D7.1

PLAN FOR THE D & E & C OF RESULTS (PDEC) - FIRST VERSION

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Abstract

Dissemination, Communication, and Exploitation is crucial to the success of all Horizon Europe funded projects. This report provides a detailed overview of GRAPHERGIA's D&E&C strategy, defining the goals, the priorities, and potential implementation mechanisms to achieve all planned outcomes. To this end, the GRAPHERGIA D&E&C Master Plan sets out the objectives, tools, materials, and channels to be exploited to effectively spread the project's activities, achievements, and tangible results to targeted audiences, also encompassing the strategy for the successful commercialization and market uptake of GRAPHERGIA solution.

Keywords

Dissemination, Communication, Exploitation, Agility, Impact, Sustainability, Awareness, Standardisation, Intellectual Property

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Nature of the deliverable		**R**
Dissemination level		
PU	Public, fully open. e.g., website	✓
CL	Classified information as referred to in Commission Decision 2001/844/EC	

CO Confidential to GRAPHERGIA project and Commission Services

* **Deliverable types:**
R: document, report (excluding periodic and final reports).
DEM: demonstrator, pilot, prototype, plan designs.
DEC: websites, patent filings, press and media actions, videos, etc.
OTHER: software, technical diagrams, etc.

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THE GRAPHERGIA PROJECT

GRAPHERGIA brings together innovations to create strategic synergies and develop an integral approach for radically new technology solutions, leading to real-life applications and revolutionary products by implementing essential advances required to successfully overcome current challenges on 2D materials for harvesting and storage applications.
We consider two wide areas of applications: all-in-one self-charging textiles and LIB-cells. The aims are to establish adaptable pilot-scale methodologies for these two main applications, grounded in eco-design principles elevating the technology readiness level (TRL) to 5 or beyond.

Self-powered e-Textiles
Imagine clothes that connect you to the Internet of Things (IoT) with wireless signals, making you a walking, talking, tech-integrated individual. Smart clothing not only looks great, but it also serves a purpose. GRAPHERGIA spearheads the development of all-in-one, multifunctional self-charging power textiles, seamlessly integrating advanced electronic systems into the fabric. In addition to providing battery-less solutions for wearables, this technology offers a user-centric interface to the IoT through wireless sensor signal transmission.

Next generation Li-Ion Batteries
By leveraging the partners' tech know-how and Intellectual Property Rights (IPR)-protected technologies, GRAPHERGIA is on the brink of defining the future of next-generation electrodes for Li-ion batteries, blending them with Two-dimensional (2D) materials.
The outcome is a dry-electrode fabrication approach for producing advanced graphene-based electrodes for next gen LIB cells. A comprehensive approach will be employed, integrating 2D materials and process-oriented methodologies, utilizing cost-effective raw materials and scalable fabrication techniques to ensure economically viable and environmentally sustainable solutions.
The two novel methodologies will be piloted in three different use cases including, All-in-one self-charging textile capable of energy harvesting and storage (demo case #1), Self-powered structurally integrated sensor for aerospace structures, (demo case #2), and Advanced graphene-based LIB module prototype for space applications (demo case #3).

With the aim of transforming the energy landscape, GRAPHERGIA was initiated in October 2023 for 3,5 years. Teamed by 11 partners from 6 European countries, our interdisciplinary consortium brings together strong actors of the 2D-materials value chain and involves key experts in IPR, exploitation, dissemination, and communication.

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Abbreviations

Abbreviation	Definition
ADA	Adamant Composites Ltd.
AUSTRALO	AUSTRALO Marketing Lab
Born GmbH	Born - Knitting Engineers
ComS	ComSensus
CRM	Critical Raw Materials
DLR	Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR e.V.)
ESPR	Eco-design for Sustainable Products Regulation
FORTH	Foundation For Research and Technology Hellas (Project coordinator)
GFi	GRAPHENE Flagship Initiative
IPR	Intellectual Property Rights
IRG	Industrial Reference Group
KER	Key Exploitable Result
LCA	Life Cycle Assessment
LCC	Life cycle costing
NTT	Next Technology Tecnotessile
PLE	Pleione Energy GmbH
SLCA	Social Life Cycle Assessment
SME	Small and Medium-sized Enterprises
UGE	Univ Gustave Eiffel / ESYCOM lab
URM	University "Sapienza" Rome
WP	Work Package

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EXECUTIVE SUMMARY

This report defines the overall strategy for the outreach and impact management of the GRAPHERGIA project, delivering the research results to the stakeholders and paving the way for a successful market uptake beyond the project. This **master strategy consists of five key areas:**

Communication is the first one of the five cornerstones of the master framework. It means taking strategic and targeted measures for promoting the GRAPHERGIA project and its results to many target audiences, including research communities, graphene industrials, the media, and the public and engaging in a two-way exchange. With proactive communication campaigns and a mixed communication portfolio, the GRAPHERGIA project will share the best practices to trigger new collaborations and opportunities but also raise public awareness about the EU-supported activities that tackle societal challenges, building a greener tomorrow with graphene technologies.

Dissemination is the second element to sustain the project's impact. Our dissemination strategy will plan and organize the publication of the public project results, including primarily peer-reviewed scientific publications, public deliverables, and participation to scientific and non-scientific events to spread the research results. The objective is to enable the target stakeholders to make use of the produced project results.

Exploitation is the third cornerstone of this framework ensuring that the project results are used beyond the project duration, in a sustainable manner. The exploitation strategy will define the key markets, key exploitable outcomes, and paths for further exploitation. These can follow commercial, scientific, or technical exploitation paths, and GRAPHERGIA partners will work on defining the Key Exploitable Result (KER) of the project, which will be the main exploitable assets, and specific paths for their exploitation within the partner organisations.

Intellectual Property Rights (IPR) Management is the fourth element ensuring that the project results and their innovation is protected. This work consists of building an intellectual property management system where the project results follow a lifecycle of IP-assets from their creation until the detection of their exploitation including with protected schemes. The aim is to create patents for the results, when applicable, and to achieve this aim, partners will follow IPR-trainings to understand the patenting process from identification of the patent opportunities until drafting, filing, and defending a patent.

Standardisation is the fifth element endorsing the sustainability of the GRAPHERGIA project. Standards serve as a catalyst for innovations and help in anchoring solutions more quickly on the market, helping to ensure that the created solution meets notably the existing safety, reliability, performance, and environmental criteria. GRAPHERGIA will comply with international standards

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related to energy devices, batteries, and environmental-friendly manufacturing. The project will monitor and assess existing relevant standards, but also, through its membership to the GRAPHENE Flagship, search to contribute to developing or revising existing applicable standards.

This overall strategy is addressed to the well-defined stakeholders from the academic sector, industries, SMEs, advocate organisations and policy-oriented organisations who all deal with graphene or 2D-material applications. Finally, GRAPHERGIA belongs to the **GRAPHENE Flagship initiative**, which will support the project in implementing these five aspects of the sustainability framework and addressing the relevant stakeholders.

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1 INTRODUCTION

This deliverable is the first iteration of a series of three GRAPHERGIA deliverables (deliverables 7.1, 7.2 and 7.3) entirely dedicated to set a holistic framework to the communication, dissemination, and exploitation activities of the project. These sit under the Work Package 7 "Dissemination, exploitation and communication of the project results", led by AUS.

1.1 Structure of the report

The report consists of five sections, but all the treated topics are interrelated, each of them contributing to foster the impact and sustainability of the GRAPHERGIA Project:

- Section 2 introduces the GRAPHERGIA stakeholders defining their profiles and the key engagement tactics. These groups are the target audience of the project's communication, dissemination, and exploitation strategies.
- Section 3 lays out the specific strategies for the GRAPHERGIA communication and dissemination. These will guide the activities throughout the project, but, at the same time, they can be re-fined and adjusted based on the research progress and identified needs or opportunities.
- Section 4 presents the project's exploitation laying the foundation for the commercialisation of the key research and innovation results while managing an adapted plan for intellectual property rights and dealing with relevant international standards and regulations.
- Section 5 shares the conclusions and the next steps for the impact activities of the project.

1.2 Related tasks and deliverables

This deliverable offering an overarching strategy for GRAPHERGIA dissemination, communication and exploitation is published as a part of the WP7 tasks:

- T7.1 Dissemination and Communication
- T7.2 Exploitation plan and Project sustainability
- T7.3 IPR Management
- T7.4 Clustering activities and community building

In line with these tasks, the report is linked to forthcoming deliverables of the WP7, including

- D7.2 Plan for the D&E&C Results - Updated version (M26, AUS). It will gather the project's results achieved from the communication, dissemination, and exploitation activities until

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its mid-term. It will also lay out the updated strategies (if any), and analyse faced challenges, risks and share mitigation to these.

- **D7.3 Plan for the D&E&C Results - Final version** (M42, AUS). It will provide the related results from the second project half as well as provide lessons learnt and insights to plans to sustain the results beyond the project duration.
- **D7.4 Preliminary IPR and exploitation plan** (M12, EUGL). It will provide the outline of the IPR management cycles for the GRAPHERGIA innovation and link the IPR management to the general exploitation plan.
- **D7.5 Final IPR and exploitation plan** (M42, EUGL). It will showcase the results of the IPR management strategy and their impact to the overall exploitation plan.
- **D7.6 GRAPHERGIA Best practices handbook** (M42, AUS). It aims to spread the acquired know-how and experiences in research collaboration with the international graphene, smart textiles, and battery communities. It will showcase the most meaningful results from the collaboration with the GRAPHENE Flagship initiative that can encourage synergies for other related initiatives. It will also share the most relevant findings related to standardisation, regulations, and innovation road mapping.

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2 GRAPHERGIA STAKEHOLDERS

The stakeholders are in the core of all dissemination, communication, and exploitation activities. We have defined the target stakeholder groups to whom the GRAPHERGIA outreach activities are addressed to, and the principal objectives are to raise awareness about the project activities and results, to make them use the project results that are in open access, and finally to define how they can exploit the project results in a sustainable manner even beyond the project.

2.1 Definition of the target stakeholders

The target stakeholders are the groups of individuals or organisations who will benefit from the GRAPHERGIA research and innovation activities and results either directly or indirectly. The direct involvement of the GRAPHERGIA initiative can be joining project's events, webinars, or educational activities, whereas the indirect involvement means a party benefits from the GRAPHERGIA results indirectly; for instance, a PhD student participates in an organised workshop, and this way his academic organisation benefits indirectly from the research activities of the project.

For instance, if an SME purchases a novel product (such as graphene-enabled smart-textile or LIB-battery) that was developed by a partner during the GRAPHERGIA project, then this organisation is a direct stakeholder in the GRAPHERGIA ecosystem. If another third party, such as a sub-contractor, benefits from this same product through this SME, this third party would be an indirect beneficiary of the GRAPHERGIA project.

The stakeholders are categories in different groups based on their activity, industry or organisation type. In addition, the Industrial Reference Group (formed by 7 experts) will guide the consortium in the project's exploitation work.

2.1.1 Stakeholders' Map

The GRAPHERGIA Stakeholders' Map (see Figure 1) is a starting point for scouting, contacting, and exchanging with different relevant actors from the European and International areas related to innovation in graphene, 2D materials, smart textile, and batteries. The GRAPHERGIA partners will update this map throughout the project and build a database of stakeholders' contacts to whom the project's activities, opportunities and accomplishments will be communicated.

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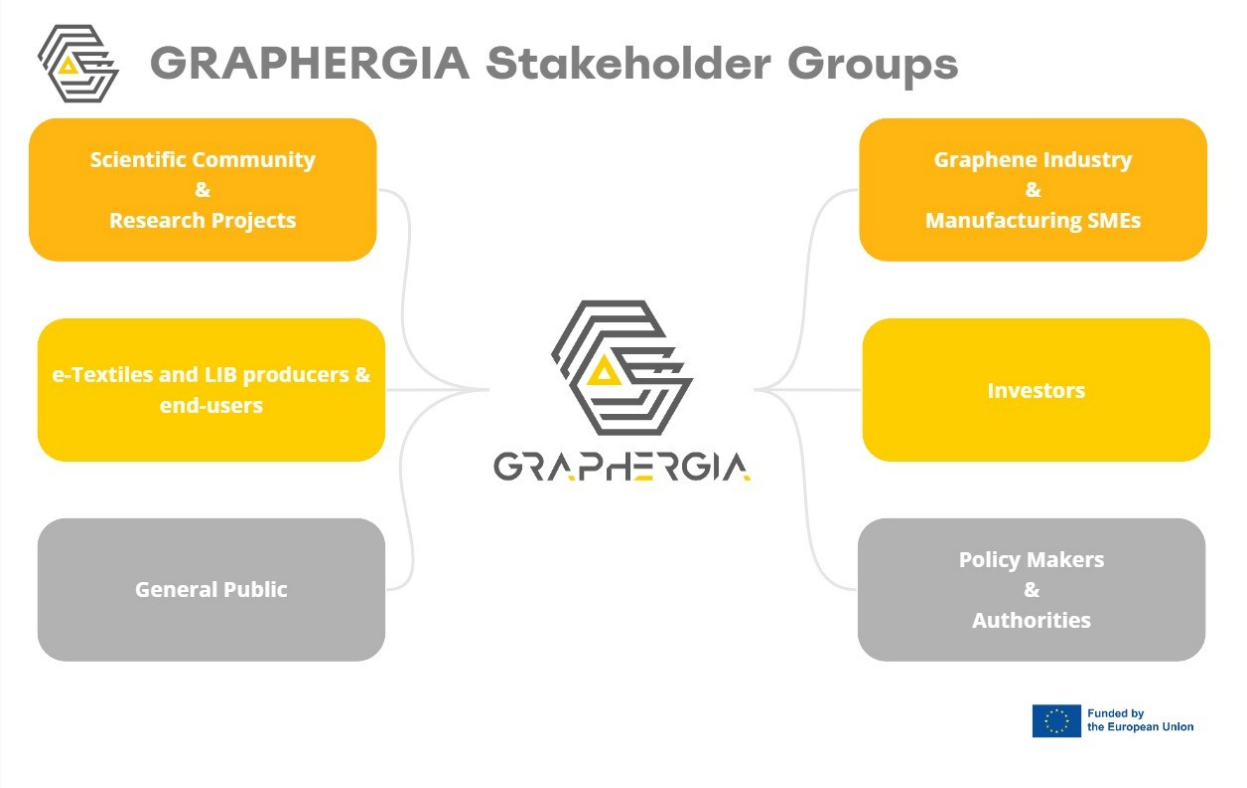

Figure 1 Initial Mapping of GRAPHERGIA stakeholders

Annex 2 presents an insight to the list of stakeholders that will be maintained and built further throughout the project.

2.1.2 The Industrial Reference Group

Beyond the commercial competence within the consortium beneficiaries, GRAPHERGIA has established an Industrial Reference Group (IRG) to ensure maximum benefit from the scientific, technological and innovation results of the project. Among the IRG roles, is to guide GRAPHERGIA by providing product specifications, market trends and priorities. The members of the IRG have already agreed upon their role in GRAPHERGIA, expressing their strong interest in guiding product development, and their feedback will be requested at the different phases of the exploitation activity (see more in 4.7).

