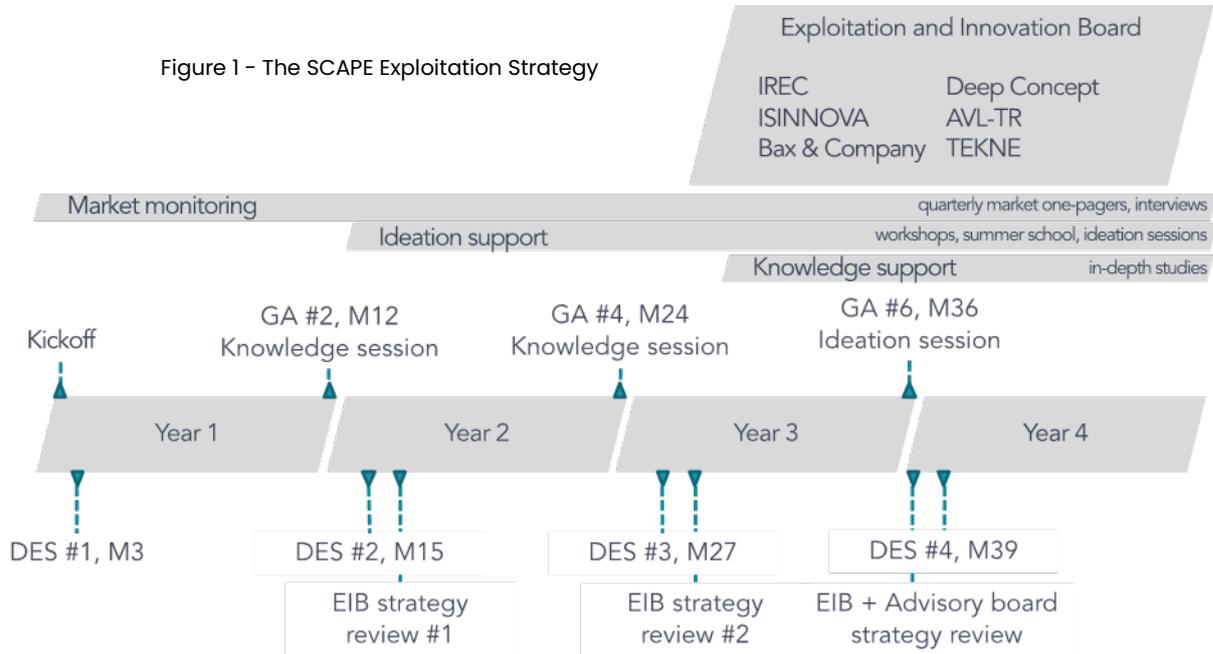
As the project has entered its second year of activity and will approach several milestones, the dissemination actions will concentrate on:

- Elaborating 'friendly' takeaways from the Workshop that will be shared through the website and social media channels.
- Continued participation at events within the framework of E-VOLVE cluster, including a shared paper (*E-VOLVE cluster. Increasing innovation efficiency to support the transition toward sustainable e-mobility*) that will be presented by E-VOLVE at the Transport Research Arena 2024 (TRA), the foremost European transport event that covers all transport modes and all aspects of mobility. This will be the occasion to contribute to the European discussion on how research and innovation can reshape the transport and mobility system. SCAPE might also be involved in other electro-mobility focused sessions during the conference.
- Promoting informal knowledge-sharing sessions with other projects and within the working groups of the E-VOLVE cluster.
- Brainstorming for the next workshop.
- Supporting technical WPs in delivering sound and powerful dissemination outputs, grounded on project activities and results, as these become available.



4. Exploitation activities

4.1. Reflection on the exploitation strategy – Year 1



Throughout the first year of the project, it was reinstated that the SCAPE consortium is motivated to make an impact with the project. In the first year of the project, several activities have been undertaken to kickstart the exploitation strategy and integrate exploitation in ongoing project developments. Based on the insights gathered in the first year, the consortium will further focus its market monitoring, continue hosting ideation sessions, and search for ways to integrate these findings into ongoing dissemination and technical development activities. This chapter reflects on the project’s exploitation strategy, the actions undertaken and the next exploitation steps.

