

D1.12 1. Awareness and wider societal implications

WP1 - Management – MGT



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List of abbreviations

FLAPEP – Flexible large-area printed electronics and photonics

KBest – Knowledge and Best practice

RTO – Research & technological organisation

SME – Small-medium enterprise

TA – Transnational access

TLO – Technology Liaison Officer

UNOVA - Uninova - Instituto Desenvolvimento de Novas Tecnologias

WP – Workpackage

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1. Executive summary

Deliverable **D1.12 – Awareness and wider societal implications (M24)**, under the scope of Work Package 1 (WP1) – Management, provides details on the exploration strategies and activities implemented to raise awareness about the project among stakeholders and the general public. Additionally, the report emphasises the societal relevance of the project's outcomes, highlighting potential positive impacts. The findings presented in this report will serve as a guiding framework for future efforts, ensuring the maximisation of the project's positive influence on society.

2. Fostering synergistic collaboration for advancing FLAPEP

The action activities planned in the EMERGE project rely on a synergistic interaction among clusters of European organisations, focusing on establishing new flexible large-area printed electronics and photonics (FLAPEP) communities. By offering unique and advanced research infrastructure services, EMERGE aims to benefit the industry by exchanging ideas, materials, and technologies. Thus, EMERGE fosters a fertile culture of interchangeable technical and scientific expertise to be shared and transferred between and beyond its consortium members, emphasising close-to-market prototype development.

In summary, EMERGE is expected to contribute with a positive impact in:

- Enabling researchers to access the best research infrastructures more conveniently and efficiently, regardless of their location;
- Making new or more advanced research infrastructure services available to a wider user community, fostering leading-edge and multidisciplinary research;
- Promoting synergies and complementary capabilities among operators of related infrastructures, leading to improved and harmonised services;
- Facilitating innovation in the domain of green FLAPEP technologies through robust partnerships between research infrastructures and industry;
- Empowering a new generation of researchers, well-equipped to leverage essential tools for their research endeavours;
- Integrating major scientific equipment or sets of instruments and knowledge-based resources leads to better management of the continuous flow of data collected or produced by these facilities and resources.

The EMERGE project defined a strategic plan to attract and inspire stakeholders from academia, research & technological organisations (RTOs), small-medium enterprises (SMEs), and industry to achieve its goals. These target groups are the focus of the project's dissemination and communication activities, encouraging them to apply for free-of-charge access opportunities to the research infrastructures within EMERGE. This report provides an analysis of how external users engaged with the project and the open calls. This topic will be addressed in **section 3**.

Also, in line with EMERGE strategy, the FLAPEP Knowledge and Best Practice (KBest) repository will be an additional and unique helpful tool for efficient knowledge transfer among the researchers through an adequate open-data access policy. The KBest platform is currently under construction, and the first tests with transnational access (TA) participants are predicted to start during the upcoming open calls.

To ensure optimised service provision, scientific excellence and potential of innovation, the proposals submitted by the research community on the online portal during the open calls are evaluated for technical feasibility and the quality of their workplans. The selection process follows well-defined eligibility and ranking criteria, adjusted according to the abundance of projects submitted. Within the EMERGE consortium, the technology liaison officers (TLOs) assume a key role in these activities, as they are responsible for the efficient management of the facilities in collaboration with UNOVA (UNOVA – *Instituto de Desenvolvimento de Novas Tecnologias* - UNINOVA) management team, as well as the expertise and skills available across the consortium. They are also dedicated to user consultancy, local desk-service, technical support and processing of proposals, and coordinate actions in standard metrology and protocols.

By fostering collaboration and knowledge exchange between researchers and operators of related infrastructures, EMERGE enables researchers to exploit the required tools to conduct their project ideas, regardless of the location, and acquire complementary capabilities and develop multidisciplinary skills in the field of FLAPEP through proper training, and create robust and long-lasting collaborations between users and operators of related infrastructures. This approach benefits highly skilled research groups and supports and empowers a broader and newer community of users from all regions of Europe, including those with limited expertise, lack of resources, or restricted access to open-access infrastructures or large-scale facilities to develop their projects.

By the end of EMERGE project, proper platforms and hubs will be established, facilitating the development of industrially compatible fabrication processes for feasible, reliable and high-quality flexible, sustainable integrated systems, and suitable simulation tools using machine learning will be made available to a wide range of user community to model devices and systems on foils accurately.