Table 1 GRAPHERGIA Industrial Reference Group

Enterprise	Contact person	Interest in GRAPHERGIA R&I activities
Siemens	Franzika Wiebels	Potential application of project products in power tools
ESA	Dr. Ugo Lafont	Graphene-based LIB cells for space industry applications
Rolls-Royce plc	Dr Ch. Argyrakis	Self-powered structurally integrated sensors

EasyMotionSkin	Ralf Kahlenberg	Adoption of products for wearables integration into clothing
Würth Electronics	Dr. Alina Schreivogel	Potential application of LIB cells in electric components
NPL	Dr. Cristina Giusca	Metrology and validation of laser-grown graphene on textiles
Hyperion Investing	George Malandrakis	Investing in green energy and digital transition technologies
GRAPHENE Flagship	Innovation Working Group	Contribution to the governance and coordination of GF initiative

2.2 Engagement Cycles

The stakeholders are engaged in the project in agile cycles (see Figure 2) corresponding to major ongoing research activities or accomplishments. The objective of these cycles is to leverage the project's impact among the different target groups creating a sustainable footprint of GRAPHERGIA. One agile cycle includes three phases:

- **Scouting** – where the relevant and interested parties (individuals or organisations) are identified and mapped.
- **Exchanging** - where the GRAPHERGIA team contacts the identified entities with either one-to-one communication (email or meetings) or using the project's existing communication channels.
- **Learning** – the results of the exchanges are analysed to re-adjust the next engagement cycle.

During the first half of the project the efforts will focus on establishing contacts and collaboration with the GRAPHENE Flagship ecosystem, whereas during the second half of the project the activities will expand the GRAPHERGIA community beyond this framework.

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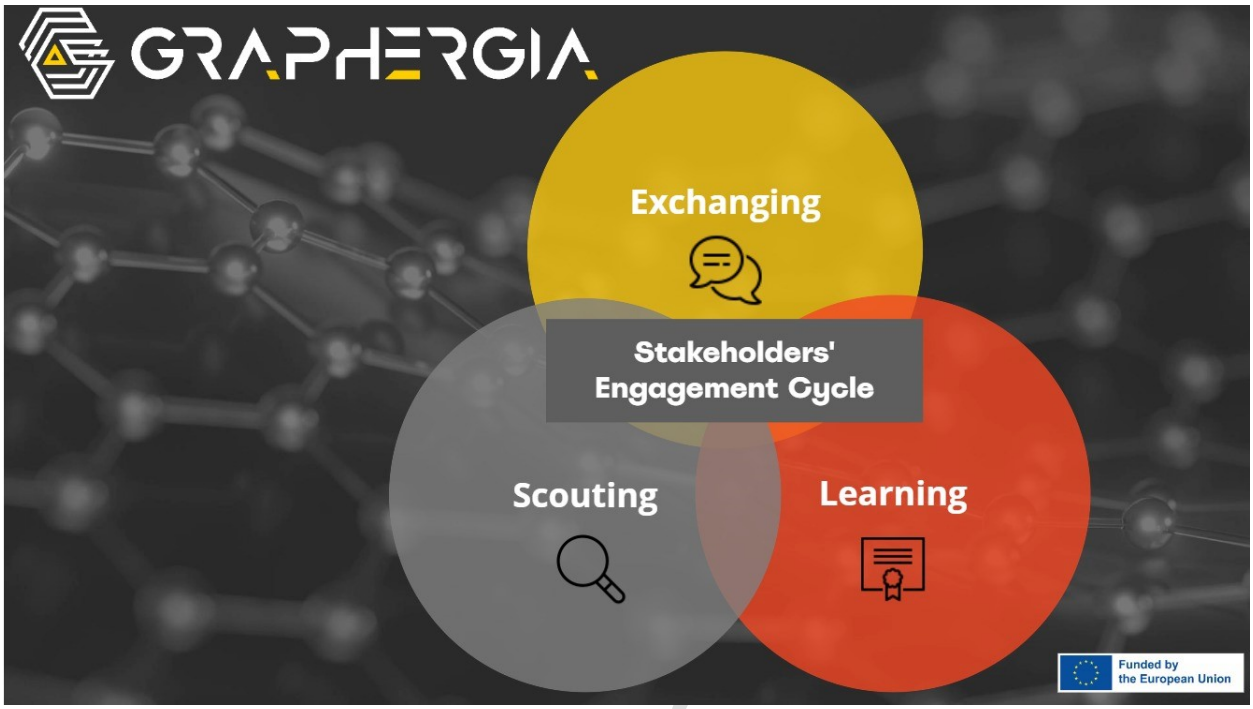

Figure 2 Stakeholders Engagement Cycle

2.3 Graphene Flagship Ecosystem

The Graphene Flagship, which builds on the previous 10-years of the initiative[1], is funded by the **European Commission's Horizon Europe** research and innovation programme. The Graphene Flagship brings together 118 academic and industrial partners in 12 Research and Innovation (RIA) projects, one 2D Experimental Pilot line project, and one Coordination and Support Action (CSA) project (GrapheneEU). GRAPHERGIA is one of the 12 RIA projects of the Graphene Flagship and will contribute to Europe's strategic autonomy in technologies that rely on **graphene** and other **2D materials**, to **fight Europe's energy crisis**.

The Graphene Flagship initiative aims at advancing **Europe's strategic autonomy in technologies that rely on graphene and other 2D materials** and sustaining the first-mover advantage that Europe has obtained through earlier investments. The overall coherence of the Graphene Flagship initiative is guaranteed by GrapheneEU, co-funded by the EU, that allows the sibling projects to exploit synergies in their scientific and technological activities and work more efficiently by utilising common services and support functions.

[1] https://graphene-flagship.eu/materials/news/ten-years-of-research-innovation-and-collaboration-the-graphene-flagship-and-the-2dm-community/

Inside the Graphene Flagship, GRAPHERGIA is actively participating and contributing to four groups:

- Coordination Board - where the sibling project coordinators aim to establish synergies among their project implementations. The project coordinator, **Foundation for Research and Technology Hellas (FORTH),** represents the GRAPHERGIA project in this board.
- Associating Mechanism to Onboard New Members - where all associated partners bring efforts to find new members for the Graphene Flagship ecosystem.
- Dissemination Working Group - where the communication and dissemination leaders of the sibling projects exchange their knowledge and opportunities among the project partners to increase their impact to the stakeholder's community. GRAPHERGIA communication and dissemination leader, **AUSTRALO Marketing Lab (AUS)**, represents the project in this Working Group.
- Roadmap Officer for Standardisation Activities - where the expert partners leading the standardisation efforts discuss and search relevant standards to be implemented in the development of the innovative 2D material solutions and methodologies.

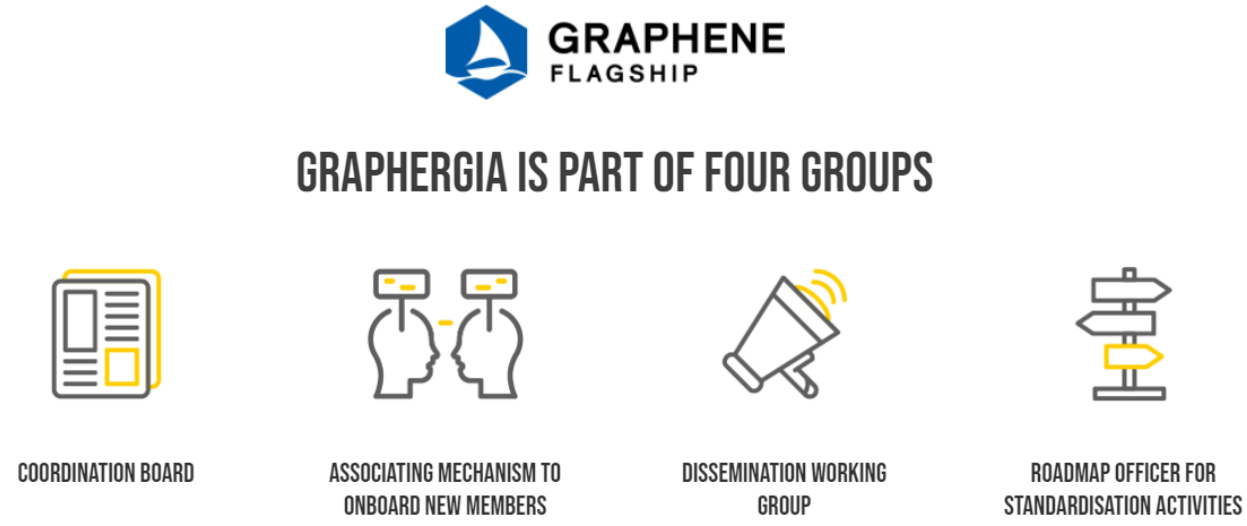

Figure 3 GRAPHERGIA's involvement in the GRAPHENE Flagship Working Groups

GRAPHERGIA **eleven sister projects** act in **six different core areas** related to research and innovation in **graphene and 2D-materials**. These areas include Energy, 2D-materials of tomorrow, Safe by design, composites, Biomedical and Electronics and Photonics. All these projects, along with GRAPHERGIA, are part of the Graphene Flagship community.

Find out more about the sibling projects from the different focus areas:

- Energy: GRAPHERGIA, ARMS.
- 2D-materials of tomorrow: 2DSPIN-TECH, 2D ENGINE, 2D-PRINTABLE.
- Safe by design: SAFARI.
- Composites: GIANCE.
- Biomedical: MUNASET, 2D-BioPAD.

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- **Electronics and photonics**: GATEPOST, Next-2DIGITS, 2DNEURALVISION.

Figure 4 Graphene Flagship projects, including GRAPHERGIA

The collaboration among the sister projects was launched in a joint kick-off meeting, hosted by the Graphene Flagship team in Gothenburg, Sweden, on the 6th and 7th of February 2024. Four representatives from GRAPHERGIA joined the meeting (read more in our dedicated article[2]).

2 https://graphergia.eu/2024/02/06/joint-kick-off-meeting-with-the-graphene-flagship-sister-projects-establishing-contacts-and-opportunities-for-synergies/

3 COMMUNICATION & DISSEMINATION PLAN

Communication and dissemination are the two major elements of sustaining the GRAPHERGIA project impact. The Communication strategy focuses on raising awareness about the project whereas the dissemination strategy is dedicated to ensuring that the stakeholders can make use of the project results. Both activities are complementary and run throughout the project (from M1 until M42).

3.1 Communication Strategy

GRAPHERGIA considers the versatility and agility of a coherent communication plan and is adopting **a funnelled approach** (see Figure 5) to ensure that a targeted but wide communication towards all possible target groups and stakeholders, will be deployed and achieved. Such an approach primarily focuses on generating awareness by conveying key aspects and benefits of the project to all target audiences and end users. Easy to interpret, understand and recognize visual material will be designed and communicated allowing GRAPHERGIA concepts and benefits to become instantly identifiable to the wider audience while growing and cultivating further interest towards the project and its key outcomes.

Additional customised content will be produced and communicated towards specialised target group audiences aiming at creating and maintaining information that will be extracted from project deliverables; interviews with partners, pilot case studies; industry reports; and will be relayed through the GRAPHERGIA communication channels to further support active user engagement, aimed at building the potential clientele base.

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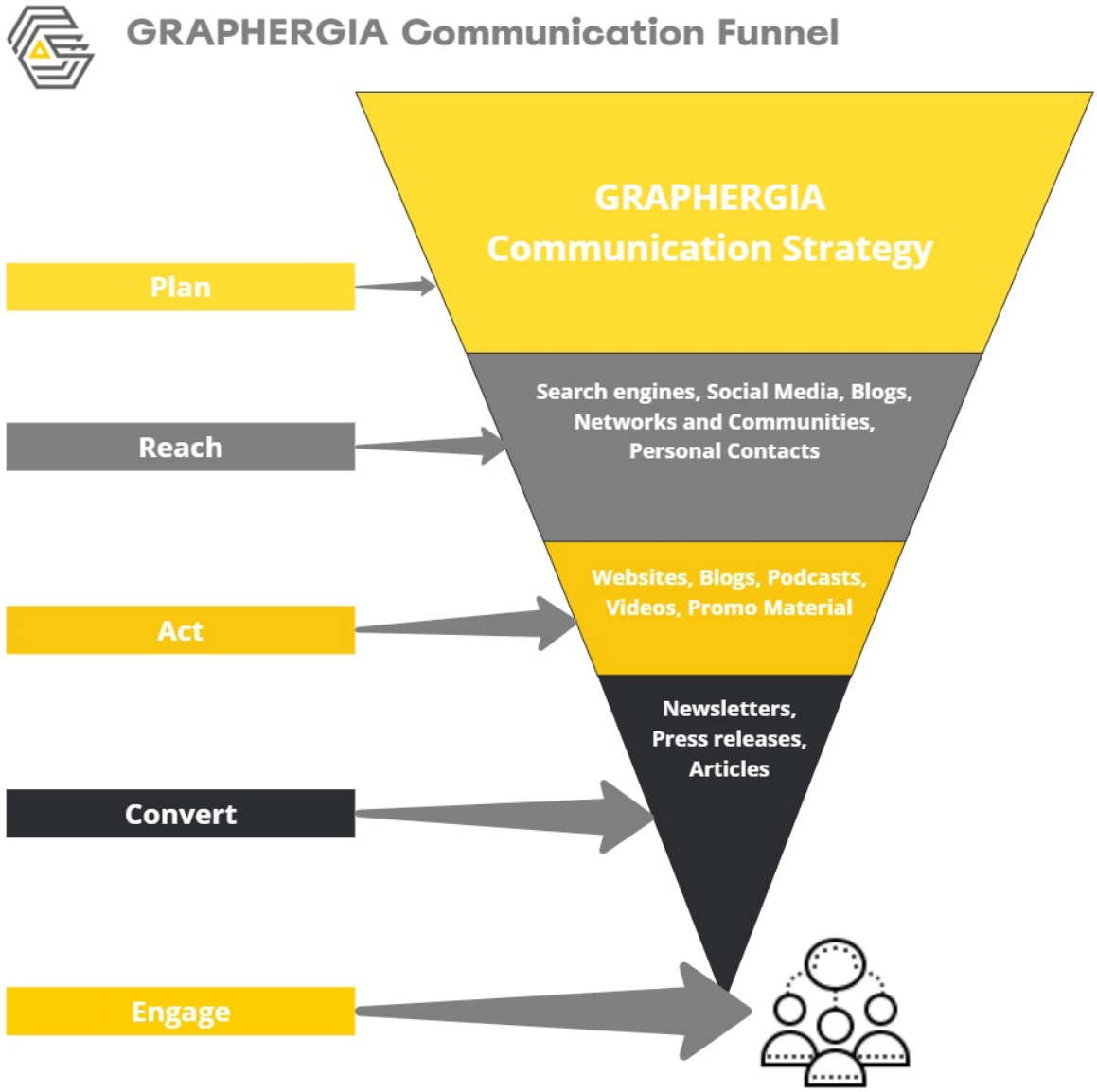

Figure 5 GRAPHERGIA Communication Funnel

3.1.1 Objectives

The communication plan is being driven by some key objectives which are crucial for the deployment of such plan. Although communication objectives may be treated and tackled as a single block, some objectives are being related to specific target groups only and will be approached with specific tools and activities throughout the lifespan of the project (see Table 2). The overall objectives are:

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- **Increase general awareness and interest** about the project for building a sustainable customer base/ecosystem for future expansion.
- **Communicate technical, scientific results and benefits** to specialised target groups and stakeholders.
- **Deliver top-level messages** about the project to non-technical target groups and audiences.
- **Raise awareness to non-specialised audiences** of the added value of GRAPHERGIA to the widest possible community.

Table 2 Communication Objectives per Target Group

	Awareness about & interest in	Communicate technical & scientific results	Deliver top-level messages	Raise awareness to non-specialised audiences
Scientific Community	✓	✓		
e-Textiles and LIB producers & end-users	✓	✓		
Graphene Industry & Manufacturing SMEs	✓	✓		
Investors	✓		✓	
Policy makers & Authorities	✓	✓	✓	
General public	✓			✓

In addition, the GRAPHERGIA team has a set of key performance indicators that enable to monitor and assess the execution of the communication objectives. These indicators will be monitored monthly and reported to the entire consortium.