4.2. Exploitation outlook for the first period

In the early phase of the project, exploitation efforts mainly revolved around market monitoring efforts. Additionally, efforts have been made to integrate exploitation into the project’s technical developments by presenting and discussing the gathered market knowledge at monthly executive board meetings. The effect of this integration on actual technical developments is still to be evaluated. Of course, the Grant Agreement has already provided an agreed-upon workplan that should already be directed towards market needs reducing potential pivots needed for exploitation of the projects results.

As stated on the SCAPE website, SCAPE aims to revolutionise the design, architecture and implementation of power converters for electric vehicles to counter the lack of standardisation across different vehicles. There is a solid base of exploitation interest in the consortium from both commercial and knowledge partners alike, with a desire to make the project results ready for follow-up steps.

The workshop organized by ISINNOVA at the AEIT automotive conference proved to be a good example where research and industry met. Moreover, it proved to be a useful place to discuss and introduce the voice of the Advisory Board to the project. The focus of the workshop revolved around the fit of SCAPE project results within automotive, aerospace and maritime industry.



4.2.1. Activities performed and insights collected

- *Quarterly Scape-to-Market reports*

Starting in the first quarter of 2023, three Scape-to-Market reports have been written and presented within the executive board meetings, on a quarterly basis. Table 1 shows the insights that have been collected and further delineated in the reports. A sample of keywords that have been used to find relevant articles include platform, scalable modular, Inverter, On Board Chargers, Converters.

The quarterly reports have shown several trends in the relevant environment that are useful to keep an eye on: V2G automotive designs and development funding opportunities, GaN/SiN uptake in different industries, modular EV platforms and designs. This continuous collection of market developments will allow for an iterative and well-informed exploitation strategy throughout the project.

	Power Electronics	Vertical Integration	Modular Platforms	Innovation	Policy	Public Investment	Studies
2022	<u>Power Electronics Market (1st edition)</u> <u>EVBox Expands its DC Charging Portfolio with EVBox Trionia Modular Compact (2nd edition)</u>		<u>Infineon partners with REE automotive to foster sustainable mobility (2nd edition)</u> <u>Volkswagen Pivots To MEB+ Platform – 700 Km Range, 200 kW Charging (3rd edition)</u>	<u>CES 2023: Power Electronics Companies Showcase New Products (1st edition)</u>	<u>Chips Act: Council adopts position (1st edition)</u> <u>Electric Vehicle Onboard Equipment and Charging Infrastructure Standards (2nd edition)</u>	<u>EU-US Joint Statement of the Trade and Technology Council (2nd edition)</u>	<u>The All-Electric Society - Enabled by Power Electronics (1st edition)</u> <u>Best practices and assessment of regulatory measures for cost-efficient integration of EV into the electricity grid (2nd edition)</u>
Q1 2023	<u>Global Electric Vehicle Semiconductors Market 2023-2030 (1st edition)</u>	<u>Volkswagen Group Technology develops complete drive system for electric cars (2nd edition)</u> <u>New Nissan EV development plan to cut costs by 30% (3rd edition)</u>	<u>Wolfspeed Silicon Carbide Devices Power Future Mercedes-Benz Electric Vehicle Platforms (2nd edition)</u>			<u>UK: New plan for smart electric vehicle (EV) charging could save consumers up to £1000 a year (3rd edition)</u>	<u>The Pulse of the Semiconductor Industry (1st edition)</u>
Q2 2023		<u>Volkswagen among consortium trialling bidirectional EV charging (3rd edition)</u>		<u>Infineon provides an innovative solution for second life of EV batteries (3rd edition)</u> <u>Silicon carbide (SiC) inverter extends EV range by over 7% (3rd edition)</u>	<u>California Ponders V2G Mandate (3rd edition)</u>		

Table 1 - Insights collected through Scape-to-Market reports

- *Advisory board members, 1st SCAPE workshop and sector deepdives*

The Advisory Board members of the project have shown to deliver useful contributions to the SCAPE workshop at AEIT automotive 2023, and subsequent sector deepdive interviews. Although the main focus of the SCAPE project proposal lies in the automotive sector, it is deemed worthwhile to explore surrounding application areas for SCAPE results. The input from AB members originated from the aerospace and maritime industries and was complemented by SCAPE partner TEKNE’s input on the power machine industry. The resulting insights from interaction with Advisory Board members and others at the AEIT automotive 2023 revolved around: cost sensitivity, technical replicability, industry trends, manufacturing & economic feasibility.