This combination of efforts is expected to be more advantageous and competitive in comparison to individual national projects and localised infrastructures as they will lead to a coordinated increase of innovation capacity and expertise on FLAPEP. EMERGE will push symbiotic, innovative, and highly interconnected clusters in Europe to the front line of development. All these activities will help create new market opportunities, stimulate entrepreneurship, and strengthen the competitiveness and growth of European businesses by shortening the innovation loop and speeding up the translation of value-added ideas into innovative products in the market based on FLAPEP materials and technologies. Furthermore, EMERGE's efforts will foster the success and profitability of existing and newly established companies within its network.

Overall, EMERGE's collaborative approach holds immense potential to shape the future of FLAPEP, strengthening Europe's position as a global leader in this field.

3. Enhancing user engagement and streamlining access to FLAPEP innovations

The impact of EMERGE on creating a user community based on FLAPEP can be fairly discussed based on the data collected from the EMERGE website and LinkedIn's back-office database. The website provides irrelevant information for potential users. Besides the presentation of the project objectives, consortium, and available infrastructures, the applicants can find guidelines for the preparation of proposal and submission platform where the users can make their applications to conduct short-term projects in the infrastructure offered by the consortium. Until M24, four calls were launched in the past, and the 5th open call for submissions is open until mid-September 2023.

As the EMERGE project progresses, website engagement has seen a remarkable increase. From the launch of the website in March 2022 to the end of June 2023, there have been an impressive 17,583 unique visitors and a total of 27,217 pages. We have received over 135 subscriptions, showing their interest in the EMERGE project.

The second relevant online presence of the project is the EMERGE project LinkedIn (<https://www.linkedin.com/company/emerger-infrastructure/>). LinkedIn has been one of the main tools to raise awareness of the project, namely posting regular news of upcoming calls, projects publications, success histories of past users, and events, and directing potential users to the website where the submission is processed. At the moment, EMERGE LinkedIn has over 370 followers spread across five continents, with 587 unique visits and 1,723 page views. This notable engagement on both platforms reflects the project’s growing visibility and impact within the community.

The largest share of the subscribers (approximately 70%) work in research organisations, academia, semiconductors, nanotechnology, fabrication of electronic devices, and biotechnology, which matches the project’s premises and target. Therefore, it is possible to conclude that the relevant stakeholders are being reached using this platform.

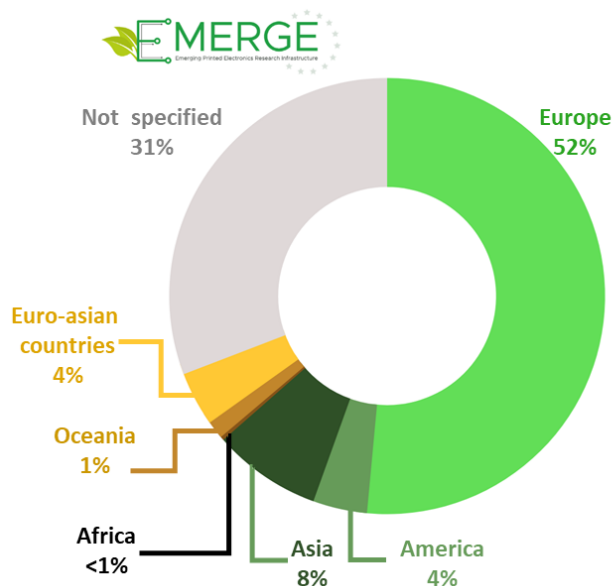


Figure 1 - EMERGE: geographical distribution of the LinkedIn subscribers (August 2023).

During registration, the applicants identify how they become aware of the EMERGE opportunities. Several effective means have been identified for attracting our target audience, with word of mouth (37.7%), direct contact with access providers (27.1%), conferences (14.1%), and social media (14.1%), and proving to be particularly successful strategies in engaging the user community.

The website (6%) has shown to be the least effective means in terms of engagement. This insight highlights the importance of investing in improving EMERGE’s online presence and user experience, as doing so is likely to yield better results. By enhancing our website and making it more user-friendly and engaging, we can better connect with our target audience

and increase our overall impact. Although the EMERGE website is fully functional, ongoing efforts are dedicated to optimising its user experience. The website will be enhanced with an aesthetic, clean, intuitive, and user-friendly design. Additionally, it will offer more comprehensive information about the services provided by EMERGE collaborating institutions, promotions, project outcomes, and press releases highlighting updates from the user community.

Besides, as the number of proposals submitted increases, moving to a fully online service is paramount. All stages of TA access to EMERGE infrastructure, from submission to completion of the granted TA projects, are performed through the website to streamline the process of accessing EMERGE infrastructures. This shift will significantly reduce the workload of the TLOs, Selection Committee board members, and management.