Table 3 - Communication KPI Objectives

		GA Objective
Project Website	Total number of visits (by the end of the project)	**60,000**
	No. of visitors (monthly average) (users)	
	No; of sessions (monthly average)	
Open virtual hub	No. of members	**100**
Zenodo	Downloads per public deliverable	**250**
Newsletter	No. of published / featured newsletters	**13**
	No. of subscribers	**600**

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Promotional material	e-material sent to No. of recipients	1,000
	No. of shared hard copy material	600
Videos & Podcasts	No. of views in Youtube	10,000
	No. of produced videos	10
	No. of unique listeners	1,000
	No. of produced podcast episodes	5
Social Media	**No. of followers per social media account**	1,500
	No. of impressions (monthly average)	
	Twitter Followers	
	Twitter Monthly Impressions (monthly average)	
	LinkedIn Followers	
	LinkedIn Monthly Impressions (monthly average)	
Project workshops	No. of participants in 3 thematic workshops	200
Visits to schools	Visit at least 1 school per partner in its territory, No. of visits in total	12
Events	No. of events in total	30
	No. of scientific events participated	
	No. of non-scientific events participated	

3.1.2 Communication Phases

The communication strategy will be rolling out in three different phases, as shown in Figure 6.

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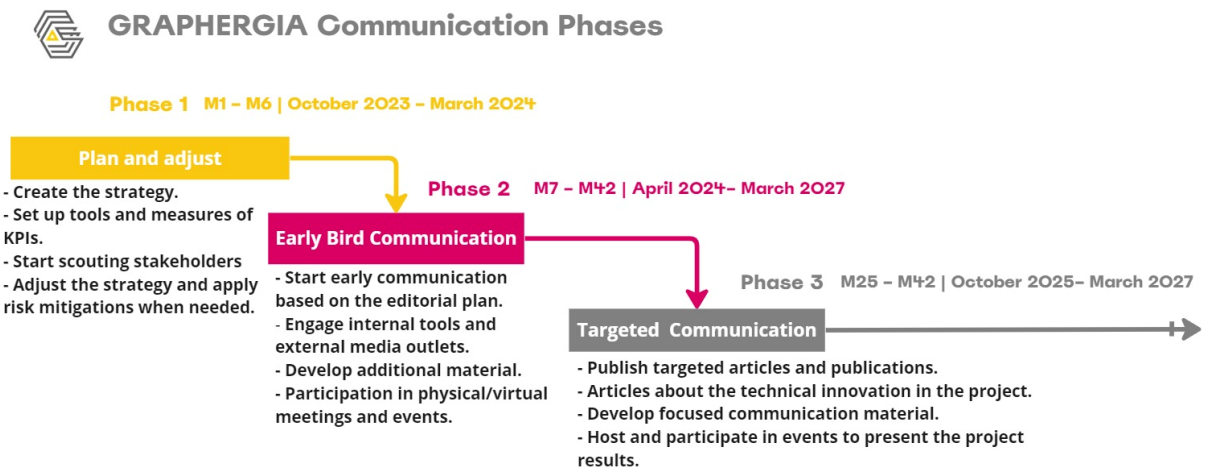

Figure 6 GRAPHERGIA Communication Phases Outline

Phase 1 – Plan and Re-adjust | (M1 – M6) (October 2023 – March 2027)

The first communication phase will start in M1 of the project and primarily aims at planning all activities, setting up the main communication tools and channels (Website, social media), and identifying potential target groups and stakeholders. However, the latter is an activity that will be implemented throughout the whole project. This first phase also includes the concept of adjusting the plan: whenever this is required, the communication plan will be revisited and adjusted according to the needs or circumstances that may exist at a specific period-of-time. During this phase, initial communication activities (i.e. press releases) will also take place. The re-adjustments of the communication plan will be done in an agile manner throughout the project based on the achievements and stakeholders' requirements.

Phase 2 – Early Bird Communication | (M7 – M42) (April 2024– March 2027)

During this phase early bird communication activities aim to raise awareness of a wider public and to specific communities, about the project and its forthcoming activities and actions. Emphasis will be given to the online tools and measures as they tend to have a wider reach than traditional measures. During this phase, participation for networking purposes to webinars or other online events, articles over the internet about the project (i.e. CORDIS, etc.) will take place. This phase will last for the whole duration of the project as it mainly focuses on communicating the generic aspect of the project to a wide stakeholder base.

Phase 3 – Targeted Communication | (M25 – M42) (October 2025– March 2027)

The third communication phase requires the project to be in the relative maturity stage while concrete outcomes are released. During this phase targeted communication activities will take place such as publishing articles, blogs, or posts about certain project outcomes and benefits, hosting and/or participating in relevant external stakeholder events, producing targeted

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communication material (i.e. videos) for the community, etc. This phase will run in parallel with phase 2 as it focuses on targeted communication actions for specific audiences and not actions for the whole community.

3.1.3 Measures

To achieve the fixed objectives, the GRAPHERGIA project will deploy a wide range of targeted communications towards its target groups. These activities are framed with the project branding and an editorial plan.

3.1.3.1 GRAPHERGIA Branding

The project logo (see Figure 7) is a crucial part of the visual identity. The guideline "**GRAPHERGIA Branding Elements**"[3] showcases further the different logo formats. The project logo in its different formats is shared with partners on the online project folder. Also, the project has two dedicated fonts:

- Titles: **BEBAS NEUE**
- Normal text: Lato Regular

Only these fonts can be used in the project's publications and presentations.
The project colours are the following:

- Primary: #5E5E5E (grey) | #FFCE00 (yellow)
- Secondary: #B2B2B2 (light grey) | #FFB612 (dark yellow) | #FFF878 (light yellows)

As with the fonts, only these colours should be used in the project's publications and presentations.

[3] https://zenodo.org/records/10000942

Figure 7 GRAPGERHIA Branding

Even more, AUSTRALO Marketing Lab (AUS) leads the communication of the project, however, all partners contribute to it enabling to reach different audience from all partners' countries, and beyond. Therefore, it is important to set the common basis for the communication language elements:

- **The corner stones** of the GRAPGERHIA-related communications are the following aspects: GRAPHERGIA is a European initiative, collaborative effort, innovative action, and its attitude is encouraging and inclusive.
- **Tone of voice**, that is deployed throughout the communication and dissemination, is positive, approachable, and informative.
- **Grammar**: All partners should communicate by following the spelling and grammar of British English.
- **Partners names**: refer to partners with their complete names and add the abbreviation in parenthesis after the name.

These will be the guiding principles for all communication activities detailed in the next section.

3.1.3.2 Mixed Promotion Portfolio

The GRAPHERGIA project designs and deploys the mixed portfolio of communication actions to reach as wide array as possible of the different stakeholders. The results of each communication campaign will be monitored and assessed to fine-tune the strategies and activities throughout the project.

Table 4 lists the different set of tools created and used for the project communication.

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Table 4 GRAPHERGIA Tools for Communication

Tool	Objective	Channel	Target Group
Project Website	The GRAPHERGIA website is a key instrument for enhancing visibility of the project, informing visitors about the project concept. All public project results (deliverables, publications, articles, and news) are published on the website to allow all interested parties to learn about the project activities and results.	https://graphergia.eu/	All
GRAPHERGIA Contact Mail	External stakeholders can contact the project team directly for any further information about the project or collaboration proposition. AUS oversees these contacts and re-directs to the relevant partners.	contact@graphergia.eu	All
GRAPHENE Flagship Website	This platform helps to widen our target audience from the well-established Graphene flagship ecosystem that has been running for over 10 years. The dedicated GRAPHERGIA pages will be updated with project updates and milestones.	https://graphene-flagship.eu/focus/energy/graphergia/	All
Social media	We will share project updates and results several times a week to reach our target audiences quickly and with a minimal cost. GRAPHERGIA is present in LinkedIn (the privileged social media channel), X, and YouTube. More channels can be joined according to the project's needs.	LinkedIn | @graphergia X | @graphergia_eu Youtube | @graphergia	All
Newsletters	These will be published every six months presenting the latest project updates and results, such as events, publications, or research progress. The newsletter will be sent to its subscribers via two dedicated distribution channels. In addition, the project aims to feature in related external stakeholders' newsletters.	Via LinkedIn Newsletter tool	All
Press Releases	These are issued at each important project milestone (such as the project kick-off) to inform online and offline press, media and journalists about the project and to introduce new external articles about the project.	A PDF document, published on the project website and Zenodo.	Media, journalists, scientific community, policy makers & authorities
Slide-decks and one-pagers	These can be used for one-to-one engagement (e-mails and meetings) with stakeholders to mark as an entry point to the project.	A PDF document, published on the project website, Zenodo, social media and via mynewsdesk-platform.	Industry, end-users, SMEs, scientific community,

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			policy makers & authorities
General spreading	Creating and publishing GRAPHERGIA related articles in different online media targets and shaping a communication globe around the web sphere to maximise the outreach of scope to all stakeholders.	Publications in external online platforms and websites.	All
Printed material	Most of the PR material will be available as e-documents and printing will occur as required (e.g. for events, workshops, etc.). GRAPHERGIA will also explore other innovative alternatives to traditional informative material. Labelled gadgets and merchandise have turned out quite effective means of promoting initiatives among a less specialised audience, while encouraging a more sustainable approach when considering long-lasting items.	Creation of dedicated PDF documents, roll-up banner, project goodies based on the internal needs to be distributed in events and workshops.	All
Podcasts and videos	Audiovisual content is proven to be efficient and complementary to publications, articles, and reports. It helps to broaden the outreach and target new audiences. GRAPHERGIA will produce a podcast series with short episodes presenting the project's essence and multiple videos that foster our presence in the social media.	Creation and editing of video and audio material distributed through the website and social media.	All

The first tools for the GRAPHERGIA communication are already available, notably:

- Social media accounts are LinkedIn, and X running since November 2023.
- Website is up and running since December 2023.
- New content is published monthly on the website's "Activities"-page.
- The project flyer is published.

To see more details about the communication toolkit, see **Annex 1.**

3.1.3.3 Editorial Plan

One of the main activities to focus on during the first year is the publication of original content under the "Activities"[4] page of the project website. We plan to publish at least two blog articles in each month. These knowledge publications will help to reach out to a critical mass through the project website.

[4] https://graphergia.eu/activities/

To make the interest of our community consistently high, we plan to diversify the content of the pieces, regrouping the content in the following series:

- **WHAT IS GRAPHERGIA?** – This series introduces the project to specialised and non-specialised audiences. The task will divide detailed information such as the objectives, methodology, lexicon, and impacts into a series of articles.
- **GRAPHERGIA BENEFITS** – This series presents the reasons why the project is important and innovative, as well as it showcases the benefits for the target stakeholders.
- **MEET THE TEAM** – This series can be paired with a social media campaign highlighting the consortium's partners through interviews with a member/team of experts on the project.
- **WHAT WE ACHIEVED** – This series highlights the project's milestones and achievements throughout its duration, concluding with results from different perspectives. Other articles, related to project's results and activities, such as public deliverables, scientific publications, event participation etc. will complement these series, and these are published as soon as new results are achieved.
- **THE FUTURE OF RESEARCH** - Editorial from PhD/master students, junior researchers and junior staff working on the project, to present their point of view and what working in an EU-funded project means to them and their career.
- **GRAPHENE FLAGSHIP CLUSTERING** – this series focuses on presenting GRAPHERGIA's collaboration with this ecosystem and the 12 sister projects.

All article series will be paired with dedicated social media campaigns, and for certain specific topics, videos will be produced. Table 5 provides the initial editorial plan until M24 (September 2025), when the next iteration of this report is due. However, this is an initial plan that will be updated and adjusted during the project and its achievements. Moreover, as the partners participate or host events or publish scientific articles, these will be featured in the editorial plan as an additional element.

Table 5 GRAPHERGIA Editorial Plan Up to M24

	Editorial Campaign Focus
M1	N/A.
M2	▪ Social media launch (LinkedIn and X). ▪ Press Release #1: GRAPHERGIA project launch. ▪ Event chronicle: GRAPHERGIA Kick-Off Meeting.
M3	▪ GRAPHERGIA website announcement.
M4	▪ Meet the team - Interview #1 - FORTH ▪ Article #1: Why is GRAPHERGIA part of GFi? ▪ Deliverable: D1.1 Project Management Plan
M5	▪ Meet the team - Interview #2 - PLE

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	▪ Article #2: What is the GRAPHERGIA project? ▪ Event chronicle: GFi Common Kick-Off Meeting ▪ GRAPHERGIA flyer
M6	▪ Meet the team - Interview #3 - ADA ▪ GRAPHERGIA Newsletter #1 ▪ Article #3: GRAPHERGIA Challenges & Methodology
M7	▪ Meet the team - Interview #4 - UGE ▪ Article #4: GRAPHERGIA WPs and impact in science, industry and society ▪ Deliverable: D7.1 Plan for the D & E & C of Results (PDEC) ▪ Deliverable: D2.2 Data Management Plan
M8	▪ Meet the team - Interview #5 - Born GmbH ▪ Article #5: GRAPHERGIA Demo Cases
M9	▪ Meet the team - Interview #6 - URM ▪ Future of Research editorial #1
M10	▪ Meet the team - Interview #7 - COMS ▪ Article #6: GRAPHERGIA objectives
M11	▪ Meet the team - Interview #8 - DLR ▪ Article #7: GRAPHERGIA GFi sibling projects
M12	▪ Meet the team - Interview #9 - NTT ▪ Article #8: GRAPHERGIA year 1 recap and technical advancements ▪ GRAPHERGIA Newsletter #2
M13	▪ Meet the team - Interview #10 - AUS ▪ GRAPHERGIA Benefits #1 (related with use case 1) ▪ Event chronicle: Graphene Week
M14	▪ Meet the team - Interview #11 - EUGL ▪ The future of research – profile #1
M15	▪ GRAPHERGIA Benefits #2 (related with use case 2) ▪ The future of research – profile #2
M16	▪ The future of research – profile #3 ▪ GRAPHERGIA KER #1

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M17	▪ GRAPHERGIA Benefits #3 (related with use case 2) ▪ The future of research – profile #4 ▪ GRAPHERGIA KER #2
M18	▪ Article #9: Insights to the project's Mid-term Review ▪ The future of research – profile #5 ▪ GRAPHERGIA Newsletter #3 ▪ GRAPHERGIA KER #3
M19	▪ GRAPHERGIA Benefits #4 (related with exploitation) ▪ GRAPHERGIA KER #4 ▪ Deliverable: D4.3 Preliminary Energy harvesting system with regulated 3.3 V output based on μ-plasma systems
M20	▪ Meet the Team – Podcast #1 episode with FORTH ▪ GRAPHERGIA KER #5
M21	▪ Meet the Team – Podcast episode #2 with ADA ▪ GRAPHERGIA KER #6
M22	▪ Meet the Team – Podcast episode #3 with PLE ▪ GRAPHERGIA KER #7
M23	▪ Meet the Team – Podcast episode #4 with Born GmbH ▪ GRAPHERGIA KER #8
M24	▪ Article #10: GRAPHERGIA year 2 recap and technical advancements ▪ GRAPHERGIA Newsletter #4

3.1.3.4 Tools for internal communication

Proactive and continuous internal communication within the project team is crucial for the project success. The GRAPGHERGIA team comprises eleven partner organisations collaborating to achieve the set research and innovation objectives. Partners need to easily follow the ongoing projects activities and to discuss the running and forthcoming work. The tools for the internal communication are:

- Slack – real-time discussion platform enabling to exchange messages, have video-calls and to host discussion channels by different project topics.
- Shared online work folder – partners store their internal work documents on SharePoint accessible only to the accredited members of the partner organisations.