- *Exploitation monitoring survey*

The yearly exploitation monitoring was sent out to SCAPE partners after the workshop at the AEIT conference. The survey asked for additional data points besides the ones already presented in the Grant Agreement (see table 2).

Some take-aways from the exploitation monitoring survey include:

- Partners have indicated that further funding and technical development is required since most project results will be at TRL 5 at the end of SCAPE.



- Several partners show to have a strong interest in exploiting their project results, seeing the need to further develop the technology with industrial partners that could ensure adoption.
- There is more room to define the market application of the project results. Even though partners show to have a commercialization pathway in mind, it is yet undefined toward what directions the technical development will go to after SCAPE.

4.3. Planned steps for Year 2

After delivery of the exploitation strategy update (DES#2) following year 1, the second year of exploitation activities is kicked-off with the yearly EIB strategy meeting. This meeting has the main goal to translate all gathered insights related to exploitation (from interviews, market reports, workshop, partner survey) into actions for the subsequent year. Thereby this meeting aims to address the following goals of the EIB:

1. Project dissemination strategy
 - Couple intermediate results, market insights and strategies to dissemination.
2. Align with roadmaps and strategies
 - Align with ongoing policy developments and research strategies.
3. New processes and products; changes in the market
 - Translate market insights into actionable input for partners.