The improvement of the website's services and accessibility will attract a broader and more engaged target audience, with the ultimate goal of leading to a simplified process of TA access to EMERGE infrastructures, with the ultimate goal of establishing closer partnerships between the experts from consortium members and stakeholders. This will foster knowledge exchange on technologies of interest within the scope of FLAPEP, promoting a robust and collaborative user community.

4. EMERGE call: analysis of the applicants

Four open calls were organised (completed process, the 5th call is currently ongoing and is not considered for the current document since the process is not closed.), resulting in an impressive submission of 63 projects. The collaborative efforts of 11 European partners have brought together a vibrant community of 85 participants (40% female) from 26 nationalities (61% with EU nationality). This multicultural and multidisciplinary approach has fueled invaluable knowledge exchange and fostered a dynamic environment within the EMERGE project.

Table 1 provides an in-depth analysis of the gender balance among external users of EMERGE at month M24, based on data collected from the four open calls. The table illustrates the distribution of participants by gender at all stages of implementation for TA access proposals (submission, granted, and implemented). Notably, the global female presence in submitted, granted, and completed TA projects is about 41.4, 41.0, and 45.2%, respectively. The global success rate appears reasonably balanced by gender.

Table 1. Gender data status at M24 of users and proposals submitted for TA access to the EMERGE infrastructure (source: data collected directly from the database of the website's back office).

Call	Nº of proposals	Nº of participants	Female	Male
Submitted projects for TA access				
1	7	9	3 (33.3%)	6 (66.7%)
2	10	13	8 (61.5%)	5 (31.5%)
3	17	24	8 (33.3%)	16 (66.7%)
4	29	48	19 (39.6%)	29 (60.4%)
Total of participants			34 (40.0%)	51 (60.0%)
Granted projects for TA access				
1	5 (approval rate: 71.4%)	7	2 (28.6%)	5 (71.4%)
2	8 (approval rate: 80%)	10	7 (70.0%)	3 (30.0%)
3	17 (approval rate: 100%)	24	8 (33.3%)	16 (66.7%)
4	29 (under evaluation)	-	-	-
Total of participants			16 (41.0%)	23 (59.0%)
Concluded projects for TA access				
1	5 (completion rate: 100%)	7	2 (28.6%)	5 (71.4%)
2	7 (completion rate: 87.5%)	9	7 (77.8%)	2 (22.2%)
3	12 (completion rate: 70.6%, 1 project cancelled *)	17	11 (64.7%)	6 (35.3%)
4	0 (completion rate: not applicable)	-	-	-
Total of participants			14 (45.2%)	17 (54.8%)

* Project not included in the gender statistics of the completed projects.

EMERGE calls in numbers

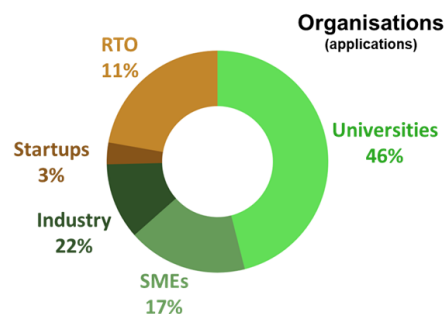
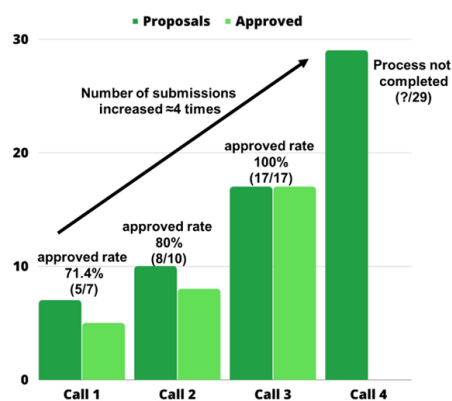
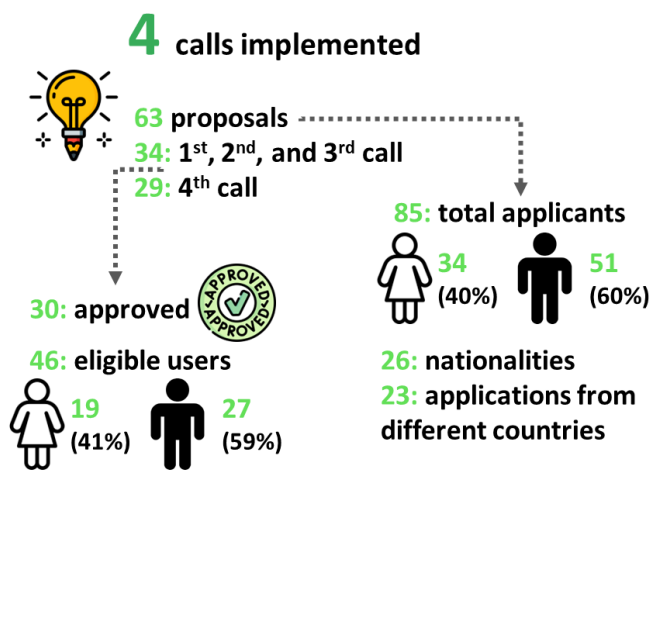


Figure 2 – EMERGE open call summary: number of projects, applicants, and organisations.