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- **Online work meetings** – each WP leader oversees the organisation of regular virtual meetings to coordinate the work between the different WP tasks. The WP leaders report the progress and plans to the project coordinator and the entire consortium.
- **Mailing list** – this diffusion tool is used for the administrative aspects of the project, concerning major decision-making or project reporting to the EC.

3.2 Dissemination Strategy

Dissemination is key for the success and sustainability of the GRAPHERGIA outcomes, as it aims not only at sharing results with target stakeholders in the research field, industry, other commercial players, and policymakers, but also at making these results available to the community contributing to the progress of science and technology in general. To this end, GRAPHERGIA has developed a flexible and adjustable dissemination plan that aims on building effective awareness of the project results, creating understanding and aiming for action among the key target audience identified. The execution of this plan will facilitate the best use and uptake of the outcomes and research insights generated throughout the project lifetime, reinforcing each of the impacts aimed in the work plan.

3.2.1 Objectives

Dissemination objectives have been predefined since the beginning of the project. However, these objectives are closely interlinked both with communication objectives and with the overall project objectives, all to create impact beyond the boundaries of this project. To resume, our dissemination activities aim to:

- Share the project results to the widest possible community building a cluster around the project.
- Enable external stakeholders to use the GRAPHERGIA results (e.g., scientific publications, technical webinars, public deliverables) in open access.
- Endorse our team members participation in scientific, technical and/or networking events to build a strong international community of stakeholders around the project.
- Raise the visibility of the GRAPHERGIA activities and results among the identified stakeholders.
- Spread the GRAPHERGIA research in educational paths (among different student groups, including Master- and PhD-levels.

The project has fixed itself a list of key performance indicators (KPIs) for dissemination, enabling to monitor and assess its success (see Table 6).

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Table 6 GRAPHERGIA KPIs for Dissemination

		Objective
		GA
Publications	Peer-reviewed articles in scientific research publications in international journals or conferences	**15**
Official EU tools	Use of key tools	**4**
	Articles published in EU magazines	**5**
GRAPHERGIA Best Practice handbook	Views / downloads	**1,000**
Diffusion of the project results to associations' members	Number of reached Organisations (*Smart-X, Smart textile alliance, Smarttex network, Battery 2030+ initiative, European Battery Alliance)*	**100**
Research educational activities	MSc related to GRAPHERGIA research	**5**
	PhD theses related to GRAPHERGIA research	**5**
	Students reached	**300**
Clustering and networking activities with stakeholders,	Created joint actions	**3**

In addition, these planned activities will be leveraged with the Graphene Flagship Ecosystem (see more in Section 3.3).

3.2.2 Dissemination Phases

Like the communication plan, the dissemination plan will be implemented in three different phases, as shown in Figure 8. The key difference between the two plans, although they are closely interlinked, is that the three dissemination phases do not span the whole project duration but have a starting and an ending date. Of course, this does not mean that these phases cannot be extended if necessary or cannot be adjusted if required.

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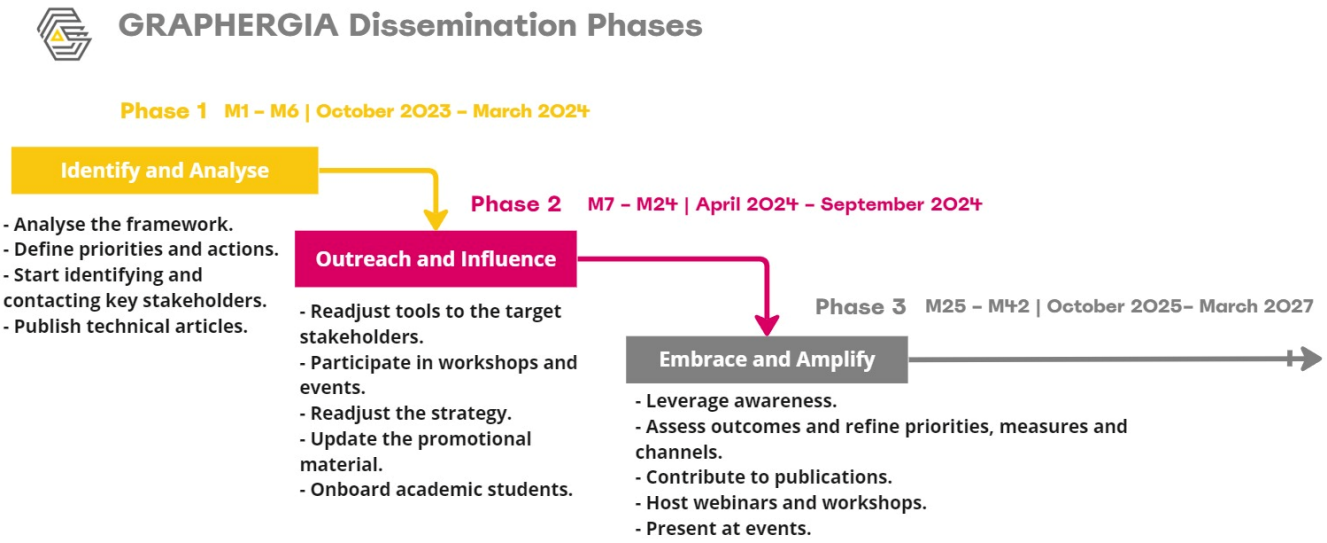

Figure 8 GRAPHERGIA's Dissemination Phases

Phase 1 Identify and Analyse | (M1-M6) (October 2023 - March 2024)

During this phase, the project's framework is analysed to be aligned with the dissemination plan. Moreover, the focus is on identifying internal and external barriers and obstacles that could slow down the dissemination activities, as well as on defining the priorities and actions for the first year of the project. During this phase, a first set of promotional material, produced as a part of the GRAPHERGIA communication strategy, will be prepared and delivered. Furthermore, the scouting, identification and contacting key stakeholders starts from this phase onwards.

Phase 2 Outreach and Influence | (M7-M24) (April 2024 – September 2025)

The main objective of the second phase is to increase the impact and awareness around GRAPHERGIA, and to share the first achievements and activities of the project. All channels (including communication) will be adapted to the specific needs of this phase, and to properly find the right means to engage and collaborate with the target groups. This will help increase the potential impact of the project's results. Participation in events, as well as organisation of workshops, webinars, podcasts etc., will boost the dissemination process. Based on different event participation and engaged collaborations, specific PR material will be also produced.

Phase 3 Embrace and Amplify | (M25 -M42) (October 2025 – March 2027)

This phase will leverage the general awareness raised by the two initial phases, attracting more potential end users and clientele interested in GRAPHERGIA. Earlier phases will be evaluated and, if needed, priorities, measures and dissemination channels will be refined. Participation in events, workshops, and conferences as well as contributions to publications in targeted specific media online and printed trade and research journals will be implemented.

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3.2.3 Measures

As already highlighted, communication and dissemination are closely interlinked; therefore a number of tools are common for both. However, there are some tools specific to the dissemination and to create impact for the project.

Table 7 Measures for GRAPHERGIA's Dissemination

Tool	Objective	Channel	Target Group
Project documentation	All public deliverables will be shared in open access via our public repository, and through our communication channels.	- Project website - Zenodo - Social media channels	- All
Peer-reviewed publications	The project aims to publish and contribute to publications in top refereed scientific journals and conferences relevant to material innovation, smart textiles, batteries, related topics, and manufacturing. One of our main objectives is to ensure the technical achievements and experimental findings of the project will be known and exploited by a larger research community and related scientific domains.	- Scientific Conferences - Scientific articles - Books	- Scientific community and research projects - Graphene industry and manufacturing SMEs - E-textile and LIB producers and end-users - Policy makers and authorities
Technical publications	Technical articles can disseminate the outcomes to a wider scientific and technical audience. The project will publish and contribute to technical blogs and articles in the relevant research and manufacturing areas.	- Project website - External websites - Newsletters - Media outlets	- All
The EC Services for projects	GRAPHERGIA will monitor and assess opportunities that the European Commission proposes for the RIA projects, as their support can endorse the dissemination of the project's impact.	- Horizon Results Booster - Horizon Magazine - Horizon Results Platform - Innovation radar - CORDIS - HS Booster	- Scientific community and research projects - Graphene industry and manufacturing SMEs - E-textile and LIB producers and end-users - Policy makers and authorities

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Open access library	GRAPHERGIA will provide open access to peer-reviewed publications, public deliverables, and scientific research data by using Zenodo online repository, where it is possible to deposit both publications and data, while providing a direct online link to them.	- Zenodo[5]	- All
Stakeholder Feedback	Collecting feedback from the project's stakeholders enables to expand its horizon, especially in terms of sustainability of the results, but also spread the outcomes to a specialized audience. This can also support the decision making in critical issues and to refine the project's strategies.	- Online surveys and polls	- Scientific community and research projects - Graphene industry and manufacturing SMEs - E-textile and LIB producers and end-users
Conferences, Trade fairs, and Workshops	Participating in conferences, workshops, and trade fairs constitute a strategic mechanism for interacting with multiple stakeholders at a time. The consortium will disseminate outcomes achieved by the project in the form of presentations, talks and personal engagement. This action will include events directly related to 2D-materials, innovation in energy and battery manufacturing, but also end use-oriented affairs with a focus on material innovation and manufacturing.	- Physical and online events	- All
Educational research activities	The GRAPHERGIA's academic partners will involve students from the different grades in the project's research enabling them to contribute to the project's research experiments and to endorse their skills related to graphene-applications. This enables the academic spreading of the project's research activities, which fosters its impact among the academic community and researchers.	- Academic cursus of the scientific project partners	- Scientific community and research projects - Graphene industry and manufacturing SMEs - E-textile and LIB producers and end-users

3.3 Coordination with Graphene Flagship Initiative

As outlined in Section 2.3, the Graphene Flagship Initiative (GFi) brings crucial support to the dissemination of the GRAPHERGIA project. Thanks to its ecosystem in graphene-related research and innovation that has been built for over 10 years, GRAPHERGIA will be able to disseminate its

[5] https://zenodo.org/communities/graphergia_heurope?q=&l=list&p=1&s=10&sort=newest

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results to an important number of stakeholders. The Flagship hosted a physical joint kick-off meeting in Gothenburg, Sweden, on the 4th and 5th of February 2024[6], which marked the start to the coordinated efforts among the 13 sister projects working on graphene-innovation.

3.3.1 Objectives - Dissemination Working Group

AUSTRALO Marketing Lab (AUS), leading the project's WP7, represents the project in the GFi Dissemination Work Group that runs regular online meetings to coordinate and plan joint communications and efforts in dissemination. This group gathers the communication and dissemination leaders from the 13 sister projects. AUS role is notably to ensure that:

- GFi and the sister projects get visibility on the GRAPHERGIA channels, and vice-versa.
- The project's editorial calendar is aligned with the GFi's calendar.
- The project plans and hosts joint events, meetings, and webinars according to the established synergies with sister projects.
- GRAPHERGIA is represented in the GFi major annual event "Graphene Week".
- Efforts done in the Dissemination WG relate to work done in the other GFi WGs dedicated to standardisation and innovation management.

3.3.1.1 Plan and next steps

The GRAPHERGIA team visions the collaboration with the GFi ecosystem in three key phases corresponding to the project's evolution.

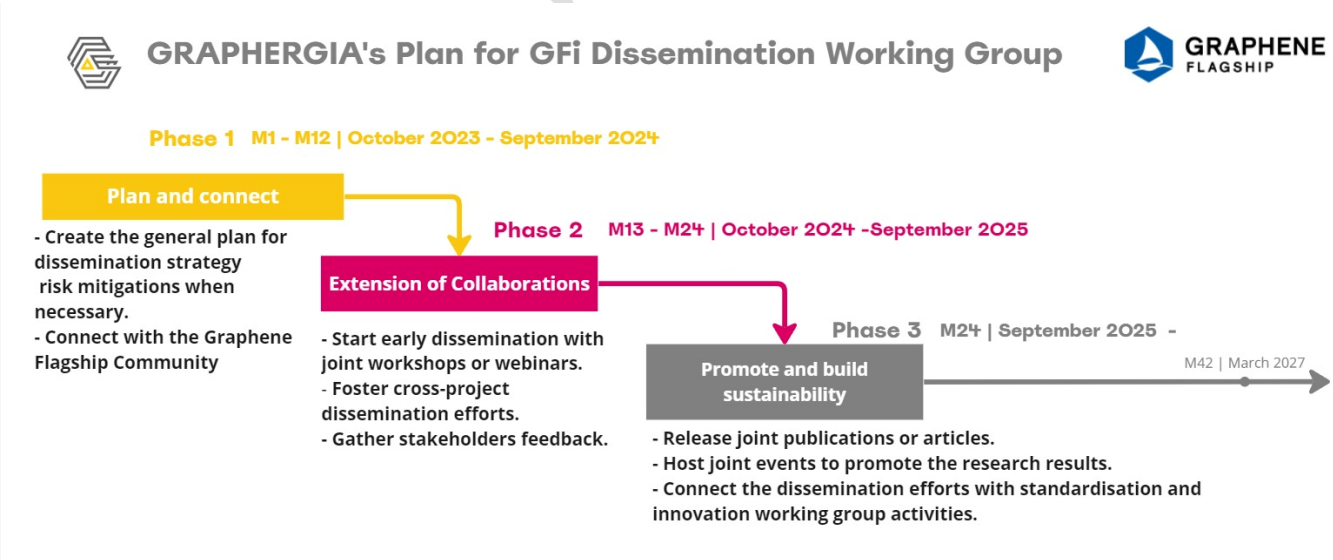

Figure 9 Plan for efforts in GFi Dissemination Work Group

[6] https://graphergia.eu/2024/02/06/joint-kick-off-meeting-with-the-graphene-flagship-sister-projects-establishing-contacts-and-opportunities-for-synergies/

Phase 1 Plan and connect | (M1 – M12) (October 2023- September 2024)

This phase is dedicated to establishing a solid dissemination strategy for the project, and then connecting it to the wider scope of the GFi ecosystem. This strategy will underline the objectives for GRAPHERGIA's dissemination, to better understand how these can be linked to the sister projects' activities to leverage the research and innovation results even further. Also, as a newcomer in the GFi, this phase will be dedicated to building a network of contacts among the GFi actors, especially with projects dealing with energy harvesting and storage.

Phase 2 Extension of Collaborations | (M13 - M24) (October 2024 -September 2025)

From the second project year onwards, as the project's research is processed, we aim to extend collaborations with sister projects, hosting at least two joint workshops or webinars presenting the project's progress and insights to external stakeholders. These sessions will also be occasions to collect stakeholder feedback and to grow the network for future collaborations. In addition, GRAPHERGIA continues to disseminate results from the sister projects on its communication channels, and to join key physical and online events organised by the ecosystem members.

Phase 3 Promote and build sustainability | M25 - M42 (October 2025 – March 2027)

During the final half of the project, as more research results are delivered, GRAPHERGIA plans to use the GFi Community to spread the results across its network as much as possible. The aim of this proactive engagement is also to obtain support for the exploitation activities of the project, building the framework for the GRAPHERGIA's sustainability beyond the project duration. In this sense, the work done in the Dissemination WG will be also connected to efforts carried out in the other GFi Working Groups related to standardisation and innovation management.

3.4 Activity Monitoring and Risk Mitigation

3.4.1 Monitoring strategy

Monitoring and adjusting the Communication & Dissemination plan, on a frequent basis, is a fundamental element of the project's success. Continuous monitoring allows the consortium to correct any possible deviations and improve its effectiveness by applying correction and mitigation measures when needed.

It will also address possible implementation problems and identify whether further action is required to ensure that objectives are met. Emphasis is given on the pre-assessment of information needs, on the monitoring frequency (on monthly basis) and the method of collecting evidence.