Table 2 – Current exploitation strategies foreseen per project result

Partner	Exploitable result	Primary interest	Exploitation pathway foreseen	Competing technologies / products	Key partners needed to fulfill exploitation	IPR strategy foreseen	Follow-up funding foreseen
IREC	Methodology to translate comprehensive multiphysics models of the powertrain elements to compact models capable of real time execution into off-the-shelf automotive computers.	Provide consulting services to relevant stakeholders to incorporate it into their products. Use the proposed solutions in future research.	Using them in further research activities (outside the project). Creating and providing a service	No market study performed yet	The multiphysics models are a key component and we need a deep knowledge of them to properly come up with the compact version. Thus, academic and industrial partners with profound knowledge of the powertrain elements are required.	None, open access	Funding from Horizon Europe R&I actions and Spanish and Catalan government calls intended to TRL increase of low-maturity technologies.
CSIC	Improvement of metal plating solutions of bare-die terminals to allow packaging methods with higher levels of integration.	Provide these solutions to relevant stakeholders (mainly, EU power electronics companies). Use the proposed solutions in future research projects.	Using them in further research activities (outside the project). Creating and providing a service	Semiconductor manufacturers can provide chips metallized with the right metals but only for big productions.	Basically, companies or institutions dealing on power systems integration are required as end users of metallized dies.	The method was already patented. Improvements could be protected by industry secret.	Next EU projects can use this method for achieving new power systems integration solutions. Direct exploitation as a service is also foreseen.
UPC	Modular and scalable architecture and design methodology for power conversion systems.	Provide consulting services to relevant stakeholders to incorporate it into their products.	Using them in further research activities (outside the project). Further developing the concept in new R&D projects	Competing technologies are traditional power electronics converters, usually with less transistors, well accepted by industry, but with similar or lower performance and, definitely, with less potential for scale economy development.	In order to support the development of the SCA concept, we will need industrial partners who are willing to pilot our solutions beyond a controlled environment into a manufacturing pipeline to proof the industrial viability of the concept, both in terms of performance and potential for scale economy.	None, open access	Seeing the interest of our Catalan regional innovation fund into EV powertrain developments, we are looking to apply for a small grant to fund our personnel cost in the further development of consulting services. We also see this fund as a facilitator in funding the collaboration with an industrial company and, eventually, a consulting company.
UPC	Online method to assess the battery bank SoH, based on a specific operating strategy of the multilevel power converter connected to the battery bank.	License the use of the method to suppliers and other relevant end-users.	Using them in further research activities (outside the project). Creating and providing a service	SoH estimation methods based in the measurement of the operation of the battery.	In order to support the development of consulting services we will need industrial partners who are willing to pilot our solutions beyond a controlled environment into a manufacturing pipeline to derive interesting insights.	None, open access	Since the SoTA after the project will be around TRL 5, a Horizon Europe (or similar EU instruments) follow-up project is foreseen.
UNIMORE	Online method to assess the windings SoH based on a specific operating strategy of the multilevel power converter.	License the use of the method to suppliers and other relevant end-users.	Using them in further research activities (outside the project). Developing, creating or marketing a product or process	1. there are not competing technologies in the market	1. partner able to provide experimental data of voltage and current supplying electrical motors	Copyright	1. Since the SoTA after the project will be around TRL 5, a Horizon Europe follow-up project is foreseen.
UNIMORE	Gate driver circuit and associated switching strategy for reduced dv/dt and improved winding lifetime.	Licensed to relevant stakeholders to incorporate it into their products.	Using them in further research activities (outside the project). Developing, creating or marketing a product or process	2. conventional gate driver circuit for power converters based on WBG devices	2. In order to support the development of consulting services we will need industrial partners who are willing to pilot our solutions	Copyright	1. Since the SoTA after the project will be around TRL 5, a Horizon Europe follow-up project is foreseen.
DEEP CONCEPT	Increase of the expertise in power module packaging, with a differentiating technology.	Provide the CE technology to future products of DC.	Using them in further research activities (outside the project). Developing, creating or marketing a product or process	Competing technologies are innovative integrated technologies for semi-conductors	For the chip embedded technology, we will need a strong collaboration with Schweizer.	Industry secret	linked to the TRL5, a new Horizon Europe follow-up project is foreseen
BAX	Consulting methodology for commercialisation strategies in R&I environments.	Provide consulting services to industrial partners regarding their R&I strategy and commercialisation strategies.	Using them in further research activities (outside the project). Developing, creating or marketing a product or process	Internal consulting or full-time dedicated staff.	In order to exploit this service, relevant contacts in R&I environments are needed to further develop the service and commercialise it for commercial assignments.	None, open access	Next EU or nationally funded projects to further develop the service.
AVL	Improved approaches and reduced costs in the area of power converters and concrete validation results of these newly designed e-drive elements.	After an analysis of the innovations resulting from the project is conducted, the exploitation plan will be applied considering several objectives such as: technological advancements, academic collaboration potential and business impact. To do so, 3 major approaches will be practiced: (1) making project results and their impact visible by spreading the results among stakeholders from automotive industry in order to keep technology ready to be improved more. (2) preparing academic publications and organizing events to discuss with local academic institutions and universities. (3) enhancing existing services provided for customers and increasing business potential, accordingly.	No commercial exploitation expected as AVL has worked on the systems engineering part of the project.	n/a	n/a	n/a	n/a
TEKNE	Short term: (1) on-line monitoring and control system and advanced control for EV. (2) improved integration and verification processes (battery, converter, e-axle, powertrain). Medium term: (3) more efficient, compact, and reliable powertrain based on the new power converter design approach.	TEK is an Italian medium enterprise that produces special vehicles for professional applications, and the demand for EV is increasing also in this market. The industrial growth stands on three factors: (a) the product, EV in this case, which can benefit from the on-line monitoring and control system and, in the medium term, from a better power supply system; (b) the industrial process, in which integration and verification play a key role; (c) the individual technical skills, which will grow (knowledge and experience) thanks to the participation in SCAPE	Using them in further research activities (outside the project). Developing, creating or marketing a product or process	Not applicable at the moment.	No partner puts directly in the project its expertise of e-drive manufacturer: such a cooperations could be very useful.	Industry secret	TEKNE will continue the cooperation with SCAPE partners, to bring the new inverters to a higher maturity level, from the TRL6 at the end of the project, on the basis of the "road to market" task that the latter includes.





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