The strong interest and involvement of research institutions in the EU is evident, with 43 projects (68%) submitted by participants working in institutes located in EU countries. (<https://emerge-infrastructure.eu/pushing-the-frontiers-of-flexible-large-area-electronics-and-photonics-technologies/>). Equally remarkable is the fruitful contribution of 20 projects from industry, start-ups, and small-medium enterprises, ensuring that the projects developed under EMERGE are both relevant and applicable in real-world contexts.

One of the project's key highlights is the exceptional quality and relevance of the submitted proposals. An impressive 88% of the 34 projects submitted during the first three open calls have been approved for further development. The projects submitted during the fourth call are undergoing evaluation, promising additional exciting outcomes.

The approved projects have already generated valuable insights and tangible outcomes, with 24 of them successfully completed at EMERGE institutions, leading to the publication of two [research papers](#) and the receipt of 1 prestigious [award](#), validating the impact of EMERGE project.

As the EMERGE project progresses, it is poised to make even greater contributions to the European innovation ecosystem and play a pivotal role in shaping the future of green FLAPEP technologies.

5. Gender equality in the consortium

Gender equality is a paramount priority within the EMERGE project partnership, with a firm commitment to ensuring equal participation at all levels, including decision-making bodies, expert groups, managerial positions, the user community, and participants of events, schools, and workshops. The project aligns with Article 33 on "Gender Equality", particularly emphasising Article 33.1's obligation to aim for gender equality.

To effectively assess gender balance, the UNOVA management team has continuously collected and analysed detailed gender statistics. This data is obtained from the personal data stored in the database of the website's back-office and the regularly updated contact list of the consortium members. The objective is to identify any existing barriers that may affect the adoption of this research by individuals of different genders.

Looking into the data presented in **Table 2**, EMERGE consortium maintains a close to 50% gender balance, reflecting equitable representation of female and male personnel. The EMERGE consortium is committed to continually promoting gender equality, ensuring that

efforts are made to uphold gender balance whenever staff positions are renewed, or new members are hired.

Table 2. Gender data status at M24 in EMERGE institutions.

Institute	Nº of female researchers	Nº of male researchers	Nº of females in the workforce other than researchers	Nº of males in the workforce other than researchers	Total nº of females in the workforce	Total nº of males in the workforce
UNOVA	8	6	3	4	11 (52.3%)	10 (47.7%)
HMU	3	6	0	0	3 (33.3%)	6 (66.7%)
WUT	0	2	5	1	5 (62.5%)	3 (37.5%)
FZJ	0	4	2	0	2 (33.3%)	4 (66.7%)
ICN2	0	2	1	0	1 (33.3%)	2 (66.7%)
JOR	6	9	4	1	10 (50.0%)	10 (50.0%)
MCL	2	3	0	0	2 (40.0%)	3 (60.0%)
TUD	1	6	0	1	1 (12.5%)	7 (87.5%)
ALMA	2	1	2	0	4 (80%)	1 (20%)
CERTH	0	1	2	1	2 (50%)	2 (50%)
RISE	3	6	3	3	6 (40%)	9 (60%)
Overall	25	46	22	11	47 (45%)	57 (55%)

6. Final remarks

The present report highlights EMERGE's successful strategies in raising awareness about FLAPEP and showcasing its positive societal impacts. The project has fostered valuable collaborations and provided advanced research infrastructure, specifically promoting green FLAPEP technologies. Stakeholder engagement has been achieved by offering free access to research infrastructures, targeting academia, SMEs, and industry. Throughout the project's implementation, EMERGE has monitored and prioritised gender equality.

EMERGE's user engagement has been strengthened by implementing a functional website and a streamlined process for accessing FLAPEP innovations. These efforts have yielded promising results, with significant website engagement and a growing user community.

As EMERGE progresses, it aims to establish industrially compatible fabrication processes and drive the development of sustainable integrated systems. These endeavours contribute to EMERGE's overall commitment to sustainable and innovative research in the field of FLAPEP. By focusing on collaboration, innovation, and sustainability, EMERGE is set to leave a lasting impact on the FLAPEP field and contribute to Europe's position as a leader in this domain.