The execution and effectiveness of the Communication & Dissemination plan is dependent on close monitoring, and a flexible and prompt response mechanism (Figure 10). Every designed and implemented activity will be monitored and evaluated according to its impact and closely related

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to the KPIs (*see Table 3 - Communication KPI Objectives and Table 6 GRAPHERGIA KPIs for Dissemination*).

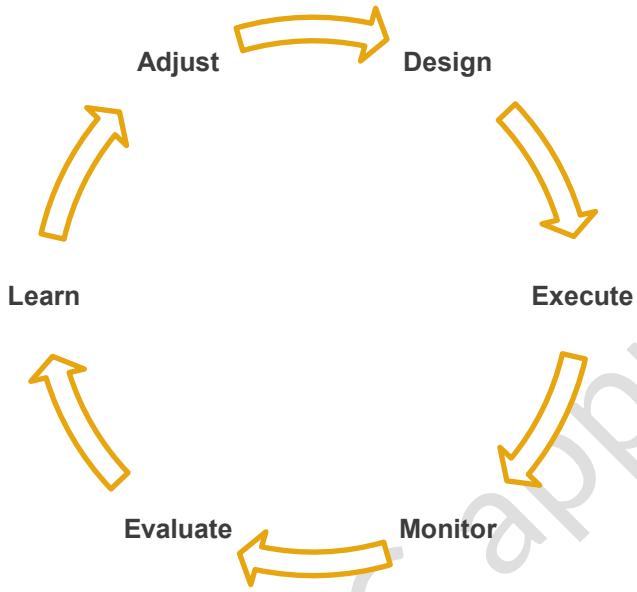

Figure 10 Communication & Dissemination Cycle

- **Design:** Design each activity based on the Communication & Dissemination Plan and the desired impact.
- **Execute:** Execute according to plan.
- **Monitor:** Closely monitor the activity and collect input and results. Monitoring will be based on a template that is available only to partners through an internal monitoring tool.
- **Evaluate:** Evaluate the outcomes of the activity in a collaborative way according to the desired targets set in the design phase.
- **Learn:** Learn through this evaluation and try to extract the most valuable outcomes out of it.
- **Adjust:** Absorb findings and lessons learnt, and adjust the plan accordingly, if needed.

All outcomes and results of the Communication & Dissemination Plan will be reported in **D7.2 Plan for the D & E & C of Results (PDEC) - Updated version** at Month 26 and **D7.3 Plan for the D & E & C of Results (PDEC) - Final version** at Month 42.

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3.4.2 Possible Risks

There are several risks and potential issues related to the communication and dissemination side of the project. These risks will be monitored and mitigated by the Communication & Dissemination leader who will also control these risks on a regular basis and will report any changes to the Project Coordinator. Examples of communication risks include but are not limited to:

Table 8 Dissemination & Communication Risks

Risk	Priority	Measure to minimise Risk
Communication & Dissemination activities fail to target the correct audiences. The project may fail to draw interest from relevant stakeholders.	High	**GRAPHERGIA** partners have defined a clear set of objectives and measures for each target group. However, this agile strategy allows us to revisit and mitigate our activities if needed. Close monitoring and frequent evaluations will make sure that our strategy will remain on track throughout the project.
Lack of public awareness of the project activities	High	The network is diverse and includes leading scientists, industrial partners, end users, experts in communication etc. most of them affiliated to international work groups that guarantee relevant connections and channels.
Lack of partner's engagement	High	**GRAPHERGIA** partners have developed a concrete communication and dissemination strategy, supported by internal dissemination and communication manuals and guidelines, monitoring procedures and internal reviews enabling them to assess, both from a quantitative and a qualitative perspective, project's performance and engagement of partners.

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4 EXPLOITATION PLAN

The exploitation strategy of GRAPHERGIA relates to the way each project partner individually, and the project partnership, intend to use the project results for scientific, societal, economic purposes, and policy making. The wide industrial participation in GRAPHERGIA brings strong expertise and benefits for an effective exploitation strategy. Task 7.2 is dedicated to exploitation and project sustainability, and it is closely related to all other tasks running under work package 7 "*Dissemination, exploitation and communication of project results*", including:

- Task 7.1 Dissemination and communication (AUS)
- Task 7.3 IPR Management (EUGL)
- Task 7.4 Clustering activities and community building (AUS)

In this framework, the consortium has defined a set of Key Exploitable Results (KER) (see Section 4.3). The goal is to create an enabling support system that maximizes the large-scale uptake of the project exploitable results both during and after project completion, ensuring that as many solutions as possible reach the **industries of graphene, e-textiles, and batteries**. To achieve this, this effort focuses on developing exploitation plans for the KERs. In addition, there is a specific task and related deliverables dedicated to IPR management led by EUGL partner, assessment of regulations and standards in EU and associated countries that apply to the solutions of GRAPHERGIA.

All partners are highly interested in strengthening their organizations by exploiting the project's end results following the well-defined exploitation models for each key exploitable result.

4.1 Exploitation principles

GRAPHERGIA will invest in three main exploitation models, including:

- **Commercial exploitation model**, which implies the paid provision of the project results to the end users, complying with a licensing scheme that will be defined at a later stage.
- **Research exploitation model**, which implies the use of the research know-how acquired in future research activities.
- **Technological exploitation model**, which implies the use of the technological know-how gained for the development of innovative products and the provision of advanced services built on top of them.

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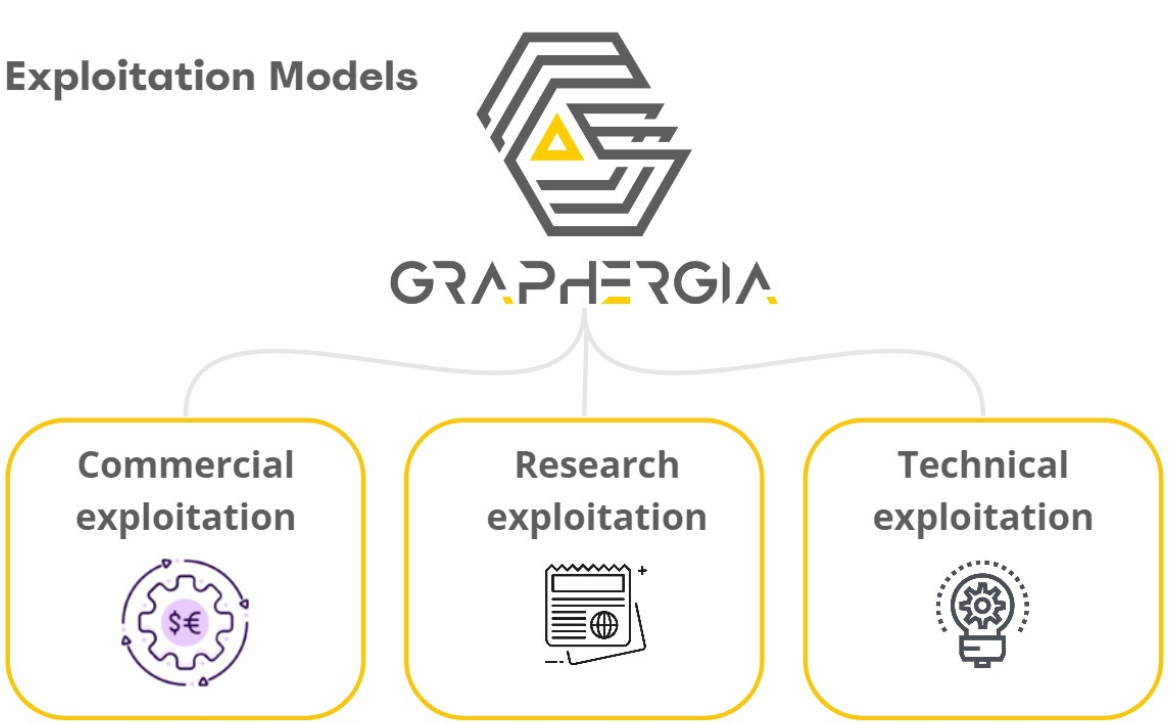

Figure 11 Exploitation Models

All three routes will be explored independently as the project evolves while the most appropriate exploitation model will be selected. At this point, it is important to highlight that GRAPHERGIA will produce several exploitable results, as further detailed in Section 4.3. All exploitable results will be treated on equal terms therefore the most appropriate model for each one will be proposed. However, it also needs to be addressed that the exploitation models of the project's results will be dependent upon three main parameters:

- the nature and interests of the project partners and stakeholders in general,
- the distribution model (commercial or non-commercial) of the project results, and
- the distribution of the IPRs amongst the project partners.

4.2 GRAPHERGIA's added value

The exploitation plan will be built on the added value of the GRAPHERGIA system, that will be communicated and disseminated in different formats throughout the project.

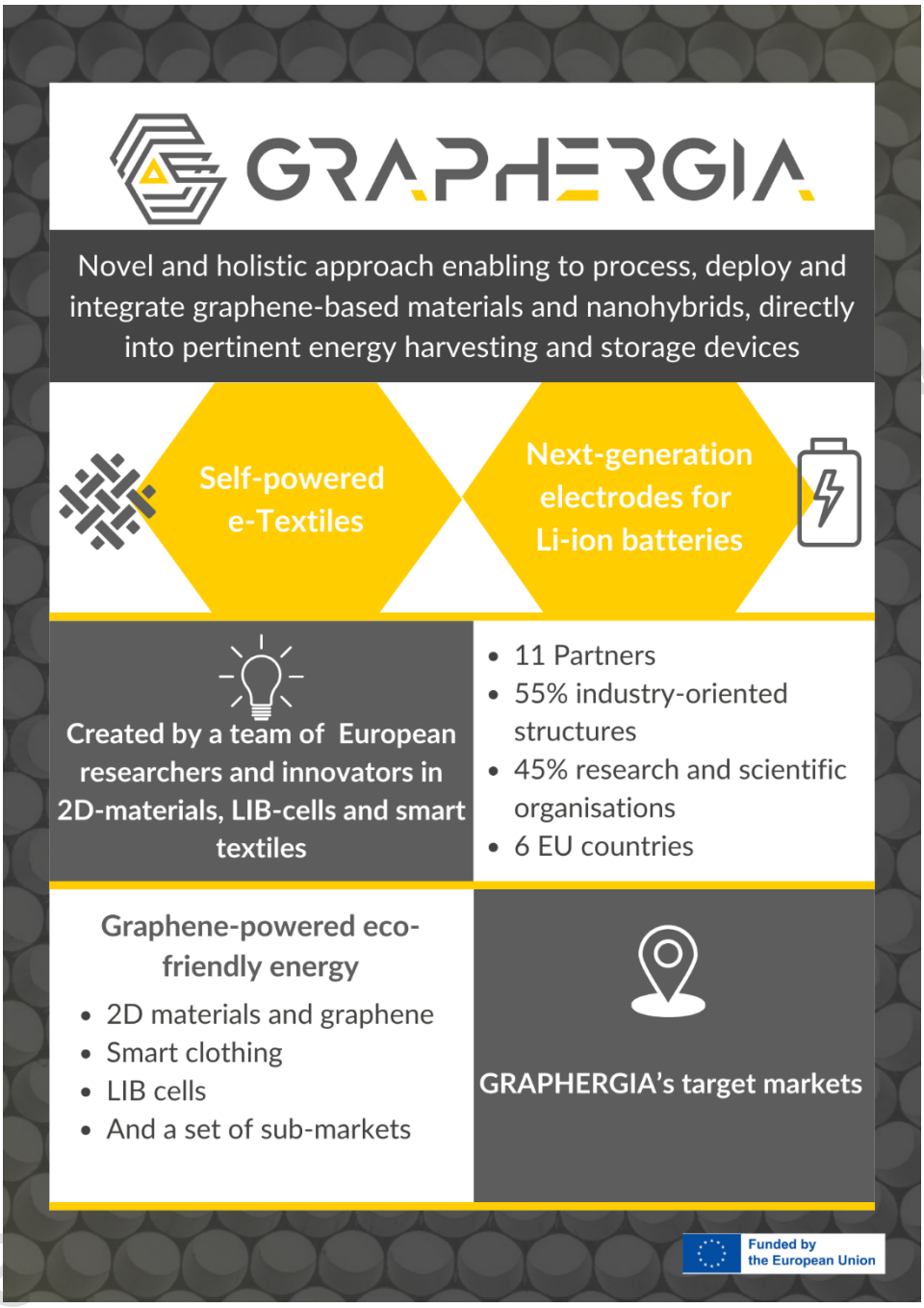

Figure 12 GRAPHERGIA's Added Value

As showcased in Figure 12, GRAPHERGIA develops a novel and holistic approach enabling to process, deploy and integrate graphene-based materials and nanohybrids, directly into pertinent energy harvesting and storage devices. This will pave the way for scalable, cost-efficient, and climate-neutral production of two kinds of two-dimensional (2D) material technologies:

Firstly, the partners will apply this innovative method for e-textiles aimed at smart clothing, with the specific functions of wearable power supplying and self-powered structural sensors. The objective is to produce all-in-one, multifunctional self-charging power textiles with integrated electronic systems offering a user-centric technology that interfaces the wearer to the IoT through wireless sensor signal transmission.

Secondly, the project will define the next-generation electrodes for Li-ion batteries. This exploration will capitalize on the consortium partners' IPR-protected technologies, integrating them with 2D materials and process-oriented approaches. The development is based on low-cost raw materials and inherently scalable fabrication approaches, ensuring cost-effective and eco-friendly production of energy harvesting and storage devices.

These approaches are strategically designed to reduce reliance on wet-chemistry methods and to decrease the usage of Critical Raw Materials (CRMs).

Starting from the present technology readiness level (TRL) of 3-4, the consortium delves into innovative concepts for 2D materials engineering and integration at TRL 5 or higher, establishing versatile pilot-scale-based approaches for these two application categories.

Moreover, the GRAPHERGIA project benefits from a strong direct industrial involvement, which enables to ensure industrial relevance and impacts of the R&I efforts in GRAPHERGIA. Almost 60% of the partners are either partially or totally industrially oriented, either as manufacturers or experts in technology transfer and IPR management. This strong industrial involvement will assist the starting TRL 3-4 research activities to be designed and implemented in a way that would facilitate fast and successful exploitation of the project results, ensuring commercialization. The presence of partners with strong corporate policy and expertise in eco-design and sustainability strengthen the project contribution to circular economy.

This business-oriented consortium ensures a market-driven approach of the R&I activities, but also prepares the ground to a transition at much higher TRL readiness level than the target TRL 5, shortly after the project lifetime. Born GmbH, with TRL 9 expertise in e-textiles, will contribute to GRAPHERGIA the experience and competence in the development and validation of TENG-embedded textile demonstrators, while they will also consider advancing the developed innovation to much higher TRL beyond the project lifetime. With the confirmation of the technology results in cylindrical cell batteries and the demonstration in system level with the assembly of a power module for CubeSats, PLE will achieve a rapid TRL increase maturing the technology ready for In-Orbit Demonstration and Validation. ADA will benefit from new technology after a pilot validation (Demo #2) and add in their exploitation portfolio devises such as self-powered sensors embedded in smart composites structures.

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4.3 Key exploitable results

The research, development, and piloting work carried out within the different work packages of the project (WP2-WP6) will result in key exploitable results (KER) for which partners will define tailored exploitation plans to ensure their commercial market uptake, further research and innovation or scientific exploitation.

4.3.1 Target markets

GRAPHEGIA project's tangible outcomes will be disseminated and exploited in several different target markets that are relevant to its innovation. As presented in the exploitation phases (see Section 4.7), there is a dedicated phase to conduct an in-depth market research. At this stage, partners possess initial market research evidence for the project products:

The 2D materials market is currently dominated by graphene and GRMs, while other types of 2D materials now hold much smaller share in comparison to graphene. Further, no detailed quantitative market analysis for other 2D materials (beyond graphene) has been yet demonstrated. Reports on the graphene market growth indicate a highly optimistic future of graphene market growth, because several R&D efforts and patents mature into end-user applications. Currently, the Asia Pacific region represents the fastest growing graphene market[7]. According to the most recent predictions, the global graphene market is valued at €234 million in 2024, and is projected to grow to €1,469 million by 2030, at a CAGR of 35.1% in the forecast period, 2024-2030[8].

The e-textiles wearables market also rises at a fast pace. The smart clothing market is expected to grow from €2.72 billion in 2022 to €19.46 billion by 2030 and is expected to grow at a CAGR of 27.4 % during 2023-2030[9]. This significant growth over the past years, is mainly due to the advancement and implementation of technologies like AI and IoT in smart textiles and expanding flexible wearable electronics which is expected to grow in the coming years. The potential applications of self-charging e-textiles may spread over a wide range of areas including athletics, military, elderly, people with handicaps, and in general any battery-less technology that would be associated with IoT applications. Currently, the industry is witnessing a shift with a positive confluence of the technology and textiles that is leading to an easier integration of comfortable fabric-based energy harvesting units, together with the introduction of self-powered sensors for the Industrial IoT.

The graphene battery market is projected to grow from €153 million in 2024 to €556 million by 2030, at a CAGR of 23.9% on this period[10]. This growth is driven by rapid advances in graphene

[7] https://www.fortunebusinessinsights.com/asia-pacific-graphene-market-108294 (02/01/2024)
[8] https://www.grandviewresearch.com/industry-analysis/graphene-industry (02/01/2024)
[9] https://www.grandviewresearch.com/industry-analysis/smart-clothing-market-report (02/01/2024)
[10] https://www.marketsandmarkets.com/Market-Reports/graphene-battery-market-96975481.html (02/01/2024)

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electrodes and the use of graphene batteries in a large spectrum of consumer products, i.e. portable electronics, and automotive industries.

In addition, partners will explore alternative sub-markets that could be relevant for further exploitation of the GRAPHERGIA's innovation, these include notably, **IoT-based wearables, connected sports clothing, e-health, aeronautics, and space** that can all exploit graphene-powered energy solutions.

4.3.2 Overview of the KER Definition Process

GRAPHERGIA brings together innovations to create strategic synergies and develop an integral approach for radically new energy technology solutions, leading to real-life applications, including 8 defined key exploitable outcomes that will be further defined throughout the exploitation task. The listing of the GRAPHERGIA KER is not provided in the version of the deliverable due to the sensitive character of this information and this approach is part of the adopted IPR management strategy (see more in Section 4.5).

Moreover, each KER will be associated with a dedicated group of GRAPHERGIA partners, having interests for the specific KERs, for identifying relevant exploitation opportunities. The following steps of the KER definition with focus on:

- Drafting a **short description** of each KER describing its key elements and deployed scientific methodologies.
- Defining the **IPR owners**: naming the GRAPHERGIA consortium members owning the related intellectual property.
- Monitoring the **Background Intellectual Property**: If partners bring in already existing intellectual property, it is specified in this section.
- Specifying the **Individual exploitation intention**: each partner investing in the KER develops their individual paths for further exploitation of the result within their organisation.

These definitions will be discussed during the exploitation workshops and further detailed in the forthcoming iterations of this deliverable (D7.2 | M18 and D7.3 | M42). Finally, the set of KERs constitute the KER database, which is one of the exploitation tools further described in the next section.

4.4 Exploitation tools

The following table lists a collection of exploitation tools that can be used to support the definition of the exploitation strategies throughout and beyond the project. This is an indicative list that can evolve based on the needs and outcomes of the project.

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Table 9 Exploitation tools

Tool	Description
Results map	It is a visual representation in the form of a table that provides a comprehensive overview of the categorization of the project results. The map includes Key Exploitable Results (KERs) - both Joint Key Exploitable Results (J-KERs) and Individual Key Exploitable Results (I-KERs) - as well as other Results. These are further divided into 'commercial' and 'non-commercial' categories. Commercial results encompass products (software and hardware), as well as professional services. Non-commercial results, on the other hand, can range from standards, knowledge, open-source or free-access results, recommendations for policy making, to education and training-related outcomes.
KERs Database	It is a valuable tool for compiling and organizing information related to the Key Exploitable Results identified. It provides easy access to information on different elements such as a brief description, a categorization of the type of result, ownership, exploitation paths, interested partners, target audience, expected maturity in terms of Technology Readiness Level (TRL), as well as time to market and commercialization potential.
ERs Database	Like the previous tool, the ERs Database is a useful instrument for compiling and organizing information related to the identified Exploitable Results (ERs). It provides information on key elements such as a brief description of the result, the maturity of the result in terms of Technology ReadinessLevel (TRL), the time required to exploit the result after the project, the subtype of result, and the ownership.
IPR Strategy Plan	This plan, running under task 7.3 “IPR Management & Exploitation” evaluates the potential for exploitation and dissemination and designs the best plan to achieve the highest possible impact in terms of financial rewards (commercial exploitation) and of dissemination through public and scientific disclosure (publications, transfer of knowledge to the public).
IPR and licensing repository	The IPR and Licensing Repository is a centralized and organized database that stores information related to intellectual property rights (IPR) and licensing for the results generated by the project. It serves as a repository for all relevant documentation, agreements, and licenses associated with the commercial and non-commercial outcomes of the project. This effort is coordinated under task 7.3 “IPR Management” led by EUGL.
Freedom to operate (FTO) analysis	This analysis is done generally to products at TRL5-6 to understand in which countries a new patent could be operated making sure that there are no existing patents blocking the patent access on the market. This analysis is linked to task 7.3 “IPR Management” led by EUGL.

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Market research	This tool is used to gather and analyse data about the GRAPHERGIA solution and its competitors. The findings of the market research and benchmarking process are used to elaborate an internal report informing the development and positioning of the solution in the market. It will include the conclusions of the market analysis, benchmarking, SWOT analysis, and it can be linked to the exploration of intellectual property rights.
Diagram of scientific components	It offers a graphical overview of the various parts, such as modules, subsystems, etc., that constitute the GRAPHERGIA solution, along with their interconnections. The diagram includes boxes and shapes. representing individual components, labelled with their names, and arrows to indicate interconnections. Serving as an exploitation tool, the Diagram places a significant emphasis on the Key Exploitable Results (KERs), positioning them as the backbone or main pillars beneath which each component is positioned. ▪ Documentation: To capture and document the scientific components of the GRAPHERGIA solution for reference. ▪ Communication: To visually convey the scientific components and their interactions to team members. This will facilitate discussions and decision-making in the exploitation field.
Global exploitation pathways map	The global exploitation pathways map is a graphic diagram that includes well-defined and prioritized routes for exploiting GRAPHERGIA results (e.g., further research, commercialization, education and training or policy contribution). It provides a visual representation of the planned routes for maximizing the impact and value of the project's results. The map serves as a strategic guide for decision-making and resource allocation, ensuring that the exploitation efforts are aligned with the objectives pursued. In the map, the stakeholders targeted are identified and short-term objectives and mid-term impacts are also included, providing a reference timeline for each pathway. By outlining all of these, the tool facilitates coordinated and effective exploitation efforts.
Individual exploitation pathways map	This is a similar tool to “Global exploitation pathways map”, but tailored to each specific partner within the GRAPHERGIA consortium, making it individualized and concrete for their unique context. It includes well-defined and prioritized routes for each partner to exploit the project results most relevant for them. This personalized approach ensures that each partner's interests and objectives taken into consideration.
Internal exploitation workshops	A series of internal exploitation workshops will help to implement the exploitation plan among the GRAPHERGIA consortia. These efforts will result in the elaboration of well-defined and prioritized exploitation pathways for each identified key exploitable result further research, commercialisation, education and training, policy

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	contribution, etc. Also, this continuous engagement with all partners allows to update and adjust the definition of GRAPHERGIA KER set, to build business cases, and to follow-up the standards that should be considered for the exploitation plan. AUS will run these exploitation workshops on a regular basis, taking place every six months.
Innovation Roadmap	The innovation roadmap takes the form of an internal report. It is aimed at identifying and proposing new functionalities, features, and enhancements to the GRAPHERGIA solution. The approach is forward-looking, focusing on making the solution more competitive and relevant in the market. The tool will also serve to align the business models of GRAPHERGIA with market demands and technological advancements to position the solution as an offering capable of meeting customer needs. This roadmap could be included in the final iteration of this deliverable (D7.6).
Business Cases and Models	Developing business cases around the GRAPHERGIA system enables to analyse where the market's needs are, and what kind of problems should be solved on the market. Once the business cases are established, one can use business models as strategic roadmaps to define how the different stakeholders can generate and deliver value through the GRAPHERGIA system. They incorporate several elements, including the target customers, the unique value proposition, the revenue streams, the cost structure, the sales channels, as well as the go-to-market approach.
GRAPHENE Flagship Annual Report Insights	Along with the 11 other sibling projects, GRAPHERGIA provides an annual overview of the project's results and achievements to the Graphene Flagship's annual report that is a public document shared within the Graphene flagship ecosystem. It allows to resume the projects innovation results to a wide range of target stakeholders on European and international arenas.

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4.5 IPR Strategy

The overall IPR Strategy Plan is based on a market-oriented IP approach aiming at introducing a sound methodology for the implementation of an IP valorization methodology based on the partial steps of a) recognizing the IP, b) evaluating its potential for exploitation and dissemination and c) designing the best plan to achieve the highest possible impact in terms of financial rewards (commercial exploitation) and of dissemination through public and scientific disclosure (publications, exhibitions, transfer of knowledge to public).

It is important, the involved partners to decide the type of protection (IP rights) they will seek. Initially, it will be examined if the invention is novel, if it has an inventive step and if it is worth the investment for commercializing. If the innovative method/product can be reversed engineered and be repeated by the competitors, protection as a patent will be the first option. If the invention cannot be copied by potential competitors, it will be handled as a trade secret so the partners will do all the relevant steps to keep it secret. In any case, publications or other public disclosure action will take place only after filing of the relevant patent application or after the decision to follow no IP protection. In the following schematic diagram, the proposed methodology is presented.

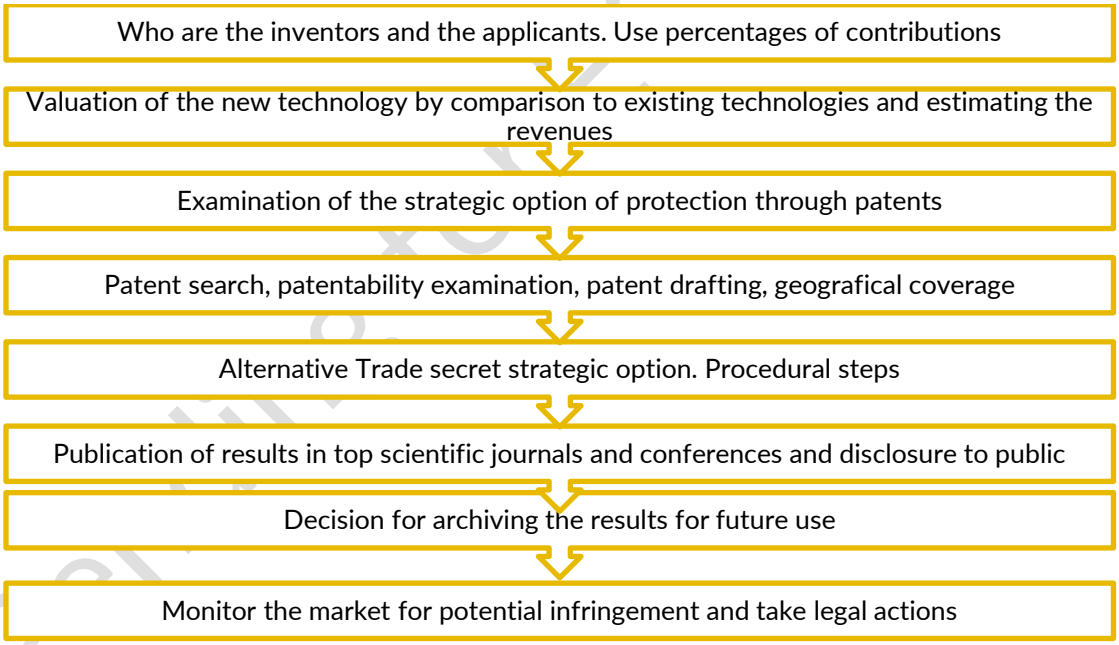

Figure 13 IPR Management methodology

The initial step of the IPR Strategy Plan is to identify the owners of the IP and to attribute the rights to the correct applicants. The second step is to identify the potential market value of the new technology to estimate the amount that could be invested for protection and relative actions. Third the patentability is evaluated considering that for software the use of copyright protection

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is an alternative but weaker protection method. When the subject matter of an invention cannot be revealed by reverse engineering actions, the Consortium should consider keeping the invention as a trade secret. A trade secret is a piece of information treated as confidential by an enterprise because its features combined with limited access provide a competitive advantage (*EU Directive 2016/943 on the Protection of Undisclosed Know-How and Business Information against Unlawful Acquisition, Use and Disclosure*[11]). A patent application is published in 18 months after filing so it will be disclosed to the public. Therefore, it is crucial the consortium to monitor the market for potential infringement of the IP rights of the project. In the case of infringement of the published patent applications by a competitor, the partners will defend their IP by suitable legal actions, if an agreement cannot be reached with the infringer.

4.6 Standardisation Strategy

The GRAPHERGIA standardisation strategy focuses on standards in the fields of smart textile, battery manufacturing as well as products safety and eco-design. This strategy includes two components; Firstly, the team will monitor and assess the existing relevant standards and create a dedicated database of GRAPHERGIA related standards that should be considered in the system components. Secondly, with its implication to the Graphene Flagship initiative / Standardisation WG, the project investigates the opportunities to contribute to the development of new standards in the pre-selected areas.

4.6.1 Standards landscape in smart textiles and battery manufacturing

The consortium will assess standards in EU and associated countries that apply to the solutions of GRAPHERGIA. Industrial partners, especially ADA, PLE, Born GmbH and ComS, will cover standards relating to their manufacturing processes, whereas scientific partners, including FORTH, DRL, URM and UGE, will monitor standards relevant to their respective research areas in the project.

Moreover, the monitoring and assessment of relevant applicable **standards in smart textile technologies** is overviewed by Born GmbH whereas the standardisation landscape in **battery production** led by PLE.

Furthermore, NTT will focus on monitoring standards for **products safety and eco-design**. Standards for the Life Cycle Assessment (LCA), Social Life Cycle Assessment (SLCA) and Life Cycle Costing (LCC) are framed by the global standards *ISO 14040/ISO 14044:2021*[12].
The framework for eco-design, instead, is established by *European directive 2009/125/EC*[13]. This directive is not specific for textile products but now a new Regulation on *Eco-design of Sustainable*

[11] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32016L0943
[12] https://www.iso.org/fr/standard/38498.html
[13] https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32009L0125

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Products (ESPR)[14] is proposed in 2022 to extend the scope of the current directive to improve the circularity and sustainability of almost all categories of physical products, including textile products, placed on the EU market.

In addition, during the exploitation workshops, the partners continue to identify relevant standards and regulations from both, European level and from the partners countries where the system would be operating at first. This is a continuous effort ensuring that the changing standardisation landscape is considered in the system development and its plans for sustainability. The final findings of standardisation landscape research will be presented in the forthcoming iterations of the deliverable (D7.2 and D7.3).

4.6.2 Roadmap Officer for Standardisation Activities

The Graphene Flagship project will provide industrialisation support to GRAPHERGIA, and one of the core topics will be the coordination of standardisation activities. Dedicated and relevant GRAPHERGIA partners (especially ADA and PLE) will be involved in this task force within the flagship. This work and joint effort will be focused not only on monitoring existing standards but also on finding opportunities to contribute the development and/or revising of related European and international standards.

4.7 Exploitation phases and next steps

The research work defining the GRAPHERGIA exploitation plan includes three key phases covering the entire project duration, from first project month (M1 | October 2023) until the end of the project (M42 | March 2027). Given the relatively long duration of the project (3.5 years), where the related technological, scientific, standardisation, regulatory and business landscape evolve continuously, the exploitation plan will be drafted in an agile manner, including updates in M26 and M42, and gathering continuous input from partners and feedback from the most relevant stakeholders.
Figure 14 outlines the general work phases for defining the GRAPHERGIA exploitation plan, and these phases are further described in the sections right after it.

[14] https://commission.europa.eu/energy-climate-change-environment/standards-tools-and-labels/products-labelling-rules-and-requirements/sustainable-products/ecodesign-sustainable-products-regulation_en

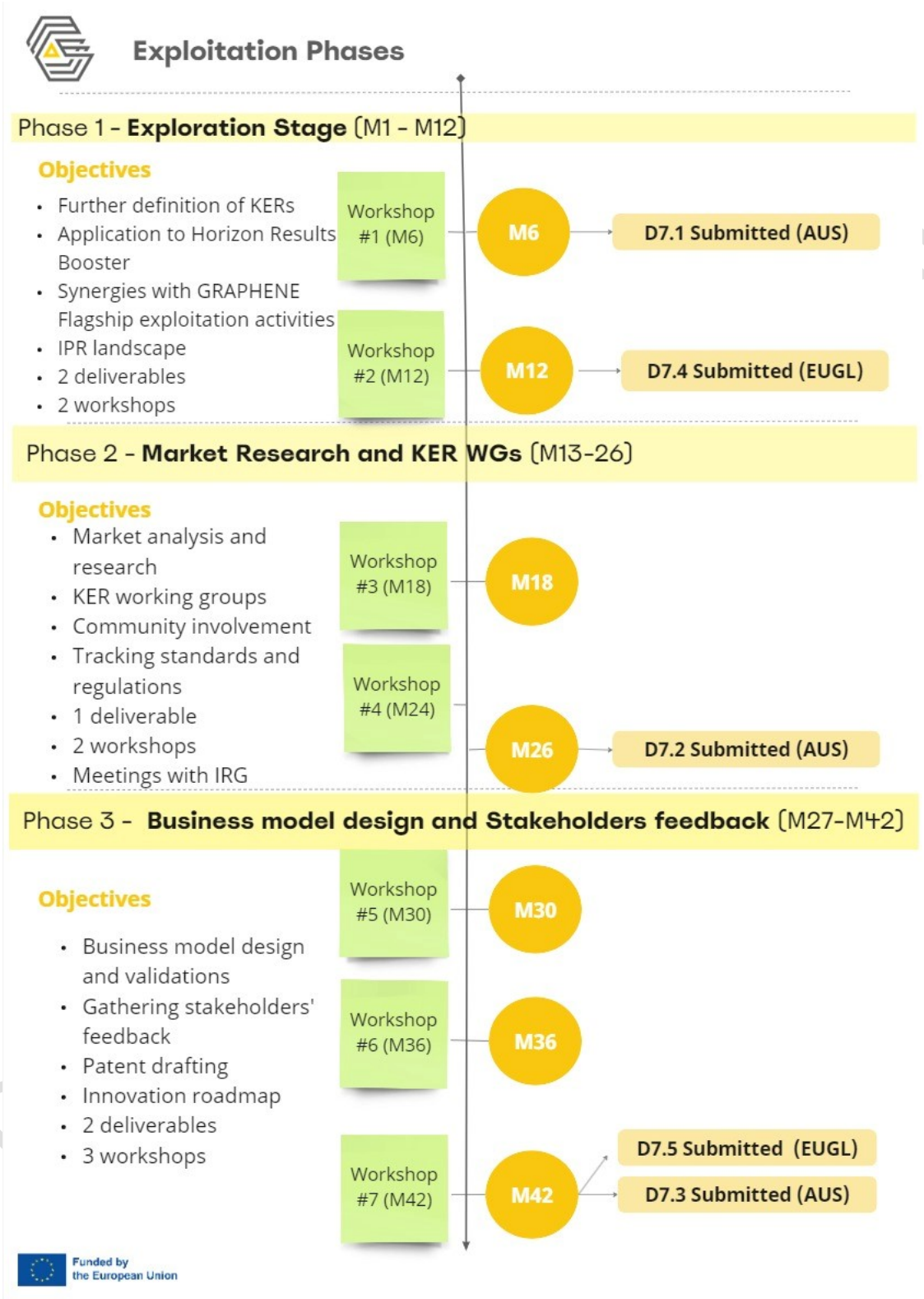

Figure 14 Phases for the Initial Exploitation Plan

PHASE 1 – Exploration Stage (M1-M12) | (October 2023 – September 2024)

The first stage covers mainly M1-M12, and its objective is laying the foundation of the exploitation strategy, by defining the objectives, the methodology and by specifying the key exploitable results (KER) to be invested.

From M1 to M5, the initial approach for exploitation and market analysis presented in the project's Grant Agreement will be reviewed to establish the starting point for the exploitation strategy definition. This will be followed by the definition of the methodological approach for the exploitation activities. In M6, the milestone is the submission of this deliverable (D7.1 D&C&E First version) defining the initial plan for the project's exploitation.

Also, in this phase, one of the first objectives is to map and deepen the understanding regarding all partners', including both RTOs and SMEs, individual motivation, and objectives for their participation in GRAPHERGIA, and especially their individual aspirations for the exploitation of the project's key exploitable results (KER). This will be analysed in internal exploitation meetings, and the initial approach for the KERs is described in this report, in Section 4.3.

From M6 onwards, the internal exploitation meetings will take the form of workshops, allowing partners to also share their interests in reaching specific stakeholders through the exploitation activities. These efforts will result in the elaboration of well-defined and prioritized exploitation pathways for each identified key exploitable result for further research, commercialisation, education and training, policy contribution, etc. Also, this continuous engagement with all partners allows to update and adjust the definition of GRAPHERGIA KER set, to build business cases, and to follow-up the standards and regulations that should be considered for the exploitation plan. AUS will run these exploitation workshops on a regular basis, taking place every six months.

The specific workshop topics and focus will be further developed as the project progresses, but this is an initial plan for these:

- Development of the KER exploitation plans (several editions in the different phases)
- Business case development
- Business model design and validations
- Market analysis research and validations
- Identification of relevant standards and regulations
- Feedback on the established plans from the target stakeholders

To support the exploitation plan activities and to make sure that this plan exploits all possible potential of the project results, GRAPHERGIA will apply in the Horizon Results Booster[15]

[15] www.horizonresultsbooster.eu/apply

programme with the objective to improve the exploitation plan, when necessary, and to obtain experts' advice on the development of the business models.

From the very start, the task 7.2 "the Exploitation Plan and Sustainability" will be linked to task 7.3 "IPR management". This task oversees providing partners IPR training in three seminars, which will be a complementary activity to the T7.3 workshops.

Also, the Graphene Flagship community will be engaged in this phase to find synergies in the implementation of the exploitation strategies, for example by organising joint exploitation workshops or by participating in joint events to exhibit the innovation for industrial and academic stakeholders. Within the Graphene Flagship ecosystem, 13 new graphene-related innovation and research projects will develop their own exploitation strategies and Working Group (WG) on Dissemination will follow-up the possibility of establishing synergies in this framework.

The deliverable D7.4 IPR Management and exploitation, managed by EUGL, is due at the end of this phase, in month 12.

PHASE 2: Market Research related to the GRAPHERGIA Solution and KER Working Groups (M13-26) | (October 2024 – November 2025)

In this phase, a comprehensive Market and Domain research will be conducted to gather and analyse data about the GRAPHERGIA solution. This research will include a market analysis definition, which involves analysing market trends, customer needs, competitors, and potential opportunities. The findings from this research will be used to inform the development and positioning of the GRAPHERGIA solution in the market. The market analysis task will undergo an iterative validation process, where the results will be processed and validated with the relevant project partners.

A benchmarking analysis of the competitors, focused on the functionalities of the GRAPHERGIA solution, will be conducted to assess their advantages and disadvantages. This will be followed by a SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats) to further evaluate the solution's market positioning.

In parallel, in this phase, as the scientific research, the technical development, and the demonstrations of the GRAPHERGIA system are running in a stable manner, the further development of the KER exploitation strategies will continue. AUS will manage the creation of a dedicated working group for each KER, that will be investigating the potential channels for further commercialization, marketing, and scientific exploitation. These working groups will gather in regular workshops (established from M6 onwards) at least every six months to continue planning the exploitation in an agile manner.

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Moreover, all activities starting during the phase 1 will be monitored and continued, when relevant throughout the phase 2, especially, the synergies established within the Graphene Flagship community will continue to be built and exploited as well as follow up of relevant standards, regulations, and the IPR management, identifying opportunities for exploitation GRAPHERGIA IP assets.

Also, the consortium will meet with the Industrial Reference Group (see Section 2.1.2) to present the first milestones from the exploitation activities, and more importantly, to obtain their feedback and guidance for the next steps in the exploitation and commercialisation plans of the GRAPHERGIA results.

The results of this phase will be detailed in the next iteration of this report, deliverable D7.2 (due in M26).

PHASE 3: Business model design and Stakeholders feedback (M27-M42) | (December 2025 – March 2027)

During the GRAPHERGIA business models design stage, spanning from M27 to M33, we will start by developing business cases for the GRAPHERGIA solution, helping to understand which challenges on the market need a new solution. Once the business cases are established, diverse business model options will be developed for the innovation results of the GRAPHERGIA system. Then, from M33 to M36, workshops and iterative validation processes will be carried out to define the pricing strategy, revenue streams, sales channels, and go-to-market approach for the complete solution.

In this phase, we will also gather feedback from the relevant stakeholders, including the industry experts' group, about the established exploitation plans and business models to ensure that the expectations and needs of the different target groups in the target market are well considered. Especially, the Graphene flagship community will be an essential arena for gathering the feedback (using for instance, workshops, interviews, or questionnaires).

From M36 to M42, efforts will also be directed towards the development of an Innovation Roadmap which will identify new functionalities for the GRAPHERGIA solution, taking a forward-looking approach to innovation. This will serve as a radar to identify potential areas for growth, ensuring that the business models are future-proof and aligned with market demands and technological advancements. The innovation roadmap, to be presented as a section in D7.3, will also include the key findings from the task 7.3 IPR management.

Also, activities launched under Phase 1 and 2 will be pursued and the results will be monitored. The results will be detailed in the final iteration of this report, deliverable D7.3 (due in M42).

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5 CONCLUSIONS

Communication, dissemination, and exploitation in Horizon Europe projects are structured to ensure that projects have an impact beyond the mere research outcome. To this end, GRAPHERGIA has developed the master plan for dissemination, communication, and exploitation, which outlines the most important and critical elements related to these three strategies, that must be considered throughout the entire project lifetime. The current document is expected to act as a point of reference for current and foreseen communication, dissemination, and exploitation activities while all mentioned activities will be continuously monitored and updated throughout the project lifetime.

Regarding communication and dissemination, GRAPHERGIA spread the project results, in its different phases, to the right audiences at the right time to demonstrate the ways in which research and innovation are contributing to a European 'Innovation Union'. Communication activities will show our multidisciplinary European consortium achievements in scientific excellence and contribution to competitiveness. In addition, the plan has been made keeping in mind the multidisciplinary nature of our consortium members, which allows them to reach very different and well targeted segments of the identified stakeholders. Some channels have been chosen to accomplish a wider visibility and boost the project through the most meaningful marketing tools, including social networks, events, external media, papers, conferences, or email marketing.

At the same time, public relations campaigns have been planned to keep all related stakeholders updated on GRAPHERGIA's progress and results. All these actions must be done under the designed corporate image and by spreading the right messages, so that every communication released to the audience is coherent with the scope of the whole project. To ensure that all these procedures are carried out properly, a system of metrics has been designed to measure the obtained results and compare them with the previously set objectives.

Regarding exploitation, GRAPHERGIA's consortium will continuously monitor and evaluate project's outcomes, examine possible exploitation routes, and identify the most prominent exploitation pathway for each individual asset. Various possible routes, such as individual and/or joint exploitation, scientific vs commercial exploitation etc. will be examined to define the optimum way to go forward and generate impact in a sustainable manner, beyond the project's duration. Moreover, proactive IPR management of the project's research results ensure that these are valued and preserved in the most appropriate manner, enabling event to generate revenue to the concerned partners after the project's lifetime.

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ANNEX 1 - THE SET OF FIRST COMMUNICATION TOOLS

GRAPHERGIA Website (https://graphergia.eu/) is running since December 2023. It contains six different pages dedicated to the project presentation, consortium, demo, activities and community.

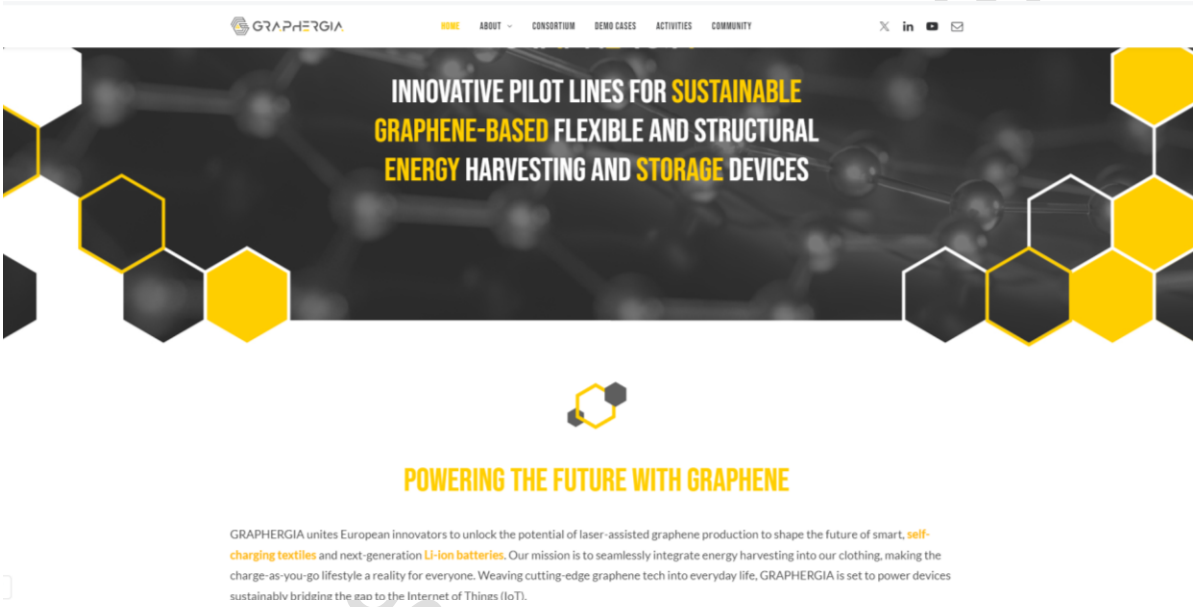

Figure 15 GRAPHERGIA Website Home-page.

The first set of articles is published under the "Activities"-page on the website.

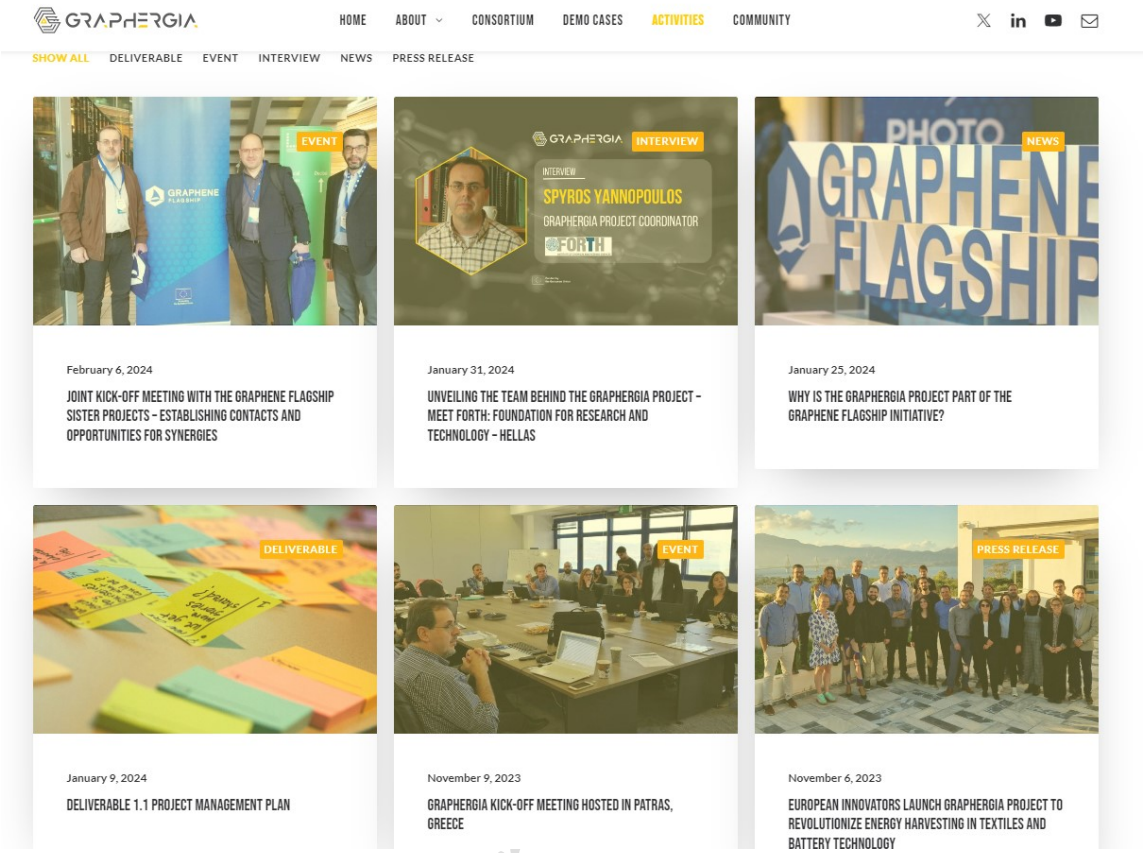

Figure 16 Published articles on the project website

The GRAPHERGIA LinkedIn page is up and running since November 2023, and in less than three months it has gained 597 followers. New posts are shared in this channel three times a week.

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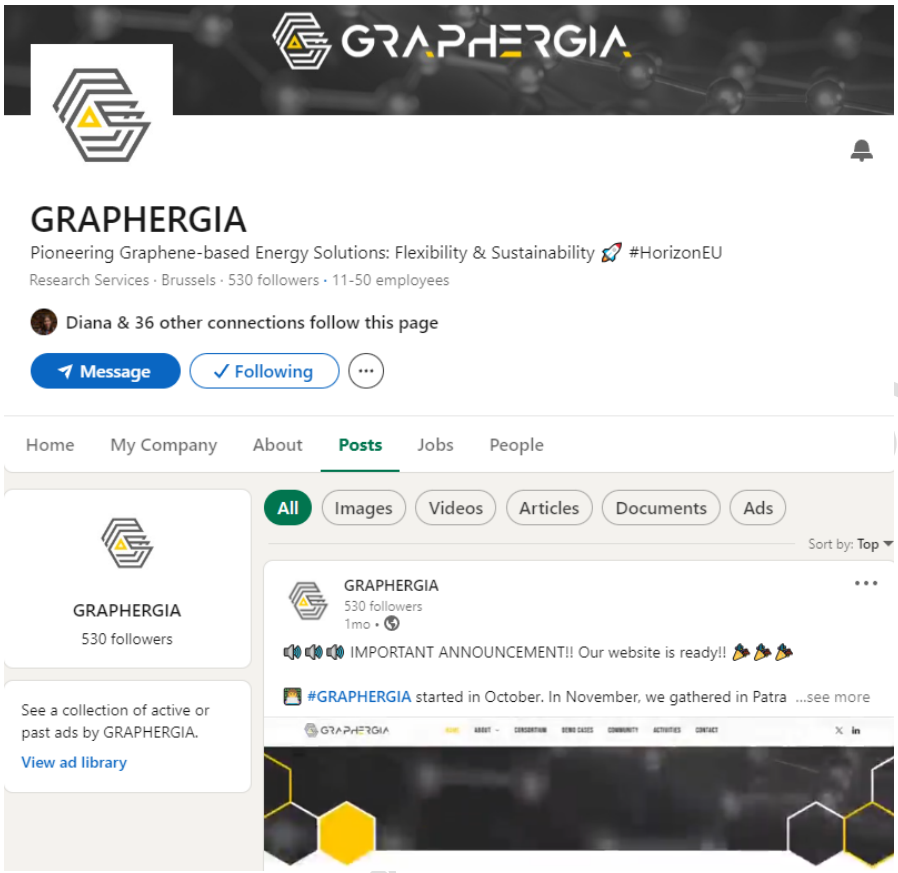


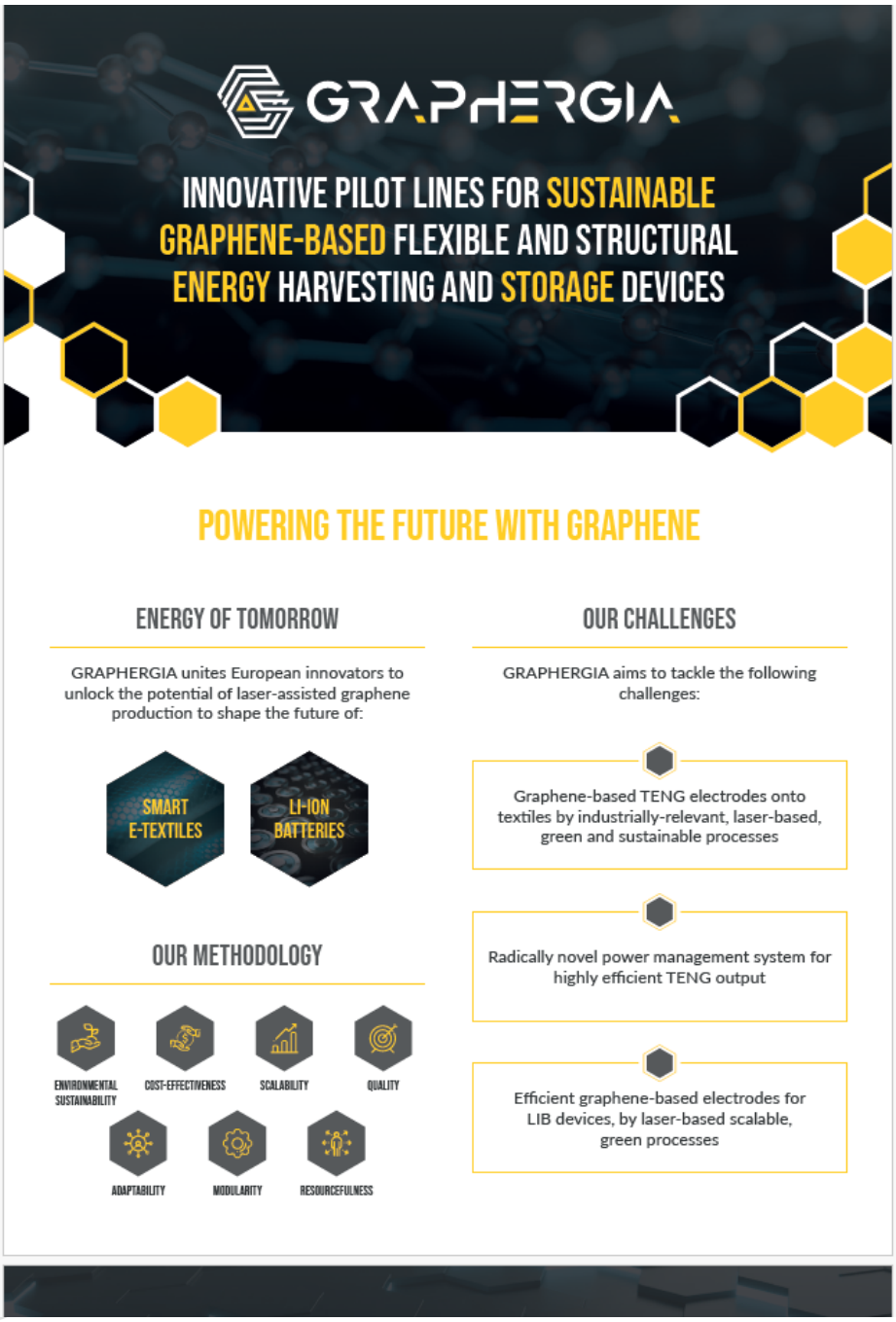
Figure 17 GRAPHERGIA LinkedIn Page

The second social media channel is X where the project is present since November 2023. Via X, the project has 113 followers at the moment of writing this report. We share new posts in this channel three times a week.

Figure 18 GRAPHERGIA's Page on X

The **GRAPHERGIA one-pager** resumes the project's key objectives and actions. It can be used for engaging with stakeholders in meetings, events, and in other one-to-one communications. The flyer can be downloaded in open access via Zenodo[16].

[16] https://zenodo.org/records/10683332



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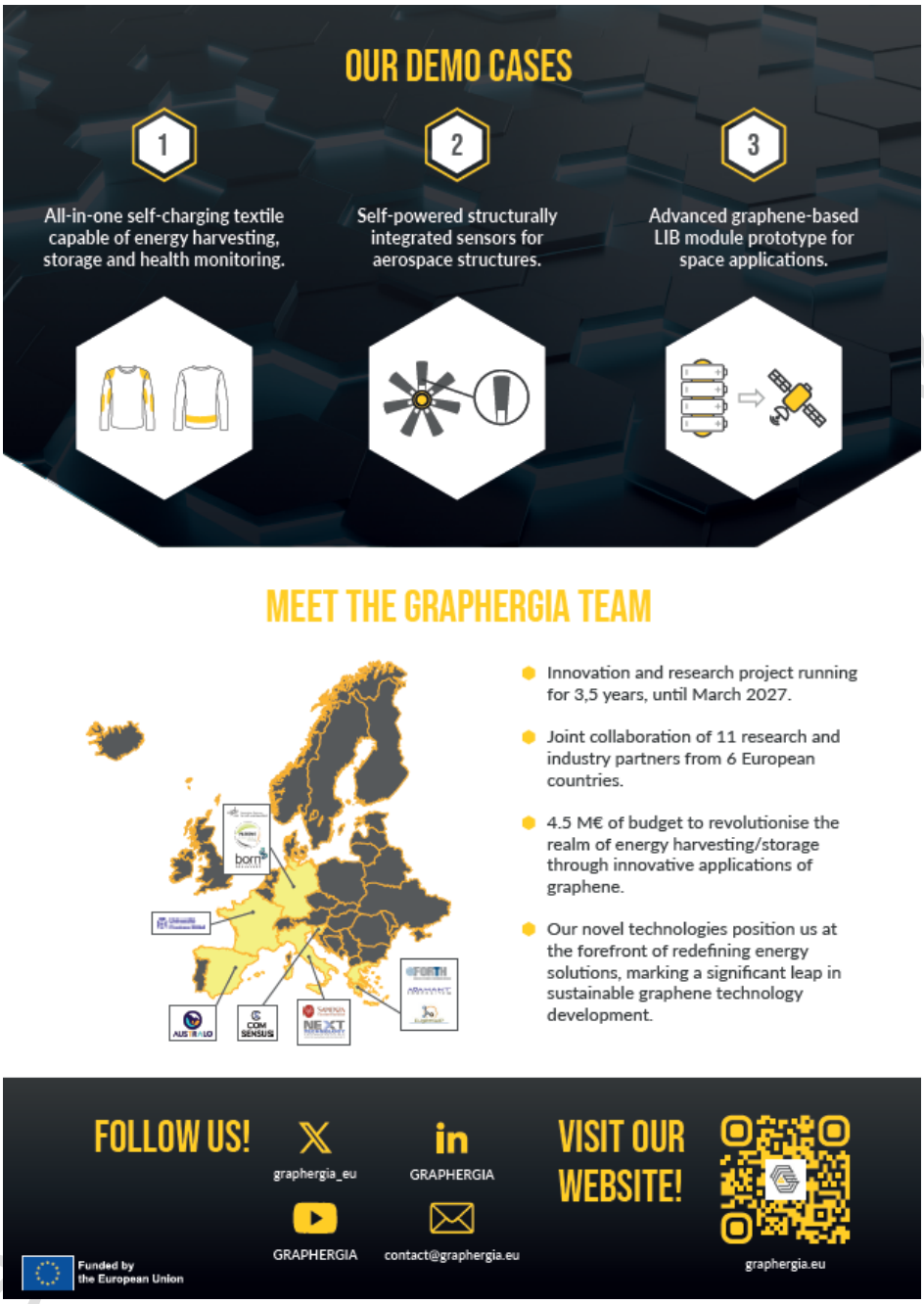

Figure 19 GRAPHERGIA One-Pager

ANNEX 2 – STAKEHOLDER LISTING

	A	B
1	Name (Project / organisation	Country
2	The European Technology Platform for the Future of Textiles and Clothing	EU
3	GRAPHENE Flagship	EU
4		
5	Smart Textile Alliance	UK
6	Smarttex network	Germany
7	Battery 2030+	Sweden
8	European Battery Alliance	EU
9	AITEX	Spain
10	ADRESYS	AUSTRIA
11	AEI Textils	Portugal
12	A.I.U.F.F.A.S.S. Association Internationale des Utilisateurs de Fils de Filaments Artificiels et Synthétiques et de Soie naturelle	France
13	Albini Group	Italy
14	Ateval	Spain
15	ATOK	Czech Republ
16	ATP	Portugal
17	Ave valley Smart Hub	Portugal
18	BekaertDeslee Belgium	Belgium
19	First Graphene Ltd	UK
20	Nanogafi	Estonia
21	ITP GmbH - Society for Intelligent Textile Products	Germany
22	Leipniz Institute of Photonic Technology (IPHT)	Germany
23	AiQ Smart Clothing Inc.	Taiwan
24	STATSports	UK
25	Royal College of Art	UK
26	EURATEX	EU
27	Ami2023 Advanced Materials Initiative	EU
28	INL- International Iberian Nanotechnology Laboratory	Spain
29	Tech-Fab Europe	EU
30	Graphene Innovation Investment Fund	US
31	Graphene Investments	France
32	Department of Materials at The University of Manchester	UK
33	Leoch Battery Global	US
34	Graphenea	Spain
35	NanoScientifica Scandinavia	Sweden
36	Nanobioelectronics & Biosensors group lead by Prof. Arben Merkoçi, at ICN2	
37	Polymat	EU / Spain
38	Correlated Quantum Materials (CQM), Aalto University	Finland
39	ARCGrapheneHub	Australia
40	NanoEngineering Cambridge University Engineering Department	UK
41	Kavli Institute of Nanoscience in Delft	Netherlands

Figure 20 Example of the GRAPHERGIA stakeholders listing

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